

TENDER NO. PROC-FC/CB/P&P/UCH-4691/2020

**PROCUREMENT OF EMERGENCY VENTS AND
PSV'S FOR AMINE STORAGE TANKS AS UCH FIELD**

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CONSISTING OF FOLLOWING SECTIONS**

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SECTION – II

**MASTER SET OF PRESS TENDER DOCUMENTS-FOREIGN AVAILABLE ON OGDCL WEBSITE:
WWW.OGDCL.COM FOR REMAINING TERMS & CONDITIONS ALONG WITH ANNEXURES I.E
BID BOND FORMAT, DATA SUMMARY SHEET, BIDDING FORM, INTEGRITY & ETHICS PACT
ETC WHICH ARE ALSO MANDATORY PART OF TECHNICAL AND COMMERCIAL PROPOSALS**

**(NOTE: IN CASE OF ANY CONFLICT BETWEEN
SECTION I & SECTION II, SECTION I SHALL PREVAIL
OVER THE TENDER DOCUMENT)**

TERMS & CONDITIONS

1. The case will be processed on single stage – two envelop bidding procedure as per PPRA Rules.
2. Bid shall remain valid for a period of 180 Days from the date of technical Bid Opening.
3. Commercial evaluation will be made on complete package. Incomplete bid will be rejected and will not be considered for evaluation. Bidders should quote for all the items in schedule of requirement.
4. The bidders are required to submit a Bid bond amounting to **PKR 200,000/-** or equivalent in shape of Bank Guarantee/pay Order upfront along with the technical bid. Any bid without bid bond shall be rejected without any right to appeal.
5. Bid Bond shall remain valid for a period of 210 Days from the date of technical Bid Opening. **The Bid Bond shall only be issued by banks as mentioned in tender document uploaded on OGDCL website.**
6. OGDCL may arrange Third Party Pre-Shipment Inspection at its own cost.
7. Within fifteen (15) days of the receipt of notification of intent to award the Contract from OGDCL, the successful Bidder shall furnish a Performance Bond in the Form of Bank Guarantee (**Attachment-03**) for an amount of ten (10) percent (%) of the Contract Price as a guarantee for the due and faithful performance of the Contract. The said Performance Bond shall be valid upto eighteen (18) months from the date of shipment. The bank guarantee shall be as per terms stipulated in clause # 31 of the tender document
8. **The bidder must provide a “certificate of compliance/acceptance” (attachment # 06) of complete tender document along with the technical bid.**
9. Only those clarifications will be entertained which are received ten (10) days before technical bid opening. Any clarification received after that shall not be responded.
10. Payment will be made as per Attachment No. 02.
11. **Corporate and financial information of the company needs to be submitted with the technical bid as per Attachment # 05.**
12. **Copy of Certificate of incorporation to be enclosed with the technical bid.**
13. **Blacklisting affidavit on letterhead of LC beneficiary and local agent to be enclosed with the technical bid.**

PAYMENT TERMS

The payment shall be made as follow:-

- a. Seventy (70%) percent of Material LC/Purchase Order Price shall be paid by OGDCL on shipment of the complete material. The payment under the L/C shall be effected upon submission of following documents upon each shipment of material component:
 - I. Original Clean on-board ocean vessel Master bills of lading.
 - II. Original detailed invoice showing material description, quantity unit price and total price strictly in line with the Contract.
 - III. Packing list
 - IV. Certificate and list of measurements and weight gross/net.
 - V. Mill Inspection/Quality Certificate.
 - VI. Insurance declaration.
 - VII. Warranty Certificate
 - VIII. Certificate of origin.
 - IX. Third Party Inspection report/certificate issued by any one of the following (if required)
 1. M/s Bureau Veritas Pakistan (Pvt) Ltd
 2. M/s SGS Pakistan (Private) Limited
 3. M/s TÜV Rheinland Arabia LLC Pakistan
 4. M/s Applus Velosi Pakistan
 5. TUV Austria Bureau of Inspection & Certification (Pvt.) Ltd. Pakistan
- b. Thirty (30%) percent of the Material LC/Purchase Order Price shall be released under the L/C upon delivery of complete equipment/material and after inspection/acceptance of material confirming complete delivery upon submission of supplier's original invoice duly verified by OGDCL.

PERFORMANCE BANK GUARANTEE

Oil & Gas Development Company
Limited OGDCL House, Jinnah Avenue,
Blue Area, Islamabad, (Pakistan)

Dear Sir,

Ref; our Bank Guarantee No. _____ in the sum of _____
Account _____ in consideration of you
having entered into Contract
No. _____ Dated _____ with _____ C
alled Contractor and in consideration for value received from CONTRACTOR. We hereby agree and
undertake as followings:

1 To make unconditional payment to you as called upon of (10%) ten percent of the Contract value of the contract price mentioned in the said contract, on your written FIRST and SIMPLE demand without further recourse, question or reference to CONTRACTOR or any other person in the event of default, non-performance or non-fulfillment by CONTRACTOR of his obligations, liabilities, responsibilities under the said contract of which you shall be the sole judge.

2 The accept written intimation from you as conclusive and sufficient evidence of the existence of the default or breach as aforesaid on the part of CONTRACTOR and to make payment immediately and forthwith upon receipt of your FIRST and SIMPLE written demand.

3 This Performance Bond shall remain valid and in full force and effect upto _____ or issue of statement of discharge by your authorized representative or return of original guarantee whichever is earlier.

