OIL INDIA LIMITED
(A Government of India Enterprises)
PO : Duliajan – 786602
Assam (India)

TELEPHONE NO. (91-374) 2808719
FAX NO: (91-374) 2800533
Email: ranjanbarman@oilindia.in; erp_mm@oilindia.in

FORWARDING LETTER

Tender No. : **SDI1282P20 DT: 29.04.2019**

Tender Fee : **NIL**

Bid Security : **Applicable**

Bidding Type : **SINGLE STAGE TWO BID SYSTEM**

Bid Closing on : **27.06.2019 (11.00 HRS IST)**

Bid Opening on : **27.06.2019 (14.00 HRS IST)**

Performance Security : **Applicable**

Integrity Pact : **Applicable**

The complete bid documents and details for purchasing bid documents, participation in e-tenders are available on OIL's e-procurement portal https://etender.srm.oilindia.in/irj/portal as well as OIL's website https://www.oil-india.com/

NOTE: All addenda, Corrigenda, time extension etc. to the tenders will be hosted on above website and e-portal only. Bidders should regularly visit above website and e-portal to keep themselves updated.

The items covered by this enquiry shall be used by Oil India Limited in the PEL/ML areas which are issued/renewed after 01/04/99 and hence concessional rate of GST @5% against Essentiality Certificate for invoice value 1 Lakh and above will be applicable as per Notification No. 3/2017- Integrated/ Central Tax (Rate) dated 28th June, 2017.

In the event of order, OIL will issue Essentiality Certificate (EC), where concessional rate of GST @5% will be applicable. Supplier shall affect dispatch only on receipt of this certificate from OIL, failing which all related liabilities shall be to Supplier's account.

OIL invites Bids for **SUPPLY OF HORIZONTAL GAS – OIL SEPERATOR** through its e-Procurement site under **SINGLE STAGE TWO BID SYSTEM**. The bidding documents and other terms and conditions are available at Booklet No. MM/LOCAL/E-01/2005 for E-Procurement of Indigenous Tenders. The prescribed Bid Forms for submission of bids are available in the Technical RFx -> External Area - > Tender Documents

The general details of tender can be viewed by opening the RFx [Tender] under RFx and Auctions. The details of items tendered can be found in the Item Data and details uploaded under Technical RFX.

The tender will be governed by:

a) For technical support on various matters viz. Online registration of vendors, Resetting of Passwords, submission of online bids etc, vendors should contact OIL's ERP MM Deptt at following: Tel Nos = 0374-2807178, 0374-2807171 , 0374-2807192. Email id = erp_mm@oilindia.in; esupport@oilindia.in.

b) OIL's office timings are as below:

	Time (in IST)
Monday – Friday	**07.00 AM to 11.00 AM; 12.30 PM to 03.30 PM**
Saturday	**07.00 AM to 11.00 AM**
Sunday and Holidays	**Closed**

Vendors should contact OIL officials at above timings only.

OIL Bank Details :

	Bank Details of Beneficiary	
a	Bank Name	STATE BANK OF INDIA
b	Branch Name	Duliajan
c	Branch Address	Duliajan, Dist-Dibrugarh
d	Banker Account No.	10494832599
e	Type of Account	Current Account
f	IFSC Code	SBIN0002053
g	MICR Code	786002302
h	SWIFT Code	SBININBB479
i	Contact No.	9435554859
j	Contact Person Name	Mr. K.L.K.Banik, AGM
k	Fax No.	0374-2802729
l	Email Id	sbi.02053@sbi.co.in

c) "General Terms & Conditions" for e-Procurement as per Booklet No. MM/LOCAL/E-01/2005 for E-Procurement of Indigenous Tenders.

d) Technical specifications and Quantity as per **Annexure – 1A**.

e) The prescribed Bid Forms for submission of bids are available in the Technical RFx -> External Area - > Tender Documents.

f) Amendments to the NIT after its issue will be published on OIL's website only. Revision, clarification, addendum, corrigendum, time extension etc. to the tender will be hosted on OIL website only. No separate notification shall be issued in the press. Prospective bidders are requested to visit website regularly to keep themselves updated.

g) Any sum of money due and payable to the contractor (including Security Deposit refundable to them) under this or any other contract may be appropriated by Oil India Limited and set-off against any claim of Oil India Limited (or such other person or persons contracting through Oil India Limited) for payment of sum of money arising out of this contract or under any other contract made by the contractor with Oil India Limited (or such other person or persons contracting through Oil India Limited).

h) Bidder are advised to fill up the Technical bid check list (**Annexure EEE**) and Response sheet (**Annexure FFF**) given in MS excel format in Technical RFx -> External Area - > Tender Documents. The above filled up document to be uploaded in the Technical Attachment. For details please refer "Vendor User Manual" / "NEW INSTRUCTIONS"

Special Notes:

1.0

a) Bidders who do not have E-tender Login ID and Password should complete their online registration at least seven (7) days prior to the scheduled bid closing date and time of the tender. For online registration, Bidder may visit the OIL's E-tender site https://etender.srm.oilindia.in/irj/portal

b) Necessary Login ID & Password will be issued by OIL only after submitting the complete online registration by the Bidder. In the event of late registration/incomplete registration by Bidder, OIL INDIA LIMITED shall not be responsible for late allotment of User ID & Password and request for bid closing date extension on that plea shall not be entertained by Company.

c) MSE Units (Manufacturers/Service Providers only and not their dealers/distributors) who are already registered with District Industry Centers or Khadi & Village Industries Commission or Khadi & Village Industries Board or Coir Board or National Small Industries Corporation or Directorate of Handicrafts & Handloom or any other body specified by Ministry of MSME are exempted from payment of Bid Security (EMD) irrespective of their monetary limit, product category and capacity mentioned in their registration, subject to submission of valid MSE registration certificate issued by appropriate authority.

d) For availing benefits under Public Procurement Policy (Purchase preference), the interested MSE Bidders must ensure that they are the manufacturers of the tendered item(s) and registered with the appropriate authority for the said item(s). Bids without EMD shall be rejected, if the technical offer does not include a valid copy of relevant MSE Certificate issued by appropriate authority specifying the item as per tender. Therefore, it is in the interest of such MSE Vendors to furnish a copy of complete certificate to the concerned tender handling officer of OIL at least seven (7) days prior to the scheduled Bid Closing Date of the tender, seeking clarification/confirmation as to whether their MSE certificate is eligible for EMD exemption or not. Late communication in this regard and request for bid closing date extension on that plea shall not be entertained by Company.

NOTE:
In case of MSE/PSUs/ Govt. Bodies / eligible institutions etc., they must apply to concerned tender handling officer, Materials Department, Oil India Limited, P.O. Duliajan, Assam-786602 for waiver of EMD upto one week prior to the Bid closing date (or as amended in e-portal).

2.0 The tender is invited under SINGLE STAGE-TWO BID SYSTEM. The bidders are required to submit both the "TECHNO-COMMERCIAL UNPRICED BID" and "PRICED BID" through electronic format in the OIL's e-Tender portal within the Bid Closing Date and Time stipulated in the e-Tender.

2.1 Please ensure that Technical Bid / all technical related documents related to the tender are uploaded in the RFx Information > Technical Attachment only**.** The "**TECHNO-COMMERCIAL UNPRICED BID**" shall contain all techno-commercial details **except the prices**. **Please note that no price details should be uploaded in** Technical RFx Response**.**

2.2 The "**PRICE BID**" must contain the price schedule and the bidder's commercial terms and conditions. **For price upload area , please refer** "NEW INSTRUCTIONS" Please refer Annex-BB for price schedule.

2.3 Offer not complying with above submission procedure will be rejected as per Bid Rejection Criteria mentioned in Annexure-CCC.

3.0 Please note that all tender forms and supporting documents are to be submitted through OIL's e-Procurement site only except following documents which are to be submitted manually in sealed envelope super scribed with **Tender no.** and **Due date** to **DGM-Materials, Materials Department, Oil India Limited, Duliajan - 786602, Assam** on or before the Bid Closing Date and Time mentioned in the Tender.

a) **Original Bid Security**
b) **Detailed Catalogue (if any)**
c) **Any other document required to be submitted in original as per tender requirement**

All documents submitted in physical form should be signed on all pages by the authorised signatory of the bidder and to be submitted in Duplicate.

4.0 Benefits to Micro & Small Enterprises (MSEs) as per OIL's Public Procurement Policy for Micro and Small Enterprises (MSEs) shall be given. Bidders are requested to go though ANNEXURE – I of MM/LOCAL/E-01/2005 for E-Procurement of Indigenous Tenders for more details.

5.0 Bidders are requested to examine all instructions, forms, terms and specifications in the bid. Failure to furnish all information required as per the NIT or submission of offers not substantially responsive to the bid in every respect will be at the bidders risk and may result in rejection of its offer without seeking any clarifications.

6.0 Bidders must ensure that their bid is uploaded in the system before the tender closing date and time. Also, they must ensure that above documents which are to be submitted in a sealed envelope are also submitted at the above mentioned address before the bid closing date and time failing which the offer shall be rejected.

7.0 Bid must be submitted electronically only through OIL's e-procurement portal. Bid submitted in any other form will be rejected.

8.0 **SINGLE STAGE TWO BID SYSTEM** shall be followed for this tender and only the PRICED-BIDS of the bidders whose offers are commercially and technically acceptable shall be opened for further evaluation.

9.0 **a) The Integrity Pact is applicable against this tender. Therefore, please submit the Integrity Pact document duly signed along with your quotation as per BRC. OIL shall**

be entering into an Integrity Pact with the bidders as per format enclosed vide Annexure DDD of the tender document. This Integrity Pact proforma has been duly signed digitally by OIL's competent signatory. The proforma has to be submitted by the bidder (along with the technical bid) duly signed (digitally) by the same signatory who signed the bid, i.e., who is duly authorized to sign the bid. Uploading the Integrity Pact with digital signature will be construed that all pages of the Integrity Pact has been signed by the bidder's authorized signatory who sign the Bid. If any bidder refuses to sign Integrity Pact or declines to submit Integrity Pact with the offer, their bid shall be rejected straightway.

b) The name of the OIL's Independent External Monitors at present are as under:

i) SHRI RAJIV MATHUR, IPS (Retd.)
Former Director, IB, Govt. of India,
e-Mail ID : rajivmathur23@gmail.com

ii) SHRI SATYANANDA MISHRA, IAS (Retd.)
Former Chief Information Commissioner &
Ex-Secretary, DOPT, Govt. of India
E-Mail ID : satyanandamishra@hotmail.com

iii) SHRI JAGMOHAN GARG
EX-VIGILANCE COMMISSIONER, CVC
E-mail id: jagmohan.garg@gmail.com

10.0 The tender shall be governed by the Bid Rejection & Bid Evaluation Criteria given in enclosed **Annexure-CCC**. However, if any of the Clauses of the Bid Rejection Criteria / Bid Evaluation Criteria (as per **Annexure-CCC**) contradict the Clauses of the tender and / or "General Terms & Conditions" as per Booklet No. MM/LOCAL/E-01/2005 for E-Procurement of Indigenous Tenders elsewhere, those in the BEC / BRC shall prevail.

11.0 To ascertain the substantial responsiveness of the bid OIL reserves the right to ask the bidder for clarification in respect of clauses covered under BRC also and such clarifications fulfilling the BRC clauses in toto must be received on or before the deadline given by the company, failing which the offer will be summarily rejected.

12.0 Please do refer the User Manual provided on the portal on the procedure How to create Response for submitting offer.

13.0 If Bank Guarantee is submitted towards 'Bid Security', then bidders have to ensure that the Bank Guarantee issuing bank indicate the name and detailed address (including e-mail) of their higher office from where confirmation towards genuineness of the Bank Guarantee can be obtained.

14.0 Bidders are requested to refer to the enclosed **Annexure – BBB** for the Taxes and Duties clauses under GST regime.

15.0 Delivery/collection Instructions in cases where transportation is in OIL's scope:

(i) the suppliers shall be required to deliver the Sundry consignments of weight less than 3 (Three) Tons at the godown/office/collection point of OIL's authorized transporter in various cities.
(ii) consignments weighing more than 3(Three) Tons shall be collected from the supplier's premises/loading points by OIL's authorized transporter.
(iii) the names of OIL's current authorized transporters are:

a) M/s Western Carriers (India) Ltd.
b) M/s DARCL Logistics Limited

Bidder's are requested to note the above delivery/collection instructions while submitting their offers.

16.0 While submitting the offers bidders are requested to refer to the enclosed **Annexure – BB (Price Bid Format and Evaluation Criteria).**

17.0 Bidders should fill-up and submit alongwith their bid an UNDERTAKING towards authenticity of information/documents furnished by them, as per enclosed ANNEXURE-K.

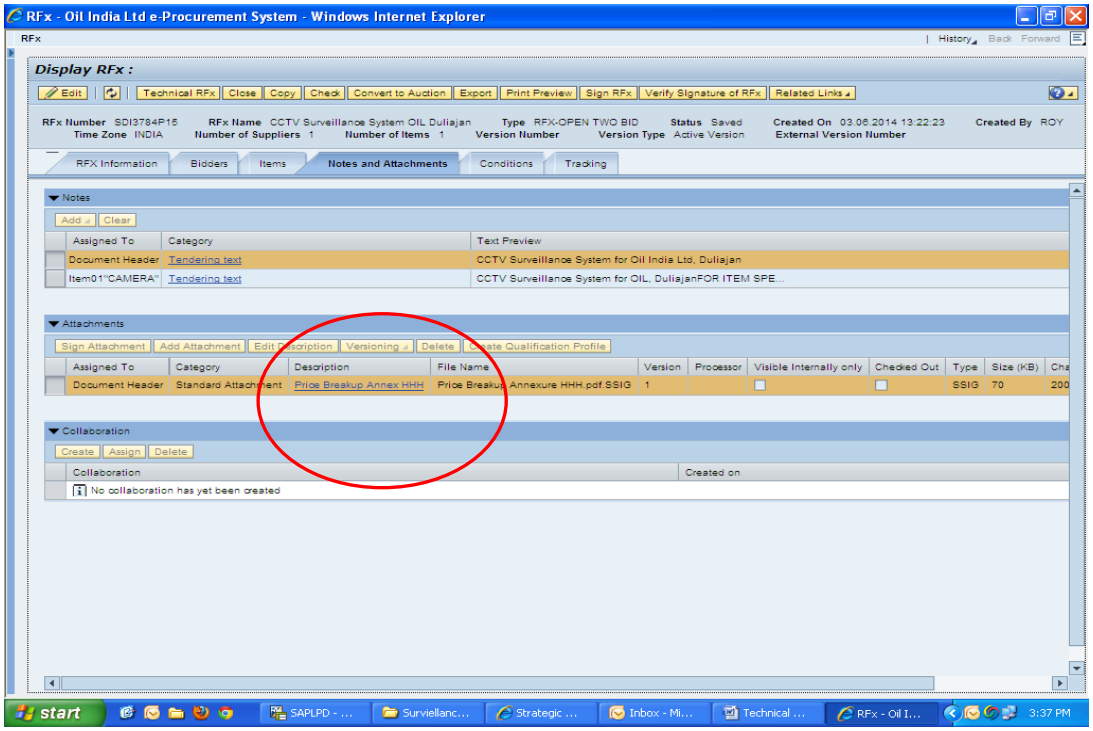
18.0 The applicable GST on the Liquidated Damage if any, shall have to be borne by the Seller. Accordingly, the Liquidated Damage shall be recovered from the seller along with applicable GST.

19.0 For convenience of the qualified Bidders and to improve transparency, the rates/costs quoted by bidders against OIL's e-tenders shall be available for online viewing by such Bidders whose price bids are opened by Company. A Bidder can view item-wise rates/ costs of all other such peer bidders against the tender immediately after price bid opening, if the e-tender is floated by Company with PRICE CONDITION. In case the Price-Bid is invited by Company through attachment form under "Notes & Attachment" (i.e., NO PRICE Condition), Bidders must upload their detailed Price-Bid as per the prescribed format under "Notes & At4ichment", in addition to filling up the "Total Bid Value" Tab taking into account the cost of all individual line items and other applicable charges like freight, tax, duties, levies etc. Under NO PRICE Condition (i.e., Price Bid in attachment form), the "Total Bid Value" as calculated & quoted by the Bidder shall only be shared amongst the eligible bidders and Company will not assume any responsibility whatsoever towards calculation errors/ omissions therein, if any. Notwithstanding to sharing the "Total Bid Value" or the same is whether filled up by the Bidder or not, Company will evaluate the cost details to ascertain the inter-se-ranking of bidders strictly as per the uploaded attachment and Bid Evaluation Criteria only. Online view of prices as above shall be available to the Bidders only upto seven days from the date of Price-Bid opening of thee-tender.

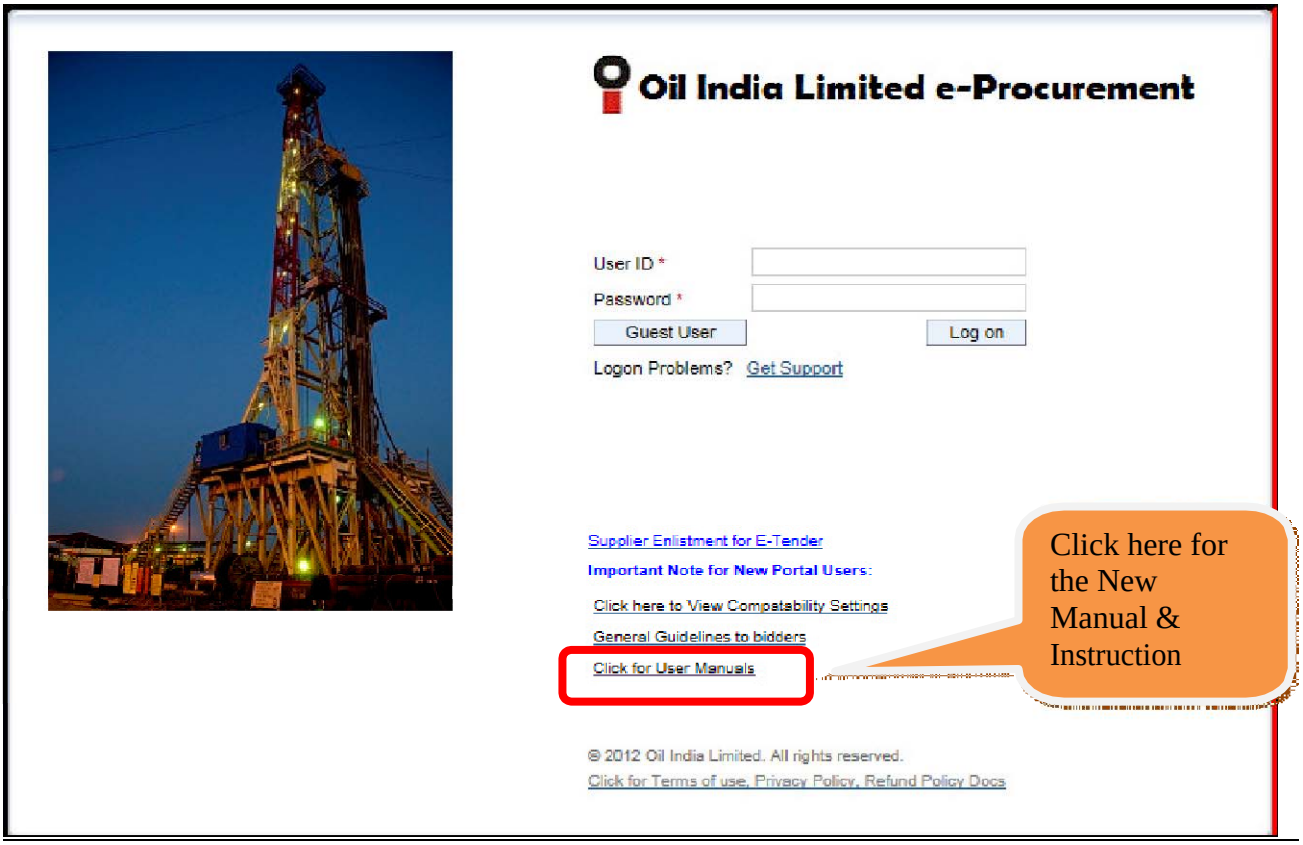
20.0 DISCLAIMER: Rates/Costs shown above are as calculated/quoted by the respective Bidder. Company does not assume any responsibility and shall not be. liable for any calculation error or omissions. However, for placement of order/award of contract, Company shall evaluate the cost details to determine the inter-se-ranking of Bidders strictly as per their Price-Bids and Bid Evaluation Criteria of the Tender. OIL INDIA LTD accepts no liability of any nature resulting from mismatch of "Total Bid Value" & price submitted under "Notes & Attachment" by any bidder and no claim whatsoever shall be entertained thereof.

21.0 Price Breakup:

Bidders should submit the price breakup of all the items as per "**Annexure HHH**" which has been uploaded under "Notes & Attachments" > "Attachments" as shown below. The price breakup "Annexure HHH" should be filled up, signed and uploaded under "Notes & Attachments" > "Attachments" only. **The filled up price breakup of all the items should not be uploaded in Technical Attachment.**



Please do refer "NEW INSTRUCTION TO BIDDER FOR SUBMISSION" for the above two points and also please refer "New Vendor Manual (effective 01.03.2019)" available in the login Page of the OIL's E-tender Portal.



NOTE:

Bidders should submit their bids (preferably in tabular form) explicitly mentioning compliance / non compliance to all the NIT terms and conditions of NIT.

Yours Faithfully

Sd-

(R BARMAN)
CMM (IP)
FOR GM-MATERIALS

Annexure - CCC

TENDER NO. SDI1282P20 DT: 29.04.2019

BID REJECTION CRITERIA (BRC) / BID EVALUATION CRITERIA (BEC)

The following BRC/BEC will govern the evaluation of the bids received against this tender. Bids that do not comply with stipulated BRC/BEC in full will be treated as non responsive and such bids shall prima-facie be rejected. Bid evaluation will be done only for those bids that pass through the "Bid Rejection Criteria" as stipulated in this document.

Other terms and conditions of the enquiry shall be as per General Terms and Conditions vide MM/LOCAL/E-01/2005 for E-Procurement of Indigenous Tenders. However, if any of the Clauses of the Bid Rejection Criteria / Bid Evaluation Criteria (BRC / BEC) contradict the Clauses of the tender or MM/LOCAL/E-01/2005 elsewhere, those in the BRC / BEC shall prevail.

Criteria	**Complied / Not Complied. (Remarks if any)**
1.0 BID REJECTION CRITERIA (BRC): The bid shall conform generally to the specifications, terms and conditions given in this document. Notwithstanding the general conformity of the bids to the stipulated specifications, the following requirements will have to be particularly met by the Bidders without which the same will be considered as non-responsive and rejected. **A) TECHNICAL:** 1.0 Bidder's Qualification: 1.1 The bidder shall be an Original Equipment Manufacturer (OEM) of the tender items. 1.2 The bidder shall carry out the fabrication work of the tender item by engaging welders who are qualified under ASME boiler and pressure vessel code section- IX regulations. Documentary evidence in regard of welder qualifications shall be supplied by the bidder along with the bid. The list of welder(s), who will be engaged for fabrication of the tender item, along with respective welder performance qualification test report carried out within last 05 years preceding original bid closing date of this tender, shall be submitted along with the technical bid. 2.0 Bidder's Experience: 2.1 The bidder shall have experience of successful execution of past supply for minimum 50% tendered quantity against each item (to be rounded off to next higher integer), of any of the crude oil process equipments as detailed below, to an E&P Company or service provider to an E&P company, in last 05 years from the original bid closing date of the tender.	

a) Gas Oil Separator /scrubber / knock-out of minimum 200 KLPD capacities & working pressure 1.0 kg/cm2 or above. b) Indirect Heater of working pressure of 105.46 kg/cm2 or above. c) Crude Oil Emulsion Treater of working pressure 2.0 kg/cm2 or above. 2.2 The bidder shall submit the following documents in support of successful execution of past supply /contract, as applicable under clause 2.1 (a) Copy(ies) of Purchase Order(s) / Contract document(s), and (b) Any of the following documents that confirms the successful execution of the order(s)- - Performance/Commissioning Report from the clients, - Delivery challan / invoice etc. - any other documentary evidence that can substantiate the successful execution of each of the above Purchase Order/ contract. 3.0 Delivery date should be of maximum 10 months from the date of issue of LOI /Letter of Credit. The bidder should categorically confirm in their technical bid that the tendered items will be supplied within the delivery period, without which the bid will be rejected. **Note:** **a) The Purchase Order date need not be within 5 (five) years preceding original bid closing date of this tender. However, the execution of supply should be within 5 (five) years preceding original bid closing date of this tender.** **b) Satisfactory supply/completion/installation report (if submitted) should be issued on client's official letterhead with signature and stamp** **B) FINANCIAL:** a) Annual Financial Turnover of the bidder during any of preceding 03 (three) financial / accounting years from the original bid closing date should be at least **Rs. 250.53 Lakhs** b) Net Worth of the firm should be Positive for preceding Financial / Accounting year (FY=2018-19). **<u>Note -For (a) & (b)</u>: Considering the time required for preparation of Financial Statements, if the last date of preceding financial / accounting year falls within the preceding six months reckoned from the original bid closing date and the Financial Statements of the preceding financial / accounting year are not available with the bidder, then the financial turnover of the previous three financial / accounting years excluding the preceding financial / accounting year will be considered. In such cases, the Net worth of the previous financial / accounting year excluding the preceding financial / accounting year will be considered. However, the bidder has to submit an affidavit/undertaking certifying that 'the balance sheet/Financial Statements for the financial year…....…… (As the case may be) has actually not been audited so far'.**	

Notes:

a) For proof of Annual Turnover & Net worth any one of the following document must be submitted along with the bid:-

i) A certificate issued by a practicing Chartered Cost Accountant (with Membership Number and Firm Registration Number), certifying the Annual turnover & Net worth as per format prescribed in ANNEXURE-J.

OR

ii) Audited Balance Sheet along with Profit & Loss account.

b) In case the bidder is a Central Govt. Organization/PSU/State Govt. Organization/Semi-State Govt. Organization or any other Central/State Govt. Undertaking, where the auditor is appointed only after the approval of Comptroller and Auditor General of India and the Central Government, their certificates may be accepted even though FRN is not available. However, bidder to provide documentary evidence for the same.

C) COMMERCIAL:

i) Validity of the bid shall be minimum 120 days from the Bid Closing Date.

ii) Bid security:
The bid must be accompanied by Bid Security of **Rs 10,01,600.00** in OIL's prescribed format as Bank Guarantee in favour of OIL. The Bid Security may be submitted manually in sealed envelope superscribed with Tender no. and Bid Closing date to Head Materials, Materials Department, Oil India Limited, Duliajan- 786602, Assam on or before the Bid Closing Date and Time mentioned in the Tender. **The Bank Guarantee towards Bid Security shall be valid for 7 months from Bid closing date. (i.e. upto 31.01.2020)**

Bid Security may also be paid online on or before the Bid Closing Date and Time mentioned in the Tender.

If bid security in ORIGINAL of above mentioned Amount and Validity is not received or paid online within bid closing date and time, the bid submitted through electronic form will be rejected without any further consideration.

For exemption for submission of Bid Security, please refer Clause No. 8.16 of General Terms and Conditions vide MM/LOCAL/E-01/2005 for E-Procurement of Indigenous Tenders.

The format of Bank Guarantee towards Bid Security (Annexure – VII) has been amended to Annexure – VII (Revised) and bidders should submit Bank Guarantee towards Bid Security as per Annexure – VII (Revised) only.

iii) Bids are invited under "Single Stage Two Bid System". Bidders have to submit both the "Techno-commercial Unpriced Bids" and "Priced Bids" through electronic form in the OIL's e-Tender portal within the bid Closing

date and time stipulated in the e-tender. The Techno-commercial Unpriced bid is to be submitted as per scope of works and Technical specification of the tender and the priced bid as per the online Commercial bid format. For details of submission procedure, please refer relevant para of General Terms and Conditions vide MM/LOCAL/E-01/2005 for E-Procurement of Indigenous Tenders. Any offer not complying with the above shall be rejected straightway.

iv) Performance Security:

The successful bidder shall submit Performance Security @ 10% of PO value within 30 days of receipt of the formal purchase order failing which OIL reserves the right to cancel the order and forfeit the Bid Security. Bidders should undertake in their bids to submit Performance Security as stated above.

The Performance Security shall be in the following form :

A Bank Guarantee in the prescribed OIL's format valid for 90 days beyond delivery period and applicable warranty/guarantee period (if any).

The validity requirement of Performance Security is assuming despatch within stipulated delivery period and confirmation to all terms and conditions of order. In case of any delay in despatch or non-confirmation to all terms and conditions of order, validity of the Performance Security is to be extended suitably as advised by OIL.

v) The prices offered will have to be firm through delivery and not subject to variation on any account. A bid submitted with an adjustable price will be treated as non-responsive and rejected.

vi) Bids received after the bid closing date and time will be rejected. Similarly, modifications to bids received after the bid closing date & time will not be considered.

vii) All the Bids must be Digitally Signed using "Class 3" digital certificate with Organisation's name *(e-commerce application)* as per Indian IT Act obtained from the licensed Certifying Authorities operating under the Root Certifying Authority of India (RCAI), Controller of Certifying Authorities (CCA) of India. The bid signed using other than "Class 3 with Organisation's Name" digital certificate, will be rejected.

viii) Technical RFx Response folder is meant for Technical bid only. Therefore, No price should be given in Technical RFx Response folder, otherwise the offer will be rejected.

ix) Price should be maintained in the "online price schedule" only. The price submitted other than the "online price schedule" shall not be considered.

x). Integrity Pact :

OIL shall be entering into an Integrity Pact with the bidders as per format enclosed vide Annexure DDD of the tender document. This Integrity Pact proforma has been duly signed digitally by OIL's competent signatory. The proforma has to be submitted by the bidder (along with the technical bid) duly signed (digitally) by the same signatory who signed the bid, i.e., who is duly authorized to sign the bid. Uploading the Integrity Pact with digital signature will be construed that all pages of the Integrity Pact has been signed by the bidder's authorized signatory who sign the Bid. If any bidder refuses to sign Integrity Pact or declines to submit Integrity Pact with the offer, their bid shall be rejected straightway.

xi). A bid shall be rejected straightway if it does not conform to any one of the following clauses:
(a) Validity of bid shorter than the validity indicated in the Tender.
(b) Original Bid Security not received within the stipulated date & time mentioned in the Tender.
(c) Bid Security with (i) Validity shorter than the validity indicated in Tender and/or (ii) Bid Security amount lesser than the amount indicated in the Tender.
(d) In case the Party refuses to sign Integrity Pact.
(e) Annual Turnover of a bidder lower than the Annual turnover mentioned in the Tender.

NOTE: FOR CLAUSE NOS. C(ii) & C(iv) OF BID SECURITY/EMD AND PBG

The bidders/successful bidders are requested to advise the Bank Guarantee issuing bank to comply with the following and ensure to submit, the receipt of the copy of SFMS message as sent by the issuing bank branch, along with the original bank guarantee in Oil's tender issuing office:
The bank guarantee issued by the bank must be routed through SFMS platform as per following details:
(i) "MT 760 / MT 760 COV for issuance of bank guarantee.
(ii) "MT 760 / MT 767 COV for amendment of bank guarantee
The above message/intimation shall be sent through SFMS by the BG issuing bank branch to Axis Bank, Duliajan Branch, IFS Code - UTIB0001129, Branch Address - AXIS Bank Ltd, Duliajan Branch, Daily Bazar, Jyotinagar, Duliajan, District - Dibrugarh, PIN- 786602

2.0 BID EVALUATION CRITERIA (BEC)

The bids conforming to the terms and conditions stipulated in the tender and considered to be responsive after subjecting to the Bid Rejection Criteria as well as verification of original of any or all documents/ documentary evidences pertaining to BRC, will be considered for further evaluation as per the Bid Evaluation Criteria given below.

A) TECHNICAL:

1.0 Bidder's Compliance to Technical, Commercial and other Special Terms

as mentioned in NIT. **B) COMMERCIAL:** i) Priced bids of only those bidders will be opened whose offers are found technically acceptable. The technically acceptable bidders will be informed before opening of the "priced bid". ii) A job executed by a bidder for its own organization / subsidiary cannot be considered as experience for the purpose of meeting BEC. iii) To ascertain the substantial responsiveness of the bid OIL reserves the right to ask the bidder for clarification in respect of clauses covered under BRC also and such clarifications fulfilling the BRC clauses in toto must be received on or before the deadline given by the company, failing which the offer will be summarily rejected.	

NOTE:

Bidders should submit their bids (preferably in tabular form) explicitly mentioning compliance / non compliance to all the NIT terms and conditions of NIT.

-----xxxx-----

ANNEXURE-IA

TECHNICAL SPECIFICATIONS WITH QUANTITY

Tender No & Date: SDI1282P20 DT: 29.04.2019

	Complied / Not Complied. (Remarks if any)
ITEM NO. 10 **Supply of TWO PHASE HORIZONTAL GAS-OIL SEPARATOR (GU-I) as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and reflex type liquid level gauge glass assembly as per OIL's Drawings. – QTY = 01 NO (REQUIRED FOR OIL, DULIAJAN).** OIL Drawing No: OIL/7617/A, Sk No: OIL/3991/A A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid (Oil & Water) and gas efficiently from the well stream. ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends. B. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition: i) Well Stream Characteristics: As the separator will be used in the process layout of differential separation of crude oil, water and natural gas, the unit will be subjected to the well fluid having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose. a) Water content (Produced) : 0% - 20% b) API gravity of oil : 20 Deg - 35 Deg c) Water specific gravity : 1.02 - 1.08 d) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Wax (Paraffin) content: 10% maximum by volume. g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream. ii) Operating Pressure & Temperature: The separator is to be sized for the following operating conditions: Fluid handling capacity : 900 KLPD(5000 BPD) Design pressure : 30 kg/cm2 Test pressure : 45 kg/cm2	

Working temperature : 37 deg C average
Gas flow rate : 8 MMSCFD

C. Material of construction & standards :
1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel and others as per skt Sk. No. OIL/3991/A
2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 300 class rating..
3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard
3. Bolts and Nuts for non pressure plates shall conform to BS: 916.
4. All threads as per API standard unless otherwise stated.
5. Spot Radiographic test to be done as per as per ASME sec VIII part-I.
6. Flanges to be drilled off CRS as per ANSI class 300 rating & ANSI B16.5 Standard.
7. Pressure rating of all coupling connections shall be 3000 psi WP.
8. Heat Treatment shall be required for the whole vessel.
9. Nozzle necks are to be made of SA 106 Gr B material only and to be provided with RF plates /saddle made of the material similar to the shell material.

D. Separator Mountings: The separator is to be equipped with the following mountings:

a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of
I. Two spring loaded valves,
II. Rocker arm (linkage assy.)
III. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field .
IV. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following:
a) Material : Forged ASTM, A-105 steel.
b) Mounting : Right hand
c) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade
d) Control function : Proportional output type
e) Output signal : 0.2-1.1kg/cm2
Rising Level : Increase out put
Material of Float : 316 SS
Stuffing box : SS with PTFE or Graphite asbestos packing similar to
Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom.
Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange
Float size : 185 mm (7.75") OD rating
Pressure requirement: As per vessel requirement) kg/cm2

(b)PNEUMATIC PRESSURE CONTROLLER,
Pressure rating : As per vessel requirement)KG/CM2
PRESSURE CONTROLLER :
Type: Pneumatic, Indicating with Proportional & Reset Action

General:
Function: Indicating Controller
Mounting: Vertical pipe mount 2"(50 mm) pipe
Housing Material: Glass fibre reinforced polyester/Polyester Plastic

Enclosure: Minimum IP53
Maximum Dimension: 260mmX150mmX340mm (LXBXH)
Maximum Weight: 7 Kg
Controller Performance:
Control Mode: Proportional Integral (PI)
Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.)
Auto/Manual Switch: To be provided
Set Point Adjustment: Manual
Supply pressure: 20 psig
Output: 3 to 15 psig
Proportional Band: 4 to 400% of process scale span
Reset: 0.02 to 50 repeats per minute
Differential Gap: 5 to 100%
Repeatability: 0.4% of output span
Dead band: Less than 0.4% of process scale span.
Unit of process variable display scale: psig & kg/sqcm

General Components:
Service: Gauge Pressure
Sensing Element Type: Bourdon Tube, 316 Stainless steel
Range: (Adj. Range): As per vessel requirement)
Process:
Process Fluid: Natural Gas / Hydrocarbon liquid
Process connection: ¼ inch NPT (F) (Bottom Entry)
Air Consumption: 20 scfh maximum
Input connection: ¼" NPT (F) bottom entry.
Output connection: ¼" NPT (F) bottom entry.
Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig)

Accessories: (To be supply with each item)

1. Pressure gauge :(Two Numbers)
Dial size 2 ", connection ¼"(NPT (M) back connection,
Range: 0-30 psig

(c) Two nos. of Pressure gauge with isolation valves with following specifications:
a. Type: Direct Reading
b. Mounting :Local
c. Range : As per vessel requirement) kg/cm2
d. Accuracy: +/-1.0% of span
e. Dial Size: 6 inch(150mm)
f. Dial Colour: White with black lettering
g. Case Material: SS316
h. Lens: Laminated Safety glass lens
i. Pressure element: Bourdon tube
j. Element material: SS 316
k. Socket Material: SS316
l. Movement material: SS316
m. Connection: ½ inch NPT(M)
n. Connection Type: Direct with bottom entry
o. Operating Pressure:1 Kg/cm2

p. Units: Kg/cm2,psi
q. Service: Natural Gas

(d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2

ITEM NO. 20

TWO PHASE HORIZONTAL GAS-OIL SEPARATOR(GU II) – QTY = 02 NOS (REQUIRED FOR OIL, DULIAJAN).

Supply of TWO PHASE HORIZONTAL GAS-OIL SEPARATOR (GU-II) as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and reflex type liquid level gauge glass assembly as per OIL's Drawings.

OIL Drawing No: OIL/3410/D

SPECIFICATIONS :
A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement:

i) To separate liquid (Oil & Water) and gas efficiently from the well stream.
ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron.
iv) Suitable provision to take liquid and gas samples for analysis.
v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends.

B. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition:

i) Well Stream Characteristics: As the separator will be used in the process layout of differential separation of crude oil, water and natural gas, the unit will be subjected to the well fluid having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose.

a) Water content (Produced) : 0% - 20%
b) API gravity of oil : 20 Deg - 35 Deg
c) Water specific gravity : 1.02 - 1.08
d) Gas gravity : 0.65 - 0.80 (Air = 1)
e) Pour Point of oil : 27 Deg - 33 Deg C.
f) Wax (Paraffin) content: 10% maximum by volume.
g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream.

ii) Operating Pressure & Temperature: The separator is to be sized for the following operating conditions:
Fluid capacity : 900 klpd
Design pressure : 8.5 kg/cm2

Test pressure : 12.8 kg/cm2
Working temperature : 50 deg C
Gas flow rate : 8 MMSCFD.
Oil gravity : 30 deg - 35 deg API
Gas gravity : 0.7 to 0.8 (air = 1)
Primary objective : Gas-Oil separation
Design code : ASME Sec. VIII Div. 1.
Radiography : Spot (10% minimum)

C. Material of construction & standards :
1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel and others as per skt Sk. No. OIL/3410/D
2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 300 class rating..
3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard
3. Bolts and Nuts for non pressure plates shall conform to BS: 916.
4. All threads as per API standard unless otherwise stated.
5. Spot Radiographic test to be done as per as per ASME sec VIII part-I.
6. Flanges to be drilled off CRS as per ANSI class 300 rating & ANSI B16.5 Standard.
7. Pressure rating of all coupling connections shall be 3000 psi WP.
8. Heat Treatment shall be required for the whole vessel.
9. Nozzle necks are to be made of SA 106 Gr B material only and to be provided with RF plates /saddle made of the material similar to the shell material.

D. Separator Mountings: The separator is to be equipped with the following mountings:
a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of
I. Two spring loaded valves,
II. Rocker arm (linkage assy.)
III. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field .
IV. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following:
a) Material : Forged ASTM, A-105 steel.
b) Mounting : Right hand
c) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade
d) Control function : Proportional output type
e) Output signal : 0.2-1.1kg/cm2
Rising Level : Increase out put
Material of Float : 316 SS
Stuffing box : SS with PTFE or Graphite asbestos packing similar to
Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom.
Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange
Float size : 185 mm (7.75") OD rating
Pressure requirement: As per vessel requirement) kg/cm2

(b)PNEUMATIC PRESSURE CONTROLLER,
Pressure rating : As per vessel requirement)KG/CM2
PRESSURE CONTROLLER :
Type: Pneumatic, Indicating with Proportional & Reset Action

General:
Function: Indicating Controller
Mounting: Vertical pipe mount 2"(50 mm) pipe
Housing Material: Glass fibre reinforced polyester/Polyester Plastic
Enclosure: Minimum IP53
Maximum Dimension: 260mmX150mmX340mm (LXBXH)
Maximum Weight: 7 Kg
Controller Performance:
Control Mode: Proportional Integral (PI)
Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.)
Auto/Manual Switch: To be provided
Set Point Adjustment: Manual
Supply pressure: 20 psig
Output: 3 to 15 psig
Proportional Band: 4 to 400% of process scale span
Reset: 0.02 to 50 repeats per minute
Differential Gap: 5 to 100%
Repeatability: 0.4% of output span
Dead band: Less than 0.4% of process scale span.
Unit of process variable display scale: psig & kg/sqcm

General Components:
Service: Gauge Pressure
Sensing Element Type: Bourdon Tube, 316 Stainless steel
Range: (Adj. Range): As per vessel requirement)
Process:
Process Fluid: Natural Gas / Hydrocarbon liquid
Process connection: ¼ inch NPT (F) (Bottom Entry)
Air Consumption: 20 scfh maximum
Input connection: ¼" NPT (F) bottom entry.
Output connection: ¼" NPT (F) bottom entry.
Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig)

Accessories: (To be supply with each item)

1. Pressure gauge :(Two Numbers)
Dial size 2 ", connection ¼"(NPT (M) back connection,
Range: 0-30 psig

(c) Two nos. of Pressure gauge with isolation valves with following specifications:
a. Type: Direct Reading
b. Mounting :Local
c. Range : As per vessel requirement) kg/cm2
d. Accuracy: +/-1.0% of span
e. Dial Size: 6 inch(150mm)
f. Dial Colour: White with black lettering
g. Case Material: SS316
h. Lens: Laminated Safety glass lens
i. Pressure element: Bourdon tube
j. Element material: SS 316

k. Socket Material: SS316 l. Movement material: SS316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas (d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2	
ITEM NO. 30 **Supply of THREE PHASE HORIZONTAL GAS-OIL SEPARATOR (TPS) as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and Reflex type liquid level gauge assembly, Safety relief valve etc as per following OIL's Drawings. – QTY = 02 NOS (REQUIRED FOR OIL, DULIAJAN).** 1. OIL/1563/A 2. OIL/2024/B A. Standards & Material of Construction: The unit shall be manufactured conforming to the following code of practices and standards. a) Separator: ASME section VIII, Div. I b) Pipe fittings, flanges etc.: ANSI B 31.3, ANSI B 16.5 c) Safety Relief Valves: ASME section VIII, Div-I/ANSI-B-16.11 d) Structural: IS 226 e) All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 150 class rating. f) Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard g) Bolts and Nuts for non pressure plates shall conform to BS: 916. h) All threads as per API standard unless otherwise stated. i) All pressure plates to IS:2002 Gr. 2A steel or SA-516 gr60/70 ,Non pressure plates to IS: 2062 quality steel and others as per OIL/1563/A. B. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate Oil, Water and gas efficiently from the well stream. ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends. vi) Connections: As per OIL/2024/C C. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition:	

i) Well Stream Characteristics: As the test unit will be used in the process layout of differential separation process, the unit will be subjected to the well stream having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose.

a) Water content (Produced): 5- 90%
b) API gravity of oil : 20 Deg - 35 Deg
c) Water specific gravity : 1.02 - 1.08
d) Gas gravity : 0.65 - 0.80 (Air = 1)
e) Pour Point of oil : 27 Deg - 33 Deg C.
f) Wax (Paraffin) content: 10% maximum by volume.
g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream.

ii) Service requirement and Design Data :

Oil handling capacity : 7000 BPD fluid (2000 BPD free water+ 5000 BPD oil/ emulsion)
Design pressure : 7 kg/cm2
Test pressure : 10.5 kg/cm2
Working temperature : 45 deg C (average)
Gas flow rate : 5 MMSCFD
gas gravity : 0.7-0.8 (air=1)
Oil gravity : 30-35 deg API
Design code : ASME Sec. VIII Div. 1.
Radiography : Spot (10% minimum)

D. Separator Mountings: The separator is to be equipped with the following mountings:

a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of
I. Two spring loaded valves,
II. Rocker arm (linkage assy.)
III. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field .
IV. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following:
a) Material : Forged ASTM, A-105 steel.
b) Mounting : Right hand
c) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade
d) Control function : Proportional output type
e) Output signal : 0.2-1.1kg/cm2
Rising Level : Increase out put
Material of Float : 316 SS
Stuffing box : SS with PTFE or Graphite asbestos packing similar to
Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom.
Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange
Float size : 185 mm (7.75") OD rating
Pressure requirement: As per vessel requirement) kg/cm2

(b)PNEUMATIC PRESSURE CONTROLLER,
Pressure rating : As per vessel requirement)KG/CM2
PRESSURE CONTROLLER :
Type: Pneumatic, Indicating with Proportional & Reset Action

General:
Function: Indicating Controller
Mounting: Vertical pipe mount 2"(50 mm) pipe
Housing Material: Glass fibre reinforced polyester/Polyester Plastic
Enclosure: Minimum IP53
Maximum Dimension: 260mmX150mmX340mm (LXBXH)
Maximum Weight: 7 Kg
Controller Performance:
Control Mode: Proportional Integral (PI)
Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.)
Auto/Manual Switch: To be provided
Set Point Adjustment: Manual
Supply pressure: 20 psig
Output: 3 to 15 psig
Proportional Band: 4 to 400% of process scale span
Reset: 0.02 to 50 repeats per minute
Differential Gap: 5 to 100%
Repeatability: 0.4% of output span
Dead band: Less than 0.4% of process scale span.
Unit of process variable display scale: psig & kg/sqcm

General Components:
Service: Gauge Pressure
Sensing Element Type: Bourdon Tube, 316 Stainless steel
Range: (Adj. Range): As per vessel requirement)
Process:
Process Fluid: Natural Gas / Hydrocarbon liquid
Process connection: ¼ inch NPT (F) (Bottom Entry)
Air Consumption: 20 scfh maximum
Input connection: ¼" NPT (F) bottom entry.
Output connection: ¼" NPT (F) bottom entry.
Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig)

Accessories: (To be supply with each item)

1. Pressure gauge :(Two Numbers)
Dial size 2 ", connection ¼"(NPT (M) back connection,
Range: 0-30 psig

(c) Two nos. of Pressure gauge with isolation valves with following specifications:
a. Type: Direct Reading
b. Mounting :Local
c. Range : As per vessel requirement) kg/cm2
d. Accuracy: +/-1.0% of span
e. Dial Size: 6 inch(150mm)

f. Dial Colour: White with black lettering g. Case Material: SS316 h. Lens: Laminated Safety glass lens i. Pressure element: Bourdon tube j. Element material: SS 316 k. Socket Material: SS316 l. Movement material: SS316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas (d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2	
ITEM NO. 40 **Supply of TWO PHASE HORIZONTAL GAS-OIL SEPARATOR (Stabilizer) as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and Reflex type liquid level gauge assembly as per OIL's Drawings. – QTY = 02 NOS(REQUIRED FOR OIL, DULIAJAN).** OIL Drawing No. OIL/3411/C. A. Standards & Material of Construction: The unit shall be manufactured conforming to the following code of practices and standards. a) Separator: ASME section VIII, Div. I b) Pipe fittings, flanges etc.: ANSI B 31.3, ANSI B 16.5 c) Safety Relief Valves: ASME section VIII, Div-I/ANSI-B-16.11 d) Structural: IS 226 e) All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 150 class rating. f) Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard g) Bolts and Nuts for non pressure plates shall conform to BS: 916. h) All threads as per API standard unless otherwise stated B. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid (Oil & Water) and gas efficiently from the well stream. ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends. C. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition:	

i) Well Stream Characteristics: As the test unit will be used in the process layout of differential separation process, the unit will be subjected to the well stream having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose.

a) Water content (Produced) : 0% - 20%
b) API gravity of oil : 20 Deg - 35 Deg
c) Water specific gravity : 1.02 - 1.08
d) Gas gravity : 0.65 - 0.80 (Air = 1)
e) Pour Point of oil : 27 Deg - 33 Deg C.
f) Wax (Paraffin) content: 10% maximum by volume.
g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream

ii) Operating Pressure & Temperature: The separator is to be sized for the following operating conditions:
Fluid capacity : 10,000 BBL(1800KLPD)
Design pressure : 3.5 kg/cm2
Test pressure : 5.25 kg/cm2
Working pressure : 1 Kg/cm2
Working temperature : 50 deg C
Design temperature : 80 deg C
Gas flow rate : 0.14 MMSCMD
Primary objective : Gas-Oil separation

D. Separator Mountings: The separator is to be equipped with the following mountings:

a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of
I. Two spring loaded valves,
II. Rocker arm (linkage assy.)
III. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field .
IV. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following:
a) Material : Forged ASTM, A-105 steel.
b) Mounting : Right hand
c) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade
d) Control function : Proportional output type
e) Output signal : 0.2-1.1kg/cm2
Rising Level : Increase out put
Material of Float : 316 SS
Stuffing box : SS with PTFE or Graphite asbestos packing similar to
Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom.
Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange
Float size : 185 mm (7.75") OD rating
Pressure requirement: As per vessel requirement) kg/cm2

(b)PNEUMATIC PRESSURE CONTROLLER,
Pressure rating : As per vessel requirement)KG/CM2

PRESSURE CONTROLLER :
Type: Pneumatic, Indicating with Proportional & Reset Action

General:
Function: Indicating Controller
Mounting: Vertical pipe mount 2"(50 mm) pipe
Housing Material: Glass fibre reinforced polyester/Polyester Plastic
Enclosure: Minimum IP53
Maximum Dimension: 260mmX150mmX340mm (LXBXH)
Maximum Weight: 7 Kg
Controller Performance:
Control Mode: Proportional Integral (PI)
Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.)
Auto/Manual Switch: To be provided
Set Point Adjustment: Manual
Supply pressure: 20 psig
Output: 3 to 15 psig
Proportional Band: 4 to 400% of process scale span
Reset: 0.02 to 50 repeats per minute
Differential Gap: 5 to 100%
Repeatability: 0.4% of output span
Dead band: Less than 0.4% of process scale span.
Unit of process variable display scale: psig & kg/sqcm

General Components:
Service: Gauge Pressure
Sensing Element Type: Bourdon Tube, 316 Stainless steel
Range: (Adj. Range): As per vessel requirement)
Process:
Process Fluid: Natural Gas / Hydrocarbon liquid
Process connection: ¼ inch NPT (F) (Bottom Entry)
Air Consumption: 20 scfh maximum
Input connection: ¼" NPT (F) bottom entry.
Output connection: ¼" NPT (F) bottom entry.
Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig)

Accessories: (To be supply with each item)

1. Pressure gauge :(Two Numbers)
Dial size 2 ", connection ¼"(NPT (M) back connection,
Range: 0-30 psig

(c) Two nos. of Pressure gauge with isolation valves with following specifications:
a. Type: Direct Reading
b. Mounting :Local
c. Range : As per vessel requirement) kg/cm2
d. Accuracy: +/-1.0% of span
e. Dial Size: 6 inch(150mm)
f. Dial Colour: White with black lettering
g. Case Material: SS316
h. Lens: Laminated Safety glass lens

i. Pressure element: Bourdon tube j. Element material: SS 316 k. Socket Material: SS316 l. Movement material: SS316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas (d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2	
ITEM NO. 50 **VERTICAL MIST EXTRACTOR (HIGH PRESSURE MASTER SEPARATOR) generally as per drawing no. OIL/7618 and OIL/3990(enclosed) complete with necessary companion flanges, stud & nuts, Internal Ball Float Type Level Controller, Pressure controller and pressure gauge. – QTY = 01 NO (REQUIRED FOR OIL, DULIAJAN).** A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid particle (Oil & Water) from the entrained gas efficiently. ii) To arrest entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be vertical, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends. B. Separator Sizing Parameters: The master separator unit is to be sized to suit the following service condition: i) Gas Stream Characteristics: As the separator will be used in the process layout for arresting particles of crude oil, water from natural gas, the unit will be subjected to the gas stream having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose. a) Water particle (Produced) : 0% - 1% b) OIL content(mist form) : 0-1% b) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Sand /solid/slit content: There may be few amount of sand/slit/drilling fluids particle in the gas stream. ii) Service requirement and Design Data : a) Gas handling capacity : 15 MMSCFD b) Design pressure : 30 Kg/cm2 c) Test pressure : 45 kg/cm2 d) Working temperature : 30-45 degree centigrade average e) gas gravity : 0.7-.85(air=1) f) Gas quality : sweet natural gas.	

g) Design code : ASME Sec. VIII Div. 1.
h) Radiography : Spot (10% minimum)

iii) Connections: As per OIL/7618

C. Material of construction & standards :
1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel.
2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. and the rating of flanges should be 150 class slip on RF (serrated).
3. Companion flanges shall be provided for all nozzle flanges (of all sizes from the supplied drawing)and shall be weld neck type made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. and the rating of flanges should be 300 class.
3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard

4) Connections: As per OIL/7618
5) Demister assembly shall be vane type.

6) Drain line shall be provided with 2"x3000 psi WP elbow (both ends screwed, LP threaded) after nipple connection instead of Flanged connection.

7) Liquid Level Glass Gauge connection point in vessel shall be provided with 1/2" x 3000 psi screwed coupling, LP threaded instead of flanged connection to avoid transit damage. However, requisite 1/2" X 3000 psi WP screwed nipple and 1/2" X 150 class flange (screwed) are to be supplied additionally.

D. Separator Mountings: The separator is to be equipped with the following mountings:
a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of
I. Two spring loaded valves,
II. Rocker arm (linkage assy.)
III. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field .
IV. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following:
a) Material : Forged ASTM, A-105 steel.
b) Mounting : Right hand
c) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade
d) Control function : Proportional output type
e) Output signal : 0.2-1.1kg/cm2
Rising Level : Increase out put
Material of Float : 316 SS
Stuffing box : SS with PTFE or Graphite asbestos packing similar to
Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom.
Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange
Float size : 185 mm (7.75") OD rating
Pressure requirement: As per vessel requirement) kg/cm2

(b)PNEUMATIC PRESSURE CONTROLLER,
Pressure rating : As per vessel requirement)KG/CM2
PRESSURE CONTROLLER :
Type: Pneumatic, Indicating with Proportional & Reset Action

General:
Function: Indicating Controller
Mounting: Vertical pipe mount 2"(50 mm) pipe
Housing Material: Glass fibre reinforced polyester/Polyester Plastic
Enclosure: Minimum IP53
Maximum Dimension: 260mmX150mmX340mm (LXBXH)
Maximum Weight: 7 Kg
Controller Performance:
Control Mode: Proportional Integral (PI)
Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.)
Auto/Manual Switch: To be provided
Set Point Adjustment: Manual
Supply pressure: 20 psig
Output: 3 to 15 psig
Proportional Band: 4 to 400% of process scale span
Reset: 0.02 to 50 repeats per minute
Differential Gap: 5 to 100%
Repeatability: 0.4% of output span
Dead band: Less than 0.4% of process scale span.
Unit of process variable display scale: psig & kg/sqcm

General Components:
Service: Gauge Pressure
Sensing Element Type: Bourdon Tube, 316 Stainless steel
Range: (Adj. Range): As per vessel requirement)
Process:
Process Fluid: Natural Gas / Hydrocarbon liquid
Process connection: ¼ inch NPT (F) (Bottom Entry)
Air Consumption: 20 scfh maximum
Input connection: ¼" NPT (F) bottom entry.
Output connection: ¼" NPT (F) bottom entry.
Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig)

Accessories: (To be supply with each item)

1. Pressure gauge :(Two Numbers)
Dial size 2 ", connection ¼"(NPT (M) back connection,
Range: 0-30 psig

(c) Two nos. of Pressure gauge with isolation valves with following specifications:
a. Type: Direct Reading
b. Mounting :Local
c. Range : As per vessel requirement) kg/cm2
d. Accuracy: +/-1.0% of span
e. Dial Size: 6 inch(150mm)

f. Dial Colour: White with black lettering g. Case Material: SS316 h. Lens: Laminated Safety glass lens i. Pressure element: Bourdon tube j. Element material: SS 316 k. Socket Material: SS316 l. Movement material: SS316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas (d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2	
ITEM NO. 60 **VERTICAL MIST EXTRACTOR (LOW PRESSURE MASTER SEPARATOR) generally as per drawing no. OIL/7232 (enclosed), complete with necessary companion flanges, stud & nuts , Internal Ball Float Type Level Controller, Pressure controller and pressure gauge. – QTY = 05 NOS(REQUIRED FOR OIL, DULIAJAN).** A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid particle (Oil & Water) from the entrained gas efficiently. ii) To arrest entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be vertical, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends. B. Separator Sizing Parameters: The master separator unit is to be sized to suit the following service condition: i) Gas Stream Characteristics: As the separator will be used in the process layout for arresting particles of crude oil, water from natural gas, the unit will be subjected to the gas stream having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose. a) Water particle (Produced) : 0% - 1% b) OIL content(mist form) : 0-1% b) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Sand /solid/slit content: There may be few amount of sand/slit/drilling fluids particle in the gas stream. ii) Service requirement and Design Data : a) GAS handling capacity : 15 MMSCFD b) Design pressure : 6.4 kg/cm2	

c) Test pressure : 10.5 kg/cm2
d) Working temperature : 30-45 degree centigrade average
e) gas gravity : 0.7-.85(air=1)
f) Gas quality : sweet natural gas.
g) Design code : ASME Sec. VIII Div. 1.
h) Radiography : Spot (10% minimum)

C. Material of construction & standards :
1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel.
2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. and the rating of flanges should be 150 class slip on RF (serrated).
3.Companion flanges shall be provided for all nozzle flanges (of all sizes from the supplied drawing)and shall be weld neck type made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. and the rating of flanges should be 150 class.
3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard
3. Bolts and Nuts for non pressure plates shall conform to BS: 916.
4. All threads as per API standard unless otherwise stated.
5. Spot Radiographic test to be done as per as per ASME sec VIII part-I.
6. Flanges to be drilled off CRS as per ANSI class rating as specified in the drawing & ANSI B16.5 Standard.
7. Pressure rating of all coupling connections shall be 3000 psi WP.
8. Heat Treatment shall be required for the whole vessel.
9. Nozzle necks are to be made of SA 106 Gr B material and to be provided with RF plates /saddle made of the material similar to the shell material.

D. Separator Mountings: The separator is to be equipped with the following mountings:

a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of
I. Two spring loaded valves,
II. Rocker arm (linkage assy.)
III. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field .
IV. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following:
a) Material : Forged ASTM, A-105 steel.
b) Mounting : Right hand
c) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade
d) Control function : Proportional output type
e) Output signal : 0.2-1.1kg/cm2
Rising Level : Increase out put
Material of Float : 316 SS
Stuffing box : SS with PTFE or Graphite asbestos packing similar to
Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom.
Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange
Float size : 185 mm (7.75") OD rating
Pressure requirement: As per vessel requirement) kg/cm2

(b)PNEUMATIC PRESSURE CONTROLLER,
Pressure rating : As per vessel requirement)KG/CM2
PRESSURE CONTROLLER :
Type: Pneumatic, Indicating with Proportional & Reset Action

General:
Function: Indicating Controller
Mounting: Vertical pipe mount 2"(50 mm) pipe
Housing Material: Glass fibre reinforced polyester/Polyester Plastic
Enclosure: Minimum IP53
Maximum Dimension: 260mmX150mmX340mm (LXBXH)
Maximum Weight: 7 Kg
Controller Performance:
Control Mode: Proportional Integral (PI)
Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.)
Auto/Manual Switch: To be provided
Set Point Adjustment: Manual
Supply pressure: 20 psig
Output: 3 to 15 psig
Proportional Band: 4 to 400% of process scale span
Reset: 0.02 to 50 repeats per minute
Differential Gap: 5 to 100%
Repeatability: 0.4% of output span
Dead band: Less than 0.4% of process scale span.
Unit of process variable display scale: psig & kg/sqcm

General Components:
Service: Gauge Pressure
Sensing Element Type: Bourdon Tube, 316 Stainless steel
Range: (Adj. Range): As per vessel requirement)
Process:
Process Fluid: Natural Gas / Hydrocarbon liquid
Process connection: ¼ inch NPT (F) (Bottom Entry)
Air Consumption: 20 scfh maximum
Input connection: ¼" NPT (F) bottom entry.
Output connection: ¼" NPT (F) bottom entry.
Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig)

Accessories: (To be supply with each item)

1. Pressure gauge :(Two Numbers)
Dial size 2 ", connection ¼"(NPT (M) back connection,
Range: 0-30 psig

(c) Two nos. of Pressure gauge with isolation valves with following specifications:
a. Type: Direct Reading
b. Mounting :Local
c. Range : As per vessel requirement) kg/cm2
d. Accuracy: +/-1.0% of span
e. Dial Size: 6 inch(150mm)

f. Dial Colour: White with black lettering g. Case Material: SS316 h. Lens: Laminated Safety glass lens i. Pressure element: Bourdon tube j. Element material: SS 316 k. Socket Material: SS316 l. Movement material: SS316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas (d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2	
ITEM NO. 70 **Supply of TWO PHASE HORIZONTAL GAS-OIL SEPARATOR (GU-I) as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and reflex type liquid level gauge glass assembly as per OIL's Drawings. – QTY = 01 NO. (SAME AS ITEM NO. 10) REQUIRED FOR EASTERN ASSETS OIL, DIGBOI.** OIL Drawing No: OIL/7617/A, Sk No: OIL/3991/A A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid (Oil & Water) and gas efficiently from the well stream. ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends. B. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition: i) Well Stream Characteristics: As the separator will be used in the process layout of differential separation of crude oil, water and natural gas, the unit will be subjected to the well fluid having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose. a) Water content (Produced) : 0% - 20% b) API gravity of oil : 20 Deg - 35 Deg c) Water specific gravity : 1.02 - 1.08 d) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Wax (Paraffin) content: 10% maximum by volume. g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the	

well stream.

ii) Operating Pressure & Temperature: The separator is to be sized for the following operating conditions:

Fluid handling capacity : 900 KLPD(5000 BPD)
Design pressure : 30 kg/cm2
Test pressure : 45 kg/cm2
Working temperature : 37 deg C average
Gas flow rate : 8 MMSCFD

C. Material of construction & standards :

1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel and others as per skt Sk. No. OIL/3991/A
2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 300 class rating..
3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard
3. Bolts and Nuts for non pressure plates shall conform to BS: 916.
4. All threads as per API standard unless otherwise stated.
5. Spot Radiographic test to be done as per as per ASME sec VIII part-I.
6. Flanges to be drilled off CRS as per ANSI class 300 rating & ANSI B16.5 Standard.
7. Pressure rating of all coupling connections shall be 3000 psi WP.
8. Heat Treatment shall be required for the whole vessel.
9. Nozzle necks are to be made of SA 106 Gr B material only and to be provided with RF plates /saddle made of the material similar to the shell material.

D. Separator Mountings: The separator is to be equipped with the following mountings:

a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of

I. Two spring loaded valves,
II. Rocker arm (linkage assy.)
III. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field .
IV. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following:

a) Material : Forged ASTM, A-105 steel.
b) Mounting : Right hand
c) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade
d) Control function : Proportional output type
e) Output signal : 0.2-1.1kg/cm2
Rising Level : Increase out put
Material of Float : 316 SS
Stuffing box : SS with PTFE or Graphite asbestos packing similar to
Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom.
Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange
Float size : 185 mm (7.75") OD rating
Pressure requirement: As per vessel requirement) kg/cm2

(b)PNEUMATIC PRESSURE CONTROLLER,
Pressure rating : As per vessel requirement)KG/CM2

PRESSURE CONTROLLER :
Type: Pneumatic, Indicating with Proportional & Reset Action

General:
Function: Indicating Controller
Mounting: Vertical pipe mount 2"(50 mm) pipe
Housing Material: Glass fibre reinforced polyester/Polyester Plastic
Enclosure: Minimum IP53
Maximum Dimension: 260mmX150mmX340mm (LXBXH)
Maximum Weight: 7 Kg
Controller Performance:
Control Mode: Proportional Integral (PI)
Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.)
Auto/Manual Switch: To be provided
Set Point Adjustment: Manual
Supply pressure: 20 psig
Output: 3 to 15 psig
Proportional Band: 4 to 400% of process scale span
Reset: 0.02 to 50 repeats per minute
Differential Gap: 5 to 100%
Repeatability: 0.4% of output span
Dead band: Less than 0.4% of process scale span.
Unit of process variable display scale: psig & kg/sqcm

General Components:
Service: Gauge Pressure
Sensing Element Type: Bourdon Tube, 316 Stainless steel
Range: (Adj. Range): As per vessel requirement)
Process:
Process Fluid: Natural Gas / Hydrocarbon liquid
Process connection: ¼ inch NPT (F) (Bottom Entry)
Air Consumption: 20 scfh maximum
Input connection: ¼" NPT (F) bottom entry.
Output connection: ¼" NPT (F) bottom entry.
Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig)

Accessories: (To be supply with each item)

1. Pressure gauge :(Two Numbers)
Dial size 2 ", connection ¼"(NPT (M) back connection,
Range: 0-30 psig

(c) Two nos. of Pressure gauge with isolation valves with following specifications:
a. Type: Direct Reading
b. Mounting :Local
c. Range : As per vessel requirement) kg/cm2
d. Accuracy: +/-1.0% of span
e. Dial Size: 6 inch(150mm)
f. Dial Colour: White with black lettering
g. Case Material: SS316
h. Lens: Laminated Safety glass lens

i. Pressure element: Bourdon tube j. Element material: SS 316 k. Socket Material: SS316 l. Movement material: SS316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas (d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2	
ITEM NO. 80 **TWO PHASE HORIZONTAL GAS-OIL SEPARATOR(GU II)** **Supply of TWO PHASE HORIZONTAL GAS-OIL SEPARATOR (GU-II) as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and reflex type liquid level gauge glass assembly as per OIL's Drawings. – QTY = 01 NO (REQUIRED FOR EASTERN ASSETS OIL, DIGBOI).** OIL Drawing No: OIL/3410/D SPECIFICATIONS : A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid (Oil & Water) and gas efficiently from the well stream. ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends. B. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition: i) Well Stream Characteristics: As the separator will be used in the process layout of differential separation of crude oil, water and natural gas, the unit will be subjected to the well fluid having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose. a) Water content (Produced) : 0% - 20% b) API gravity of oil : 20 Deg - 35 Deg c) Water specific gravity : 1.02 - 1.08 d) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Wax (Paraffin) content: 10% maximum by volume. g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the	

well stream.

ii) Operating Pressure & Temperature: The separator is to be sized for the following operating conditions:

Fluid capacity : 900 klpd
Design pressure : 8.5 kg/cm2
Test pressure : 12.8 kg/cm2
Working temperature : 50 deg C
Gas flow rate : 8 MMSCFD.
Oil gravity : 30 deg - 35 deg API
Gas gravity : 0.7 to 0.8 (air = 1)
Primary objective : Gas-Oil separation
Design code : ASME Sec. VIII Div. 1.
Radiography : Spot (10% minimum)

C. Material of construction & standards :

1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel and others as per skt Sk. No. OIL/3410/D
2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 300 class rating..
3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard
3. Bolts and Nuts for non pressure plates shall conform to BS: 916.
4. All threads as per API standard unless otherwise stated.
5. Spot Radiographic test to be done as per as per ASME sec VIII part-I.
6. Flanges to be drilled off CRS as per ANSI class 300 rating & ANSI B16.5 Standard.
7. Pressure rating of all coupling connections shall be 3000 psi WP.
8. Heat Treatment shall be required for the whole vessel.
9. Nozzle necks are to be made of SA 106 Gr B material only and to be provided with RF plates /saddle made of the material similar to the shell material.

D. Separator Mountings: The separator is to be equipped with the following mountings:

a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of

I. Two spring loaded valves,
II. Rocker arm (linkage assy.)
III. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field .
IV. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following:

a) Material : Forged ASTM, A-105 steel.
b) Mounting : Right hand
c) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade
d) Control function : Proportional output type
e) Output signal : 0.2-1.1kg/cm2
Rising Level : Increase out put
Material of Float : 316 SS
Stuffing box : SS with PTFE or Graphite asbestos packing similar to
Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom.
Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange
Float size : 185 mm (7.75") OD rating

Pressure requirement: As per vessel requirement) kg/cm2

(b)PNEUMATIC PRESSURE CONTROLLER,
Pressure rating : As per vessel requirement)KG/CM2
PRESSURE CONTROLLER :
Type: Pneumatic, Indicating with Proportional & Reset Action

General:
Function: Indicating Controller
Mounting: Vertical pipe mount 2"(50 mm) pipe
Housing Material: Glass fibre reinforced polyester/Polyester Plastic
Enclosure: Minimum IP53
Maximum Dimension: 260mmX150mmX340mm (LXBXH)
Maximum Weight: 7 Kg
Controller Performance:
Control Mode: Proportional Integral (PI)
Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.)
Auto/Manual Switch: To be provided
Set Point Adjustment: Manual
Supply pressure: 20 psig
Output: 3 to 15 psig
Proportional Band: 4 to 400% of process scale span
Reset: 0.02 to 50 repeats per minute
Differential Gap: 5 to 100%
Repeatability: 0.4% of output span
Dead band: Less than 0.4% of process scale span.
Unit of process variable display scale: psig & kg/sqcm

General Components:
Service: Gauge Pressure
Sensing Element Type: Bourdon Tube, 316 Stainless steel
Range: (Adj. Range): As per vessel requirement)
Process:
Process Fluid: Natural Gas / Hydrocarbon liquid
Process connection: ¼ inch NPT (F) (Bottom Entry)
Air Consumption: 20 scfh maximum
Input connection: ¼" NPT (F) bottom entry.
Output connection: ¼" NPT (F) bottom entry.
Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig)

Accessories: (To be supply with each item)

1. Pressure gauge :(Two Numbers)
Dial size 2 ", connection ¼"(NPT (M) back connection,
Range: 0-30 psig

(c) Two nos. of Pressure gauge with isolation valves with following specifications:
a. Type: Direct Reading
b. Mounting :Local
c. Range : As per vessel requirement) kg/cm2
d. Accuracy: +/-1.0% of span

e. Dial Size: 6 inch(150mm) f. Dial Colour: White with black lettering g. Case Material: SS316 h. Lens: Laminated Safety glass lens i. Pressure element: Bourdon tube j. Element material: SS 316 k. Socket Material: SS316 l. Movement material: SS316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas (d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2	
ITEM NO. 90 **Supply of TWO PHASE HORIZONTAL GAS-OIL SEPARATOR (GU-I) as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and reflex type liquid level gauge glass assembly as per OIL's Drawings. QTY = 03 NOS. (REQUIRED FOR EASTERN ASSETS OIL, DIGBOI).** OIL Drawing No: OIL/7617/A, Sk No: OIL/3991/A A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid (Oil & Water) and gas efficiently from the well stream. ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends. B. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition: i) Well Stream Characteristics: As the separator will be used in the process layout of differential separation of crude oil, water and natural gas, the unit will be subjected to the well fluid having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose. a) Water content (Produced) : 0% - 20% b) API gravity of oil : 20 Deg - 35 Deg c) Water specific gravity : 1.02 - 1.08 d) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C.	

f) Wax (Paraffin) content: 10% maximum by volume.
g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream.

ii) Operating Pressure & Temperature: The separator is to be sized for the following operating conditions:

Fluid handling capacity : 900 KLPD(5000 BPD)
Design pressure : 30 kg/cm2
Test pressure : 45 kg/cm2
Working temperature : 37 deg C average
Gas flow rate : 8 MMSCFD

C. Material of construction & standards :

1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel and others as per skt Sk. No. OIL/3991/A
2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 300 class rating..
3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard
3. Bolts and Nuts for non pressure plates shall conform to BS: 916.
4. All threads as per API standard unless otherwise stated.
5. Spot Radiographic test to be done as per as per ASME sec VIII part-I.
6. Flanges to be drilled off CRS as per ANSI class 300 rating & ANSI B16.5 Standard.
7. Pressure rating of all coupling connections shall be 3000 psi WP.
8. Heat Treatment shall be required for the whole vessel.
9. Nozzle necks are to be made of SA 106 Gr B material only and to be provided with RF plates /saddle made of the material similar to the shell material.

D. Separator Mountings: The separator is to be equipped with the following mountings:

a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of

I. Two spring loaded valves,
II. Rocker arm (linkage assy.)
III. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field .
IV. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following:

a) Material : Forged ASTM, A-105 steel.
b) Mounting : Right hand
c) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade
d) Control function : Proportional output type
e) Output signal : 0.2-1.1kg/cm2
Rising Level : Increase out put
Material of Float : 316 SS
Stuffing box : SS with PTFE or Graphite asbestos packing similar to
Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom.
Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange
Float size : 185 mm (7.75") OD rating
Pressure requirement: As per vessel requirement) kg/cm2

(b)PNEUMATIC PRESSURE CONTROLLER, Pressure rating : As per vessel requirement)KG/CM2 PRESSURE CONTROLLER : Type: Pneumatic, Indicating with Proportional & Reset Action General: Function: Indicating Controller Mounting: Vertical pipe mount 2"(50 mm) pipe Housing Material: Glass fibre reinforced polyester/Polyester Plastic Enclosure: Minimum IP53 Maximum Dimension: 260mmX150mmX340mm (LXBXH) Maximum Weight: 7 Kg Controller Performance: Control Mode: Proportional Integral (PI) Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.) Auto/Manual Switch: To be provided Set Point Adjustment: Manual Supply pressure: 20 psig Output: 3 to 15 psig Proportional Band: 4 to 400% of process scale span Reset: 0.02 to 50 repeats per minute Differential Gap: 5 to 100% Repeatability: 0.4% of output span Dead band: Less than 0.4% of process scale span. Unit of process variable display scale: psig & kg/sqcm General Components: Service: Gauge Pressure Sensing Element Type: Bourdon Tube, 316 Stainless steel Range: (Adj. Range): As per vessel requirement) Process: Process Fluid: Natural Gas / Hydrocarbon liquid Process connection: ¼ inch NPT (F) (Bottom Entry) Air Consumption: 20 scfh maximum Input connection: ¼" NPT (F) bottom entry. Output connection: ¼" NPT (F) bottom entry. Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig) Accessories: (To be supply with each item) 1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psig (c) Two nos. of Pressure gauge with isolation valves with following specifications: a. Type: Direct Reading b. Mounting :Local c. Range : As per vessel requirement) kg/cm2 d. Accuracy: +/-1.0% of span e. Dial Size: 6 inch(150mm) f. Dial Colour: White with black lettering	

g. Case Material: SS316 h. Lens: Laminated Safety glass lens i. Pressure element: Bourdon tube j. Element material: SS 316 k. Socket Material: SS316 l. Movement material: SS316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas (d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2	
ITEM NO. 100 **Supply of TWO PHASE HORIZONTAL GAS-OIL SEPARATOR (GU-I) as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and reflex type liquid level gauge glass assembly as per OIL's Drawings. - – QTY = 01 NO. (REQUIRED FOR EASTERN ASSETS OIL, DIGBOI.)** OIL Drawing No: OIL/7617/A, Sk No: OIL/3991/A A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid (Oil & Water) and gas efficiently from the well stream. ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends. B. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition: i) Well Stream Characteristics: As the separator will be used in the process layout of differential separation of crude oil, water and natural gas, the unit will be subjected to the well fluid having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose. a) Water content (Produced) : 0% - 20% b) API gravity of oil : 20 Deg - 35 Deg c) Water specific gravity : 1.02 - 1.08 d) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Wax (Paraffin) content: 10% maximum by volume. g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the	

well stream.

ii) Operating Pressure & Temperature: The separator is to be sized for the following operating conditions:

Fluid handling capacity : 900 KLPD(5000 BPD)
Design pressure : 30 kg/cm2
Test pressure : 45 kg/cm2
Working temperature : 37 deg C average
Gas flow rate : 8 MMSCFD

C. Material of construction & standards :

1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel and others as per skt Sk. No. OIL/3991/A
2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 300 class rating..
3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard
3. Bolts and Nuts for non pressure plates shall conform to BS: 916.
4. All threads as per API standard unless otherwise stated.
5. Spot Radiographic test to be done as per as per ASME sec VIII part-I.
6. Flanges to be drilled off CRS as per ANSI class 300 rating & ANSI B16.5 Standard.
7. Pressure rating of all coupling connections shall be 3000 psi WP.
8. Heat Treatment shall be required for the whole vessel.
9. Nozzle necks are to be made of SA 106 Gr B material only and to be provided with RF plates /saddle made of the material similar to the shell material.

D. Separator Mountings: The separator is to be equipped with the following mountings:

a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of

I. Two spring loaded valves,
II. Rocker arm (linkage assy.)
III. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field .
IV. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following:

a) Material : Forged ASTM, A-105 steel.
b) Mounting : Right hand
c) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade
d) Control function : Proportional output type
e) Output signal : 0.2-1.1kg/cm2
Rising Level : Increase out put
Material of Float : 316 SS
Stuffing box : SS with PTFE or Graphite asbestos packing similar to
Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom.
Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange
Float size : 185 mm (7.75") OD rating
Pressure requirement: As per vessel requirement) kg/cm2

(b)PNEUMATIC PRESSURE CONTROLLER,
Pressure rating : As per vessel requirement)KG/CM2

PRESSURE CONTROLLER :
Type: Pneumatic, Indicating with Proportional & Reset Action

General:
Function: Indicating Controller
Mounting: Vertical pipe mount 2"(50 mm) pipe
Housing Material: Glass fibre reinforced polyester/Polyester Plastic
Enclosure: Minimum IP53
Maximum Dimension: 260mmX150mmX340mm (LXBXH)
Maximum Weight: 7 Kg
Controller Performance:
Control Mode: Proportional Integral (PI)
Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.)
Auto/Manual Switch: To be provided
Set Point Adjustment: Manual
Supply pressure: 20 psig
Output: 3 to 15 psig
Proportional Band: 4 to 400% of process scale span
Reset: 0.02 to 50 repeats per minute
Differential Gap: 5 to 100%
Repeatability: 0.4% of output span
Dead band: Less than 0.4% of process scale span.
Unit of process variable display scale: psig & kg/sqcm

General Components:
Service: Gauge Pressure
Sensing Element Type: Bourdon Tube, 316 Stainless steel
Range: (Adj. Range): As per vessel requirement)
Process:
Process Fluid: Natural Gas / Hydrocarbon liquid
Process connection: ¼ inch NPT (F) (Bottom Entry)
Air Consumption: 20 scfh maximum
Input connection: ¼" NPT (F) bottom entry.
Output connection: ¼" NPT (F) bottom entry.
Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig)

Accessories: (To be supply with each item)

1. Pressure gauge :(Two Numbers)
Dial size 2 ", connection ¼"(NPT (M) back connection,
Range: 0-30 psig

(c) Two nos. of Pressure gauge with isolation valves with following specifications:
a. Type: Direct Reading
b. Mounting :Local
c. Range : As per vessel requirement) kg/cm2
d. Accuracy: +/-1.0% of span
e. Dial Size: 6 inch(150mm)
f. Dial Colour: White with black lettering
g. Case Material: SS316
h. Lens: Laminated Safety glass lens

i. Pressure element: Bourdon tube j. Element material: SS 316 k. Socket Material: SS316 l. Movement material: SS316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas (d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2	
ITEM NO. 110 **TWO PHASE HORIZONTAL GAS-OIL SEPARATOR(GU II)** **Design, fabrication, testing and supply of TWO PHASE HORIZONTAL GAS-OIL SEPARATOR (GU-II) as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and reflex type liquid level gauge glass assembly as per OIL's Drawings. QTY = 03 NOS (REQUIRED FOR EASTERN ASSETS OIL, DIGBOI.)** OIL Drawing No: OIL/3410/D SPECIFICATIONS : A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid (Oil & Water) and gas efficiently from the well stream. ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends. B. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition: i) Well Stream Characteristics: As the separator will be used in the process layout of differential separation of crude oil, water and natural gas, the unit will be subjected to the well fluid having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose. a) Water content (Produced) : 0% - 20% b) API gravity of oil : 20 Deg - 35 Deg c) Water specific gravity : 1.02 - 1.08 d) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C.	

f) Wax (Paraffin) content: 10% maximum by volume.
g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream.

ii) Operating Pressure & Temperature: The separator is to be sized for the following operating conditions:

Fluid capacity : 900 klpd
Design pressure : 8.5 kg/cm2
Test pressure : 12.8 kg/cm2
Working temperature : 50 deg C
Gas flow rate : 8 MMSCFD.
Oil gravity : 30 deg - 35 deg API
Gas gravity : 0.7 to 0.8 (air = 1)
Primary objective : Gas-Oil separation
Design code : ASME Sec. VIII Div. 1.
Radiography : Spot (10% minimum)

C. Material of construction & standards :

1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel and others as per skt Sk. No. OIL/3410/D
2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 300 class rating..
3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard
3. Bolts and Nuts for non pressure plates shall conform to BS: 916.
4. All threads as per API standard unless otherwise stated.
5. Spot Radiographic test to be done as per as per ASME sec VIII part-I.
6. Flanges to be drilled off CRS as per ANSI class 300 rating & ANSI B16.5 Standard.
7. Pressure rating of all coupling connections shall be 3000 psi WP.
8. Heat Treatment shall be required for the whole vessel.
9. Nozzle necks are to be made of SA 106 Gr B material only and to be provided with RF plates /saddle made of the material similar to the shell material.

D. Separator Mountings: The separator is to be equipped with the following mountings:
a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of
I. Two spring loaded valves,
II. Rocker arm (linkage assy.)
III. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field .
IV. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following:

a) Material : Forged ASTM, A-105 steel.
b) Mounting : Right hand
c) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade
d) Control function : Proportional output type
e) Output signal : 0.2-1.1kg/cm2
Rising Level : Increase out put
Material of Float : 316 SS
Stuffing box : SS with PTFE or Graphite asbestos packing similar to
Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom.

Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange Float size : 185 mm (7.75") OD rating Pressure requirement: As per vessel requirement) kg/cm2 (b)PNEUMATIC PRESSURE CONTROLLER, Pressure rating : As per vessel requirement)KG/CM2 PRESSURE CONTROLLER : Type: Pneumatic, Indicating with Proportional & Reset Action General: Function: Indicating Controller Mounting: Vertical pipe mount 2"(50 mm) pipe Housing Material: Glass fibre reinforced polyester/Polyester Plastic Enclosure: Minimum IP53 Maximum Dimension: 260mmX150mmX340mm (LXBXH) Maximum Weight: 7 Kg Controller Performance: Control Mode: Proportional Integral (PI) Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.) Auto/Manual Switch: To be provided Set Point Adjustment: Manual Supply pressure: 20 psig Output: 3 to 15 psig Proportional Band: 4 to 400% of process scale span Reset: 0.02 to 50 repeats per minute Differential Gap: 5 to 100% Repeatability: 0.4% of output span Dead band: Less than 0.4% of process scale span. Unit of process variable display scale: psig & kg/sqcm General Components: Service: Gauge Pressure Sensing Element Type: Bourdon Tube, 316 Stainless steel Range: (Adj. Range): As per vessel requirement) Process: Process Fluid: Natural Gas / Hydrocarbon liquid Process connection: ¼ inch NPT (F) (Bottom Entry) Air Consumption: 20 scfh maximum Input connection: ¼" NPT (F) bottom entry. Output connection: ¼" NPT (F) bottom entry. Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig) Accessories: (To be supply with each item) 1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psig (c) Two nos. of Pressure gauge with isolation valves with following specifications: a. Type: Direct Reading b. Mounting :Local	

c. Range : As per vessel requirement) kg/cm2 d. Accuracy: +/-1.0% of span e. Dial Size: 6 inch(150mm) f. Dial Colour: White with black lettering g. Case Material: SS316 h. Lens: Laminated Safety glass lens i. Pressure element: Bourdon tube j. Element material: SS 316 k. Socket Material: SS316 l. Movement material: SS316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas (d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2	
ITEM NO. 120 **TWO PHASE HORIZONTAL GAS-OIL SEPARATOR(GU II)** **Design, fabrication, testing and supply of TWO PHASE HORIZONTAL GAS-OIL SEPARATOR (GU-II) as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and reflex type liquid level gauge glass assembly as per OIL's Drawings. QTY = 01 NO (REQUIRED FOR EASTERN ASSETS OIL, DIGBOI.)** OIL Drawing No: OIL/3410/D SPECIFICATIONS : A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid (Oil & Water) and gas efficiently from the well stream. ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends. B. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition: i) Well Stream Characteristics: As the separator will be used in the process layout of differential separation of crude oil, water and natural gas, the unit will be subjected to the well fluid having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose.	

a) Water content (Produced) : 0% - 20%
b) API gravity of oil : 20 Deg - 35 Deg
c) Water specific gravity : 1.02 - 1.08
d) Gas gravity : 0.65 - 0.80 (Air = 1)
e) Pour Point of oil : 27 Deg - 33 Deg C.
f) Wax (Paraffin) content: 10% maximum by volume.
g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream.

ii) Operating Pressure & Temperature: The separator is to be sized for the following operating conditions:

Fluid capacity	: 900 klpd
Design pressure	: 8.5 kg/cm2
Test pressure	: 12.8 kg/cm2
Working temperature	: 50 deg C
Gas flow rate	: 8 MMSCFD.
Oil gravity	: 30 deg - 35 deg API
Gas gravity	: 0.7 to 0.8 (air = 1)
Primary objective	: Gas-Oil separation
Design code	: ASME Sec. VIII Div. 1.
Radiography	: Spot (10% minimum)

C. Material of construction & standards :
1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel and others as per skt Sk. No. OIL/3410/D
2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 300 class rating..
3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard
3. Bolts and Nuts for non pressure plates shall conform to BS: 916.
4. All threads as per API standard unless otherwise stated.
5. Spot Radiographic test to be done as per as per ASME sec VIII part-I.
6. Flanges to be drilled off CRS as per ANSI class 300 rating & ANSI B16.5 Standard.
7. Pressure rating of all coupling connections shall be 3000 psi WP.
8. Heat Treatment shall be required for the whole vessel.
9. Nozzle necks are to be made of SA 106 Gr B material only and to be provided with RF plates /saddle made of the material similar to the shell material.

D. Separator Mountings: The separator is to be equipped with the following mountings:
a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of
I. Two spring loaded valves,
II. Rocker arm (linkage assy.)
III. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field .
IV. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following:
a) Material : Forged ASTM, A-105 steel.
b) Mounting : Right hand
c) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade
d) Control function : Proportional output type

e) Output signal : 0.2-1.1kg/cm2
Rising Level : Increase out put
Material of Float : 316 SS
Stuffing box : SS with PTFE or Graphite asbestos packing similar to
Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom.
Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange
Float size : 185 mm (7.75") OD rating
Pressure requirement: As per vessel requirement) kg/cm2

(b)PNEUMATIC PRESSURE CONTROLLER,
Pressure rating : As per vessel requirement)KG/CM2
PRESSURE CONTROLLER :
Type: Pneumatic, Indicating with Proportional & Reset Action

General:
Function: Indicating Controller
Mounting: Vertical pipe mount 2"(50 mm) pipe
Housing Material: Glass fibre reinforced polyester/Polyester Plastic
Enclosure: Minimum IP53
Maximum Dimension: 260mmX150mmX340mm (LXBXH)
Maximum Weight: 7 Kg
Controller Performance:
Control Mode: Proportional Integral (PI)
Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.)
Auto/Manual Switch: To be provided
Set Point Adjustment: Manual
Supply pressure: 20 psig
Output: 3 to 15 psig
Proportional Band: 4 to 400% of process scale span
Reset: 0.02 to 50 repeats per minute
Differential Gap: 5 to 100%
Repeatability: 0.4% of output span
Dead band: Less than 0.4% of process scale span.
Unit of process variable display scale: psig & kg/sqcm

General Components:
Service: Gauge Pressure
Sensing Element Type: Bourdon Tube, 316 Stainless steel
Range: (Adj. Range): As per vessel requirement)
Process:
Process Fluid: Natural Gas / Hydrocarbon liquid
Process connection: ¼ inch NPT (F) (Bottom Entry)
Air Consumption: 20 scfh maximum
Input connection: ¼" NPT (F) bottom entry.
Output connection: ¼" NPT (F) bottom entry.
Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig)

Accessories: (To be supply with each item)

1. Pressure gauge :(Two Numbers)

Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psig (c) Two nos. of Pressure gauge with isolation valves with following specifications: a. Type: Direct Reading b. Mounting :Local c. Range : As per vessel requirement) kg/cm2 d. Accuracy: +/-1.0% of span e. Dial Size: 6 inch(150mm) f. Dial Colour: White with black lettering g. Case Material: SS316 h. Lens: Laminated Safety glass lens i. Pressure element: Bourdon tube j. Element material: SS 316 k. Socket Material: SS316 l. Movement material: SS316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas (d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2	
ITEM NO. 130 **Supply of THREE PHASE HORIZONTAL GAS-OIL SEPARATOR (TPS) as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and Reflex type liquid level gauge assembly, Safety relief valve etc as per following OIL's Drawings - QTY = 01 NOS (REQUIRED FOR EASTERN ASSETS OIL, DIGBOI.)** **OIL's Drawings** 1. OIL/1563/A 2. OIL/2024/B A. Standards & Material of Construction: The unit shall be manufactured conforming to the following code of practices and standards. a) Separator: ASME section VIII, Div. I b) Pipe fittings, flanges etc.: ANSI B 31.3, ANSI B 16.5 c) Safety Relief Valves: ASME section VIII, Div-I/ANSI-B-16.11 d) Structural: IS 226 e) All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 150 class rating. f) Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard g) Bolts and Nuts for non pressure plates shall conform to BS: 916. h) All threads as per API standard unless otherwise stated. i) All pressure plates to IS:2002 Gr. 2A steel or SA-516 gr60/70 ,Non pressure plates to IS: 2062 quality steel and others as per OIL/1563/A.	

B. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement:

i) To separate Oil, Water and gas efficiently from the well stream.
ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron.
iv) Suitable provision to take liquid and gas samples for analysis.
v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends.
vi) Connections: As per OIL/2024/C

C. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition:

i) Well Stream Characteristics: As the test unit will be used in the process layout of differential separation process, the unit will be subjected to the well stream having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose.
a) Water content (Produced): 5- 90%
b) API gravity of oil : 20 Deg - 35 Deg
c) Water specific gravity : 1.02 - 1.08
d) Gas gravity : 0.65 - 0.80 (Air = 1)
e) Pour Point of oil : 27 Deg - 33 Deg C.
f) Wax (Paraffin) content: 10% maximum by volume.
g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream.

ii) Service requirement and Design Data :

Oil handling capacity	:	7000 BPD fluid (2000 BPD free water+ 5000 BPD oil/ emulsion)
Design pressure	:	7 kg/cm2
Test pressure	:	10.5 kg/cm2
Working temperature	:	45 deg C (average)
Gas flow rate	:	5 MMSCFD
gas gravity	:	0.7-0.8 (air=1)
Oil gravity	:	30-35 deg API
Design code	:	ASME Sec. VIII Div. 1.
Radiography	:	Spot (10% minimum)

D. Separator Mountings: The separator is to be equipped with the following mountings:

a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of
I. Two spring loaded valves,
II. Rocker arm (linkage assy.)
III. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level

inside the vessel and also reversible in action in field .
IV. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following:
a) Material : Forged ASTM, A-105 steel.
b) Mounting : Right hand
c) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade
d) Control function : Proportional output type
e) Output signal : 0.2-1.1kg/cm2
Rising Level : Increase out put
Material of Float : 316 SS
Stuffing box : SS with PTFE or Graphite asbestos packing similar to
Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom.
Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange
Float size : 185 mm (7.75") OD rating
Pressure requirement: As per vessel requirement) kg/cm2

(b)PNEUMATIC PRESSURE CONTROLLER,
Pressure rating : As per vessel requirement)KG/CM2
PRESSURE CONTROLLER :
Type: Pneumatic, Indicating with Proportional & Reset Action

General:
Function: Indicating Controller
Mounting: Vertical pipe mount 2"(50 mm) pipe
Housing Material: Glass fibre reinforced polyester/Polyester Plastic
Enclosure: Minimum IP53
Maximum Dimension: 260mmX150mmX340mm (LXBXH)
Maximum Weight: 7 Kg
Controller Performance:
Control Mode: Proportional Integral (PI)
Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.)
Auto/Manual Switch: To be provided
Set Point Adjustment: Manual
Supply pressure: 20 psig
Output: 3 to 15 psig
Proportional Band: 4 to 400% of process scale span
Reset: 0.02 to 50 repeats per minute
Differential Gap: 5 to 100%
Repeatability: 0.4% of output span
Dead band: Less than 0.4% of process scale span.
Unit of process variable display scale: psig & kg/sqcm

General Components:
Service: Gauge Pressure
Sensing Element Type: Bourdon Tube, 316 Stainless steel
Range: (Adj. Range): As per vessel requirement)
Process:
Process Fluid: Natural Gas / Hydrocarbon liquid
Process connection: ¼ inch NPT (F) (Bottom Entry)
Air Consumption: 20 scfh maximum

Input connection: ¼" NPT (F) bottom entry. Output connection: ¼" NPT (F) bottom entry. Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig) Accessories: (To be supply with each item) 1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psig (c) Two nos. of Pressure gauge with isolation valves with following specifications: a. Type: Direct Reading b. Mounting :Local c. Range : As per vessel requirement) kg/cm2 d. Accuracy: +/-1.0% of span e. Dial Size: 6 inch(150mm) f. Dial Colour: White with black lettering g. Case Material: SS316 h. Lens: Laminated Safety glass lens i. Pressure element: Bourdon tube j. Element material: SS 316 k. Socket Material: SS316 l. Movement material: SS316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas (d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2	
ITEM NO. 140 **Design, fabrication, testing and supply of TWO PHASE HORIZONTAL GAS-OIL SEPARATOR (Stabilizer) as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and Reflex type liquid level gauge assembly as per OIL's Drawings.- QTY = 01 NO (REQUIRED FOR EASTERN ASSETS OIL, DIGBOI.)** OIL Drawing No. OIL/3411/C. A. Standards & Material of Construction: The unit shall be manufactured conforming to the following code of practices and standards. a) Separator: ASME section VIII, Div. I b) Pipe fittings, flanges etc.: ANSI B 31.3, ANSI B 16.5 c) Safety Relief Valves: ASME section VIII, Div-I/ANSI-B-16.11 d) Structural: IS 226 e) All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 150 class rating. f) Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard	

g) Bolts and Nuts for non pressure plates shall conform to BS: 916.
h) All threads as per API standard unless otherwise stated

B. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement:

i) To separate liquid (Oil & Water) and gas efficiently from the well stream.
ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron.
iv) Suitable provision to take liquid and gas samples for analysis.
v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends.

C. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition:

i) Well Stream Characteristics: As the test unit will be used in the process layout of differential separation process, the unit will be subjected to the well stream having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose.

a) Water content (Produced) : 0% - 20%
b) API gravity of oil : 20 Deg - 35 Deg
c) Water specific gravity : 1.02 - 1.08
d) Gas gravity : 0.65 - 0.80 (Air = 1)
e) Pour Point of oil : 27 Deg - 33 Deg C.
f) Wax (Paraffin) content: 10% maximum by volume.
g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream

ii) Operating Pressure & Temperature: The separator is to be sized for the following operating conditions:
Fluid capacity : 10,000 BBL(1800KLPD)
Design pressure : 3.5 kg/cm2
Test pressure : 5.25 kg/cm2
Working pressure : 1 Kg/cm2
Working temperature : 50 deg C
Design temperature : 80 deg C
Gas flow rate : 0.14 MMSCMD
Primary objective : Gas-Oil separation

D. Separator Mountings: The separator is to be equipped with the following mountings:

a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of
I. Two spring loaded valves,
II. Rocker arm (linkage assy.)
III. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field .

IV. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following:
a) Material : Forged ASTM, A-105 steel.
b) Mounting : Right hand
c) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade
d) Control function : Proportional output type
e) Output signal : 0.2-1.1kg/cm2
Rising Level : Increase out put
Material of Float : 316 SS
Stuffing box : SS with PTFE or Graphite asbestos packing similar to
Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom.
Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange
Float size : 185 mm (7.75") OD rating
Pressure requirement: As per vessel requirement) kg/cm2

(b)PNEUMATIC PRESSURE CONTROLLER,
Pressure rating : As per vessel requirement)KG/CM2
PRESSURE CONTROLLER :
Type: Pneumatic, Indicating with Proportional & Reset Action

General:
Function: Indicating Controller
Mounting: Vertical pipe mount 2"(50 mm) pipe
Housing Material: Glass fibre reinforced polyester/Polyester Plastic
Enclosure: Minimum IP53
Maximum Dimension: 260mmX150mmX340mm (LXBXH)
Maximum Weight: 7 Kg
Controller Performance:
Control Mode: Proportional Integral (PI)
Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.)
Auto/Manual Switch: To be provided
Set Point Adjustment: Manual
Supply pressure: 20 psig
Output: 3 to 15 psig
Proportional Band: 4 to 400% of process scale span
Reset: 0.02 to 50 repeats per minute
Differential Gap: 5 to 100%
Repeatability: 0.4% of output span
Dead band: Less than 0.4% of process scale span.
Unit of process variable display scale: psig & kg/sqcm

General Components:
Service: Gauge Pressure
Sensing Element Type: Bourdon Tube, 316 Stainless steel
Range: (Adj. Range): As per vessel requirement)
Process:
Process Fluid: Natural Gas / Hydrocarbon liquid
Process connection: ¼ inch NPT (F) (Bottom Entry)
Air Consumption: 20 scfh maximum
Input connection: ¼" NPT (F) bottom entry.

Output connection: ¼" NPT (F) bottom entry. Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig) Accessories: (To be supply with each item) 1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psig (c) Two nos. of Pressure gauge with isolation valves with following specifications: a. Type: Direct Reading b. Mounting :Local c. Range : As per vessel requirement) kg/cm2 d. Accuracy: +/-1.0% of span e. Dial Size: 6 inch(150mm) f. Dial Colour: White with black lettering g. Case Material: SS316 h. Lens: Laminated Safety glass lens i. Pressure element: Bourdon tube j. Element material: SS 316 k. Socket Material: SS316 l. Movement material: SS316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas (d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2	
ITEM NO. 150 **Design, fabrication, testing and supply of TWO PHASE HORIZONTAL GAS-OIL SEPARATOR (Stabilizer) as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and Reflex type liquid level gauge assembly as per OIL's Drawings.- QTY = 01 NO (REQUIRED FOR EASTERN ASSETS OIL, DIGBOI.)** OIL Drawing No. OIL/3411/C. A. Standards & Material of Construction: The unit shall be manufactured conforming to the following code of practices and standards. a) Separator: ASME section VIII, Div. I b) Pipe fittings, flanges etc.: ANSI B 31.3, ANSI B 16.5 c) Safety Relief Valves: ASME section VIII, Div-I/ANSI-B-16.11 d) Structural: IS 226 e) All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 150 class rating. f) Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard g) Bolts and Nuts for non pressure plates shall conform to BS: 916. h) All threads as per API standard unless otherwise stated	

B. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement:

i) To separate liquid (Oil & Water) and gas efficiently from the well stream.
ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron.
iv) Suitable provision to take liquid and gas samples for analysis.
v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends.

C. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition:

i) Well Stream Characteristics: As the test unit will be used in the process layout of differential separation process, the unit will be subjected to the well stream having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose.

a) Water content (Produced) : 0% - 20%
b) API gravity of oil : 20 Deg - 35 Deg
c) Water specific gravity : 1.02 - 1.08
d) Gas gravity : 0.65 - 0.80 (Air = 1)
e) Pour Point of oil : 27 Deg - 33 Deg C.
f) Wax (Paraffin) content: 10% maximum by volume.
g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream

ii) Operating Pressure & Temperature: The separator is to be sized for the following operating conditions:
Fluid capacity : 10,000 BBL(1800KLPD)
Design pressure : 3.5 kg/cm2
Test pressure : 5.25 kg/cm2
Working pressure : 1 Kg/cm2
Working temperature : 50 deg C
Design temperature : 80 deg C
Gas flow rate : 0.14 MMSCMD
Primary objective : Gas-Oil separation

D. Separator Mountings: The separator is to be equipped with the following mountings:

a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of
I. Two spring loaded valves,
II. Rocker arm (linkage assy.)
III. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field .
IV. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following:

a) Material : Forged ASTM, A-105 steel.
b) Mounting : Right hand
c) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade
d) Control function : Proportional output type
e) Output signal : 0.2-1.1kg/cm2
Rising Level : Increase out put
Material of Float : 316 SS
Stuffing box : SS with PTFE or Graphite asbestos packing similar to
Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom.
Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange
Float size : 185 mm (7.75") OD rating
Pressure requirement: As per vessel requirement) kg/cm2

(b)PNEUMATIC PRESSURE CONTROLLER,
Pressure rating : As per vessel requirement)KG/CM2
PRESSURE CONTROLLER :
Type: Pneumatic, Indicating with Proportional & Reset Action

General:
Function: Indicating Controller
Mounting: Vertical pipe mount 2"(50 mm) pipe
Housing Material: Glass fibre reinforced polyester/Polyester Plastic
Enclosure: Minimum IP53
Maximum Dimension: 260mmX150mmX340mm (LXBXH)
Maximum Weight: 7 Kg
Controller Performance:
Control Mode: Proportional Integral (PI)
Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.)
Auto/Manual Switch: To be provided
Set Point Adjustment: Manual
Supply pressure: 20 psig
Output: 3 to 15 psig
Proportional Band: 4 to 400% of process scale span
Reset: 0.02 to 50 repeats per minute
Differential Gap: 5 to 100%
Repeatability: 0.4% of output span
Dead band: Less than 0.4% of process scale span.
Unit of process variable display scale: psig & kg/sqcm

General Components:
Service: Gauge Pressure
Sensing Element Type: Bourdon Tube, 316 Stainless steel
Range: (Adj. Range): As per vessel requirement)
Process:
Process Fluid: Natural Gas / Hydrocarbon liquid
Process connection: ¼ inch NPT (F) (Bottom Entry)
Air Consumption: 20 scfh maximum
Input connection: ¼" NPT (F) bottom entry.
Output connection: ¼" NPT (F) bottom entry.
Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig)

Accessories: (To be supply with each item) 1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psig (c) Two nos. of Pressure gauge with isolation valves with following specifications: a. Type: Direct Reading b. Mounting :Local c. Range : As per vessel requirement) kg/cm2 d. Accuracy: +/-1.0% of span e. Dial Size: 6 inch(150mm) f. Dial Colour: White with black lettering g. Case Material: SS316 h. Lens: Laminated Safety glass lens i. Pressure element: Bourdon tube j. Element material: SS 316 k. Socket Material: SS316 l. Movement material: SS316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas (d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2	
ITEM NO.160 **VERTICAL MIST EXTRACTOR (HIGH PRESSURE MASTER SEPARATOR) generally as per drawing no. OIL/7618 and OIL/3990(enclosed) complete with necessary companion flanges, stud & nuts, Internal Ball Float Type Level Controller, Pressure controller and pressure gauge. QTY = 01 NO (REQUIRED FOR EASTERN ASSETS OIL, DIGBOI.)** A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid particle (Oil & Water) from the entrained gas efficiently. ii) To arrest entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be vertical, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends. B. Separator Sizing Parameters: The master separator unit is to be sized to suit the following service condition: i) Gas Stream Characteristics: As the separator will be used in the process layout for arresting	

particles of crude oil, water from natural gas, the unit will be subjected to the gas stream having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose.

a) Water particle (Produced) : 0% - 1%
b) OIL content(mist form) : 0-1%
b) Gas gravity : 0.65 - 0.80 (Air = 1)
e) Pour Point of oil : 27 Deg - 33 Deg C.
f) Sand /solid/slit content: There may be few amount of sand/slit/drilling fluids particle in the gas stream.

ii) Service requirement and Design Data :
a) Gas handling capacity : 15 MMSCFD
b) Design pressure : 30 Kg/cm2
c) Test pressure : 45 kg/cm2
d) Working temperature : 30-45 degree centigrade average
e) gas gravity : 0.7-.85(air=1)
f) Gas quality : sweet natural gas.
g) Design code : ASME Sec. VIII Div. 1.
h) Radiography : Spot (10% minimum)

iii) Connections: As per OIL/7618

C. Material of construction & standards :
1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel.
2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. and the rating of flanges should be 150 class slip on RF (serrated).
3. Companion flanges shall be provided for all nozzle flanges (of all sizes from the supplied drawing)and shall be weld neck type made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. and the rating of flanges should be 300 class.
3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard

4) Connections: As per OIL/7618
5) Demister assembly shall be vane type.

6) Drain line shall be provided with 2"x3000 psi WP elbow (both ends screwed, LP threaded) after nipple connection instead of Flanged connection.

7) Liquid Level Glass Gauge connection point in vessel shall be provided with 1/2" x 3000 psi screwed coupling, LP threaded instead of flanged connection to avoid transit damage. However, requisite 1/2" X 3000 psi WP screwed nipple and 1/2" X 150 class flange (screwed) are to be supplied additionally.

D. Separator Mountings: The separator is to be equipped with the following mountings:
a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of
I. Two spring loaded valves,
II. Rocker arm (linkage assy.)
III. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level

inside the vessel and also reversible in action in field .
IV. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following:
a) Material : Forged ASTM, A-105 steel.
b) Mounting : Right hand
c) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade
d) Control function : Proportional output type
e) Output signal : 0.2-1.1kg/cm2
Rising Level : Increase out put
Material of Float : 316 SS
Stuffing box : SS with PTFE or Graphite asbestos packing similar to
Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom.
Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange
Float size : 185 mm (7.75") OD rating
Pressure requirement: As per vessel requirement) kg/cm2

(b)PNEUMATIC PRESSURE CONTROLLER,
Pressure rating : As per vessel requirement)KG/CM2
PRESSURE CONTROLLER :
Type: Pneumatic, Indicating with Proportional & Reset Action

General:
Function: Indicating Controller
Mounting: Vertical pipe mount 2"(50 mm) pipe
Housing Material: Glass fibre reinforced polyester/Polyester Plastic
Enclosure: Minimum IP53
Maximum Dimension: 260mmX150mmX340mm (LXBXH)
Maximum Weight: 7 Kg
Controller Performance:
Control Mode: Proportional Integral (PI)
Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.)
Auto/Manual Switch: To be provided
Set Point Adjustment: Manual
Supply pressure: 20 psig
Output: 3 to 15 psig
Proportional Band: 4 to 400% of process scale span
Reset: 0.02 to 50 repeats per minute
Differential Gap: 5 to 100%
Repeatability: 0.4% of output span
Dead band: Less than 0.4% of process scale span.
Unit of process variable display scale: psig & kg/sqcm

General Components:
Service: Gauge Pressure
Sensing Element Type: Bourdon Tube, 316 Stainless steel
Range: (Adj. Range): As per vessel requirement)
Process:
Process Fluid: Natural Gas / Hydrocarbon liquid
Process connection: ¼ inch NPT (F) (Bottom Entry)
Air Consumption: 20 scfh maximum

Input connection: ¼" NPT (F) bottom entry. Output connection: ¼" NPT (F) bottom entry. Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig) Accessories: (To be supply with each item) 1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psig (c) Two nos. of Pressure gauge with isolation valves with following specifications: a. Type: Direct Reading b. Mounting :Local c. Range : As per vessel requirement) kg/cm2 d. Accuracy: +/-1.0% of span e. Dial Size: 6 inch(150mm) f. Dial Colour: White with black lettering g. Case Material: SS316 h. Lens: Laminated Safety glass lens i. Pressure element: Bourdon tube j. Element material: SS 316 k. Socket Material: SS316 l. Movement material: SS316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas (d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2	
ITEM NO.170 **VERTICAL MIST EXTRACTOR (HIGH PRESSURE MASTER SEPARATOR) generally as per drawing no. OIL/7618 and OIL/3990(enclosed) complete with necessary companion flanges, stud & nuts, Internal Ball Float Type Level Controller, Pressure controller and pressure gauge. QTY = 01 NO (REQUIRED FOR EASTERN ASSETS OIL, DIGBOI.)** A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid particle (Oil & Water) from the entrained gas efficiently. ii) To arrest entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be vertical, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends.	

B. Separator Sizing Parameters: The master separator unit is to be sized to suit the following service condition:
i) Gas Stream Characteristics: As the separator will be used in the process layout for arresting particles of crude oil, water from natural gas, the unit will be subjected to the gas stream having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose.

a) Water particle (Produced) : 0% - 1%
b) OIL content(mist form) : 0-1%
b) Gas gravity : 0.65 - 0.80 (Air = 1)
e) Pour Point of oil : 27 Deg - 33 Deg C.
f) Sand /solid/slit content: There may be few amount of sand/slit/drilling fluids particle in the gas stream.

ii) Service requirement and Design Data :
a) Gas handling capacity : 15 MMSCFD
b) Design pressure : 30 Kg/cm2
c) Test pressure : 45 kg/cm2
d) Working temperature : 30-45 degree centigrade average
e) gas gravity : 0.7-.85(air=1)
f) Gas quality : sweet natural gas.
g) Design code : ASME Sec. VIII Div. 1.
h) Radiography : Spot (10% minimum)

iii) Connections: As per OIL/7618

C. Material of construction & standards :
1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel.
2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. and the rating of flanges should be 150 class slip on RF (serrated).
3. Companion flanges shall be provided for all nozzle flanges (of all sizes from the supplied drawing)and shall be weld neck type made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. and the rating of flanges should be 300 class.
3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard

4) Connections: As per OIL/7618
5) Demister assembly shall be vane type.

6) Drain line shall be provided with 2"x3000 psi WP elbow (both ends screwed, LP threaded) after nipple connection instead of Flanged connection.

7) Liquid Level Glass Gauge connection point in vessel shall be provided with 1/2" x 3000 psi screwed coupling, LP threaded instead of flanged connection to avoid transit damage. However, requisite 1/2" X 3000 psi WP screwed nipple and 1/2" X 150 class flange (screwed) are to be supplied additionally.

D. Separator Mountings: The separator is to be equipped with the following mountings:
a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of

I. Two spring loaded valves,
II. Rocker arm (linkage assy.)
III. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field .
IV. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following:
a) Material : Forged ASTM, A-105 steel.
b) Mounting : Right hand
c) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade
d) Control function : Proportional output type
e) Output signal : 0.2-1.1kg/cm2
Rising Level : Increase out put
Material of Float : 316 SS
Stuffing box : SS with PTFE or Graphite asbestos packing similar to
Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom.
Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange
Float size : 185 mm (7.75") OD rating
Pressure requirement: As per vessel requirement) kg/cm2

(b)PNEUMATIC PRESSURE CONTROLLER,
Pressure rating : As per vessel requirement)KG/CM2
PRESSURE CONTROLLER :
Type: Pneumatic, Indicating with Proportional & Reset Action

General:
Function: Indicating Controller
Mounting: Vertical pipe mount 2"(50 mm) pipe
Housing Material: Glass fibre reinforced polyester/Polyester Plastic
Enclosure: Minimum IP53
Maximum Dimension: 260mmX150mmX340mm (LXBXH)
Maximum Weight: 7 Kg
Controller Performance:
Control Mode: Proportional Integral (PI)
Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.)
Auto/Manual Switch: To be provided
Set Point Adjustment: Manual
Supply pressure: 20 psig
Output: 3 to 15 psig
Proportional Band: 4 to 400% of process scale span
Reset: 0.02 to 50 repeats per minute
Differential Gap: 5 to 100%
Repeatability: 0.4% of output span
Dead band: Less than 0.4% of process scale span.
Unit of process variable display scale: psig & kg/sqcm

General Components:
Service: Gauge Pressure
Sensing Element Type: Bourdon Tube, 316 Stainless steel
Range: (Adj. Range): As per vessel requirement)
Process:

Process Fluid: Natural Gas / Hydrocarbon liquid Process connection: ¼ inch NPT (F) (Bottom Entry) Air Consumption: 20 scfh maximum Input connection: ¼" NPT (F) bottom entry. Output connection: ¼" NPT (F) bottom entry. Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig) Accessories: (To be supply with each item) 1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psig (c) Two nos. of Pressure gauge with isolation valves with following specifications: a. Type: Direct Reading b. Mounting :Local c. Range : As per vessel requirement) kg/cm2 d. Accuracy: +/-1.0% of span e. Dial Size: 6 inch(150mm) f. Dial Colour: White with black lettering g. Case Material: SS316 h. Lens: Laminated Safety glass lens i. Pressure element: Bourdon tube j. Element material: SS 316 k. Socket Material: SS316 l. Movement material: SS316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas (d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2	
ITEM NO. 180 **VERTICAL MIST EXTRACTOR (LOW PRESSURE MASTER SEPARATOR) generally as per drawing no. OIL/7232 (enclosed), complete with necessary companion flanges, stud & nuts , Internal Ball Float Type Level Controller, Pressure controller and pressure gauge. QTY = 01 NO (REQUIRED FOR EASTERN ASSETS OIL, DIGBOI.)** A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid particle (Oil & Water) from the entrained gas efficiently. ii) To arrest entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be vertical, cylindrical shell type having	

dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends.

B. Separator Sizing Parameters: The master separator unit is to be sized to suit the following service condition:
i) Gas Stream Characteristics: As the separator will be used in the process layout for arresting particles of crude oil, water from natural gas, the unit will be subjected to the gas stream having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose.

a) Water particle (Produced) : 0% - 1%
b) OIL content(mist form) : 0-1%
b) Gas gravity : 0.65 - 0.80 (Air = 1)
e) Pour Point of oil : 27 Deg - 33 Deg C.
f) Sand /solid/slit content: There may be few amount of sand/slit/drilling fluids particle in the gas stream.

ii) Service requirement and Design Data :
a) GAS handling capacity : 15 MMSCFD
b) Design pressure : 6.4 kg/cm2
c) Test pressure : 10.5 kg/cm2
d) Working temperature : 30-45 degree centigrade average
e) gas gravity : 0.7-.85(air=1)
f) Gas quality : sweet natural gas.
g) Design code : ASME Sec. VIII Div. 1.
h) Radiography : Spot (10% minimum)

C. Material of construction & standards :
1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel.
2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. and the rating of flanges should be 150 class slip on RF (serrated).
3.Companion flanges shall be provided for all nozzle flanges (of all sizes from the supplied drawing)and shall be weld neck type made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. and the rating of flanges should be 150 class.
3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard
3. Bolts and Nuts for non pressure plates shall conform to BS: 916.
4. All threads as per API standard unless otherwise stated.
5. Spot Radiographic test to be done as per as per ASME sec VIII part-I.
6. Flanges to be drilled off CRS as per ANSI class rating as specified in the drawing & ANSI B16.5 Standard.
7. Pressure rating of all coupling connections shall be 3000 psi WP.
8. Heat Treatment shall be required for the whole vessel.
9. Nozzle necks are to be made of SA 106 Gr B material and to be provided with RF plates /saddle made of the material similar to the shell material.

D. Separator Mountings: The separator is to be equipped with the following mountings:

a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type

comprising of
I. Two spring loaded valves,
II. Rocker arm (linkage assy.)
III. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field .
IV. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following:
a) Material : Forged ASTM, A-105 steel.
b) Mounting : Right hand
c) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade
d) Control function : Proportional output type
e) Output signal : 0.2-1.1kg/cm2
Rising Level : Increase out put
Material of Float : 316 SS
Stuffing box : SS with PTFE or Graphite asbestos packing similar to
Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom.
Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange
Float size : 185 mm (7.75") OD rating
Pressure requirement: As per vessel requirement) kg/cm2

(b)PNEUMATIC PRESSURE CONTROLLER,
Pressure rating : As per vessel requirement)KG/CM2
PRESSURE CONTROLLER :
Type: Pneumatic, Indicating with Proportional & Reset Action

General:
Function: Indicating Controller
Mounting: Vertical pipe mount 2"(50 mm) pipe
Housing Material: Glass fibre reinforced polyester/Polyester Plastic
Enclosure: Minimum IP53
Maximum Dimension: 260mmX150mmX340mm (LXBXH)
Maximum Weight: 7 Kg
Controller Performance:
Control Mode: Proportional Integral (PI)
Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.)
Auto/Manual Switch: To be provided
Set Point Adjustment: Manual
Supply pressure: 20 psig
Output: 3 to 15 psig
Proportional Band: 4 to 400% of process scale span
Reset: 0.02 to 50 repeats per minute
Differential Gap: 5 to 100%
Repeatability: 0.4% of output span
Dead band: Less than 0.4% of process scale span.
Unit of process variable display scale: psig & kg/sqcm

General Components:
Service: Gauge Pressure
Sensing Element Type: Bourdon Tube, 316 Stainless steel
Range: (Adj. Range): As per vessel requirement)

Process: Process Fluid: Natural Gas / Hydrocarbon liquid Process connection: ¼ inch NPT (F) (Bottom Entry) Air Consumption: 20 scfh maximum Input connection: ¼" NPT (F) bottom entry. Output connection: ¼" NPT (F) bottom entry. Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig) Accessories: (To be supply with each item) 1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psig (c) Two nos. of Pressure gauge with isolation valves with following specifications: a. Type: Direct Reading b. Mounting :Local c. Range : As per vessel requirement) kg/cm2 d. Accuracy: +/-1.0% of span e. Dial Size: 6 inch(150mm) f. Dial Colour: White with black lettering g. Case Material: SS316 h. Lens: Laminated Safety glass lens i. Pressure element: Bourdon tube j. Element material: SS 316 k. Socket Material: SS316 l. Movement material: SS316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas (d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2	
ITEM NO. 190 **VERTICAL MIST EXTRACTOR (LOW PRESSURE MASTER SEPARATOR) generally as per drawing no. OIL/7232 (enclosed), complete with necessary companion flanges, stud & nuts , Internal Ball Float Type Level Controller, Pressure controller and pressure gauge. QTY = 01 NO (REQUIRED FOR EASTERN ASSETS OIL, DIGBOI.)** A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid particle (Oil & Water) from the entrained gas efficiently. ii) To arrest entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be vertical, cylindrical shell type having	

dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends.

B. Separator Sizing Parameters: The master separator unit is to be sized to suit the following service condition:
i) Gas Stream Characteristics: As the separator will be used in the process layout for arresting particles of crude oil, water from natural gas, the unit will be subjected to the gas stream having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose.

a) Water particle (Produced) : 0% - 1%
b) OIL content(mist form) : 0-1%
b) Gas gravity : 0.65 - 0.80 (Air = 1)
e) Pour Point of oil : 27 Deg - 33 Deg C.
f) Sand /solid/slit content: There may be few amount of sand/slit/drilling fluids particle in the gas stream.

ii) Service requirement and Design Data :
a) GAS handling capacity : 15 MMSCFD
b) Design pressure : 6.4 kg/cm2
c) Test pressure : 10.5 kg/cm2
d) Working temperature : 30-45 degree centigrade average
e) gas gravity : 0.7-.85(air=1)
f) Gas quality : sweet natural gas.
g) Design code : ASME Sec. VIII Div. 1.
h) Radiography : Spot (10% minimum)

C. Material of construction & standards :
1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel.
2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. and the rating of flanges should be 150 class slip on RF (serrated).
3.Companion flanges shall be provided for all nozzle flanges (of all sizes from the supplied drawing)and shall be weld neck type made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. and the rating of flanges should be 150 class.
3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard
3. Bolts and Nuts for non pressure plates shall conform to BS: 916.
4. All threads as per API standard unless otherwise stated.
5. Spot Radiographic test to be done as per as per ASME sec VIII part-I.
6. Flanges to be drilled off CRS as per ANSI class rating as specified in the drawing & ANSI B16.5 Standard.
7. Pressure rating of all coupling connections shall be 3000 psi WP.
8. Heat Treatment shall be required for the whole vessel.
9. Nozzle necks are to be made of SA 106 Gr B material and to be provided with RF plates /saddle made of the material similar to the shell material.

D. Separator Mountings: The separator is to be equipped with the following mountings:

a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type

comprising of
I. Two spring loaded valves,
II. Rocker arm (linkage assy.)
III. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field .
IV. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following:
a) Material : Forged ASTM, A-105 steel.
b) Mounting : Right hand
c) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade
d) Control function : Proportional output type
e) Output signal : 0.2-1.1kg/cm2
Rising Level : Increase out put
Material of Float : 316 SS
Stuffing box : SS with PTFE or Graphite asbestos packing similar to
Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom.
Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange
Float size : 185 mm (7.75") OD rating
Pressure requirement: As per vessel requirement) kg/cm2

(b)PNEUMATIC PRESSURE CONTROLLER,
Pressure rating : As per vessel requirement)KG/CM2
PRESSURE CONTROLLER :
Type: Pneumatic, Indicating with Proportional & Reset Action

General:
Function: Indicating Controller
Mounting: Vertical pipe mount 2"(50 mm) pipe
Housing Material: Glass fibre reinforced polyester/Polyester Plastic
Enclosure: Minimum IP53
Maximum Dimension: 260mmX150mmX340mm (LXBXH)
Maximum Weight: 7 Kg
Controller Performance:
Control Mode: Proportional Integral (PI)
Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.)
Auto/Manual Switch: To be provided
Set Point Adjustment: Manual
Supply pressure: 20 psig
Output: 3 to 15 psig
Proportional Band: 4 to 400% of process scale span
Reset: 0.02 to 50 repeats per minute
Differential Gap: 5 to 100%
Repeatability: 0.4% of output span
Dead band: Less than 0.4% of process scale span.
Unit of process variable display scale: psig & kg/sqcm

General Components:
Service: Gauge Pressure
Sensing Element Type: Bourdon Tube, 316 Stainless steel
Range: (Adj. Range): As per vessel requirement)

Process: Process Fluid: Natural Gas / Hydrocarbon liquid Process connection: ¼ inch NPT (F) (Bottom Entry) Air Consumption: 20 scfh maximum Input connection: ¼" NPT (F) bottom entry. Output connection: ¼" NPT (F) bottom entry. Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig) Accessories: (To be supply with each item) 1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psig (c) Two nos. of Pressure gauge with isolation valves with following specifications: a. Type: Direct Reading b. Mounting :Local c. Range : As per vessel requirement) kg/cm2 d. Accuracy: +/-1.0% of span e. Dial Size: 6 inch(150mm) f. Dial Colour: White with black lettering g. Case Material: SS316 h. Lens: Laminated Safety glass lens i. Pressure element: Bourdon tube j. Element material: SS 316 k. Socket Material: SS316 l. Movement material: SS316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas (d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2	

SPECIAL TERMS AND CONDITIONS (FOR ALL THE ITEMS)

i) The bidder shall confirm that the goods, materials to be supplied shall be new, of recent make, of the best quality & workmanship. The bidder shall confirm that the materials shall be guaranteed for a period of 18 months from the date of despatch or 12 months from the date of receipt/assembling at Fields, whichever is earlier, against defects arising from faulty materials, workmanship or design. Defective goods / materials or parts notified by OIL to the Seller shall be replaced immediately by the Seller on FOR destination basis including payment of all taxes and duties at Seller's expense. This guarantee shall survive and hold good not-withstanding inspection, payment for and acceptance of the goods.

ii) Suppliers are to note that the drawing supplied by OIL is purely to guide the suppliers to make the final working drawings by them. The drawings should, in no case be treated as final fabrication drawings. Manufacturer's working drawing should be sent to OIL for approval along with Quality Assurance Plan (QAP) prior to the commencement of manufacture/fabrication of the separators. The Bidder shall confirm the same in their technical Bid

iii) The separator should be shop constructed and tested as per API specification 12J (Latest version) , ASME section VIII Div-I.

iv) All the welding shall be done as per ASME section IX. Suppliers shall confirm that all coils and shell welding will be done by welders who are qualified under ASME boiler and pressure vessel code section- IX regulations.

v) Post weld heat treatment (Stress Relieving) of the whole vessel should be carried out in an automatic temperature controlled furnace only. The Bidder shall confirm the same in their technical Bid.

vi) All welding joints should be tested 100% radio graphically tested. The Bidder shall confirm the same in their technical Bid.

vii) X- Ray plate & report, radiographic test report should be produced to OIL's inspectors while inspecting and subsequently to be provided with supply of the materials.

viii) The following documents shall be forwarded with the technical bid:
a) Typical General Arrangement Diagram (GAD) of the separator.
b) Sectional drawing showing the internals.
c) Make and technical specification of all the bought-out items along with technical literature, GAD etc.

ix) Test Certificates: Manufacturer to provide following certificates along with the supply as per standard of manufacture & QAP. The Bidder shall confirm the same with the technical bid

a) Raw materials: Chemical & mechanical test certificate as per standard specified in technical specification.
b) Hydraulic test certificate, radiographic test certificate, certificate of Quality & Standard of welding.
c) Certificate of visual inspection & measurement of dimensions.

x) Third Party Inspection: The materials shall be offered for third party inspection for the following scope-

a) Inspection of raw materials.
b) Inspection of radiography of welded joints.
c) Inspection of Hydraulic testing.
f) Inspection of bought-out items.
g) Inspection of certificates in respect of raw materials, bought-out items, radiography etc.

xi) The Third Party Inspector must be OIL's authorized / recognized inspecting agencies i.e. M/s Lloyds or M/s Bureau Veritas or RITES or M/s IRS or M/s DNV or Tuboscope Vetco.

xii) Pre-dispatch Inspection by OIL
OIL's representative shall inspect the materials prior to dispatch at vendor's works at OIL's cost. OIL's representative shall review TPI reports, witness hydraulic testing. Three weeks prior notice to be given to OIL for pre–dispatch inspection.

xiii) Painting and Insulation:
a) External surface shall be cleaned, by sand blasting to Sa2 -1/2 grade followed by 2 coats of heat resistant primer followed by high temperature aluminium paint.
b) Inner surface will be cleaned by wire brushing and will be provided with 2 coats of heat resistant primer. Each coat will have min DFT of 35 micron.

xv) Marking: OIL's logo, Purchase order No. and manufacturers name shall be die stamped/weld written in the shell of the separator.

xvii) The Bidder shall filled up and submit Technical specification on the check list(annexure-IA) and Tender notes check list (annexure-II) along with technical bid as per attached format. All formats shall be filled up with detailed information/specification. In the check lists the use of words like complied or yes or considered is not suffice the requirement of check list. The bidder shall categorically provide the information as per requirements of the check lists.

xviii) Item No.10 to 60 to be delivered in PSS Dept. Duliajan. Item No.70 & 190 to be delivered in Easter Assets, Digboi. Bidders are requested to quote freight charge considering the above delivery points. Also requested to mention approx. Gross Weight, Volume (Length X Breadth X Height) of each item separately ie approx gross weight & volume of item 10,20,30 etc

NOTE:

Bidders should submit their bids (preferably in tabular form) explicitly mentioning compliance / non compliance to all the NIT terms and conditions of NIT.

ANNEXURE- DDD

INTEGRITY PACT

Between

Oil India Limited (OIL) hereinafter referred to as "The Principal"

And

(Name of the bidder).....hereinafter referred to as "The Bidder/Contractor"

Preamble:

The Principal intends to award, under laid down organizational procedures, contract/s for **SDI1282P20** Principal values full compliance with all relevant laws and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder/s and Contractor/s.

In order to achieve these goals, the Principal cooperates with the renowned international Non-Governmental Organization "Transparency International" (TI). Following TI's national and international experience, the Principal will appoint an external independent Monitor who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section: 1 -Commitments of the Principal

(1) The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:

1. No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for him/herself or third person, any material or immaterial benefit which he/she is not legally entitled to.

2. The Principal will, during the tender process treat all Bidders with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidders the same information and will not provide to any Bidder confidential/additional information through which the Bidder could obtain an advantage in relation to the tender process or the contract execution.

3. The Principal will exclude from the process all known prejudiced persons.

(2) If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the relevant Anti-Corruption Laws of India, or if there be a Page 2 of 6 substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section: 2 -Commitments of the Bidder/Contractor

(1) The Bidder/Contractor commits itself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

1. The Bidder/Contractor will not, directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material or immaterial benefit which h e/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

2. The Bidder/Contractor will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. 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.

3. The Bidder/Contractor will not commit any offence under the relevant Anticorruption Laws of India; further the Bidder/Contractor will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

4. The Bidder/Contractor will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

(2) The Bidder/Contractor will not instigate third persons to commit offences outlined above or be an accessory to such offences.

(3) The Bidder/Contractor signing Integrity Pact shall not approach the Courts while representing the matters to IEMs and he/she will await their decision in the matter.

Section 3 -Disqualification from tender process and exclusion from future Contracts

If the Bidder, before contract award has committed a transgression through a violation of Section 2 or in any other form such as to put his reliability or risibility as Bidder into question, the Principal is entitled to disqualify the Bidder from the tender process or to terminate the contract, if already signed, for such reason.

1. If the Bidder/Contractor has committed a transgression through a violation of Section 2 such as to put his reliability or credibility into question, the Principal is entitled also to exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case, in particular the number of transgressions, the position of the transgressions within the company hierarchy of the Bidder and the amount of the damage. The exclusion will be imposed for a minimum of 6 months and maximum of 3 years.

2. The Bidder accepts and undertakes to respect and uphold the Principal's Absolute right to resort to and impose such exclusion and further accepts and undertakes not to challenge or question such exclusion on any ground, including the lack of any hearing before the decision to resort to such exclusion is taken. This undertaking is given freely and after obtaining independent legal advice.

3. If the Bidder/Contractor can prove that he has restored/recouped the Damage caused by him and has installed a suitable corruption prevention system, the Principal may revoke the exclusion prematurely.

4. A transgression is considered to have occurred if in light of available evidence no reasonable doubt is possible.

5. Integrity Pact, in respect of a particular contract, shall be operative from the date Integrity Pact is signed by both the parties till the final completion of the contract **or as mentioned in Section 9- Pact Duration whichever is later**. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings

ANNEXURE- DDD

Section 4 -Compensation for Damages

1. If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover from the Bidder liquidated damages equivalent to Earnest Money Deposit / Bid Security.

(2) If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to Section 3, the principal shall be entitled to demand and recover from the Contractor liquidated damages equivalent to Security Deposit / Performance Bank Guarantee.

3. The bidder agrees and undertakes to pay the said amounts without protest or demur subject only to condition that if the Bidder/Contractor can prove and establish that the exclusion of the Bidder from the tender process or the termination of the contract after the contract award has caused no damage or less damage than the amount or the liquidated damages, the Bidder/Contractor shall compensate the Principal only to the extent of the damage in the amount proved.

Section 5 -Previous transgression

1. The Bidder declares that no previous transgression occurred in the last 3 years with any other Company in any country conforming to the TI approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.

2. If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section: 6 -Equal treatment of all Bidders/Contractor/Subcontractors

1. The Principal will enter into Pacts on identical terms with all bidders and contractors.

2. The Bidder / Contractor undertake(s) to procure from all subcontractors a commitment in conformity with this Integrity Pact. The Bidder/Contractor shall be responsible for any violation(s) of the provisions laid down in this agreement/Pact by any of its sub-contractors/sub-vendors.

3. The Principal will disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

ANNEXURE- DDD

Section: 7 -Criminal charges against violating Bidders/Contractors/ Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor, which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section: 8 -External Independent Monitor/Monitors

1. The Principal appoints competent and credible external independent Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

2. The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the Chairperson of the Board of the Principal.

3. The Contractor accepts that the Monitor has the right to access without restriction to all Project documentation of the Principal including that provided by the Contractor. The Contractor will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor is under contractual obligation to treat the information and documents of the Bidder/Contractor/Subcontractor with confidentiality.

4. The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

5. As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or heal the violation, or to take other relevant action. The monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action. However, the Independent External Monitor shall give an opportunity to the bidder / contractor to present its case before making its recommendations to the Principal.

6. The Monitor will submit a written report to the Chairperson of the Board of the Principal within 8 to 10 weeks from the date of reference or intimation to

him by the 'Principal' and, should the occasion arise, submit proposals for correcting problematic situations.

7. If the Monitor has reported to the Chairperson of the Board a Substantiated suspicion of an offence under relevant Anti-Corruption Laws of India, and the Chairperson has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8. The word 'Monitor' would include both singular and plural.

Section:9 -Pact Duration

This Pact begins when both parties have legally signed it. It expires for the Contractor 12 months after the last payment under the respective contract, and for all other Bidders 6 months after the contract has been awarded.
If any claim is made/ lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/determined by Chairperson of the Principal.

Section:10 -Other provisions

1. This agreement is subject to Indian Law. Place of performance and jurisdiction is the Registered Office of the Principal, i.e. New Delhi. The Arbitration clause provided in the main tender document / contract shall not be applicable for any issue / dispute arising under Integrity Pact.

2. Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

3. If the Contractor is a partnership or a consortium, this agreement must be, signed by all partners or consortium members.

4. Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intensions.

R BARMAN
CMM (IP)

..... **.....**

For the Principal **For the Bidder/Contractor**

Witness 1: .....

Witness 2: .....

Place. DULIAJAN
Date . 30.04.2019

TENDER NO. SDI1282P20 DT: 29.04.2019

Annexure 1 (Technical Specification)

Technical specification check list for evaluation

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
Item:10	TWO PHASE HORIZONTAL GAS-OIL SEPARATOR as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and reflex type liquid level gauge glass assembly as per OIL's Drawings. OIL Drawing No: OIL/7617/A, Sk No: OIL/3991/A			
A	A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid (Oil & Water) and gas efficiently from the well stream. ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends.			
B(i)	B. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition: i) Well Stream Characteristics: As the separator will be used in the process layout of differential separation of crude oil, water and natural gas, the unit will be subjected to the well fluid having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose. a) Water content (Produced) : 0% - 20% b) API gravity of oil : 20 Deg - 35 Deg c) Water specific gravity : 1.02 - 1.08 d) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Wax (Paraffin) content: 10% maximum by volume.			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream.			
B(ii)	ii) Operating Pressure & Temperature: The separator is to be sized for the following operating conditions: Fluid handling capacity : 900 KLPD(5000 BPD) Design pressure : 30 kg/cm2 Test pressure : 45 kg/cm2 Working temperature : 37 deg C average Gas flow rate : 8 MMSCFD			
C	**C. Material of construction & standards** : 1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel and others as per skt Sk. No. OIL/3991/A 2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 300 class rating.. 3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard 3. Bolts and Nuts for non pressure plates shall conform to BS: 916. 4. All threads as per API standard unless otherwise stated. 5. Spot Radiographic test to be done as per as per ASME sec VIII part-I. 6. Flanges to be drilled off CRS as per ANSI class 300 rating & ANSI B16.5 Standard. 7. Pressure rating of all coupling connections shall be 3000 psi WP. 8. Heat Treatment shall be required for the whole vessel. 9. Nozzle necks are to be made of SA 106 Gr B material only and to be provided with RF plates /saddle made of the material similar to the shell material.			
D(a)	D. Separator Mountings: The separator is to be equipped with the following mountings: a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of I. Two spring loaded valves, II. Rocker arm (linkage assy.) III. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field . IV. Float rod, lever. Counter weight, chain, adjustable screw,			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	travel stop, & necessary link, bolt & nuts etc. with other specifications as per following: a) Material : Forged ASTM, A-105 steel. b) Mounting : Right hand c) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade d) Control function : Proportional output type e) Output signal : 0.2-1.1kg/cm2 Rising Level : Increase out put Material of Float : 316 SS Stuffing box : SS with PTFE or Graphite asbestos packing similar to Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom. Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange Float size : 185 mm (7.75") OD rating Pressure requirement: As per vessel requirement) kg/cm2 f) Nominal size : 254mm (10") RF as per ANSI B16.5, 300 class rating flange g) Float size : 185 mm (7.75") OD, Rating: as per design requirement.			
D(b)	(b)PNEUMATIC PRESSURE CONTROLLER, Pressure rating : As per vessel requirement)KG/CM2 PRESSURE CONTROLLER : Type: Pneumatic, Indicating with Proportional & Reset Action General: Function: Indicating Controller Mounting: Vertical pipe mount 2"(50 mm) pipe Housing Material: Glass fibre reinforced polyester/Polyester Plastic Enclosure: Minimum IP53 Maximum Dimension: 260mmX150mmX340mm (LXBXH) Maximum Weight: 7 Kg Controller Performance: Control Mode: Proportional Integral (PI) Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.)			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	Auto/Manual Switch: To be provided Set Point Adjustment: Manual Supply pressure: 20 psig Output: 3 to 15 psig Proportional Band: 4 to 400% of process scale span Reset: 0.02 to 50 repeats per minute Differential Gap: 5 to 100% Repeatability: 0.4% of output span Dead band: Less than 0.4% of process scale span. Unit of process variable display scale: psig & kg/sqcm General Components: Service: Gauge Pressure Sensing Element Type: Bourdon Tube, 316 Stainless steel Range: (Adj. Range): As per vessel requirement) Process: Process Fluid: Natural Gas / Hydrocarbon liquid Process connection: ¼ inch NPT (F) (Bottom Entry) Air Consumption: 20 scfh maximum Input connection: ¼" NPT (F) bottom entry. Output connection: ¼" NPT (F) bottom entry. Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig) Accessories: (To be supply with each item) 1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psig			
D(c)	(c) Two nos. of Pressure gauge with isolation valves with following specifications: a. Type: Direct Reading b. Mounting :Local c. Range : As per vessel requirement) kg/cm2 d. Accuracy: +/-1.0% of span e. Dial Size: 6 inch(150mm) f. Dial Colour: White with black lettering g. Case Material: SS316 h. Lens: Laminated Safety glass lens i. Pressure element: Bourdon tube j. Element material: SS 316			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	k. Socket Material: SS316 l. Movement material: SS316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas			
D(d)	(d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2			
Two Phase Separator(GU-II)				
Item 20	TWO PHASE HORIZONTAL GAS-OIL SEPARATOR(GU II) Supply of TWO PHASE HORIZONTAL GAS-OIL SEPARATOR (GU-II) as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and reflex type liquid level gauge glass assembly as per OIL's Drawings. OIL Drawing No: OIL/3410/D			
A	A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid (Oil & Water) and gas efficiently from the well stream. ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends.			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
B	B. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition: i) Well Stream Characteristics: As the separator will be used in the process layout of differential separation of crude oil, water and natural gas, the unit will be subjected to the well fluid having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose. a) Water content (Produced) : 0% - 20% b) API gravity of oil : 20 Deg - 35 Deg c) Water specific gravity : 1.02 - 1.08 d) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Wax (Paraffin) content: 10% maximum by volume. g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream.			
C(i)	ii) Operating Pressure & Temperature: The separator is to be sized for the following operating conditions: Fluid capacity : 900 klpd Design pressure : 8.5 kg/cm2 Test pressure : 12.8 kg/cm2 Working temperature : 50 deg C Gas flow rate : 8 MMSCFD. Oil gravity : 30 deg - 35 deg API Gas gravity : 0.7 to 0.8 (air = 1) Primary objective : Gas-Oil separation Design code : ASME Sec. VIII Div. 1. Radiography : Spot (10% minimum) d) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Wax (Paraffin) content: 10% maximum by volume. g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream			
C	**C. Material of construction & standards** : 1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel and others as per skt Sk. No. OIL/3410/D			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 300 class rating.. 3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard 3. Bolts and Nuts for non pressure plates shall conform to BS: 916. 4. All threads as per API standard unless otherwise stated. 5. Spot Radiographic test to be done as per as per ASME sec VIII part-I. 6. Flanges to be drilled off CRS as per ANSI class 300 rating & ANSI B16.5 Standard. 7. Pressure rating of all coupling connections shall be 3000 psi WP. 8. Heat Treatment shall be required for the whole vessel. 9. Nozzle necks are to be made of SA 106 Gr B material only and to be provided with RF plates /saddle made of the material similar to the shell material.			
D(a)	D. Separator Mountings: The separator is to be equipped with the following mountings: a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of V. Two spring loaded valves, VI. Rocker arm (linkage assy.) VII. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field . VIII. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following: h) Material : Forged ASTM, A-105 steel. i) Mounting : Right hand j) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade k) Control function : Proportional output type l) Output signal : 0.2-1.1kg/cm2 Rising Level : Increase out put Material of Float : 316 SS Stuffing box : SS with PTFE or Graphite asbestos packing similar to			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom. Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange Float size : 185 mm (7.75") OD rating Pressure requirement: As per vessel requirement) kg/cm2 (b)PNEUMATIC PRESSURE CONTROLLER, Pressure rating : As per vessel requirement)KG/CM2 PRESSURE CONTROLLER : Type: Pneumatic, Indicating with Proportional & Reset Action General: Function: Indicating Controller Mounting: Vertical pipe mount 2"(50 mm) pipe Housing Material: Glass fibre reinforced polyester/Polyester Plastic Enclosure: Minimum IP53 Maximum Dimension: 260mmX150mmX340mm (LXBXH) Maximum Weight: 7 Kg			
D(b)	(b)PNEUMATIC PRESSURE CONTROLLER, Pressure rating : As per vessel requirement)KG/CM2 PRESSURE CONTROLLER : Type: Pneumatic, Indicating with Proportional & Reset Action General: Function: Indicating Controller Mounting: Vertical pipe mount 2"(50 mm) pipe Housing Material: Glass fibre reinforced polyester/Polyester Plastic Enclosure: Minimum IP53 Maximum Dimension: 260mmX150mmX340mm (LXBXH) Maximum Weight: 7 Kg Controller Performance: Control Mode: Proportional Integral (PI) Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.) Auto/Manual Switch: To be provided			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	Set Point Adjustment: Manual Supply pressure: 20 psig Output: 3 to 15 psig Proportional Band: 4 to 400% of process scale span Reset: 0.02 to 50 repeats per minute Differential Gap: 5 to 100% Repeatability: 0.4% of output span Dead band: Less than 0.4% of process scale span. Unit of process variable display scale: psig & kg/sqcm General Components: Service: Gauge Pressure Sensing Element Type: Bourdon Tube, 316 Stainless steel Range: (Adj. Range): As per vessel requirement) Process: Process Fluid: Natural Gas / Hydrocarbon liquid Process connection: ¼ inch NPT (F) (Bottom Entry) Air Consumption: 20 scfh maximum Input connection: ¼" NPT (F) bottom entry. Output connection: ¼" NPT (F) bottom entry. Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig) Accessories: (To be supply with each item) 1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psig			
D(c)	(c) Two nos. of Pressure gauge with isolation valves with following specifications: a. Type: Direct Reading b. Mounting :Local c. Range : As per vessel requirement) kg/cm2 d. Accuracy: +/-1.0% of span e. Dial Size: 6 inch(150mm) f. Dial Colour: White with black lettering g. Case Material: SS316 h. Lens: Laminated Safety glass lens i. Pressure element: Bourdon tube j. Element material: SS 316			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	k. Socket Material: SS316 l. Movement material: SS316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas			
D(d)	(d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2			
	Item: 3 (Three Phase Separator			
Item:30	Supply of THREE PHASE HORIZONTAL GAS-OIL SEPARATOR (TPS) as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and Reflex type liquid level gauge assembly, Safety relief valve etc as per following OIL's Drawings. 1. OIL/1563/A 2. OIL/2024/B			
A	**A. Standards & Material of Construction**: The unit shall be manufactured conforming to the following code of practices and standards. a) Separator: ASME section VIII, Div. I b) Pipe fittings, flanges etc.: ANSI B 31.3, ANSI B 16.5 c) Safety Relief Valves: ASME section VIII, Div-I/ANSI-B-16.11 d) Structural: IS 226 e) All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 150 class rating. f) Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard g) Bolts and Nuts for non pressure plates shall conform to BS: 916. h) All threads as per API standard unless otherwise stated. i) All pressure plates to IS:2002 Gr. 2A steel or SA-516 gr60/70 ,Non pressure plates to IS: 2062 quality steel and others as per OIL/1563/A.			
B	**B. Service requirement**: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate Oil, Water and gas efficiently from the well stream.			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends. vi) Connections: As per OIL/2024/C			
C	C. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition: i) Well Stream Characteristics: As the test unit will be used in the process layout of differential separation process, the unit will be subjected to the well stream having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose. a) Water content (Produced): 5- 90% b) API gravity of oil : 20 Deg - 35 Deg c) Water specific gravity : 1.02 - 1.08 d) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Wax (Paraffin) content: 10% maximum by volume. g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream.			
C(ii)	ii) Service requirement and Design Data : Oil handling capacity : 7000 BPD fluid (2000 BPD free water+ 5000 BPD oil/ emulsion) Design pressure : 7 kg/cm2 Test pressure : 10.5 kg/cm2 Working temperature : 45 deg C (average) Gas flow rate : 5 MMSCFD gas gravity : 0.7-0.8 (air=1) Oil gravity : 30-35 deg API Design code : ASME Sec. VIII Div. 1. Radiography : Spot (10% minimum)			
D(a)	D. Separator Mountings: The separator is to be equipped with the			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	following mountings: a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of IX. Two spring loaded valves, X. Rocker arm (linkage assy.) XI. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field . XII. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following: m) Material : Forged ASTM, A-105 steel. n) Mounting : Right hand o) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade p) Control function : Proportional output type q) Output signal : 0.2-1.1kg/cm2 Rising Level : Increase out put Material of Float : 316 SS Stuffing box : SS with PTFE or Graphite asbestos packing similar to Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom. Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange Float size : 185 mm (7.75") OD rating Pressure requirement: As per vessel requirement) kg/cm2			
D(b)	(b)PNEUMATIC PRESSURE CONTROLLER, Pressure rating : As per vessel requirement)KG/CM2 PRESSURE CONTROLLER : Type: Pneumatic, Indicating with Proportional & Reset Action General: Function: Indicating Controller Mounting: Vertical pipe mount 2"(50 mm) pipe Housing Material: Glass fibre reinforced polyester/Polyester Plastic Enclosure: Minimum IP53			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	Maximum Dimension: 260mmX150mmX340mm (LXBXH) Maximum Weight: 7 Kg Controller Performance: Control Mode: Proportional Integral (PI) Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.) Auto/Manual Switch: To be provided Set Point Adjustment: Manual Supply pressure: 20 psig Output: 3 to 15 psig Proportional Band: 4 to 400% of process scale span Reset: 0.02 to 50 repeats per minute Differential Gap: 5 to 100% Repeatability: 0.4% of output span Dead band: Less than 0.4% of process scale span. Unit of process variable display scale: psig & kg/sqcm General Components: Service: Gauge Pressure Sensing Element Type: Bourdon Tube, 316 Stainless steel Range: (Adj. Range): As per vessel requirement) Process: Process Fluid: Natural Gas / Hydrocarbon liquid Process connection: ¼ inch NPT (F) (Bottom Entry) Air Consumption: 20 scfh maximum Input connection: ¼" NPT (F) bottom entry. Output connection: ¼" NPT (F) bottom entry. Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig) Accessories: (To be supply with each item) 1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psig			
D(c)	(c) Two nos. of Pressure gauge with isolation valves with following specifications: a. Type: Direct Reading b. Mounting :Local			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	c. Range : As per vessel requirement) kg/cm2 d. Accuracy: +/-1.0% of span e. Dial Size: 6 inch(150mm) f. Dial Colour: White with black lettering g. Case Material: SS316 h. Lens: Laminated Safety glass lens i. Pressure element: Bourdon tube j. Element material: SS 316 k. Socket Material: SS316 l. Movement material: S S316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas			
	(d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2			
	STABILIZER			
Item:40	Supply of TWO PHASE HORIZONTAL GAS-OIL SEPARATOR (Stabilizer) as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and Reflex type liquid level gauge assembly as per OIL's Drawings. OIL Drawing No. OIL/3411/C.			
A	**A. Standards & Material of Construction**: The unit shall be manufactured conforming to the following code of practices and standards. a) Separator: ASME section VIII, Div. I b) Pipe fittings, flanges etc.: ANSI B 31.3, ANSI B 16.5 c) Safety Relief Valves: ASME section VIII, Div-I/ANSI-B-16.11 d) Structural: IS 226 e) All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 150 class rating. f) Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard g) Bolts and Nuts for non pressure plates shall conform to BS: 916. h) All threads as per API standard unless otherwise stated			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
B	B. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid (Oil & Water) and gas efficiently from the well stream. ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends.			
C(i)	C. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition: i) Well Stream Characteristics: As the test unit will be used in the process layout of differential separation process, the unit will be subjected to the well stream having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose. a) Water content (Produced) : 0% - 20% b) API gravity of oil : 20 Deg - 35 Deg c) Water specific gravity : 1.02 - 1.08 d) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Wax (Paraffin) content: 10% maximum by volume. g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream			
C(ii)	ii) Operating Pressure & Temperature: The separator is to be sized for the following operating conditions: Fluid capacity : 10,000 BBL(1800KLPD) Design pressure : 3.5 kg/cm2 Test pressure : 5.25 kg/cm2 Working pressure : 1 Kg/cm2 Working temperature : 50 deg C Design temperature : 80 deg C Gas flow rate : 0.14 MMSCMD			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	Primary objective : Gas-Oil separation			
D(a)	D. Separator Mountings: The separator is to be equipped with the following mountings: a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of XIII. Two spring loaded valves, XIV. Rocker arm (linkage assy.) XV. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field . XVI. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following: r) Material : Forged ASTM, A-105 steel. s) Mounting : Right hand t) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade u) Control function : Proportional output type v) Output signal : 0.2-1.1kg/cm2 Rising Level : Increase out put Material of Float : 316 SS Stuffing box : SS with PTFE or Graphite asbestos packing similar to Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom. Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange Float size : 185 mm (7.75") OD rating Pressure requirement: As per vessel requirement) kg/cm2			
D(b)	(b)PNEUMATIC PRESSURE CONTROLLER, Pressure rating : As per vessel requirement)KG/CM2 PRESSURE CONTROLLER : Type: Pneumatic, Indicating with Proportional & Reset Action General: Function: Indicating Controller Mounting: Vertical pipe mount 2"(50 mm) pipe Housing Material: Glass fibre reinforced polyester/Polyester			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	Plastic Enclosure: Minimum IP53 Maximum Dimension: 260mmX150mmX340mm (LXBXH) Maximum Weight: 7 Kg Controller Performance: Control Mode: Proportional Integral (PI) Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.) Auto/Manual Switch: To be provided Set Point Adjustment: Manual Supply pressure: 20 psig Output: 3 to 15 psig Proportional Band: 4 to 400% of process scale span Reset: 0.02 to 50 repeats per minute Differential Gap: 5 to 100% Repeatability: 0.4% of output span Dead band: Less than 0.4% of process scale span. Unit of process variable display scale: psig & kg/sqcm General Components: Service: Gauge Pressure Sensing Element Type: Bourdon Tube, 316 Stainless steel Range: (Adj. Range): As per vessel requirement) Process: Process Fluid: Natural Gas / Hydrocarbon liquid Process connection: ¼ inch NPT (F) (Bottom Entry) Air Consumption: 20 scfh maximum Input connection: ¼" NPT (F) bottom entry. Output connection: ¼" NPT (F) bottom entry. Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig) Accessories: (To be supply with each item) 1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psig			
D(c)	(c) Two nos. of Pressure gauge with isolation valves with following specifications: a. Type: Direct Reading			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	b. Mounting :Local c. Range : As per vessel requirement) kg/cm2 d. Accuracy: +/-1.0% of span e. Dial Size: 6 inch(150mm) f. Dial Colour: White with black lettering g. Case Material: SS316 h. Lens: Laminated Safety glass lens i. Pressure element: Bourdon tube j. Element material: SS 316 k. Socket Material: SS316 l. Movement material: SS316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas			
D(d)	(d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2			
	LPMS(Vertical)			
Item:50	VERTICAL MIST EXTRACTOR (LOW PRESSURE MASTER SEPARATOR) generally as per drawing no. OIL/7232 (enclosed), complete with necessary companion flanges, stud & nuts , Internal Ball Float Type Level Controller, Pressure controller and pressure gauge.			
A	A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid particle (Oil & Water) from the entrained gas efficiently. ii) To arrest entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be vertical, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends.			
B	B. Separator Sizing Parameters: The master separator unit is to be sized to suit the following service condition:			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	i) Gas Stream Characteristics: As the separator will be used in the process layout for arresting particles of crude oil, water from natural gas, the unit will be subjected to the gas stream having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose. a) Water particle (Produced) : 0% - 1% b) OIL content(mist form) : 0-1% b) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Sand /solid/slit content: There may be few amount of sand/slit/drilling fluids particle in the gas stream.			
B(ii)	**ii) Service requirement and Design Data :** a) GAS handling capacity : 15 MMSCFD b) Design pressure : 6.4 kg/cm2 c) Test pressure : 10.5 kg/cm2 d) Working temperature : 30-45 degree centigrade average e) gas gravity : 0.7-.85(air=1) f) Gas quality : sweet natural gas. g) Design code : ASME Sec. VIII Div. 1. h) Radiography : Spot (10% minimum)			
C	**C. Material of construction & standards** : 1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel. 2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. and the rating of flanges should be 150 class slip on RF (serrated). 3.Companion flanges shall be provided for all nozzle flanges (of all sizes from the supplied drawing)and shall be weld neck type made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. and the rating of flanges should be 150 class. 3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard 3. Bolts and Nuts for non pressure plates shall conform to BS: 916. 4. All threads as per API standard unless otherwise stated. 5. Spot Radiographic test to be done as per as per ASME sec VIII part-I. 6. Flanges to be drilled off CRS as per ANSI class rating as specified in the drawing & ANSI B16.5 Standard.			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	7. Pressure rating of all coupling connections shall be 3000 psi WP. 8. Heat Treatment shall be required for the whole vessel. 9. Nozzle necks are to be made of SA 106 Gr B material and to be provided with RF plates /saddle made of the material similar to the shell material.			
D(a)	D. Separator Mountings: The separator is to be equipped with the following mountings: a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of XVII. Two spring loaded valves, XVIII. Rocker arm (linkage assy.) XIX. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field . XX. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following: w) Material : Forged ASTM, A-105 steel. x) Mounting : Right hand y) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade z) Control function : Proportional output type aa) Output signal : 0.2-1.1kg/cm2 Rising Level : Increase out put Material of Float : 316 SS Stuffing box : SS with PTFE or Graphite asbestos packing similar to Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom. Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange Float size : 185 mm (7.75") OD rating Pressure requirement: As per vessel requirement) kg/cm2			
D(b)	(b)PNEUMATIC PRESSURE CONTROLLER, Pressure rating : As per vessel requirement)KG/CM2			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	PRESSURE CONTROLLER : Type: Pneumatic, Indicating with Proportional & Reset Action General: Function: Indicating Controller Mounting: Vertical pipe mount 2"(50 mm) pipe Housing Material: Glass fibre reinforced polyester/Polyester Plastic Enclosure: Minimum IP53 Maximum Dimension: 260mmX150mmX340mm (LXBXH) Maximum Weight: 7 Kg Controller Performance: Control Mode: Proportional Integral (PI) Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.) Auto/Manual Switch: To be provided Set Point Adjustment: Manual Supply pressure: 20 psig Output: 3 to 15 psig Proportional Band: 4 to 400% of process scale span Reset: 0.02 to 50 repeats per minute Differential Gap: 5 to 100% Repeatability: 0.4% of output span Dead band: Less than 0.4% of process scale span. Unit of process variable display scale: psig & kg/sqcm General Components: Service: Gauge Pressure Sensing Element Type: Bourdon Tube, 316 Stainless steel Range: (Adj. Range): As per vessel requirement) Process: Process Fluid: Natural Gas / Hydrocarbon liquid Process connection: ¼ inch NPT (F) (Bottom Entry) Air Consumption: 20 scfh maximum Input connection: ¼" NPT (F) bottom entry. Output connection: ¼" NPT (F) bottom entry. Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig) Accessories: (To be supply with each item)			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psig			
	(c) Two nos. of Pressure gauge with isolation valves with following specifications: a. Type: Direct Reading b. Mounting :Local c. Range : As per vessel requirement) kg/cm2 d. Accuracy: +/-1.0% of span e. Dial Size: 6 inch(150mm) f. Dial Colour: White with black lettering g. Case Material: SS316 h. Lens: Laminated Safety glass lens i. Pressure element: Bourdon tube j. Element material: SS 316 k. Socket Material: SS316 l. Movement material: SS316 m. Connection: ½ inch NPT(M) n. Connection Type: Direct with bottom entry o. Operating Pressure:1 Kg/cm2 p. Units: Kg/cm2,psi q. Service: Natural Gas			
D(d)	(d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2			
HPMS(Vertical)				
Item:60	VERTICAL MIST EXTRACTOR (HIGH PRESSURE MASTER SEPARATOR) generally as per drawing no. OIL/7618 and OIL/3990(enclosed) complete with necessary companion flanges, stud & nuts, Internal Ball Float Type Level Controller, Pressure controller and pressure gauge.			
A	A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid particle (Oil & Water) from the entrained gas efficiently.			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	ii) To arrest entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be vertical, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends.			
B	B. Separator Sizing Parameters: The master separator unit is to be sized to suit the following service condition: **i) Gas Stream Characteristics**: As the separator will be used in the process layout for arresting particles of crude oil, water from natural gas, the unit will be subjected to the gas stream having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose. a) Water particle (Produced) : 0% - 1% b) OIL content(mist form) : 0-1% b) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Sand /solid/slit content: There may be few amount of sand/slit/drilling fluids particle in the gas stream.			
B(ii)	**ii) Service requirement and Design Data :** a) Gas handling capacity : 15 MMSCFD b) Design pressure : 30 Kg/cm2 c) Test pressure : 45 kg/cm2 d) Working temperature : 30-45 degree centigrade average e) gas gravity : 0.7-.85(air=1) f) Gas quality : sweet natural gas. g) Design code : ASME Sec. VIII Div. 1. h) Radiography : Spot (10% minimum)			
B(iii)	**iii)** Connections: As per OIL/7618			
C	**C. Material of construction & standards** : 1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel. 2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. and the rating of flanges should be 150 class slip on RF (serrated). 3. Companion flanges shall be provided for all nozzle flanges (of all			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	sizes from the supplied drawing)and shall be weld neck type made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. and the rating of flanges should be 300 class. 3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard 4) Connections: As per OIL/7618 5) Demister assembly shall be vane type. 6) Drain line shall be provided with 2"x3000 psi WP elbow (both ends screwed, LP threaded) after nipple connection instead of Flanged connection. 7) Liquid Level Glass Gauge connection point in vessel shall be provided with 1/2" x 3000 psi screwed coupling, LP threaded instead of flanged connection to avoid transit damage. However, requisite 1/2" X 3000 psi WP screwed nipple and 1/2" X 150 class flange (screwed) are to be supplied additionally.			
D(a)	D. Separator Mountings: The separator is to be equipped with the following mountings: a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of XXI. Two spring loaded valves, XXII. Rocker arm (linkage assy.) XXIII. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field . XXIV. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following: bb) Material : Forged ASTM, A-105 steel. cc) Mounting : Right hand dd) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade ee) Control function : Proportional output type ff) Output signal : 0.2-1.1kg/cm2 Rising Level : Increase out put Material of Float : 316 SS Stuffing box : SS with PTFE or Graphite asbestos packing			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	similar to Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom. Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange Float size : 185 mm (7.75") OD rating Pressure requirement: As per vessel requirement) kg/cm2			
D(b)	(b)PNEUMATIC PRESSURE CONTROLLER, Pressure rating : As per vessel requirement)KG/CM2 PRESSURE CONTROLLER : Type: Pneumatic, Indicating with Proportional & Reset Action General: Function: Indicating Controller Mounting: Vertical pipe mount 2"(50 mm) pipe Housing Material: Glass fibre reinforced polyester/Polyester Plastic Enclosure: Minimum IP53 Maximum Dimension: 260mmX150mmX340mm (LXBXH) Maximum Weight: 7 Kg Controller Performance: Control Mode: Proportional Integral (PI) Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.) Auto/Manual Switch: To be provided Set Point Adjustment: Manual Supply pressure: 20 psig Output: 3 to 15 psig Proportional Band: 4 to 400% of process scale span Reset: 0.02 to 50 repeats per minute Differential Gap: 5 to 100% Repeatability: 0.4% of output span Dead band: Less than 0.4% of process scale span. Unit of process variable display scale: psig & kg/sqcm General Components:			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	Service: Gauge Pressure Sensing Element Type: Bourdon Tube, 316 Stainless steel Range: (Adj. Range): As per vessel requirement) Process: Process Fluid: Natural Gas / Hydrocarbon liquid Process connection: ¼ inch NPT (F) (Bottom Entry) Air Consumption: 20 scfh maximum Input connection: ¼" NPT (F) bottom entry. Output connection: ¼" NPT (F) bottom entry. Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig) Accessories: (To be supply with each item) 1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psi			
D©	(c) Two nos. of Pressure gauge with isolation valves with following specifications: a. Type: Direct Reading b. Mounting :Local c. Range : As per vessel requirement) kg/cm2 d. Accuracy: +/-1.0% of span e. Dial Size: 6 inch(150mm) f. Dial Colour: White with black lettering g. Case Material: SS316 h. Lens: Laminated Safety glass lens i. Pressure element: Bourdon tube j. Element material: SS 316 k. Socket Material: SS316 r. Movement material: SS316 s. Connection: ½ inch NPT(M) t. Connection Type: Direct with bottom entry u. Operating Pressure:1 Kg/cm2 v. Units: Kg/cm2,psi Service: Natural Gas			
D(d)	(d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2			
NIT	Technical specification as per NIT	Technical Offer by the Bidder	Compliance by Bidder	

TENDER NO. SDI1282P20 DT: 29.04.2019

clause no		**(Note: Complete Description should be furnished by bidder)	Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
Item:70	Supply of GAS-OIL SEPARATOR as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and reflex type liquid level gauge glass assembly as per OIL's Drawings. OIL Drawing No: OIL/7617/A, Sk No: OIL/3991/A			
A	A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid (Oil & Water) and gas efficiently from the well stream. ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends.			
B(i)	B. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition: i) Well Stream Characteristics: As the separator will be used in the process layout of differential separation of crude oil, water and natural gas, the unit will be subjected to the well fluid having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose. a) Water content (Produced) : 0% - 20% b) API gravity of oil : 20 Deg - 35 Deg c) Water specific gravity : 1.02 - 1.08 d) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Wax (Paraffin) content: 10% maximum by volume. g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream.			
B(ii)	ii) Operating Pressure & Temperature: The separator is to be sized for the following operating conditions: Fluid handling capacity : 900 KLPD(5000 BPD) Design pressure : 30 kg/cm2 Test pressure : 45 kg/cm2			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	Working temperature : 37 deg C average Gas flow rate : 8 MMSCFD			
C	**C. Material of construction & standards** : 1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel and others as per Sk. No. OIL/3991/A 2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 300 class rating. 3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard 3. Bolts and Nuts for non pressure plates shall conform to BS: 916. 4. All threads as per API standard unless otherwise stated. 5. Spot Radiographic test to be done as per as per ASME sec VIII part-I. 6. Flanges to be drilled off CRS as per ANSI class 300 rating & ANSI B16.5 Standard. 7. Pressure rating of all coupling connections shall be 3000 psi WP. 8. Heat Treatment shall be required for the whole vessel. 9. Nozzle necks are to be made of SA 106 Gr B material only and to be provided with RF plates /saddle made of the material similar to the shell material.			
D(a)	D. Separator Mountings: The separator is to be equipped with the following mountings: a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of XXV. Two spring loaded valves, XXVI. Rocker arm (linkage assy.) XXVII. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field . XVIII. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following: gg) Material : Forged ASTM, A-105 steel. hh) Mounting : Right hand ii) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade jj) Control function : Proportional output type			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	kk) Output signal : 0.2-1.1kg/cm2 Rising Level : Increase out put Material of Float : 316 SS Stuffing box : SS with PTFE or Graphite asbestos packing similar to Accessories: Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom. Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange Float size : 185 mm (7.75") OD rating Pressure requirement: As per vessel requirement) kg/cm2 ll) Nominal size : 254mm (10") RF as per ANSI B16.5, 300 class rating flange mm) Float size : 185 mm (7.75") OD, Rating: as per design requirement.			
D(b)	(b)PNEUMATIC PRESSURE CONTROLLER, Pressure rating : As per vessel requirement)KG/CM2 PRESSURE CONTROLLER : Type: Pneumatic, Indicating with Proportional & Reset Action General: Function: Indicating Controller Mounting: Vertical pipe mount 2"(50 mm) pipe Housing Material: Glass fibre reinforced polyester/Polyester Plastic Enclosure: Minimum IP53 Maximum Dimension: 260mmX150mmX340mm (LXBXH) Maximum Weight: 7 Kg Controller Performance: Control Mode: Proportional Integral (PI) Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.) Auto/Manual Switch: To be provided Set Point Adjustment: Manual Supply pressure: 20 psig Output: 3 to 15 psig Proportional Band: 4 to 400% of process scale span Reset: 0.02 to 50 repeats per minute Differential Gap: 5 to 100%			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	Repeatability: 0.4% of output span Dead band: Less than 0.4% of process scale span. Unit of process variable display scale: psig & kg/sqcm General Components: Service: Gauge Pressure Sensing Element Type: Bourdon Tube, 316 Stainless steel Range: (Adj. Range): As per vessel requirement) Process: Process Fluid: Natural Gas / Hydrocarbon liquid Process connection: ¼ inch NPT (F) (Bottom Entry) Air Consumption: 20 scfh maximum Input connection: ¼" NPT (F) bottom entry. Output connection: ¼" NPT (F) bottom entry. Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig) Accessories: (To be supply with each item) 1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psig			
D(c)	(c) Two nos. of Pressure gauge with isolation valves with following specifications: w. Type: Direct Reading x. Mounting :Local y. Range : As per vessel requirement) kg/cm2 z. Accuracy: +/-1.0% of span aa. Dial Size: 6 inch(150mm) bb. Dial Colour: White with black lettering cc. Case Material: SS316 dd. Lens: Laminated Safety glass lens ee. Pressure element: Bourdon tube ff. Element material: SS 316 gg. Socket Material: SS316 hh. Movement material: SS316 ii. Connection: ½ inch NPT(M) jj. Connection Type: Direct with bottom entry kk. Operating Pressure:1 Kg/cm2 ll. Units: Kg/cm2,psi mm. Service: Natural Gas			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
D(d)	(d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2			
Two Phase Separator(GU-II)				
Item 80	TWO PHASE HORIZONTAL GAS-OIL SEPARATOR(GU II) Supply of TWO PHASE HORIZONTAL GAS-OIL SEPARATOR (GU-II) as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and reflex type liquid level gauge glass assembly as per OIL's Drawings. OIL Drawing No: OIL/3410/D			
A	A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid (Oil & Water) and gas efficiently from the well stream. ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends.			
B	B. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition: i) Well Stream Characteristics: As the separator will be used in the process layout of differential separation of crude oil, water and natural gas, the unit will be subjected to the well fluid having a wide range of characteristics. The likely range of characteristics of the well fluid is			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	given below for design purpose. a) Water content (Produced) : 0% - 20% b) API gravity of oil : 20 Deg - 35 Deg c) Water specific gravity : 1.02 - 1.08 d) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Wax (Paraffin) content: 10% maximum by volume. g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream.			
C(i)	ii) Operating Pressure & Temperature: The separator is to be sized for the following operating conditions: Fluid capacity : 900 klpd Design pressure : 8.5 kg/cm2 Test pressure : 12.8 kg/cm2 Working temperature : 50 deg C Gas flow rate : 8 MMSCFD. Oil gravity : 30 deg - 35 deg API Gas gravity : 0.7 to 0.8 (air = 1) Primary objective : Gas-Oil separation Design code : ASME Sec. VIII Div. 1. Radiography : Spot (10% minimum) d) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Wax (Paraffin) content: 10% maximum by volume. g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream			
C	**C. Material of construction & standards** : 1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel and others as per Sk. No. OIL/3410/D 2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 300 class rating.. 3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard 3. Bolts and Nuts for non pressure plates shall conform to BS: 916. 4. All threads as per API standard unless otherwise stated. 5. Spot Radiographic test to be done as per as per ASME sec VIII part-I.			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	6. Flanges to be drilled off CRS as per ANSI class 300 rating & ANSI B16.5 Standard. 7. Pressure rating of all coupling connections shall be 3000 psi WP. 8. Heat Treatment shall be required for the whole vessel. 9. Nozzle necks are to be made of SA 106 Gr B material only and to be provided with RF plates /saddle made of the material similar to the shell material.			
D(a)	D. Separator Mountings: The separator is to be equipped with the following mountings: a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of XXIX. Two spring loaded valves, XXX. Rocker arm (linkage assy.) XXXI. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field . XXXII. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following: nn) Material : Forged ASTM, A-105 steel. oo) Mounting : Right hand pp) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade qq) Control function : Proportional output type rr) Output signal : 0.2-1.1kg/cm2 Rising Level : Increase out put Material of Float : 316 SS Stuffing box : SS with PTFE or Graphite asbestos packing similar to Accessories: Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom. Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange Float size : 185 mm (7.75") OD rating Pressure requirement: As per vessel requirement) kg/cm2 (b)PNEUMATIC PRESSURE CONTROLLER,			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	Pressure rating : As per vessel requirement)KG/CM2 PRESSURE CONTROLLER : Type: Pneumatic, Indicating with Proportional & Reset Action General: Function: Indicating Controller Mounting: Vertical pipe mount 2"(50 mm) pipe Housing Material: Glass fibre reinforced polyester/Polyester Plastic Enclosure: Minimum IP53 Maximum Dimension: 260mmX150mmX340mm (LXBXH) Maximum Weight: 7 Kg			
D(b)	(b)PNEUMATIC PRESSURE CONTROLLER, Pressure rating : As per vessel requirement)KG/CM2 PRESSURE CONTROLLER : Type: Pneumatic, Indicating with Proportional & Reset Action General: Function: Indicating Controller Mounting: Vertical pipe mount 2"(50 mm) pipe Housing Material: Glass fibre reinforced polyester/Polyester Plastic Enclosure: Minimum IP53 Maximum Dimension: 260mmX150mmX340mm (LXBXH) Maximum Weight: 7 Kg Controller Performance: Control Mode: Proportional Integral (PI) Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.) Auto/Manual Switch: To be provided Set Point Adjustment: Manual Supply pressure: 20 psig Output: 3 to 15 psig Proportional Band: 4 to 400% of process scale span Reset: 0.02 to 50 repeats per minute Differential Gap: 5 to 100% Repeatability: 0.4% of output span Dead band: Less than 0.4% of process scale span.			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	Unit of process variable display scale: psig & kg/sqcm General Components: Service: Gauge Pressure Sensing Element Type: Bourdon Tube, 316 Stainless steel Range: (Adj. Range): As per vessel requirement) Process: Process Fluid: Natural Gas / Hydrocarbon liquid Process connection: ¼ inch NPT (F) (Bottom Entry) Air Consumption: 20 scfh maximum Input connection: ¼" NPT (F) bottom entry. Output connection: ¼" NPT (F) bottom entry. Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig) Accessories: (To be supply with each item) 1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psig			
D(c)	(c) Two nos. of Pressure gauge with isolation valves with following specifications: r. Type: Direct Reading s. Mounting :Local t. Range : As per vessel requirement) kg/cm2 u. Accuracy: +/-1.0% of span v. Dial Size: 6 inch(150mm) w. Dial Colour: White with black lettering x. Case Material: SS316 y. Lens: Laminated Safety glass lens z. Pressure element: Bourdon tube aa. Element material: SS 316 bb. Socket Material: SS316 cc. Movement material: SS316 dd. Connection: ½ inch NPT(M) ee. Connection Type: Direct with bottom entry ff. Operating Pressure:1 Kg/cm2 gg. Units: Kg/cm2,psi hh. Service: Natural Gas			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
D(d)	(d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2			
Item:90	Design, fabrication, testing and supply of GAS-OIL SEPARATOR as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and reflex type liquid level gauge glass assembly as per OIL's Drawings. OIL Drawing No: OIL/7617/A, Sk No: OIL/3991/A			
A	A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid (Oil & Water) and gas efficiently from the well stream. ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends.			
B(i)	B. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition: i) Well Stream Characteristics: As the separator will be used in the process layout of differential separation of crude oil, water and natural gas, the unit will be subjected to the well fluid having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose. a) Water content (Produced) : 0% - 20% b) API gravity of oil : 20 Deg - 35 Deg c) Water specific gravity : 1.02 - 1.08 d) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Wax (Paraffin) content: 10% maximum by volume. g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream.			
B(ii)	ii) Operating Pressure & Temperature: The separator is to be sized for			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	the following operating conditions: Fluid handling capacity : 900 KLPD(5000 BPD) Design pressure : 30 kg/cm2 Test pressure : 45 kg/cm2 Working temperature : 37 deg C average Gas flow rate : 8 MMSCFD			
C	**C. Material of construction & standards** : 1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel and others as per skt Sk. No. OIL/3991/A 2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 300 class rating.. 3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard 3. Bolts and Nuts for non pressure plates shall conform to BS: 916. 4. All threads as per API standard unless otherwise stated. 5. Spot Radiographic test to be done as per as per ASME sec VIII part-I. 6. Flanges to be drilled off CRS as per ANSI class 300 rating & ANSI B16.5 Standard. 7. Pressure rating of all coupling connections shall be 3000 psi WP. 8. Heat Treatment shall be required for the whole vessel. 9. Nozzle necks are to be made of SA 106 Gr B material only and to be provided with RF plates /saddle made of the material similar to the shell material.			
D(a)	D. Separator Mountings: The separator is to be equipped with the following mountings: a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of (XXIII. Two spring loaded valves, XXIV. Rocker arm (linkage assy.) (XXXV. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field . XXVI. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following: ss) Material : Forged ASTM, A-105 steel.			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	tt) Mounting : Right hand uu) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade vv) Control function : Proportional output type ww) Output signal : 0.2-1.1kg/cm2 Rising Level : Increase out put Material of Float : 316 SS Stuffing box : SS with PTFE or Graphite asbestos packing similar to Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom. Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange Float size : 185 mm (7.75") OD rating Pressure requirement: As per vessel requirement) kg/cm2 xx) Nominal size : 254mm (10") RF as per ANSI B16.5, 300 class rating flange yy) Float size : 185 mm (7.75") OD, Rating: as per design requirement.			
D(b)	(b)PNEUMATIC PRESSURE CONTROLLER, Pressure rating : As per vessel requirement)KG/CM2 PRESSURE CONTROLLER : Type: Pneumatic, Indicating with Proportional & Reset Action General: Function: Indicating Controller Mounting: Vertical pipe mount 2"(50 mm) pipe Housing Material: Glass fibre reinforced polyester/Polyester Plastic Enclosure: Minimum IP53 Maximum Dimension: 260mmX150mmX340mm (LXBXH) Maximum Weight: 7 Kg Controller Performance: Control Mode: Proportional Integral (PI) Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.) Auto/Manual Switch: To be provided Set Point Adjustment: Manual Supply pressure: 20 psig			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	Output: 3 to 15 psig Proportional Band: 4 to 400% of process scale span Reset: 0.02 to 50 repeats per minute Differential Gap: 5 to 100% Repeatability: 0.4% of output span Dead band: Less than 0.4% of process scale span. Unit of process variable display scale: psig & kg/sqcm General Components: Service: Gauge Pressure Sensing Element Type: Bourdon Tube, 316 Stainless steel Range: (Adj. Range): As per vessel requirement) Process: Process Fluid: Natural Gas / Hydrocarbon liquid Process connection: ¼ inch NPT (F) (Bottom Entry) Air Consumption: 20 scfh maximum Input connection: ¼" NPT (F) bottom entry. Output connection: ¼" NPT (F) bottom entry. Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig) Accessories: (To be supply with each item) 1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psig			
D(c)	(c) Two nos. of Pressure gauge with isolation valves with following specifications: nn. Type: Direct Reading oo. Mounting :Local pp. Range : As per vessel requirement) kg/cm2 qq. Accuracy: +/-1.0% of span rr. Dial Size: 6 inch(150mm) ss. Dial Colour: White with black lettering tt. Case Material: SS316 uu. Lens: Laminated Safety glass lens vv. Pressure element: Bourdon tube ww. Element material: SS 316 xx. Socket Material: SS316 yy. Movement material: SS316 zz. Connection: ½ inch NPT(M)			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	aaa. Connection Type: Direct with bottom entry bbb. Operating Pressure:1 Kg/cm2 ccc. Units: Kg/cm2,psi ddd. Service: Natural Gas			
D(d)	(d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2			
Two Phase Separator(GU-II)				
Item 100	TWO PHASE HORIZONTAL GAS-OIL SEPARATOR(GU II) Design, fabrication, testing and supply of TWO PHASE HORIZONTAL GAS-OIL SEPARATOR (GU-II) as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and reflex type liquid level gauge glass assembly as per OIL's Drawings. OIL Drawing No: OIL/3410/D			
A	A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid (Oil & Water) and gas efficiently from the well stream. ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends.			
B	B. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition:			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	i) Well Stream Characteristics: As the separator will be used in the process layout of differential separation of crude oil, water and natural gas, the unit will be subjected to the well fluid having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose. a) Water content (Produced) : 0% - 20% b) API gravity of oil : 20 Deg - 35 Deg c) Water specific gravity : 1.02 - 1.08 d) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Wax (Paraffin) content: 10% maximum by volume. g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream.			
C(i)	ii) Operating Pressure & Temperature: The separator is to be sized for the following operating conditions: Fluid capacity : 900 klpd Design pressure : 8.5 kg/cm2 Test pressure : 12.8 kg/cm2 Working temperature : 50 deg C Gas flow rate : 8 MMSCFD. Oil gravity : 30 deg - 35 deg API Gas gravity : 0.7 to 0.8 (air = 1) Primary objective : Gas-Oil separation Design code : ASME Sec. VIII Div. 1. Radiography : Spot (10% minimum) d) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Wax (Paraffin) content: 10% maximum by volume. g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream			
C	**C. Material of construction & standards** : 1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel and others as per skt Sk. No. OIL/3410/D 2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 300 class rating.. 3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	Standard 3. Bolts and Nuts for non pressure plates shall conform to BS: 916. 4. All threads as per API standard unless otherwise stated. 5. Spot Radiographic test to be done as per as per ASME sec VIII part-I. 6. Flanges to be drilled off CRS as per ANSI class 300 rating & ANSI B16.5 Standard. 7. Pressure rating of all coupling connections shall be 3000 psi WP. 8. Heat Treatment shall be required for the whole vessel. 9. Nozzle necks are to be made of SA 106 Gr B material only and to be provided with RF plates /saddle made of the material similar to the shell material.			
D(a)	D. Separator Mountings: The separator is to be equipped with the following mountings: a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of XXVII. Two spring loaded valves, XXVIII. Rocker arm (linkage assy.) XXIX. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field . XL. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following: zz) Material : Forged ASTM, A-105 steel. aaa) Mounting : Right hand bbb) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade ccc) Control function : Proportional output type ddd) Output signal : 0.2-1.1kg/cm2 Rising Level : Increase out put Material of Float : 316 SS Stuffing box : SS with PTFE or Graphite asbestos packing similar to Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom. Mounting Flange size : 200mm (8") RF as per ANSI B16.5,			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	300 class rating flange Float size : 185 mm (7.75") OD rating Pressure requirement: As per vessel requirement) kg/cm2 (b)PNEUMATIC PRESSURE CONTROLLER, Pressure rating : As per vessel requirement)KG/CM2 PRESSURE CONTROLLER : Type: Pneumatic, Indicating with Proportional & Reset Action General: Function: Indicating Controller Mounting: Vertical pipe mount 2"(50 mm) pipe Housing Material: Glass fibre reinforced polyester/Polyester Plastic Enclosure: Minimum IP53 Maximum Dimension: 260mmX150mmX340mm (LXBXH) Maximum Weight: 7 Kg			
D(b)	(b)PNEUMATIC PRESSURE CONTROLLER, Pressure rating : As per vessel requirement)KG/CM2 PRESSURE CONTROLLER : Type: Pneumatic, Indicating with Proportional & Reset Action General: Function: Indicating Controller Mounting: Vertical pipe mount 2"(50 mm) pipe Housing Material: Glass fibre reinforced polyester/Polyester Plastic Enclosure: Minimum IP53 Maximum Dimension: 260mmX150mmX340mm (LXBXH) Maximum Weight: 7 Kg Controller Performance: Control Mode: Proportional Integral (PI) Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.) Auto/Manual Switch: To be provided Set Point Adjustment: Manual Supply pressure: 20 psig Output: 3 to 15 psig			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	Proportional Band: 4 to 400% of process scale span Reset: 0.02 to 50 repeats per minute Differential Gap: 5 to 100% Repeatability: 0.4% of output span Dead band: Less than 0.4% of process scale span. Unit of process variable display scale: psig & kg/sqcm General Components: Service: Gauge Pressure Sensing Element Type: Bourdon Tube, 316 Stainless steel Range: (Adj. Range): As per vessel requirement) Process: Process Fluid: Natural Gas / Hydrocarbon liquid Process connection: ¼ inch NPT (F) (Bottom Entry) Air Consumption: 20 scfh maximum Input connection: ¼" NPT (F) bottom entry. Output connection: ¼" NPT (F) bottom entry. Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig) Accessories: (To be supply with each item) 1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psig			
D(c)	(c) Two nos. of Pressure gauge with isolation valves with following specifications: ii. Type: Direct Reading jj. Mounting :Local kk. Range : As per vessel requirement) kg/cm2 ll. Accuracy: +/-1.0% of span mm. Dial Size: 6 inch(150mm) nn. Dial Colour: White with black lettering oo. Case Material: SS316 pp. Lens: Laminated Safety glass lens qq. Pressure element: Bourdon tube rr. Element material: SS 316 ss. Socket Material: SS316 tt. Movement material: SS316 uu. Connection: ½ inch NPT(M)			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	vv. Connection Type: Direct with bottom entry ww. Operating Pressure:1 Kg/cm2 xx. Units: Kg/cm2,psi yy. Service: Natural Gas			
D(d)	(d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2			
Item: 3 (Three Phase Separator				
Item:130	Design, fabrication, testing and supply of THREE PHASE HORIZONTAL GAS-OIL SEPARATOR (TPS) as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and Reflex type liquid level gauge assembly, Safety relief valve etc as per following OIL's Drawings. 1. OIL/1563/A 2. OIL/2024/B			
A	**A. Standards & Material of Construction**: The unit shall be manufactured conforming to the following code of practices and standards. a) Separator: ASME section VIII, Div. I b) Pipe fittings, flanges etc.: ANSI B 31.3, ANSI B 16.5 c) Safety Relief Valves: ASME section VIII, Div-I/ANSI-B-16.11 d) Structural: IS 226 e) All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 150 class rating. f) Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard g) Bolts and Nuts for non pressure plates shall conform to BS: 916. h) All threads as per API standard unless otherwise stated. i) All pressure plates to IS:2002 Gr. 2A steel or SA-516 gr60/70 ,Non pressure plates to IS: 2062 quality steel and others as per OIL/1563/A.			
B	**B. Service requirement**: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate Oil, Water and gas efficiently from the well stream. ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis.			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends. vi) Connections: As per OIL/2024/C			
C	C. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition: i) Well Stream Characteristics: As the test unit will be used in the process layout of differential separation process, the unit will be subjected to the well stream having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose. a) Water content (Produced): 5- 90% b) API gravity of oil : 20 Deg - 35 Deg c) Water specific gravity : 1.02 - 1.08 d) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Wax (Paraffin) content: 10% maximum by volume. g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream.			
C(ii)	ii) Service requirement and Design Data : Oil handling capacity : 7000 BPD fluid (2000 BPD free water+ 5000 BPD oil/ emulsion) Design pressure : 7 kg/cm2 Test pressure : 10.5 kg/cm2 Working temperature : 45 deg C (average) Gas flow rate : 5 MMSCFD gas gravity : 0.7-0.8 (air=1) Oil gravity : 30-35 deg API Design code : ASME Sec. VIII Div. 1. Radiography : Spot (10% minimum)			
D(a)	D. Separator Mountings: The separator is to be equipped with the following mountings: a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	231-779 and mounted pilot 779k throttle type comprising of XLI. Two spring loaded valves, XLII. Rocker arm (linkage assy.) XLIII. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field . XLIV. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following: eee) Material : Forged ASTM, A-105 steel. fff) Mounting : Right hand ggg) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade hhh) Control function : Proportional output type iii) Output signal : 0.2-1.1kg/cm2 Rising Level : Increase out put Material of Float : 316 SS Stuffing box : SS with PTFE or Graphite asbestos packing similar to Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom. Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange Float size : 185 mm (7.75") OD rating Pressure requirement: As per vessel requirement) kg/cm2			
D(b)	(b)PNEUMATIC PRESSURE CONTROLLER, Pressure rating : As per vessel requirement)KG/CM2 PRESSURE CONTROLLER : Type: Pneumatic, Indicating with Proportional & Reset Action General: Function: Indicating Controller Mounting: Vertical pipe mount 2"(50 mm) pipe Housing Material: Glass fibre reinforced polyester/Polyester Plastic Enclosure: Minimum IP53 Maximum Dimension: 260mmX150mmX340mm (LXBXH) Maximum Weight: 7 Kg Controller Performance:			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	Control Mode: Proportional Integral (PI) Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.) Auto/Manual Switch: To be provided Set Point Adjustment: Manual Supply pressure: 20 psig Output: 3 to 15 psig Proportional Band: 4 to 400% of process scale span Reset: 0.02 to 50 repeats per minute Differential Gap: 5 to 100% Repeatability: 0.4% of output span Dead band: Less than 0.4% of process scale span. Unit of process variable display scale: psig & kg/sqcm General Components: Service: Gauge Pressure Sensing Element Type: Bourdon Tube, 316 Stainless steel Range: (Adj. Range): As per vessel requirement) Process: Process Fluid: Natural Gas / Hydrocarbon liquid Process connection: ¼ inch NPT (F) (Bottom Entry) Air Consumption: 20 scfh maximum Input connection: ¼" NPT (F) bottom entry. Output connection: ¼" NPT (F) bottom entry. Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig) Accessories: (To be supply with each item) 1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psig			
D(c)	(c) Two nos. of Pressure gauge with isolation valves with following specifications: r. Type: Direct Reading s. Mounting :Local t. Range : As per vessel requirement) kg/cm2 u. Accuracy: +/-1.0% of span v. Dial Size: 6 inch(150mm)			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	w. Dial Colour: White with black lettering x. Case Material: SS316 y. Lens: Laminated Safety glass lens z. Pressure element: Bourdon tube aa. Element material: SS 316 bb. Socket Material: SS316 cc. Movement material: S S316 dd. Connection: ½ inch NPT(M) ee. Connection Type: Direct with bottom entry ff. Operating Pressure:1 Kg/cm2 gg. Units: Kg/cm2,psi hh. Service: Natural Gas			
	(d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2			
	STABILIZER			
Item:140	Design, fabrication, testing and supply of TWO PHASE HORIZONTAL GAS-OIL SEPARATOR (Stabilizer) as per API specification 12J, ASME section VIII Div-I complete with necessary companion flanges, stud & nuts and Reflex type liquid level gauge assembly as per OIL's Drawings. OIL Drawing No. OIL/3411/C.			
A	**A. Standards & Material of Construction**: The unit shall be manufactured conforming to the following code of practices and standards. a) Separator: ASME section VIII, Div. I b) Pipe fittings, flanges etc.: ANSI B 31.3, ANSI B 16.5 c) Safety Relief Valves: ASME section VIII, Div-I/ANSI-B-16.11 d) Structural: IS 226 e) All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. 150 class rating. f) Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard g) Bolts and Nuts for non pressure plates shall conform to BS: 916. h) All threads as per API standard unless otherwise stated			
B	B. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	and manufactured to meet the following service requirement: i) To separate liquid (Oil & Water) and gas efficiently from the well stream. ii) To arrest 99% entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be horizontal, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends.			
C(i)	C. Separator Sizing Parameters: The test separator unit is to be sized to suit the following service condition: i) Well Stream Characteristics: As the test unit will be used in the process layout of differential separation process, the unit will be subjected to the well stream having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose. a) Water content (Produced) : 0% - 20% b) API gravity of oil : 20 Deg - 35 Deg c) Water specific gravity : 1.02 - 1.08 d) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Wax (Paraffin) content: 10% maximum by volume. g) Sand /solid/slit content: There may be some amount of sand/slit/drilling fluids content in the well stream			
C(ii)	ii) Operating Pressure & Temperature: The separator is to be sized for the following operating conditions: Fluid capacity : 10,000 BBL(1800KLPD) Design pressure : 3.5 kg/cm2 Test pressure : 5.25 kg/cm2 Working pressure : 1 Kg/cm2 Working temperature : 50 deg C Design temperature : 80 deg C Gas flow rate : 0.14 MMSCMD Primary objective : Gas-Oil separation			
D(a)	D. Separator Mountings: The separator is to be equipped with the following mountings: a) Control gear: Internal Ball Float Type Level Controller mounted			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of XLV. Two spring loaded valves, XLVI. Rocker arm (linkage assy.) XLVII. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field . XLVIII. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following: jjj) Material : Forged ASTM, A-105 steel. kkk) Mounting : Right hand lll) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade mmm) Control function : Proportional output type nnn) Output signal : 0.2-1.1kg/cm2 Rising Level : Increase out put Material of Float : 316 SS Stuffing box : SS with PTFE or Graphite asbestos packing similar to Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom. Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange Float size : 185 mm (7.75") OD rating Pressure requirement: As per vessel requirement) kg/cm2			
D(b)	(b)PNEUMATIC PRESSURE CONTROLLER, Pressure rating : As per vessel requirement)KG/CM2 PRESSURE CONTROLLER : Type: Pneumatic, Indicating with Proportional & Reset Action General: Function: Indicating Controller Mounting: Vertical pipe mount 2"(50 mm) pipe Housing Material: Glass fibre reinforced polyester/Polyester Plastic Enclosure: Minimum IP53 Maximum Dimension: 260mmX150mmX340mm (LXBXH) Maximum Weight: 7 Kg			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	Controller Performance: Control Mode: Proportional Integral (PI) Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.) Auto/Manual Switch: To be provided Set Point Adjustment: Manual Supply pressure: 20 psig Output: 3 to 15 psig Proportional Band: 4 to 400% of process scale span Reset: 0.02 to 50 repeats per minute Differential Gap: 5 to 100% Repeatability: 0.4% of output span Dead band: Less than 0.4% of process scale span. Unit of process variable display scale: psig & kg/sqcm General Components: Service: Gauge Pressure Sensing Element Type: Bourdon Tube, 316 Stainless steel Range: (Adj. Range): As per vessel requirement) Process: Process Fluid: Natural Gas / Hydrocarbon liquid Process connection: ¼ inch NPT (F) (Bottom Entry) Air Consumption: 20 scfh maximum Input connection: ¼" NPT (F) bottom entry. Output connection: ¼" NPT (F) bottom entry. Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig) Accessories: (To be supply with each item) 1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psig			
D(c)	(c) Two nos. of Pressure gauge with isolation valves with following specifications: r. Type: Direct Reading s. Mounting :Local t. Range : As per vessel requirement) kg/cm2 u. Accuracy: +/-1.0% of span v. Dial Size: 6 inch(150mm)			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	w. Dial Colour: White with black lettering x. Case Material: SS316 y. Lens: Laminated Safety glass lens z. Pressure element: Bourdon tube aa. Element material: SS 316 bb. Socket Material: SS316 cc. Movement material: SS316 dd. Connection: ½ inch NPT(M) ee. Connection Type: Direct with bottom entry ff. Operating Pressure:1 Kg/cm2 gg. Units: Kg/cm2,psi hh. Service: Natural Gas			
D(d)	(d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2			
LPMS(Vertical)				
Item:180	VERTICAL MIST EXTRACTOR (LOW PRESSURE MASTER SEPARATOR) generally as per drawing no. OIL/7232 (enclosed), complete with necessary companion flanges, stud & nuts , Internal Ball Float Type Level Controller, Pressure controller and pressure gauge.			
A	A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid particle (Oil & Water) from the entrained gas efficiently. ii) To arrest entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be vertical, cylindrical shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends.			
B	B. Separator Sizing Parameters: The master separator unit is to be sized to suit the following service condition: **i) Gas Stream Characteristics**: As the separator will be used in the process layout for arresting particles of crude oil, water from natural gas, the unit will be subjected to the gas stream having a wide range of characteristics. The likely range of characteristics of the well fluid is			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	given below for design purpose. a) Water particle (Produced) : 0% - 1% b) OIL content(mist form) : 0-1% b) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Sand /solid/slit content: There may be few amount of sand/slit/drilling fluids particle in the gas stream.			
B(ii)	**ii) Service requirement and Design Data :** i) GAS handling capacity : 15 MMSCFD j) Design pressure : 6.4 kg/cm2 k) Test pressure : 10.5 kg/cm2 l) Working temperature : 30-45 degree centigrade average m) gas gravity : 0.7-.85(air=1) n) Gas quality : sweet natural gas. o) Design code : ASME Sec. VIII Div. 1. p) Radiography : Spot (10% minimum)			
C	**C. Material of construction & standards** : 1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel. 2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. and the rating of flanges should be 150 class slip on RF (serrated). 3.Companion flanges shall be provided for all nozzle flanges (of all sizes from the supplied drawing)and shall be weld neck type made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. and the rating of flanges should be 150 class. 3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H Standard 3. Bolts and Nuts for non pressure plates shall conform to BS: 916. 4. All threads as per API standard unless otherwise stated. 5. Spot Radiographic test to be done as per as per ASME sec VIII part-I. 6. Flanges to be drilled off CRS as per ANSI class rating as specified in the drawing & ANSI B16.5 Standard. 7. Pressure rating of all coupling connections shall be 3000 psi WP. 8. Heat Treatment shall be required for the whole vessel. 9. Nozzle necks are to be made of SA 106 Gr B material and to be provided with RF plates /saddle made of the material similar to the shell			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	material.			
D(a)	D. Separator Mountings: The separator is to be equipped with the following mountings: a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of XLIX. Two spring loaded valves, L. Rocker arm (linkage assy.) LI. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field . LII. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following: ooo) Material : Forged ASTM, A-105 steel. ppp) Mounting : Right hand qqq) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade rrr) Control function : Proportional output type sss) Output signal : 0.2-1.1kg/cm2 Rising Level : Increase out put Material of Float : 316 SS Stuffing box : SS with PTFE or Graphite asbestos packing similar to Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom. Mounting Flange size : 200mm (8") RF as per ANSI B16.5, 300 class rating flange Float size : 185 mm (7.75") OD rating Pressure requirement: As per vessel requirement) kg/cm2			
D(b)	(b)PNEUMATIC PRESSURE CONTROLLER, Pressure rating : As per vessel requirement)KG/CM2 PRESSURE CONTROLLER : Type: Pneumatic, Indicating with Proportional & Reset Action General:			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	Function: Indicating Controller Mounting: Vertical pipe mount 2"(50 mm) pipe Housing Material: Glass fibre reinforced polyester/Polyester Plastic Enclosure: Minimum IP53 Maximum Dimension: 260mmX150mmX340mm (LXBXH) Maximum Weight: 7 Kg Controller Performance: Control Mode: Proportional Integral (PI) Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.) Auto/Manual Switch: To be provided Set Point Adjustment: Manual Supply pressure: 20 psig Output: 3 to 15 psig Proportional Band: 4 to 400% of process scale span Reset: 0.02 to 50 repeats per minute Differential Gap: 5 to 100% Repeatability: 0.4% of output span Dead band: Less than 0.4% of process scale span. Unit of process variable display scale: psig & kg/sqcm General Components: Service: Gauge Pressure Sensing Element Type: Bourdon Tube, 316 Stainless steel Range: (Adj. Range): As per vessel requirement) Process: Process Fluid: Natural Gas / Hydrocarbon liquid Process connection: ¼ inch NPT (F) (Bottom Entry) Air Consumption: 20 scfh maximum Input connection: ¼" NPT (F) bottom entry. Output connection: ¼" NPT (F) bottom entry. Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig) Accessories: (To be supply with each item) 1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psig			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	(c) Two nos. of Pressure gauge with isolation valves with following specifications: r. Type: Direct Reading s. Mounting :Local t. Range : As per vessel requirement) kg/cm2 u. Accuracy: +/-1.0% of span v. Dial Size: 6 inch(150mm) w. Dial Colour: White with black lettering x. Case Material: SS316 y. Lens: Laminated Safety glass lens z. Pressure element: Bourdon tube aa. Element material: SS 316 bb. Socket Material: SS316 cc. Movement material: SS316 dd. Connection: ½ inch NPT(M) ee. Connection Type: Direct with bottom entry ff. Operating Pressure:1 Kg/cm2 gg. Units: Kg/cm2,psi hh. Service: Natural Gas			
D(d)	(d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2			
		HPMS(Vertical)		
Item:190	VERTICAL MIST EXTRACTOR (HIGH PRESSURE MASTER SEPARATOR) generally as per drawing no. OIL/7618 and OIL/3990(enclosed) complete with necessary companion flanges, stud & nuts, Internal Ball Float Type Level Controller, Pressure controller and pressure gauge.			
A	A. Service requirement: The separator unit will be used in differential separation layout for processing well steam. The unit is to be designed and manufactured to meet the following service requirement: i) To separate liquid particle (Oil & Water) from the entrained gas efficiently. ii) To arrest entrained liquid particles from the separated gas for the particle size up to 10 micron. iv) Suitable provision to take liquid and gas samples for analysis. v) Separator Configuration: The separator should be vertical, cylindrical			

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	shell type having dished end. Dished end shall be spun in a dished head spinning machine only. There shall be no welding in the dished ends.			
B	B. Separator Sizing Parameters: The master separator unit is to be sized to suit the following service condition: **i) Gas Stream Characteristics**: As the separator will be used in the process layout for arresting particles of crude oil, water from natural gas, the unit will be subjected to the gas stream having a wide range of characteristics. The likely range of characteristics of the well fluid is given below for design purpose. a) Water particle (Produced) : 0% - 1% b) OIL content(mist form) : 0-1% b) Gas gravity : 0.65 - 0.80 (Air = 1) e) Pour Point of oil : 27 Deg - 33 Deg C. f) Sand /solid/slit content: There may be few amount of sand/slit/drilling fluids particle in the gas stream.			
B(ii)	**ii) Service requirement and Design Data :** i) Gas handling capacity : 15 MMSCFD j) Design pressure : 30 Kg/cm2 k) Test pressure : 45 kg/cm2 l) Working temperature : 30-45 degree centigrade average m) gas gravity : 0.7-.85(air=1) n) Gas quality : sweet natural gas. o) Design code : ASME Sec. VIII Div. 1. p) Radiography : Spot (10% minimum)			
B(iii)	**iii)** Connections: As per OIL/7618			
C	**C. Material of construction & standards** : 1. All pressure plates shall be IS:2002 Gr. 2A steel or SA-516 gr60/70 . Non pressure plates shall be IS: 2062 quality steel. 2. All flanges should be made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. and the rating of flanges should be 150 class slip on RF (serrated). 3. Companion flanges shall be provided for all nozzle flanges (of all sizes from the supplied drawing)and shall be weld neck type made of forged carbon steel conforming to ASTM A 105 and dimensions as per ANSI B 16.5 std. and the rating of flanges should be 300 class. 3. Studs & Nuts: As per ASTM A193 Gr. B7 & ASTM A194 Gr. 2H			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	Standard 4) Connections: As per OIL/7618 5) Demister assembly shall be vane type. 6) Drain line shall be provided with 2"x3000 psi WP elbow (both ends screwed, LP threaded) after nipple connection instead of Flanged connection. 7) Liquid Level Glass Gauge connection point in vessel shall be provided with 1/2" x 3000 psi screwed coupling, LP threaded instead of flanged connection to avoid transit damage. However, requisite 1/2" X 3000 psi WP screwed nipple and 1/2" X 150 class flange (screwed) are to be supplied additionally.			
D(a)	D. Separator Mountings: The separator is to be equipped with the following mountings: a) Control gear: Internal Ball Float Type Level Controller mounted complete assembly similar to fisher type 2500-249 cage less/Procon 231-779 and mounted pilot 779k throttle type comprising of LIII. Two spring loaded valves, LIV. Rocker arm (linkage assy.) LV. Pilot relay assy. to give continuous output pressure proportional to rise or fall of liquid level inside the vessel and also reversible in action in field . LVI. Float rod, lever. Counter weight, chain, adjustable screw, travel stop, & necessary link, bolt & nuts etc. with other specifications as per following: ttt) Material : Forged ASTM, A-105 steel. uuu) Mounting : Right hand vvv) Function : For controlling level of crude oil of API gravity 20 to 35degree centigrade www) Control function : Proportional output type xxx) Output signal : 0.2-1.1kg/cm2 Rising Level : Increase out put Material of Float : 316 SS Stuffing box : SS with PTFE or Graphite asbestos packing similar to Accessories : Filter Regulator suitable for operation of natural gas at maximum 18.3.kg/cm2 with drain port at bottom. Mounting Flange size : 200mm (8") RF as per ANSI B16.5,			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	300 class rating flange Float size : 185 mm (7.75") OD rating Pressure requirement: As per vessel requirement) kg/cm2			
D(b)	(b)PNEUMATIC PRESSURE CONTROLLER, Pressure rating : As per vessel requirement)KG/CM2 PRESSURE CONTROLLER : Type: Pneumatic, Indicating with Proportional & Reset Action General: Function: Indicating Controller Mounting: Vertical pipe mount 2"(50 mm) pipe Housing Material: Glass fibre reinforced polyester/Polyester Plastic Enclosure: Minimum IP53 Maximum Dimension: 260mmX150mmX340mm (LXBXH) Maximum Weight: 7 Kg Controller Performance: Control Mode: Proportional Integral (PI) Action: Direct/Reverse Action (Controller action should be Field Reversible without any change of parts.) Auto/Manual Switch: To be provided Set Point Adjustment: Manual Supply pressure: 20 psig Output: 3 to 15 psig Proportional Band: 4 to 400% of process scale span Reset: 0.02 to 50 repeats per minute Differential Gap: 5 to 100% Repeatability: 0.4% of output span Dead band: Less than 0.4% of process scale span. Unit of process variable display scale: psig & kg/sqcm General Components: Service: Gauge Pressure Sensing Element Type: Bourdon Tube, 316 Stainless steel Range: (Adj. Range): As per vessel requirement) Process:			

TENDER NO. SDI1282P20 DT: 29.04.2019

NIT clause no	Technical specification as per NIT	Technical Offer by the Bidder **(Note: Complete Description should be furnished by bidder)	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	Process Fluid: Natural Gas / Hydrocarbon liquid Process connection: ¼ inch NPT (F) (Bottom Entry) Air Consumption: 20 scfh maximum Input connection: ¼" NPT (F) bottom entry. Output connection: ¼" NPT (F) bottom entry. Controller Delivery Capacity: 0.2 to 1.0 Bar (3 to 15 Psig) Accessories: (To be supply with each item) 1. Pressure gauge :(Two Numbers) Dial size 2 ", connection ¼"(NPT (M) back connection, Range: 0-30 psi			
D©	(c) Two nos. of Pressure gauge with isolation valves with following specifications: l. Type: Direct Reading m. Mounting :Local n. Range : As per vessel requirement) kg/cm2 o. Accuracy: +/-1.0% of span p. Dial Size: 6 inch(150mm) q. Dial Colour: White with black lettering r. Case Material: SS316 s. Lens: Laminated Safety glass lens t. Pressure element: Bourdon tube u. Element material: SS 316 v. Socket Material: SS316 eee. Movement material: SS316 fff. Connection: ½ inch NPT(M) ggg. Connection Type: Direct with bottom entry hhh. Operating Pressure:1 Kg/cm2 iii. Units: Kg/cm2,psi Service: Natural Gas			
D(d)	(d) One - Reflex type liquid level gauge complete with cocks & glass gauge suitable protected from external damage, WP : As per vessel requirement)Kg/Sq.Cm2			

TENDER NO. SDI1282P20 DT: 29.04.2019

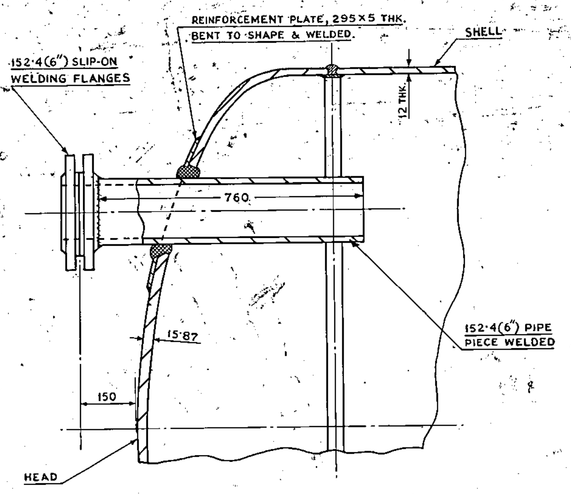
Annexure II (Special Tender notes)

Tender special notes:

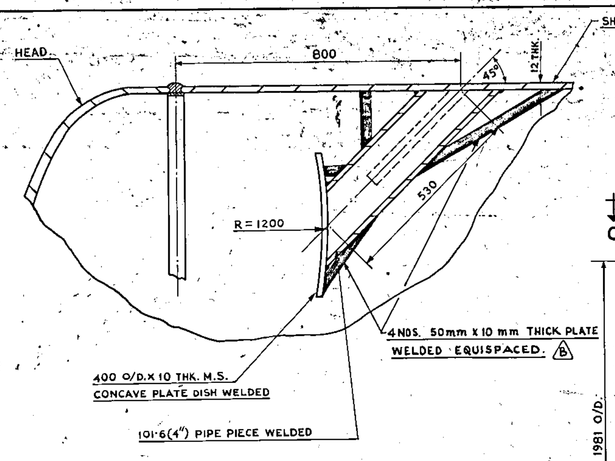
NIT clause no	Technical specification as per NIT	Bidder's Response	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
i)	i) The bidder shall confirm that the goods, materials to be supplied shall be new, of recent make, of the best quality & workmanship. The bidder shall confirm that the materials shall be guaranteed for a period of 18 months from the date of despatch or 12 months from the date of receipt/assembling at Fields, whichever is earlier, against defects arising from faulty materials, workmanship or design. Defective goods / materials or parts notified by OIL to the Seller shall be replaced immediately by the Seller on FOR destination basis including payment of all taxes and duties at Seller's expense. This guarantee shall survive and hold good not-withstanding inspection, payment for and acceptance of the goods.			
	ii) Suppliers are to note that the drawing supplied by OIL is purely to guide the suppliers to make the final working drawings by them. The drawings should, in no case be treated as final fabrication drawings. Manufacturer's working drawing should be sent to OIL for approval along with Quality Assurance Plan (QAP) prior to the commencement of manufacture/fabrication of the separators. The Bidder shall confirm the same in their technical Bid			
iii)	iii) The separator should be shop constructed and tested as per API specification 12J (Latest version) , ASME section VIII Div-I.			
iv)	iv) All the welding shall be done as per ASME section IX. Suppliers shall confirm that all coils and shell welding will be done by welders who are qualified under ASME boiler and pressure vessel code section- IX regulations.			
V)	v) Post weld heat treatment (Stress Relieving) of the whole vessel should be carried out in an automatic temperature controlled furnace only. The Bidder shall confirm the same in their technical Bid.			
Vi)	vi) All welding joints should be tested 100% radio graphically tested. The Bidder shall confirm the same in			

NIT clause no	Technical specification as per NIT	Bidder's Response	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
	their technical Bid.			
Vi)	vi) All welding joints should be tested 100% radio graphically tested. The Bidder shall confirm the same in their technical Bid.			
vii)	vii) X- Ray plate & report, radiographic test report should be produced to OIL's inspectors while inspecting and subsequently to be provided with supply of the materials.			
viii)	viii) The following documents shall be forwarded with the technical bid: b) Typical General Arrangement Diagram (GAD) of the separator. c) Sectional drawing showing the internals. i) Make and technical specification of all the bought-out items along with technical literature, GAD etc.			
ix	ix) Test Certificates: Manufacturer to provide following certificates along with the supply as per standard of manufacture & QAP. The Bidder shall confirm the same with the technical bid a) Raw materials: Chemical & mechanical test certificate as per standard specified in technical specification. b) Hydraulic test certificate, radiographic test certificate, certificate of Quality & Standard of welding. c) Certificate of visual inspection & measurement of dimensions.			
x	**x) Third Party Inspection**: The materials shall be offered for third party inspection for the following scope- a) Inspection of raw materials. b) Inspection of radiography of welded joints. c) Inspection of Hydraulic testing. f) Inspection of bought-out items. g) Inspection of certificates in respect of raw materials, bought-out items, radiography etc.			
xi	xi) The Third Party Inspector must be OIL's authorized / recognized inspecting agencies i.e. M/s Lloyds or M/s Bureau Veritas or RITES or M/s IRS or M/s DNV or Tuboscope Vetco.			

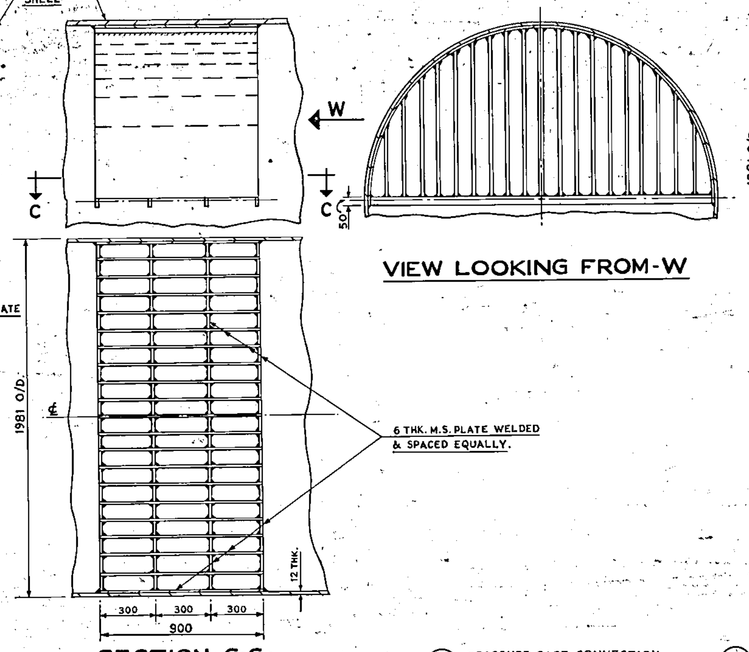
NIT clause no	Technical specification as per NIT	Bidder's Response	Compliance by Bidder	
			Indicate Complied or Deviation if any	Indicate Corresponding page ref. of unpriced bid or Comments if any
Xii	**xii) Pre-dispatch Inspection by OIL** OIL's representative shall inspect the materials prior to dispatch at vendor's works at OIL's cost. OIL's representative shall review TPI reports, witness hydraulic testing. Three weeks prior notice to be given to OIL for pre–dispatch inspection			
Xiii	**xiii) Painting and Insulation:** a) External surface shall be cleaned, by sand blasting to Sa2 -1/2 grade followed by 2 coats of heat resistant primer followed by high temperature aluminium paint. b) Inner surface will be cleaned by wire brushing and will be provided with 2 coats of heat resistant primer. Each coat will have min DFT of 35 micron.			
xiv	**xiv) Marking**: OIL's logo, Purchase order No. and manufacturers name shall be die stamped/weld written in the shell of the separator.			
xv	xv) The Bidder shall filled up and submit Technical specification on the check list(annexure-I), Tender notes check list (annexure-II) , along with technical bid as per attached format. All format shall be filled up with detailed information/specification. In the check lists the use of words like **complied or yes or considered is not suffice the requirement of check list. The bidder shall categorically provide the information as per requirements of the check lists.**			



3 DETAIL OF WELL STREAM INLET
1- OFF

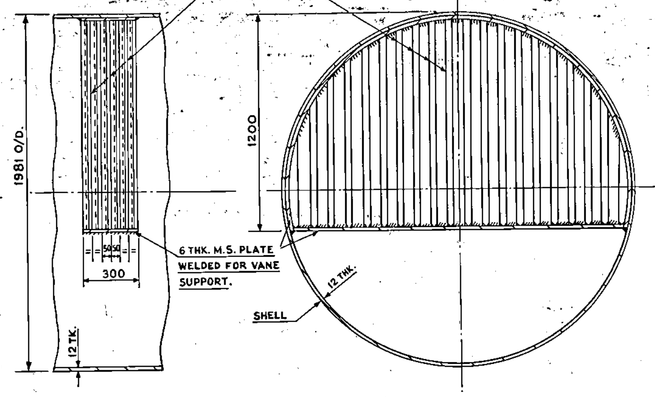


4 DETAIL OF DISHED DEFLECTOR
1- OFF

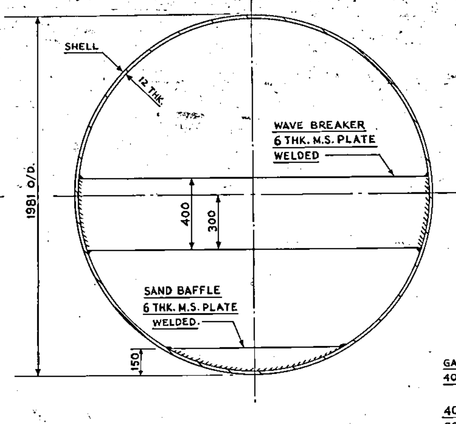


SECTION C-C

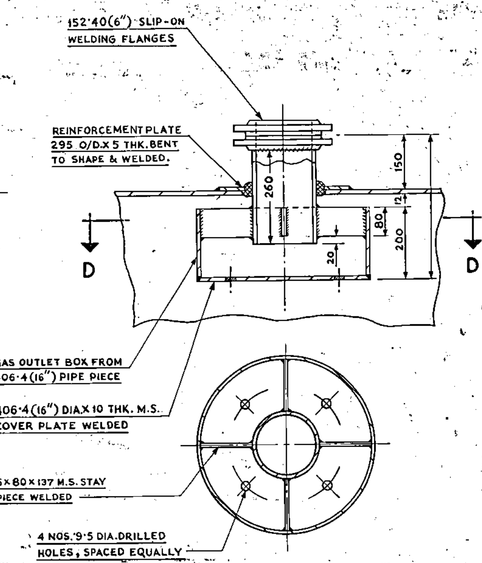
19 DETAIL OF STRAIGHTNER PLATE
1- OFF



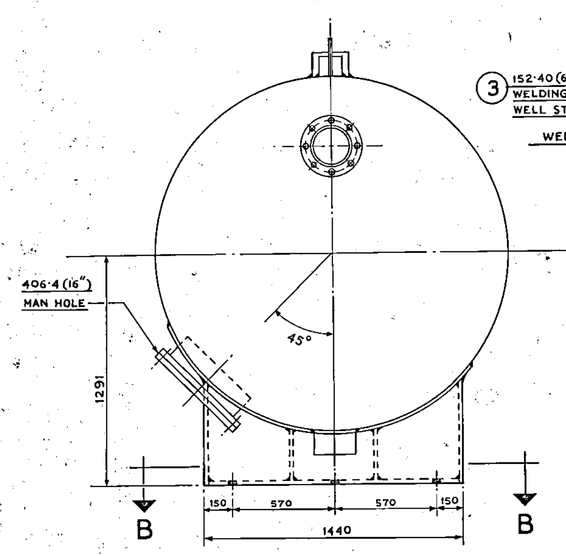
20 DETAIL OF VANE TYPE MIST EXTRACTOR
1- OFF



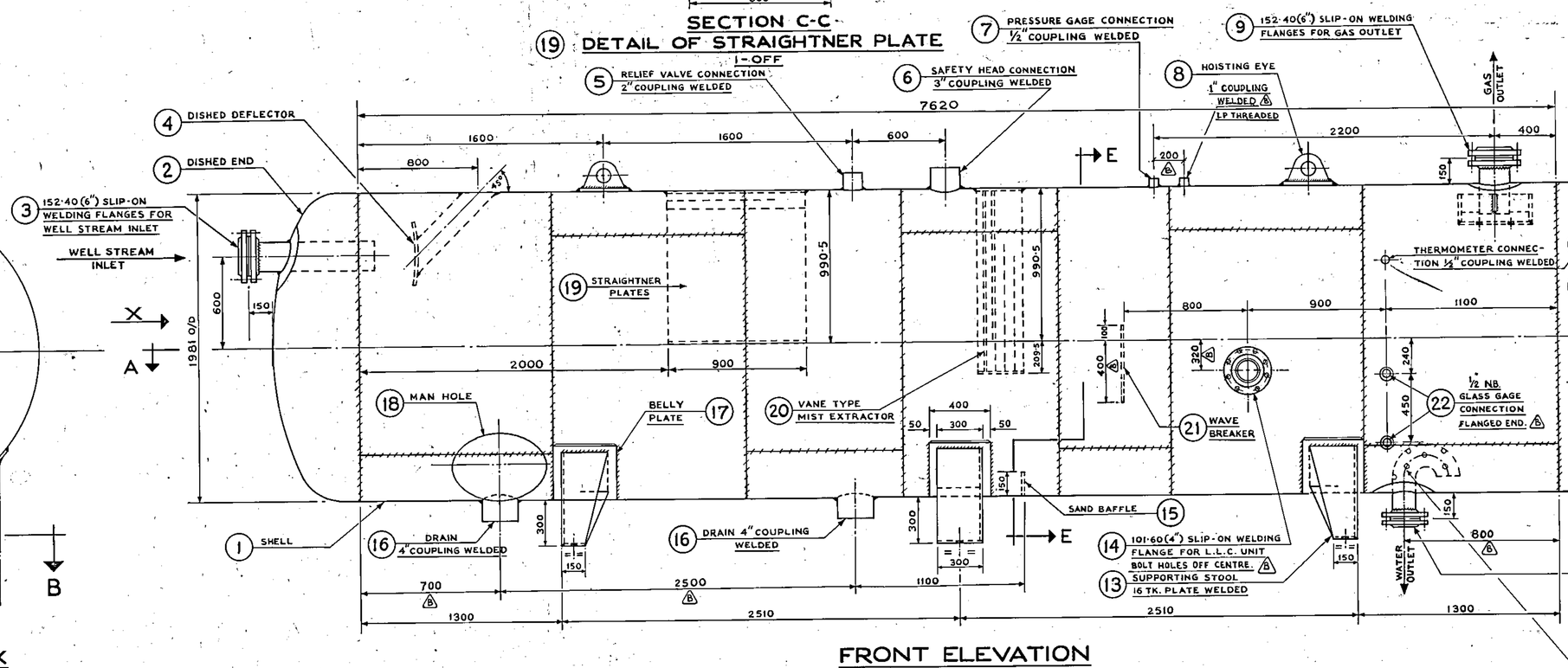
21 SECTION E-E
DETAIL OF WAVE BREAKER AND
15 SAND BAFFLE
1- OFF EACH



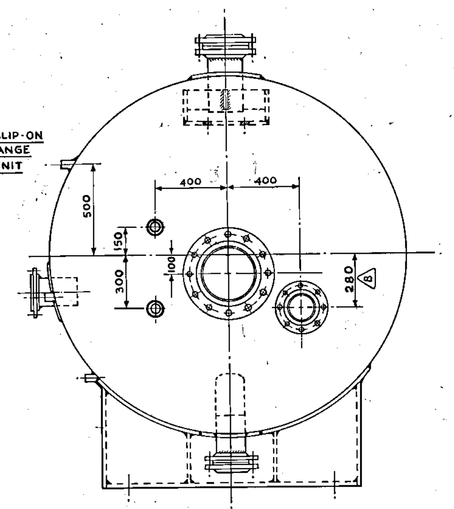
9 DETAIL OF GAS OUTLET
1- OFF



END VIEW LOOKING FROM-X



FRONT ELEVATION



END VIEW LOOKING FROM-Y

DESIGN DATA :

1. FLUID CAPACITY	—	7000 BPD FLUID 2000 BPD FREE WATER 5000 BPD OIL/EMULSION
2. GAS CAPACITY	—	5 MMSCFD (GFR 700 cft/Bbl)
3. OPARATING PRESSURE	—	100 PSIG.
4. TEST PRESSURE	—	150 PSIG.
5. WORKING TEMPERATURE	—	110° F
6. GAS GRAVITY	—	0·7 TO 0·8 (AIR = 1·00)
7. OIL GRAVITY	—	30°– 35° API
8. PRIMARY OBJECT	—	GAS, OIL AND WATER SEPERATION.

NOTES :

1. SHELL :— DOUBLE WELDED BUTT JOINT WITH DOUBLE 'V'.
2. SEAM :— SINGLE BUTT WELD WITH BACKUP STRIP.
3. DESIGN :— AS PER "ASME-VIII".
4. ALL PRESSURE PLATES TO IS:2002 Gr. 2A STEEL. NONPRESSURE PLATES TO IS:226 QUALITY STEEL.
5. BOLTS AND NUTS ON PRESSURE PARTS TO BS:1750.
6. BOLTS AND NUTS FOR NON PRESSURE PARTS TO BS: 916.
7. ALL THREADS AS PER "API" STANDARD UNLESS OTHERWISE STATED.
8. SPOT RADIOGRAPHIC TEST TO BE DONE AS PER ASME-VIII.
9. FLANGES TO BE DRILLED OFF CRS. AND 150 PSIG W.P.
10. ALL COUPLING CONNECTIONS TO 150 PSIG W.P. AND SCREWED API LINE PIPE THREAD.
11. FINISH :- APPLY ONE COAT OF OXIDE PAINT ON OUT SIDE ONLY.

LIQUID DEPTHS :

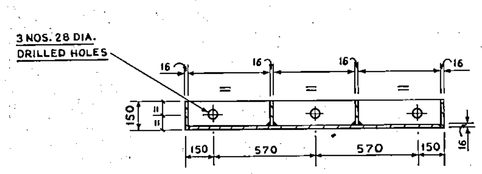
(a) GAS/OIL INTERFACE IS 890 FROM BOTTOM CENTRE LINE OF SHELL.

(b) OIL/WATER INTERFACE IS 460 FROM BOTTOM CENTRE LINE OF SHELL.

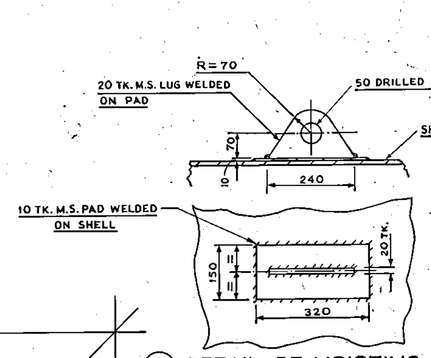
REFERENCE DRAWING :

(1) FOR MATERIAL LIST REFER TO SK. NO. OIL/1563.

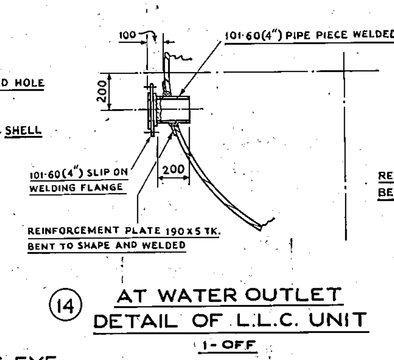
(2) FOR FOUNDATION FOR THREE PHASE HORIZONTAL SEPARATOR REF. DRG. NO. OIL/4601.



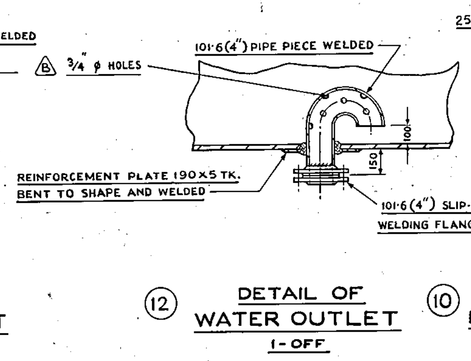
SECTION B-B



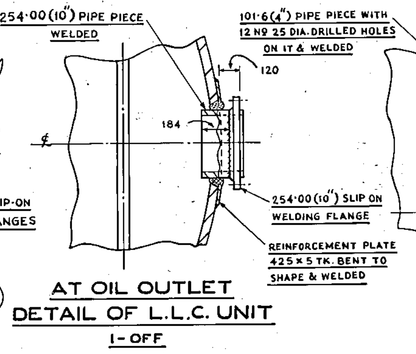
8 DETAIL OF HOISTING EYE
2-OFF



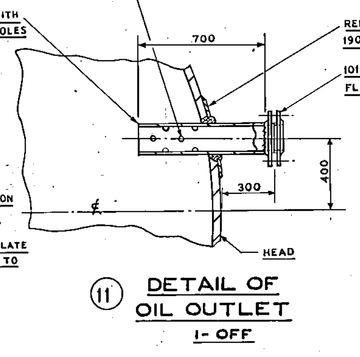
14 AT WATER OUTLET
DETAIL OF L.L.C. UNIT
1- OFF



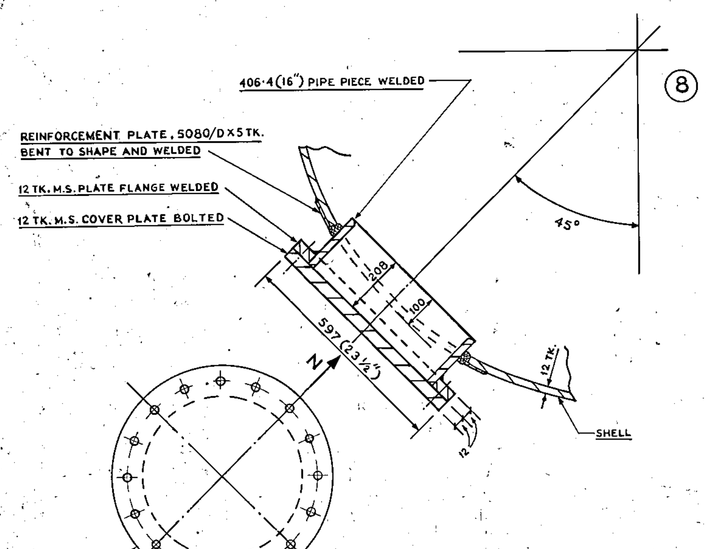
12 DETAIL OF WATER OUTLET
1- OFF



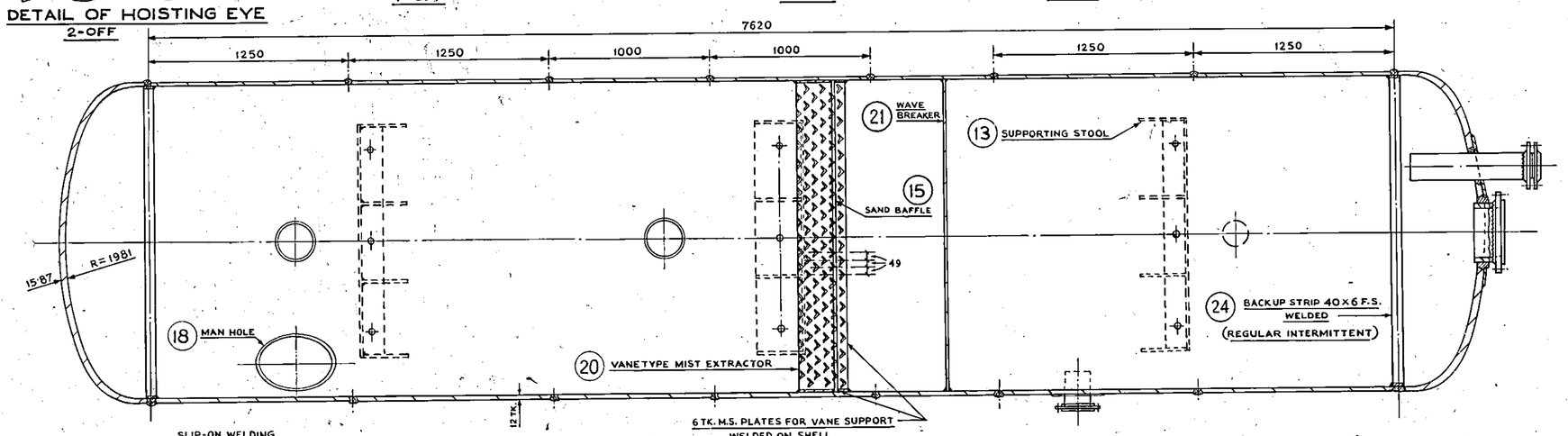
10 AT OIL OUTLET
DETAIL OF L.L.C. UNIT
1- OFF



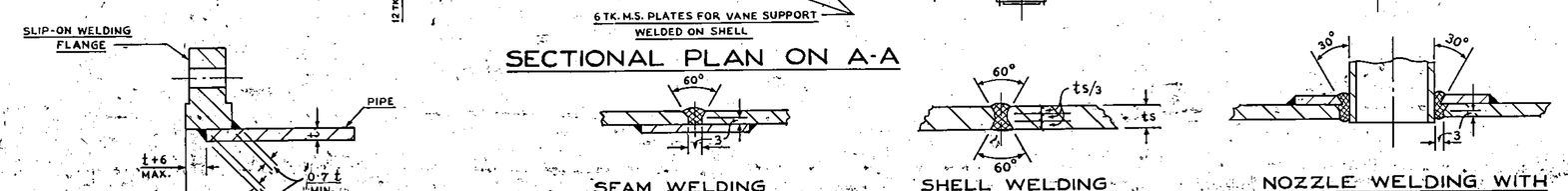
11 DETAIL OF OIL OUTLET
1- OFF



18 DETAIL OF MAN HOLE



SECTIONAL PLAN ON A-A



TYPICAL SECTIONAL WELDING DETAILS OF SLIP-ON WELDING FLANGES

SEAM WELDING

SHELL WELDING

NOZZLE WELDING WITH REINFORCEMENT

WELDING DETAILS. (N.T.S.)

ALL DIMENSIONS IN MILLIMETERS.

TRACED ON 23-8-86.

REV.	DESCRIPTION	DATE	SIGN
B	CLIENT'S COMMENTS AS PER LETTER NO. CEPP/GB/AKN/94 dt. 26.7.94 INCORPORATED CHANGES MARKED (A) THUS.	26.8.94	
A	SIZE OF ITEM NO. 10 CHANGED TO 254(10") FROM 304·80(12") AND ITEM NO. 14 CHANGED TO 101·60(4") FROM 304·80(12") AND WELDING DETAILS ADDED.	22·4·74	

OIL INDIA LIMITED
DULIAJAN

DRG. NO OIL/2024/B DATE 17-7-72.

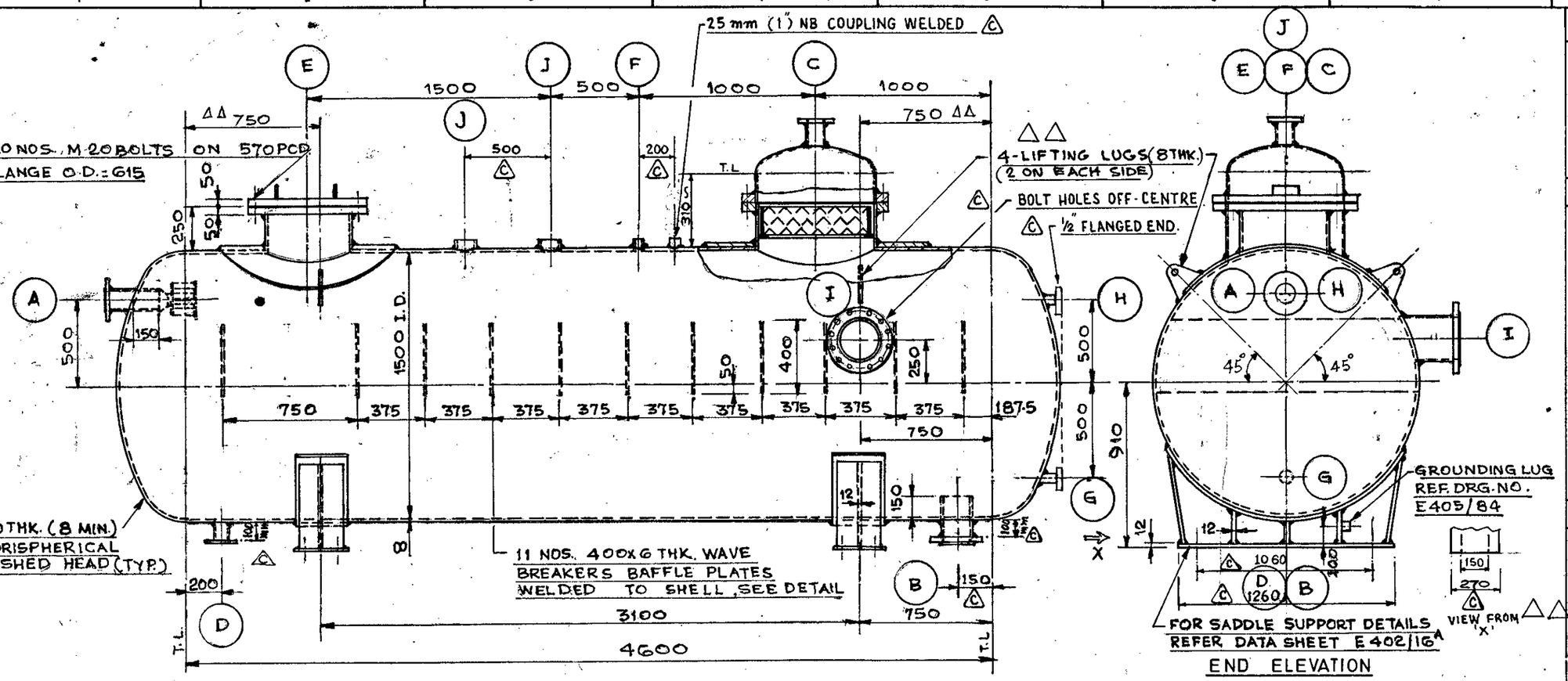
SUBJECT 3-PHASE HORIZONTAL SEPARATOR

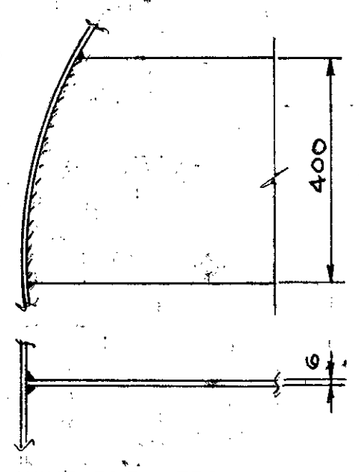
SCALE 1:20, 1:10

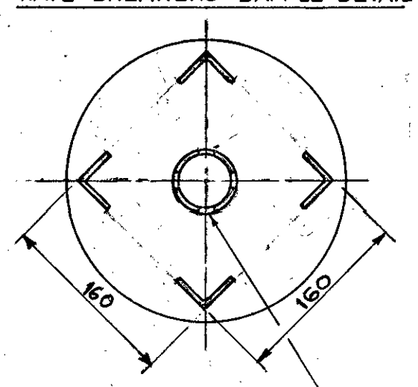
SURVEYED BY — DRAWN BY —

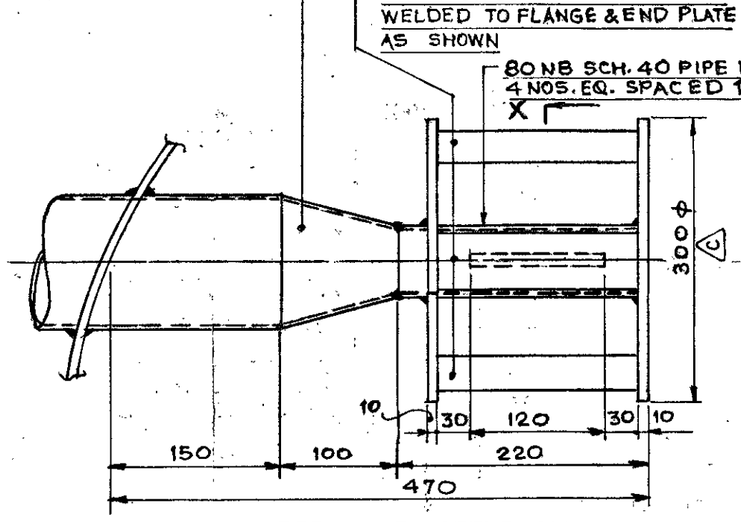
TRACED BY — CHECKED BY —

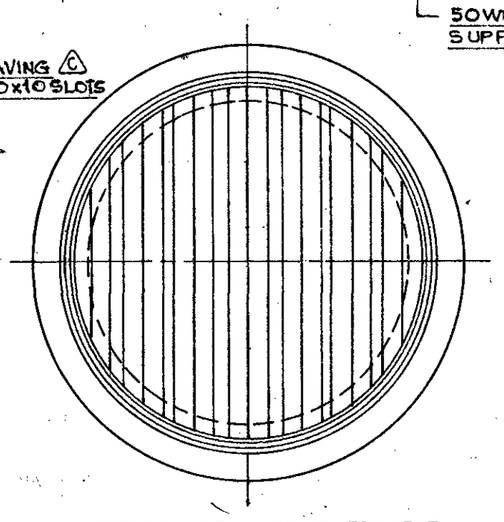
TRAC. CHECKED BY — APPROVED BY —











DESIGN DATA

WORKING PRESSURE Kg/cm²g	1	DESIGN CODE	ASME SEC. VIII DIV. 1 (LATEST)
WORKING TEMPERATURE °C	50	RADIOGRAPHY	NIL
DESIGN PRESSURE Kg/cm²g	3.5	STRESS RELEIVING	NIL
DESIGN TEMPERATURE °C	80	JOINT EFFICIENCY %	
SHOP TEST PRESSURE Kg/cm²g	5.25	SHELL	70
FIELD TEST PRESSURE Kg/cm²g	5.25	HEAD	70
CORROSION ALLOWANCE	1.5		

MATERIAL OF CONSTRUCTION

SHELL & HEADS	IS: 2002 GR. 2A
VESSEL SUPPORTS	IS 226
WELDED ATTATCHMENTS	
INTERNALS	IS 226 / IS: 2062
EXTERNALS	IS 2002 GR 2A (PADS)
REMOVABLE INTERNALS	IS 2062
INTERNAL PIPE	SA 106 GR B OR EQU.
NOZZLE NECKS	SA 106 GR B OR EQV.
NOZZLE FLANGES	IS 2002 GR 2A
BLIND FLANGES	IS 2002 GR 2A
THREADED CONNECTIONS	SA 105 GR II
PRESSURE BOLTING	SA 193 GR B7 FOR BOLTS & SA 194 GR. 2H FOR NUTS
NON-PRESSURE BOLTING	IS 1367
GASKET	CAF
PAINTING	ONE COAT OF RED OXIDE PRIMER ON UNMACHINED EXTERNAL SURFACES ONLY.
LINING	–

GENERAL NOTES

1 ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED
2 ALL BOLT HOLES TO STRADDLE HORIZONTAL & VERTICAL CENTRE LINES.
3 LOCATION OF NOZZLES & ATTATCHMENTS SHOWN IN ELEVATION ARE DIAGRAMMATIC ONLY FOR CIRCUMFERENTIAL LOCATION REFER NOZZLE ORIENTATION.
4 ALL FLANGES SHOULD CONFORM TO ANSI-B 16.5 UNLESS OTHERWISE STATED.
5 UNLESS OTHERWISE SPECIFIED DIMENSIONS FROM FACE OF FLANGE TO OUT SIDE SURFACE OF SHELL FOR NOZZLES SHALL BE 150MM FOR 100MM NB & SMALLER, 200MM FOR 150 & 200 MM NB & 250 MM FOR 250MM NB AND LARGER SIZES.
6 ALL NOZZLES UP TO 50 MM NB SHALL BE STIFFENED BY 3 NOS. EQUISPACED RIBS.
7 INSIDE WELD LINES SHOULD BE GROUND SMOOTH WHEREVER POSSIBLE AND OUTSIDE WELD LINES SHOULD REMAIN PROUD.
8 NOZZLE REINFORCEMENT PADS SHOULD BE PROVIDED WITH 3MM PIPE TAPS (PLUGGED)
9 IT SHALL BE VENDORS RESPONSIBILITY TO GUARANTEE THAT THE FABRICATION OF THE VESSEL COMPLIES WITH ALL THE SPECIFIED CODE AS WELL AS ALL PERTINENT REGULATIONS CONTROLLING THE FABRICATION OF FUSION WELDED PRESSURE VESSELS.
10 THIS DRAWING IS ONLY FOR GUIDANCE PURPOSE. FABRICATOR TO SUBMIT FABRICATION DRAWINGS SHOWING WELDING DETAILS, TOLERANCES AND OTHER FABRICATION DETAILS FOR OIL APPROVAL BEFORE FABRICATION.
11
12 SUITABLE GROUNDING LUGS TO BE PROVIDED BY VENDOR (REF. DRG. NO. E405/84)
13 TRANSIT PROTECTION : ALL COUPLINGS SHOULD BE FITTED WITH PLUGS. ALL FLANGE OPENINGS SHOULD BE PROTECTED BY 12MM THK WOODEN COVERS AND MACHINED SURFACES BY RUST PREVENTIVE COMPOUND.

REF. DRAWINGS 1. GROUNDING LUG DETAILS E405/84
2 SADDLE SUPPORT DETAILS E402/16A

WEIGHT OF VESSEL (KGS.) EMPTY : ~2000 FULL OF WATER :

NOZZLE DATA

MARK	NOMBORE	RATING#	TYPE	FACE	SERVICE	STANDARD
J	80	3000	COUPLG	SCREWED	RELIEF VALVE - 2 NOS.	ANSI-B-16.11
I	250	150	SO	RF	LEVEL FLOAT NOZZLE	ANSI-B-16.5
G&H	15	300	S.O	RF	LEVEL GAUGE	ANSI-B-16.11
F	15	3000	COUPLG	SCREWED	PRESSURE GAUGE	ANSI-B-16.11
E	500	150	S.O.	R.F.	MANHOLE	AS PER DETAIL
D	50	150	S.O.	R.F.	WATER OUTLET/DRAIN	ANSI-B-16.5
C	150	150	S.O.	R.F.	GAS OUTLET	ANSI-B-16.5
B	150	150	S.O.	R.F.	OIL OUTLET	ANSI-B-16.5
A	150	150	S.O.	R.F.	OIL GAS INLET	ANSI-B-16.5

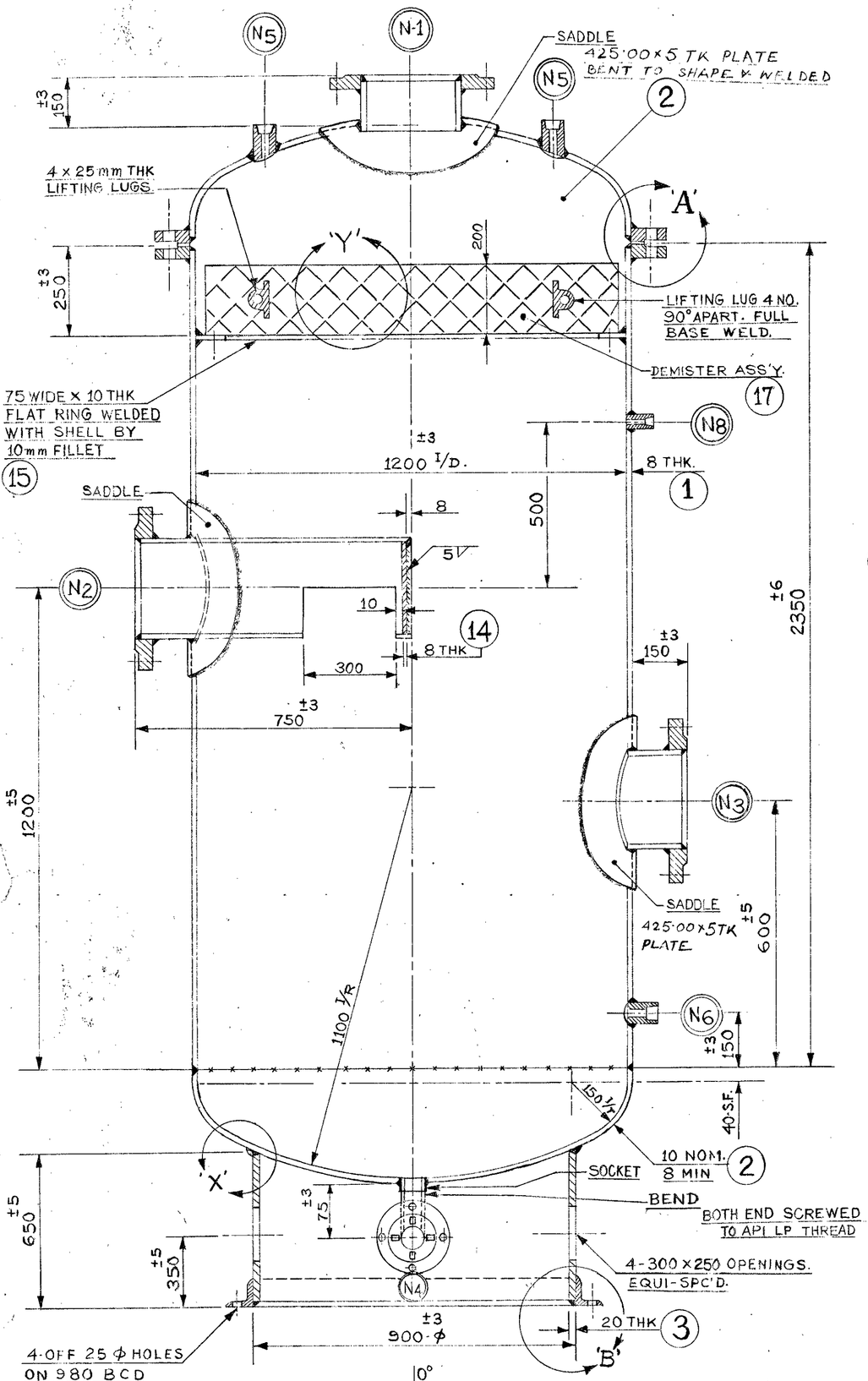
REV.	DATE	DRN.	CHK'D	APPVD.	DESCRIPTION
C	26.8.94				CLIENT'S COMMENTS AS PER LETTER NO. CEDP/68/AKN/94 dt. 26.7.94 INCORPORATED, CHANGES MARKED (C) THUS.
B	21.3.79	SKG			CLIENTS COMMENTS INCORPORATED, CHANGES MARKED ΔΔ THUS.
'A'	6.12.1978				DAVITS FOR MANHOLE, FLANGES ON GAS-OIL SEPARATOR OF NOZZLE 'A' & NOTE NO. 11 REMOVED THICKNESS OF HEADS CHANGED TO 10 MM FROM 12MM, WORKING & DESIGN PRESSURE CHANGED FROM 3.5 Kg. to 1Kg. & 5.5 Kg. to 3.5 Kg. RESPECTIVELY, WAVE BREAKER DIRECTLY WELDED TO SHELL, OTHER CHANGES MARKED THUS Δ DONE AS PER CLIENTS COMMENTS. GROUNDING LUG ADDED.

REF. DRG. :-
FOUNDATION FOR HORIZONTAL STABILIZING VESSEL (10,000 BPD)
DRG. NO. OIL/1603

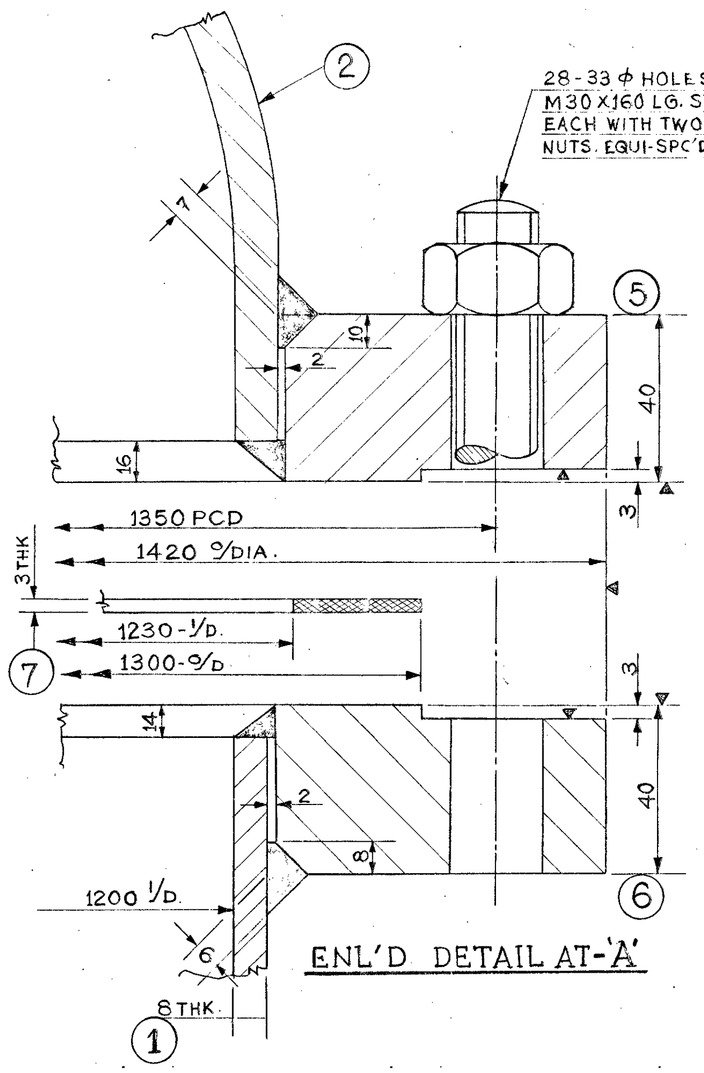
TITLE: HORIZONTAL STABLIZING VESSEL (10,000 BPD/1Kg/cm²g)

OIL INDIA LTD., DULIAJAN

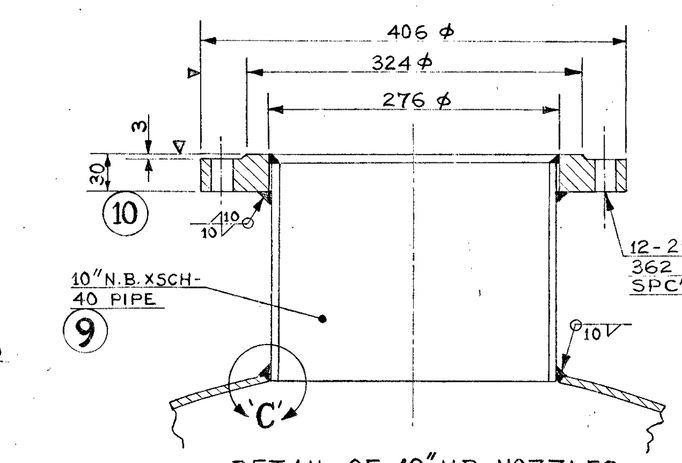
REF.			FOR TYPICAL WELDING DETAILS REFER SK. OIL/2368.
DRAWN	V.K. Goswami	19.6.1978	SCALE: 1:25 & 1:5
CHECKED			DRG. NO. 3411/C
APPVD.			



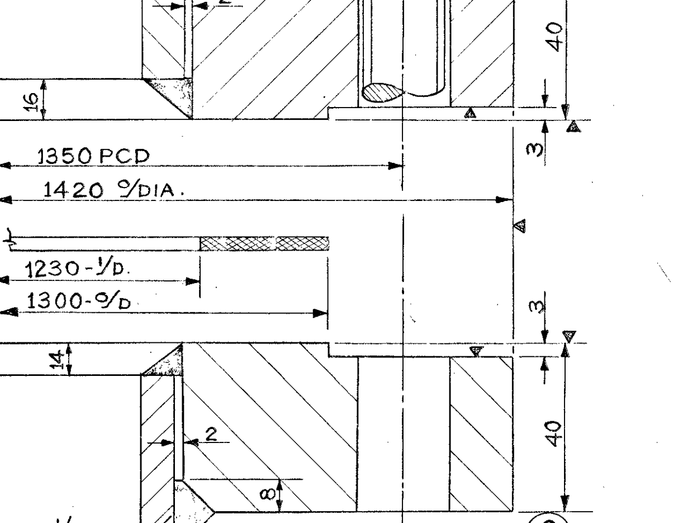
ORIENTATION PLAN



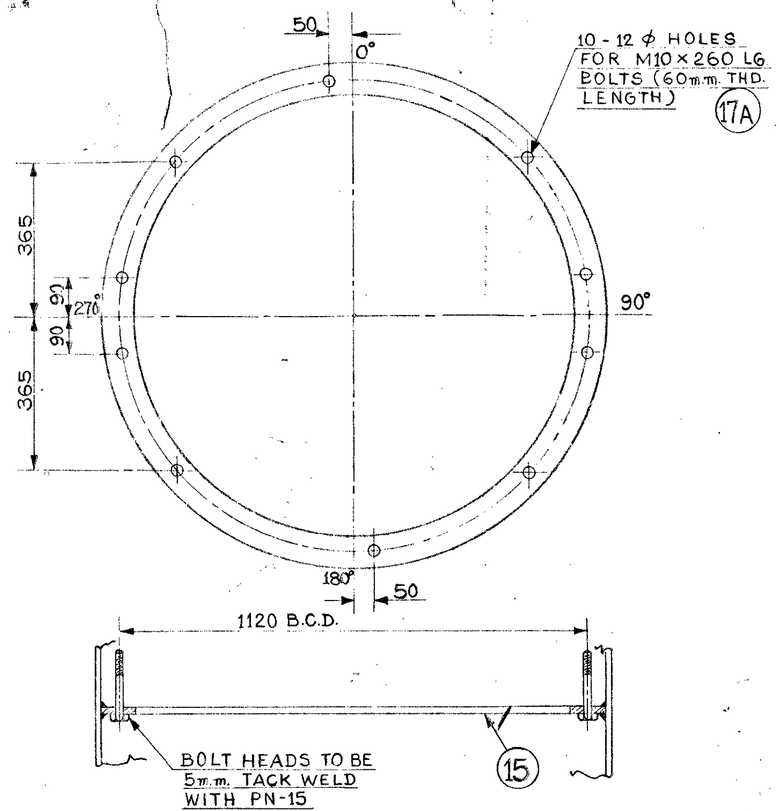
ENL'D DETAIL AT-'A'



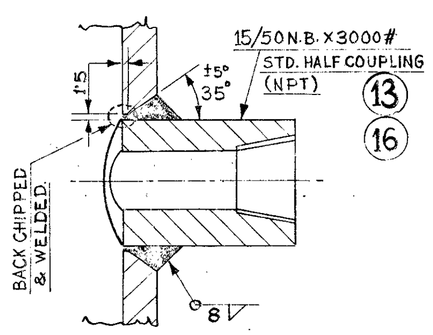
DETAIL OF 10" N.B. NOZZLES



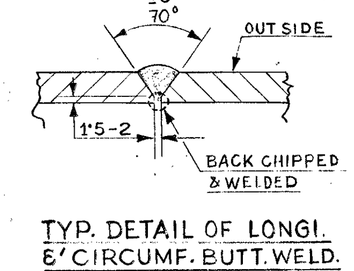
DETAIL OF 2" N.B. NOZZLE



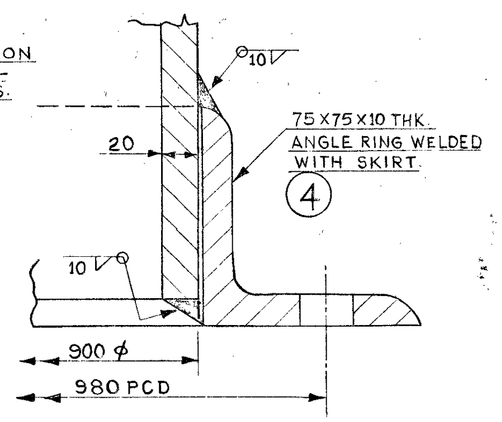
DETAIL OF DEMISTER SUPPORT RING. PN-15



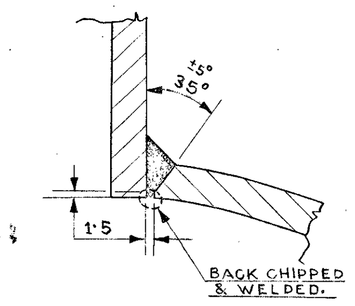
WELDING DETAIL OF HALF COUPLING TO SHELL



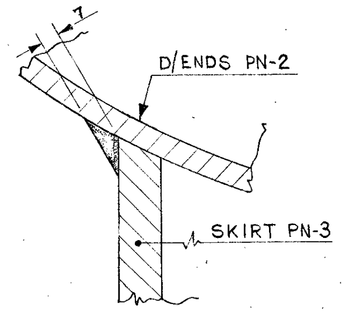
TYP. DETAIL OF LONGI. & CIRCUMF. BUTT. WELD.



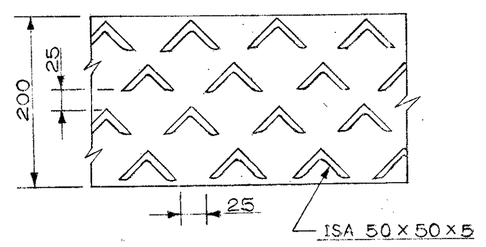
ENL'D DETAIL AT-'B'



DETAIL AT-'C'



DETAIL AT-'X'



ENL'D DETAIL AT-'Y'

DESIGN DATA

MAX. OPERATING PRESSURE :		2·1 Kg/cm² g
DESIGN PRESSURE :		6·4 Kg/cm² g
TEST PRESSURE :		10·5 Kg/cm² g
OPERATING TEMPERATURE OF FLUID :		43 °C
DESIGN TEMPERATURE OF METAL WALL :		71 °C
CORROSION ALLOWANCE :		1·5 mm
JOINT EFFICIENCY :		85 %
POST WELD HEAT TREATMENT :		REQUIRED
RADIOGRAPHY :		SPOT
CODE OF CONSTRUCTION :		ASME. SEC.- VIII, DIV-1, 1980
CAPACITY :		0·4 MM SCMD.
CONTENTS : NATURAL GAS. (SWEET)	SP. GRAVITY:	0·7 – 0·85 (AIR = 1)
LINING IF ANY : (NO)		
INSULATION, IF ANY :		NO
INSPECTION BY :		M/S OIL INDIA LTD.

WEIGHTS

WEIGHT OF EMPTY VESSEL : 1550 Kgs.

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MM. UNLESS STATED OTHERWISE
2. DO NOT SCALE THIS DRAWING, IF IN DOUBT PL. ASK OIL INDIA LTD.
3. ALL BOLT HOLES SHALL STRADDLE THE NORMAL VESSEL CENTRE LINES.
4. REF. DRG. NO :
5. PAINTING – ALL M.S. EXTERNAL SURFACES SHALL BE CLEANED BY SAND BLASTING TO REMOVE MILL SCALE AND ONE COAT OF ANTICORROSIVE PRIMER TO BE APPLIED AND ALL MACHINED SURFACE SHALL BE PROVIDED WITH A COAT OF ANTIRUST VARNISH.

NOZZLE	SIZE	NOZ. SCH/THK	RATING	TYPE	FACING	SERVICE	REMARKS
			FLANGES				
N8	15	STD.(NPT THRD)	3000 #	HALF COUPLING	–	PRESS. GAUGE CON'N	
N7	15	STD.(NPT THRD)	3000 #	HALF COUPLING	–	-DO-	
N6	100	STD.(NPT THRD.)	3000 #	HALF COUPLING	–	LIQUID OUTLET	
N5	50	STD.(NPT THRD.)	3000 #	HALF COUPLING	–	RELIEF VALVE CON'N.	
N4	100	SCH. 40	150 #	S.O.	R.F.	DRAIN	
N3	10"	SCH. 40	150 #	S.O.	R.F.	LLC UNIT CON'N	
N2	10"	SCH. 40	150 #	S.O.	R.F.	GAS INLET	
N1	10"	SCH. 40	150 #	S.O.	R.F.	GAS OUTLET	

NOZZLE SCHEDULE

PART NO	DESCRIPTION	NO. OFF	MATERIAL	REMARKS
17A	BOLTS. M 10 x 260 LG	10	S.S.	
17	DEMISTER ASS'Y		S.S.-304	
16	HALF COUPLING 15 N.B. x 3000 #	2	SA-234. WPB	1-OFF 50 mm LONG
15	DEMISTER SUPPORT RING 10 THK	1	M.S.	
14	CLOSURE PLATE	1	M.S.	
13	HALF COUPLING 50 N.B x 3000 #	2	SA-234. WPB	1-OFF 50 mm LONG
12	FLANGE	1	SA-285 Gr'C'/IS: 2002 Gr'2A'/EQUIV	
11	NOZZLE NECK PIPE MK. N4	1	SA-53/SA-106 Gr'B'	
10	FLANGE	3	SA-285 Gr'C'/IS: 2002 Gr'2A'/EQUIV	
9	PIPE FOR NOZZ. MK-N1, N2 & N3	3	SA-53/SA-106. Gr 'B'	
8	STUDS & NUTS, M30	28	IS: 1367	
7	GASKET 3 THK	1	C.A.F.	
6	FLANGE	1	SA-285 Gr'C'/IS: 2002 Gr'2A'/EQUIV.	
5	FLANGE	1	SA-285 Gr'C'/IS: 2002 Gr'2A'/EQUIV.	
4	ANGLE RING	1	M.S.	
3	SKIRT 20 THK	1	M.S.	
2	DISHED ENDS	2	SA-285 Gr'C'/IS: 2002 Gr'2A'/EQUIV	
1	SHELL 8 THK	1	SA-285 Gr'C'/IS: 2002 Gr'2A'/EQUIV.	

BILL OF MATERIALS FOR ONE OFF

OIL INDIA LTD
PRODUCTION PROJECT
DULIAJAN

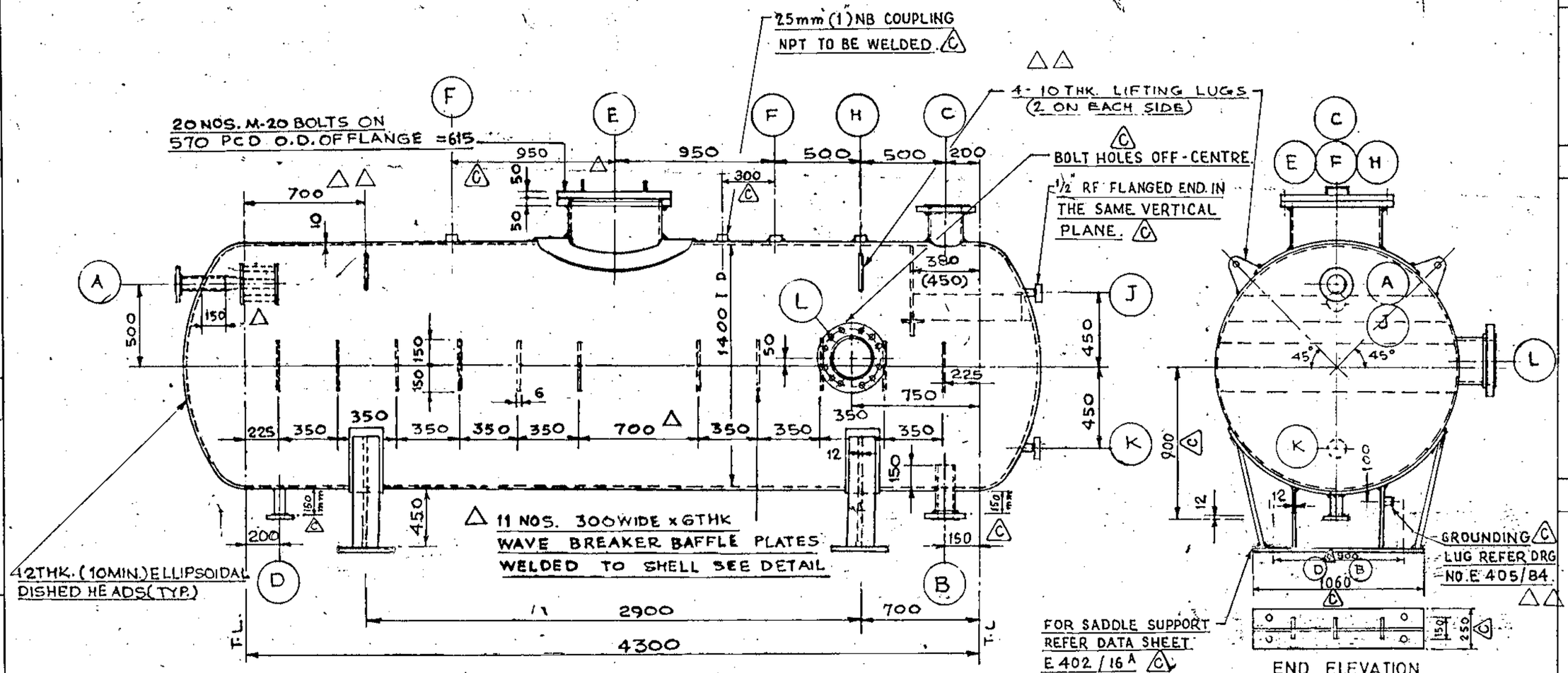
	NAME	DATE
DESIGNED		
DRAWN	M B RAJKHOWA	27-6-92
TRACED		
CHECKED	A K NATH.	21.7.92
APPROVED	L C BARUAH.	1.8.92

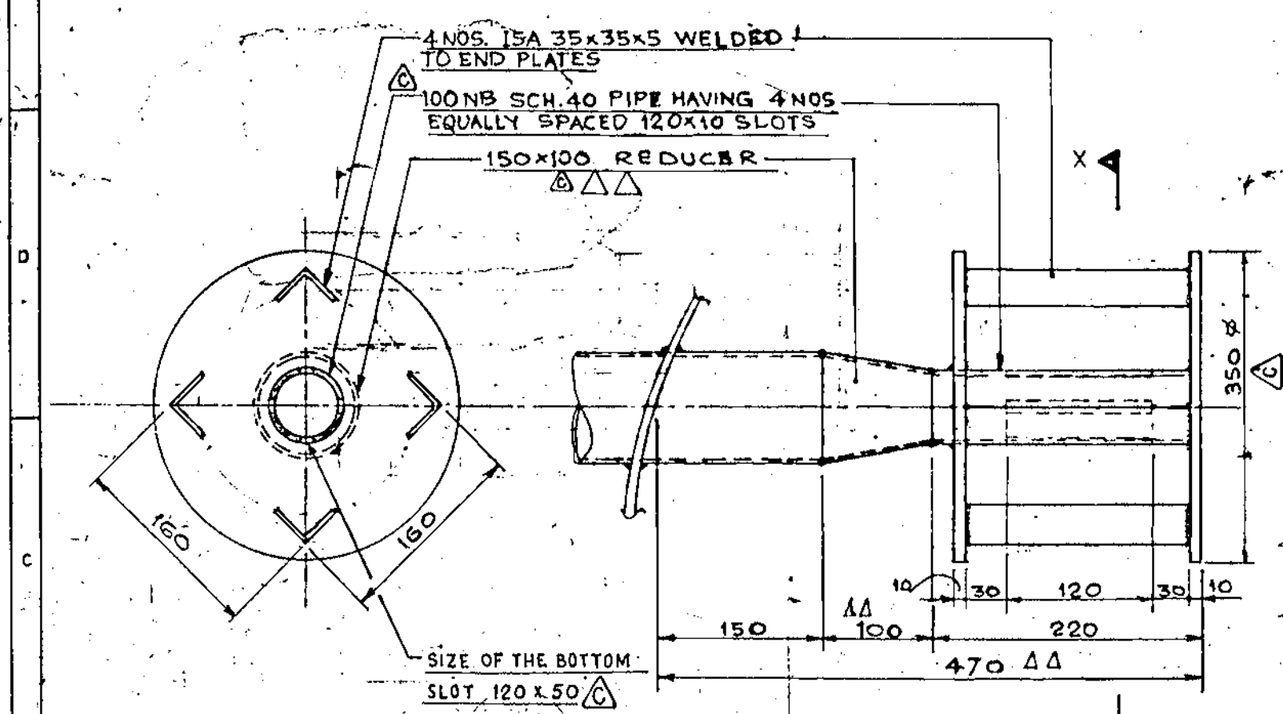
SCALE

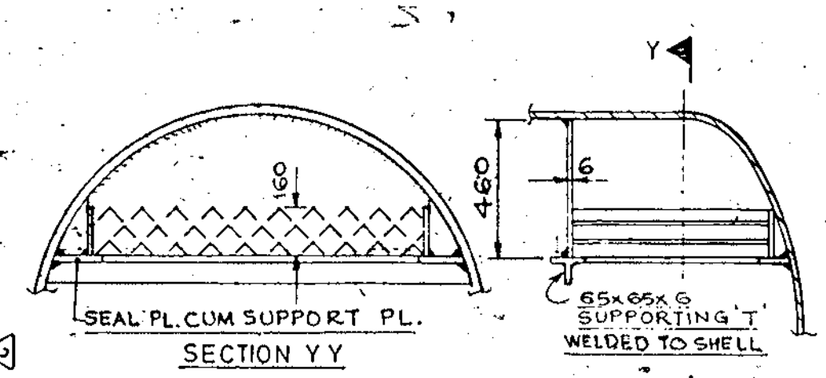
TITLE:
LOW-PRESSURE MASTER SEPARATOR (LPMS)

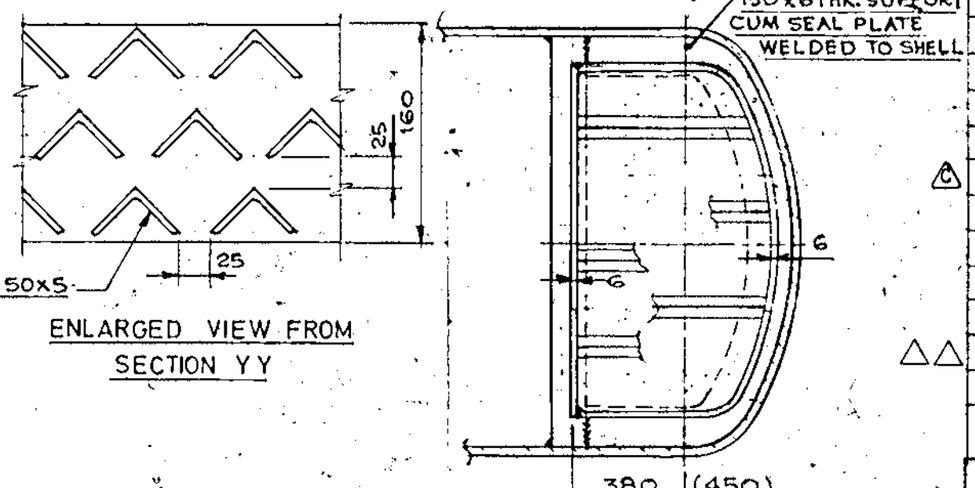
DRG. NO. OIL/7232

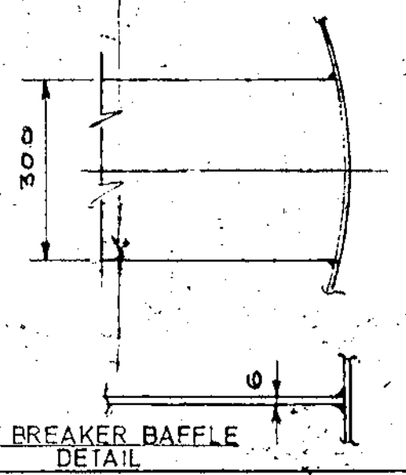
DATE - 30.9.93.











DETAIL OF MIST EXTRACTOR

REF. DRG.:-
FOR LOW PRESSURE HORIZONTAL GAS OIL SEPARATOR I & II (5000 BPD) REF. DRG. NO. OIL/-3410

DESIGN DATA

WORKING PRESSURE Kg/cm²g	△ 7.0 (3.5)	DESIGN CODE : ASME SEC. VIII DIV. I (LATEST)
WORKING TEMPERATURE °C	50	RADIOGRAPHY : SPOT
DESIGN PRESSURE Kg/cm²g	8.5	STRESS RELEIVING : NIL
DESIGN TEMPERATURE °C	80	
SHOP TEST PRESSURE Kg/cm²g	12.8	JOINT EFFICIENCY SHELL : 85%
FIELD TEST PRESSURE Kg/cm²g	12.8	HEAD 85% △
CORROSION ALLOWANCE MM	1.5	

MATERIAL OF CONSTRUCTION

SHELL & HEADS	IS:2002 GR. 2A
VESSEL SUPPORTS	IS: 226
WELDED ATTATCHMENTS	
INTERNALS	IS: 2062 / IS:226
EXTERNALS	IS: 2002 GR. 2A (PADS)
REMOVABLE INTERNALS	IS: 2062 & IS:226
INTERNAL PIPE	–
NOZZLE NECKS	SA 106 GR.B
NOZZLE FLANGES	SA 181 GR 1
BLIND FLANGES	SA 181 GR 1
THREADED CONNECTIONS	SA 105 GR. II
PRESSURE BOLTING	SA 193 GR. B-7 FOR BOLTS & SA194 GR 2H FOR NUTS
NON PRESSURE BOLTING	IS: 1367
GASKET	C.A.F.
PAINTING	ONE COAT OF RED OXIDE PRIMER ON UNMACHINED EXTERNAL SURFACES ONLY
LINING	–
INSULATION	–

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED
2. ALL BOLT HOLES TO STRADDLE HORIZONTAL & VERTICAL CENTRE LINES UNLESS OTHERWISE STATED
3. LOCATION OF NOZZLES & ATTATCHMENTS SHOWN IN ELEVATION ARE DIAGRAMMATIC ONLY FOR CIRCUMFERENTIAL LOCATION REFER NOZZLE ORIENTATION.
4. ALL FLANGES SHOULD CONFORM TO ANSI-B16.5 UNLESS OTHERWISE STATED.
5. UNLESS OTHERWISE SPECIFIED DIMENSIONS FROM FACE OF FLANGE TO OUTSIDE SURFACE OF SHELL FOR NOZZLES SHALL BE 150 MM FOR 100 MM NB AND SMALLER, 200 MM FOR 150 AND 200 MM NB AND 250 MM FOR 250 MM NB AND LARGER SIZES.
6. ALL NOZZLES UP 50 MM NB SHALL BE STIFFENED BY 3 NOS EQUISPACED RIBS.
7. INSIDE WELD LINES SHOULD BE GROUND SMOOTH WHEREVER POSSIBLE AND OUTSIDE WELD LINES SHOULD REMAIN PROUD.
8. NOZZLE REINFORCEMENT PADS SHOULD BE PROVIDED WITH 3MM PIPE TAPS (PLUGGED)
9. IT SHALL BE VENDORS RESPONSIBILITY TO GUARANTEE THAT THE FABRICATION OF THE VESSEL COMPLIES WITH ALL THE SPECIFIED CODE AS WELL AS ALL PERTINENT REGULATIONS CONTROLLING THE FABRICATION OF FUSION WELDED PRESSURE VESSELS
10. THIS DRAWING IS FOR GUIDANCE PURPOSE ONLY. FABRICATOR TO SUBMIT FABRICATION DRAWINGS SHOWING WELDING DETAILS, TOLERANCES AND OTHER FABRICATION DETAILS FOR OIL APPROVAL BEFORE FABRICATION.
11.
12. SUITABLE GROUNDING LUG TO BE PROVIDED BY VENDOR (REFER DRG NO. E405/84)
13. TRANSIT PROTECTION: ALL COUPLINGS SHOULD BE FITTED WITH PLUGS. ALL FLANGE OPENINGS SHOULD BE PROTECTED BY 12 MM THK. WOODEN COVERS AND MACHINED SURFACES BY RUST PREVENTIVE COMPOUND.

REF. DRAWINGS: GROUNDING LUG DETAILS E405/84
SADDLE SUPPORT DETAILS E402/16A

WEIGHT OF VESSEL (KGS.) EMPTY:~ 2300 FULL OF WATER:

* DIMENSIONS GIVEN IN BRACKET ARE FOR SEPARATOR-II (T-02)

△△

MARK	NOM. BORE	RATING*	TYPE	FACING	SERVICE	STANDARD
L	250	300	WN	RF	LEVEL FLOAT NOZZLE	ANSI-B.16.5
J & K	15	300	FLANGED	R.F.	LEVEL GAUGE C	ANSI-B.16.11
H	15	3000	COUPL'G	SCREWED	PRESSURE GAUGE	ANSI-B.16.11
F	80	3000	COUPL'G	SCREWED	RELIEF VALVE - 2 NOS.	ANSI-B.16.11
E	500	300	WN	RF	MANHOLE	AS PER DETAIL
D	100	300	WN	RF	WATER OUTLET / DRAIN	ANSI-B.16.5
C*	200 (250)	300	WN	RF	GAS OUTLET	ANSI-B.16.5
B	100	300	WN	RF	OIL OUTLET	ANSI-B.16.5
A	150	300	WN	RF	OIL-GAS INLET	ANSI-B.16.5

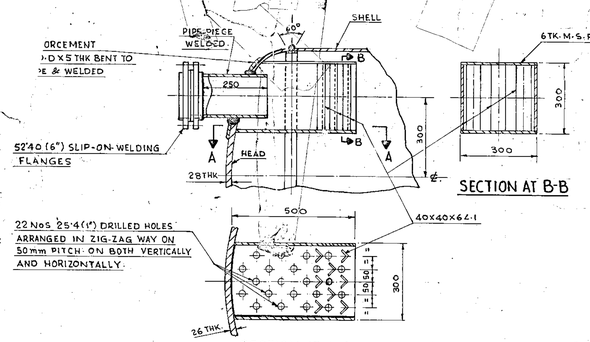
NOZZLE DATA

REV.	DATE	DRN.	CHK'D	APPVD.	DESCRIPTION
D	13-3-96				REVISED AS PER LETTER NO CEPP/96/AKN/95 DATE 16-02-96
C	26.8.94				CLIENT'S COMMENTS AS PER LETTER NO. CEPP/68/AKN/94 dt. 26.7.94 INCORPORATED, CHANGES MARKED C THUS
B	21-3-79				CLIENT'S COMMENTS INCORPORATED, CHANGES MARKED △△ THUS.
A	5.12.78				DAVITS FOR MANHOLE, FLANGES ON GAS-OIL SEPARATOR OF NOZZLE A NOTE NO 11 REMOVED. WORKING & DESIGN PRESSURE CHANGED FROM 8.5 Kg TO 7 Kg & 10.5 TO 8.5 Kg RESPECTIVELY. WAVE BREAKERS DIRECTLY WELDED TO SHELL & MIST EXTRACTOR'S ASSEMBLY WELDED INSTED OF BOLTED CONSTRUCTION. & OTHER CHANGES MARKED A THUS DONE AS PER CLIENT'S COMMENTS. GROUNDING LUG ADDED

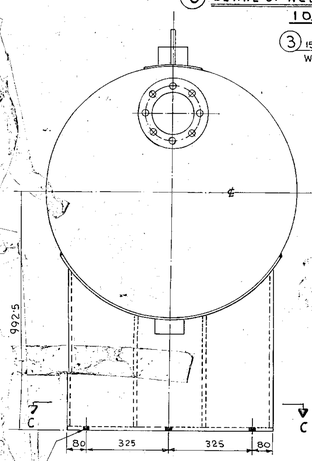
TITLE: LOW PRESSURE HORIZONTAL GAS OIL SEPARATOR I & II (5000 BPD/35 Kg/cm²g)

OIL INDIA LTD., DULIAJAN

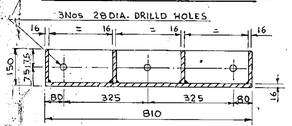
REF.		FOR TYPICAL WELDING DETAILS REFER SK. OIL/2368
DRAWN	V.K. GOSWAMI 16-6-78	SCALE: 1:25 & 1:5 & 1:20
CHECKED		DRG. NO. 3410/D
APPVD.		



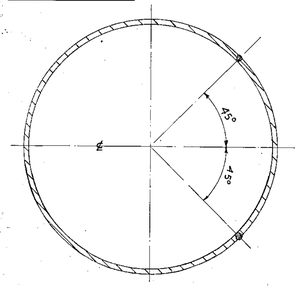
(3) DETAIL OF WELL STREAM INLET
1 OFF



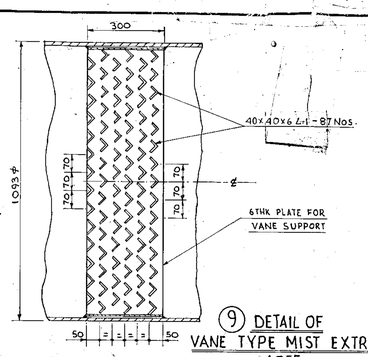
END VIEW LOOKING FROM-X



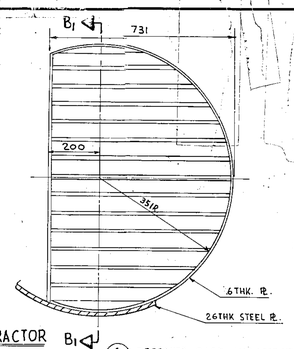
SECTION ON C-C.



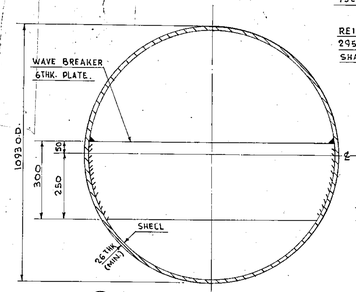
DETAIL OF SHELL WELDING



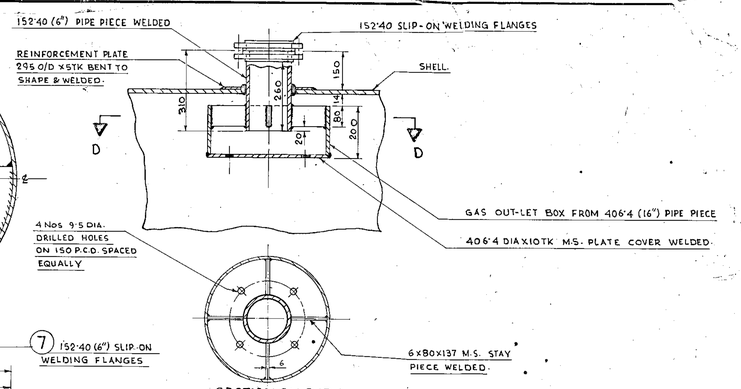
(9) DETAIL OF VANE TYPE MIST EXTRACTOR
1 OFF.



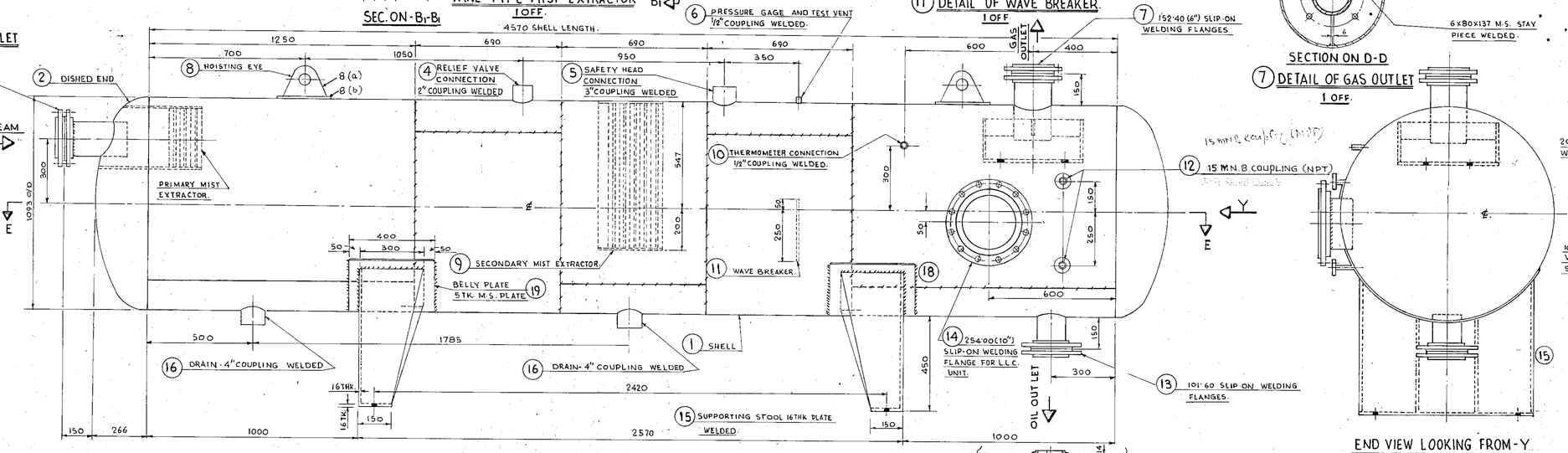
SEC. ON-B1-B1



(11) DETAIL OF WAVE BREAKER.
1 OFF.



SECTION ON D-D

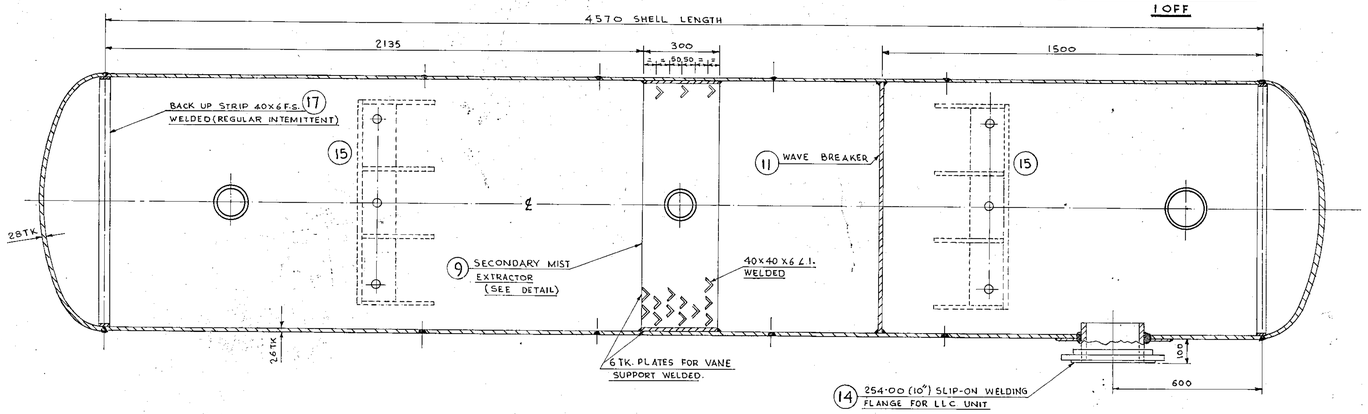


FRONT ELEVATION

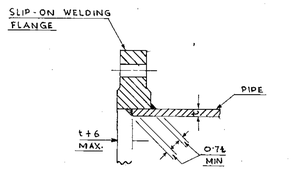
(13) DETAIL OF OIL OUTLET
1 OFF

END VIEW LOOKING FROM-Y

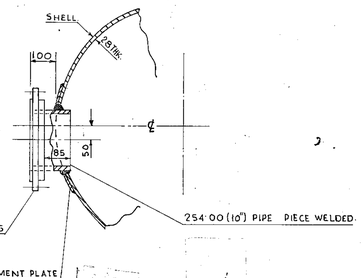
(8) DETAIL OF HOISTING EYE
2 OFF.



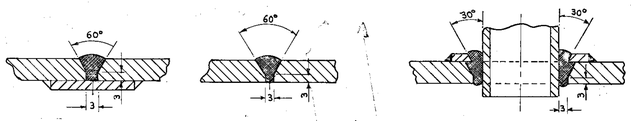
SECTIONAL PLAN ON E-E.



TYPICAL SECTIONAL WELDING DETAILS OF SLIP ON WELDING FLANGES.



(14) DETAIL OF L.L.C UNIT CONNECTION.
1 OFF



SEAM WELDING | SHELL WELDING | NOZZLE WELDING WITH REINFORCEMENT.

WELDING DETAILS
NOT TO SCALE.

NOTES:—

1. SHELL —— SINGLE BUTT FUSION WELD
   SEAM —— SINGLE BUTT WELD WITH BACK-UP STRIP.
2. DESIGN —— AS PER "ASME VIII
3. ALL PRESSURE PLATES TO IS:2002 Gr 2A/SA 516 GR 60/70 / STEEL.
   NON PRESSURE PLATES TO IS: 2062 QUALITY STEEL.
4. STUDS & NUTS ON PRESSURE PARTS TO ANSI B-16·5
   BOLTS & NUTS FOR NON PRESSURE PLATES TO BS 916
5. ALL THREADS AS PER "API" STD. UNLESS OTHERWISE STATED.
6. SPOT RADIO GRAPHIC TEST TO BE DONE AS PER ASME SEC VIII PART-1.
7. FLANGES TO BE DRILLED OFF CRS AS PER ANSI CLASS 300 RATING ANSI·B-16·5 STD.
8. ALL COUPLING CONNECTIONS TO 3000 PSIG WP AND SCREWED "API" LINE PIPE THREAD.
9. FINISH: APPLY ONE COAT OF RED OXIDE PAINT ON OUT SIDE ONLY AFTER CLEANING OUTER SURFACE PROPERLY.
10. HEAT TREATMENT: REQUIRED FOR THE WHOLE VESSEL.
11. ALL THE NOZZLE NECKS WILL BE PROVIDED RF PADS MADE OF SHELL MATERIAL.

DESIGN DATA

1. OIL CAPACITY	——	5000 BPD.
2. GAS FLOW RATE	——	8 MMSCFD.
3. DESIGN PRESSURE (MAX. W.P)	——	30·0 Kg/cm² (426 PSIG)
4. TEST PRESSURE (HYDRO)	——	45·0 Kg/cm² (640 PSIG)
5. WORKING TEMPERATURE	——	100° F AVERAGE
6. GAS GRAVITY	——	0·7 (AIR 1)
7. OIL GRAVITY	——	0·84
8. PRIMARY OBJECT	——	GAS/OIL SEPERATION

LIQUID DEPTH 1524.50 FROM THE BOTTOM CENTRE LINE.
CORROSION ALLOWANCE OF 3·0 mm. IN VESSEL INCLUDED.

REF. DRGS.

1. FOUNDATION FOR TWO PHASE HORIZONTAL GAS OIL SEPARATOR REF SK. No. OIL/3161.
2. FOR MATERIAL LIST REF. SK. No. OIL/3991.

APPROVED BY ——— DATE 24.08.96 NAME A.K.NATH DESIGNATION SE(IP).

ALL DIMENSIONS ARE IN MILLIMETRES.

REV	DATE	ZONE	DESCRIPTION	APPROVED
A	20.4.05		MODIFIED AS PER LETTER No.	

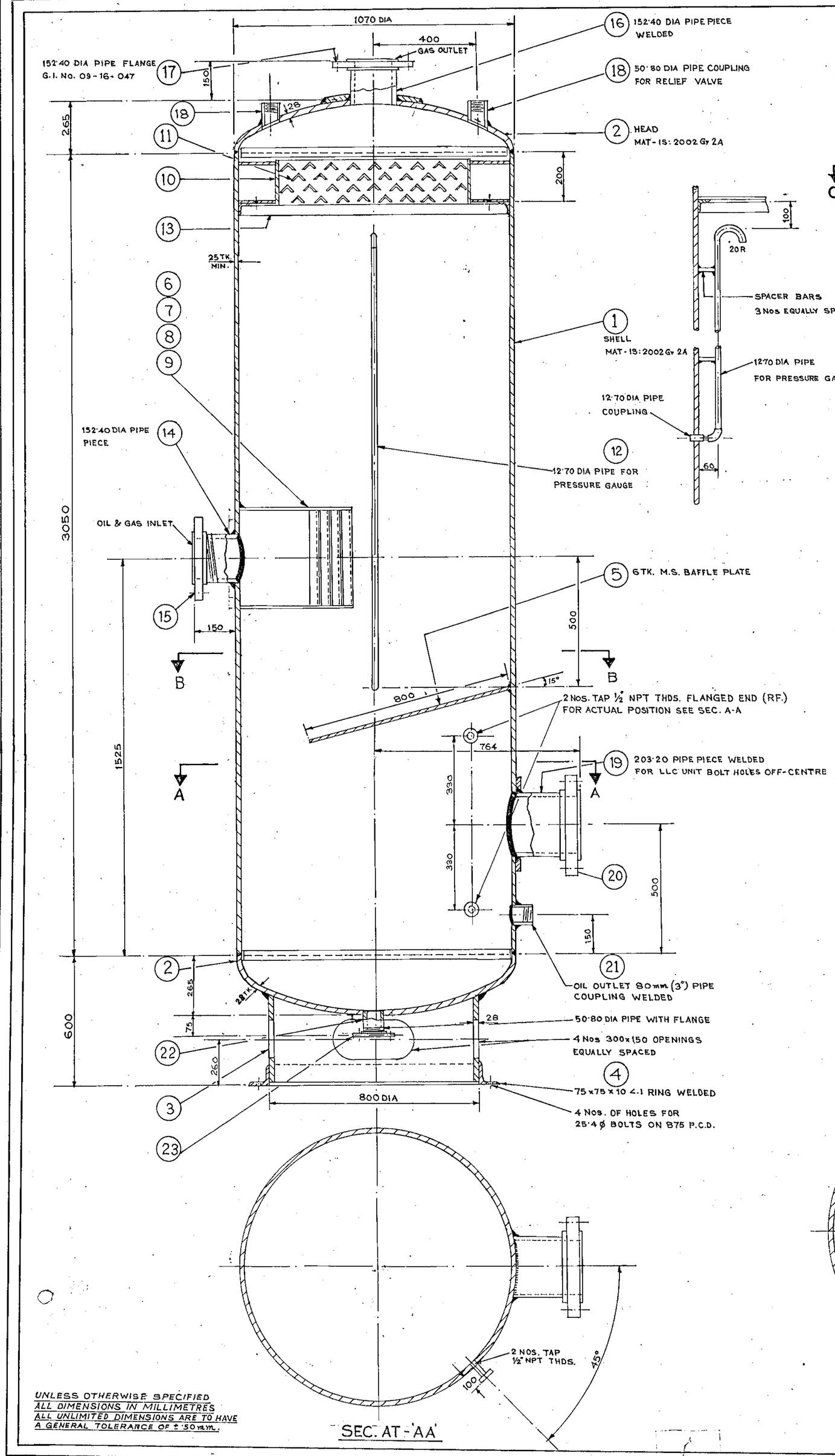
OIL INDIA LIMITED
DRAWING OFFICE
DULIAJAN

	NAME	DATE
DESIGNED		
DRAWN/TRACED	S. Chandra	01.07.96
TRACE CHECKED		22.8.96
APPROVED		

SCALE 1:10

TITLE
TWO PHASE HORIZONTAL GAS/OIL SEPARATOR

DRG No OIL/7617 A



UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS IN MILLIMETRES
ALL UNLIMITED DIMENSIONS ARE TO HAVE A GENERAL TOLERANCE OF ± 1·50 m.m.

NOTES :-

1. DESIGN PRESSURE 30·0 KG/cm² (426 PSI)
   CODE ASME: SEC. VIII
   INSPECTION- STAGE INSPECTION BY OIL INSPECTOR
2. SHELL - DOUBLE BUTT FUSION WELD
   SEAM - SINGLE BUTT WELD WITH BACKUP STRIP.
3. SPOT RADIOGRAPHIC TEST TO BE DONE FOR WELDS
4. ALL PIPE CONNECTIONS ARE TO HAVE API. LINE PIPE THREADS AS PER API 5B STD.
5. SUITABLE HOISTING EYES TO BE WELDED AT TOP
6. CORROSION ALLOWANCE OF 1·6 mm IN VESSEL INCLUDED
7. FINISH APPLY ONE COAT OF RED OXIDE PAINT AFTER CLEANING THE OUTER SURFACE BY SAND BLASTING.
8. HEAT TREATMENT :- REQUIRED FOR THE WHOLE VESSEL.
9. ALL THE NOZZLE NECKS WILLBE PROVIDED RF PAD MADE OF SHELL MATERIAL.

* HYDROSTATIC TEST PRESSURE CAN BE 45·0 KG/cm² (640 PSI.) AS PER CL. UG 99. ASME SEC. VIII

REF. DRG. :-
FOR FOUNDATION SEE SK. No. OIL/1166
FOR MATERIAL LIST REFER TO SK. No. OIL/3990

APPROVED BY ____ DATE 29.08.96 NAME A.K. NATH DESIGNATION SE (PP)

REV	DATE	ZONE	BRIEF RECORD	APPROVED
A	20.4.05			

OIL INDIA LIMITED
DRAWING OFFICE
DULIAJAN

	NAME	DATE
DESIGNED		
DRAWN/TRACED		1.7.96
TRACED		
CHECKED		29.8.96
APPROVED		

SCALE 1:10 & 1:5

TITLE
MIST EXTRACTOR
FOR 30·0 Kg./Cm² (426 P.S.I.)
GAS CAPACITY-15 MMSCED, OIL CAPACITY 500 BBL/D.

DRG. No
OIL/7618/A

MATERIAL LIST

COL. M	COL. L	COL. K	COL. J	COL. I	COL. H	COL G	COL. F	COL. E	COL. D	COL. C	COL. B	COL. A	ITEM NO.	PARTICULARS	DRG. REF.	SKETCH NO OIL CAT. NO/MATERIAL SUPPLIERS REF.	REMARKS
												1-OFF COL.B	1	SHELL	DRG. NO. OIL 2037		
											2		1(a)	1250 X 3435 X 26 TK. MINIMUM M.S. PLATE		IS: 2002 Gr. 2A / SA 516 Gr. 60/70	
											3		1(b)	690 X 3435 X 26 TK. MINIMUM M.S. PLATE		"	
												2 OFF	2	DISHED END (1093 O/D X 266 HT. X 28 TK) (SEMIELLIPSOIDAL HEAD)		"	
												1-OFF COL.C	3	WELL STREAM INLET			
										2			3(a)	152·40 (6") SLIP ON WELDING FLANGES (300 CLASS)		ASTM. A 105	DRILLED TO ANSI-B-16·5
										1			3(b)	152·40 (6") X 290 LONG PIPE PIECE		STD. W.T.	
										1			3(c)	295 O/D X 5 TK. M.S. REINFORCEMENT PLATE		IS: 2002 GR. 2A/ SA 516 GR. 60/70	
										4			3(d)	500 x 300 x 6 TK. M.S. PLATE		M.S. IS: 2062	
										9			3(e)	40 x 40 x 6 L.I. 2700 LONG TO MAKE THE PRIMARY MIST EXTRACTOR		"	
												1-OFF	4	RELIEF VALVE CONNECTION 50·8 (2") X 3000 PSIG W.P. LINE PIPE COUPLING (FULL THREADED)		STD. W.T (ASTM 106)	
												1-OFF	5	SAFETY HEAD CONNECTION 76·20 (3") X3000 PSIG W.P. LINE PIPE COUPLING		STD. W.T.	
												1-OFF	6	PRESSURE GAGE CONNECTION 12·70 (½") X3000 PSIG W.P. LINE PIPE COUPLING (NPT)		"	
												1-OFF COL.D	7	GAS OUTLET			
									2				7(a)	152·40 (6") SLIP-ON WELDING FLANGES (300 CLASS.)		ASTM. A 105	DRILLED TO ANSI-B-16·5
									1				7(b)	152·40 (6") X 300 LONG PIPE PIECE		STD. WT. (ASTM-106)	
									1				7(c)	295 O/D X 5 TK. M.S. REINFORCEMENT PLATE		IS: 2002 GR 2A/SA. 516 GR. 60/70	
									1				7(d)	406·40 (16") x 200 LONG PIPE PIECE.		STD. WT. (IS: 2002 GR. 2A/SA 516 GR. 60/70	
									1				7(e)	406·40 X 10 TK. M.S. PLATE COVER		IS: 2002 GR. 2A/SA. 516 GR. 60/70	
									4				7(f)	6 TK. X 100 X 37 M.S. STAY PIECE.		MS. IS: 2062	
												2-OFF COL.E	8	HOISTING EYE.			
								2					8(a)	20 TK. X 200 X 140 M.S. PLATE FOR THE EYES		MS. IS: 2062	
								2					8(b)	10 TK. X 240 X 150 M.S. PLATE FOR EYE PADS.		IS: 2002 GR. 2A/SA 516 GR. 60/70	
												1-OFF COL.F	9	VANE TYPE SECONDARY MIST EXTRACTOR			
							1						9(a)	2400 X 300 X 6 TK. M.S. PLATE SHAPED TO BEND ALONG SHELL FOR VANE SUPPORT		MS. IS: 2062	
							1						9(b)	1000 x 300 x 6 TK. M.S. PLATE HORIZONTALLY ACROSS SHELL FOR VANE SUPPORT.		MS. IS: 2062	
							87						9(c)	40 x 40 x 6 L.I. TO MAKE THE VANES (35100 LONG APPROXIMATELY.)		MS. IS: 2062	
												1-OFF	10	THERMOMETER CONNECTION 12·7 (½") X3000 PSIG WP LINE PIPE COUPLING (NPT)		STD. WT.	
												1-OFF	11	WAVE BREAKER 300 x 1065 X 6 TK. M.S. PLATE		M.S. IS: 2062	
												2-OFF	12	12·7 (½") X 3000PSIG W.P. COUPLING (NPT) FOR L.G.G.A.		STD. WT.	
												1-OFF COL. G	13	OIL OUT LET			
						2							13(a)	101·60 (4") SLIP-ON WELDING FLANGES (300 CLASS.)		ASTM. A 105	DRILLED TO ANSI-B-16·5.
						1							13(b)	101·60 (4") X 165 LONG PIPE PIECE		STD. WT. (ASTM 106)	
						1							13(c)	190 O/D X 5 TK. REINFORCEMENT PLATE		IS: 2002 GR. 2A/SA 516 GR. 60/70	
												1-OFF COL-M	14	LIQUID LEVEL CONTROL			
					1								14(a)	254·00 (10") SLIP-ON WELDING FLANGE (300 CLASS.)		ASTM. A 105	DRILLED TO ANSI-B-16·5
					1								14(b)	254.00 (10") X 136 PIPE PIECE		STD. WT.	
					1								14(c)	438·00 O/D X 5 TK. M.S. REINFORCEMENT PLATE		IS: 2002 GR. 2A/SA 516 GR. 60/70	
												2-OFF COL-I	15	SUPPORTING STOOL		IS: 2062	
			4										15(a)	650 X 300 X 16 TK. M.S. PLATE		IS: 2002 GR. 2A/ SA 516 GR. 60/70	
			4										15(b)	450 X 300 X 16 TK. M.S. PLATE			
			2										15(c)	810 X 150 X 16 TK. M.S. PLATE			
												2-OFF	16	101·60 (4") X 3000PSIG W.P. COUPLING (L.P. THREADED)		STD. WT.	
												2-OFF	17	40 X 6 F.S. BACK-UP STRIP 400 X		M.S. IS: 2062	
												2-OFF	18	BELLY PLATE 400 X 786 X 5 TK. M.S. PLATE		"	

COLUMN 'A' ASSEMBLED TOGETHER MAKES THE COMPLETE TWO PHASE HORIZONTAL SEPARATOR

APPROVED BY thank DATE 24.08.96 NAME A.K. NATH DESIGNATION SE (PPD)

NOTES FOR BOLTS & NUTS

FOR ITEM NO.	BOLTS FOR	NO. OF BOLTS	THREAD DESIGNATION FOR STUDS	THREAD DESIGNATION FOR NUT	MATERIAL
13	4" FLANGES	8	3/4"-10 UNC-2A (4¼" LONG STUD)	3/4"-10 UNC-2B	BOLT-BS1506-621 GRADE A NUT-BS-1506-162 GRADE 2H
3 & 7	6" FLANGES	24	3/4"-10 UNC-2A (4 3/4" LONG STUD)	3/4"-10 UNC-2B	
14	10" FLANGES	16	1"-8 UNC-2A (6" LONG STUD)	1"-8 UNC-2B	

NB. 6 NOS. SUITABLE FOUNDATION BOLTS ARE TO BE SUPPLIED BY SUPPLIER

FOR GENERAL ARRANGEMENT AND DETAIL REFER TO DRG. NO. OIL/7617

ALL DIMENTIONS IN MILLIMETRE

REV.	DATE	DESCRIPTION	APPROVED
A	22.4.05	MODIFIED AS PER LETTER No.- PROD. OIL)95/A.B.OF 22.04.05.	

OIL INDIA LIMITED
DRAWING OFFICE
DULIAJAN

SCALE

TITLE
2-PHASE HORIZONTAL GAS/OIL SEPARATOR MATERIAL LIST

	NAME	DATE
DESIGNED		
DRAWN/TRACED	D. Gogoi	1.7.96.
TRACED		
TRACE CHECKED		20.8.96
APPROVED		

S.K. NO
OIL/3991/A

Technical Bid Checklist **Annexure-EEE**

Tender No.	
Bidder's Name :	

SL. NO.	BEC / TENDER REQUIREMENTS	Compliance by Bidder	
		Indicate 'Confirmed' / 'Not Confirmed' / Not applicable	Indicate Corresponding page ref. of unpriced bid or Comments
1	Confirm that validity has been offered as per NIT.		
2	Confirm that Bid Security / Earnest Money has been submitted as per NIT (Wherever Applicable) ?		
3	Confirm that you shall submit Performance security (in the event of placement of order) (Wherever Applicable) ?		
4	Confirm that duly signed Integrity Pact has been submitted as per NIT (Wherever Applicable) ?		
5	Confirm that you have submitted documentary evidence of successfully executing one Purchase order as stipulated in NIT in any of the preceding 5 financial years (*)		
6	Confirm that you have submitted Balance Sheet and Profit and Loss Account of any of the preceding 3 financial years certified by a chartered accountant.		
7	Confirm that the bid has been signed using Class 3 digital certificate with Organisation's Name as per NIT.		
8	Confirm that you have not taken any exception/deviations to the NIT .		

NOTE: Please fill up the greyed cells only.

(*) Purchase Orders along with copies of any of the documents in respect of satisfactory execution of the Purchase Orders should be submitted – (i) Satisfactory Inspection Report (OR) (ii) Satisfactory Supply Completion / Installation Report (OR) (iii) Consignee Receipted Delivery Challans (OR) (iv) Central Excise Gate Pass / Tax , Invoices issued under relevant rules of Central Excise / VAT (OR) (v) any other documentary evidence that can substantiate the satisfactory execution of the purchase order cited above.

Response Sheet **Annexure-FFF**

Tender No.	
Bidders Name	

Bidders Response Sheet

Sl No.	Description	Remarks
1	Place of Despatch	
2	Whether Freight charges have been included in your quoted prices	
3	Whether Insurance charges have been included in your quoted prices	
4	Make of quoted Product	
5	Offered Validity of Bid as per NIT	
6	Bid Security Submitted (if applicable)	
6	Details of Bid Security Submitted to OIL (if applicable)	
	a) Bid Security Amount (In Rs):	
	b) Bid Security Valid upto:	
7	Whether you shall submit Performance Security in the event of placement of order on you (if applicable)	
8	Integrity Pact Submitted (if applicable)	
9	Whether you have submitted documentary evidence of successfully executing one Purchase order as stipulated in NIT in any of the preceding 5 financial years (*)	
10	Whether you have submitted Balance Sheet and Profit and Loss Account of any of the preceding 3 financial years certified by a chartered accountant.	
11	Delivery Period in weeks from placement of order	
12	Complied to Payment terms of NIT (if applicable) otherwise to Standard Payment Terms of OIL or not.	
13	If bidder is MSE whether you have quoted your own product	
14	If Bid security submitted as Bank Guarantee, Name and Full Address of Issuing Bank including Telephone, Fax Nos and Email id of branch manager	

NOTE: Please fill up the greyed cells only.

(*) Purchase Orders along with copies of any of the documents in respect of satisfactory execution of the Purchase Orders should be submitted – (i) Satisfactory Inspection Report (OR) (ii) Satisfactory Supply Completion / Installation Report (OR) (iii) Consignee Receipted Delivery Challans (OR) (iv) Central Excise Gate Pass / Tax , Invoices issued under relevant rules of Central Excise / VAT (OR) (v) any other documentary evidence that can substantiate the satisfactory

ANNEXURE - GGG

(TO BE FILLED UP BY ALL THE VENDOR IN THEIR OWN LETER HEAD)
(ALL FIELDS ARE MANDATORY)

Tender No.	**:……**
Name of Beneficiary	**:M/s.……**
Vendor Code	**:……...**
Address	**:...……**
	...……...
Phone No. (Land Line)	**:...……**
Mobile No.	**:...……**
E-mail address	**:...……**
Bank Account No. (Minimum	
Eleven Digit No.)	**:...……**
Bank Name	**:...……**
Branch	**:...……**
Complete Address of your	**:...……**
Bank	**:...……**
IFSC Code of your Bank	
a) RTGS	**:……...**
b) NEFT	**:……...**
PAN	**:……...**
VAT Registration No.	**:……...**
CST Registration No.	**:……...**
Service Tax Registration No.	**:……...**
Provident Fund Registration	**:……...**

I/We confirm and agree that all payments due to me/us from Oil India Limited can be remitted to our above mentioned account directly and we shall not hold Oil India Limited responsible if the amount due from Oil India Limited is remitted to wrong account due to incorrect details furnished by us.

……
Office Seal **Signature of Vendor**

Counter Signed by Banker:
Seal of Bank:

Enclosure: Self attested photocopies of the following documents-

1) **PAN Card**
2) **VAT Registration Certificate**
3) **Service Tax Registration**
4) **CST Registration**
5) **Provident Registration Certificate**
6) **Cancelled cheque of the bank account mentioned above (in original).**
7) **Bank Statement not older than 15 days on the date of submission.**