4 DEMURRAGE DUE TO DELAY IN RECEIPT / NEGOTIATION OF ORIGINAL SHIPPING DOCUMENTS.

If clean documents are not negotiated within Negotiation Period allowed in Letter of Credit or documents are with held by Bank on account of any discrepancy:

- If the Demurrage, if any incurred due to late negotiation of the Clean Documents and paid by OGDCL will be realized from the beneficiary of L/C, by encashing this Performance Bond to the extent of demurrage amount. In case demurrage amount exceeds the total value of this Performance Bond the balance amount will be payable by the beneficiary.

1 That no grant of time or other indulgence to, amendment in the terms of the Contract by Agreement between the parties, or imposition or Agreement with CONTRACTOR in respect of the performance of his obligations under the said Agreement, with or without notice to us, shall in any manner discharge or otherwise affect this Guarantee and our liabilities and commitments there under.

2 This is an independent and direct obligation guarantee and shall be binding on us and our successors interest and shall be Irrevocable.

3 This guarantee shall not be affected by any change in the constitution of the Guarantor Bank or the constitution of the Contractor.

4 The Guarantor Bank Warrants and represents that it is fully authorized, empowered and competent to issue this guarantee.

(BANKERS)

DELIVERY PERIOD
TIME IS OF ESSENCE

SUPPLY OF EQUIPMENT/MATERIAL

The Supplier is required to deliver the complete equipment/material in **seven (07) months** from the date of establishment of letter of credit on CFR by Sea Karachi Port basis.

FORMAT OF CORPORATE & FINANCIAL INFORMATION

PART - I
GENERAL INFORMATION

1. Name (Full Company Name):
 - Postal Address :
 - Telephone:
 - Facsimile:
 - e-mail:
 - Website Address:
 - 1.1 Has the Company operated under any other name? If yes please give name, date of change and reason for change.
2. Type of Entity/Firm:
 - Corporation/Stock Company
 - Public Limited
 - Private Limited
 - Partnership
 - Proprietorship
3. Shareholders information/pattern with names and addresses of majority shareholders.
4. Place of Incorporation/Registration:
5. Year of Incorporation/Registration:
(Please provide copies of Incorporation/Registration Certificates and Memorandum & Articles of Association)
6. Company's National Tax No.
7. Company's Core Business Areas and their annual sales revenue/earnings during last five (5) years.
8. Name & Address of Owners/Directors
9. Valid Registration Certificate with Pakistan Engineering Council (PEC) where applicable.

PART - II

FINANCIAL STRENGTH

1. Provide details with regard to the financial standing of the applicant including copies of last three (3) years Audited profit & loss account and balance sheet. Also, please fill the financial summary as per below table;

| S. No. | Description | Years | | |
|--------|-------------------|-------|------|------|
| | | 2014 | 2015 | 2016 |
| 1 | Sales Revenue | | | |
| 2 | Paid Up Capital | | | |
| 3 | Profit Before Tax | | | |
| 4 | Profit After Tax | | | |
| 5 | Current Assets | | | |
| 6 | T. Asset | | | |
| 7 | Owner Equity | | | |
| 8 | Long Term Debt | | | |
| 9 | Current Liability | | | |
| 10 | Total Liabilities | | | |

2. Bank(s) credit worthiness certificates (Latest Period) of applicant organization and available credit ceiling/limits with Account Number/Title.
3. Detail record with regard to litigation/arbitration proceedings or any other dispute related to project undertaken/being undertaken by the Bidder their Sub-Contractors and Suppliers (Specially with OGDCL it Joint Venture Partners or other public and private organizations working in the Oil & Gas sector of Pakistan) during past five (05) years.
4. Any information including brochures, references and other documentary evidence of technical qualification, capability and experience of the Applicant to execute the Project.

The undersigned on behalf of _____ hereby declare that the statements made and the information provided official herewith is complete, true and correct in every detail.

Signature

Official Seal of the Company

COMPLIANCE CERTIFICATE
(On official letter head)

Subject : TENDER NO. PROC-FC/CB/P&P/UCH-4691/2020 FOR PROCUREMENT OF EMERGENCY VENTS AND PSV'S FOR AMINE STORAGE TANKS AS UCH FIELD

We have read and understood the tender documents completely and confirm total compliance with the technical and commercial requirement of the tender document.

Signed on behalf of _____

OIL & GAS DEVELOPMENT COMPANY LIMITED
PROCUREMENT DEPARTMENT, ISLAMABAD
FOREIGN SECTION C

(To be completed, filled in, signed
and stamped by the principal)

ANNEXURE 'A'

Material PURCHASE OF EMERGENCY VENTS AND PSVS FOR AMINE STORAGE TANK AT UCH-II PLANT
Tender Enquiry No PROC-FC/CB/P&P/UCH-4691/2020
Due Date
Evaluation Criteria FULL

SCHEDULE OF REQUIREMENT

| Sr No | Description | Unit | Quantity | Unit Price (FOB) | Total Price (FOB) | Unit Price C & F BY SEA | Total Price C & F BY SEA | Deviated From Tender Spec. If Any |
|-------|---|--------|----------|------------------|-------------------|-------------------------|--------------------------|-----------------------------------|
| 1 | Breathing Valve, 8 inch, ANSI 150 lb. Set Pressure: -0.0725/0.213 psig, along-- with Complete Set of Standard Spare Kit. | Number | 2 | | | | | |
| 2 | Emergency Vents (Hatch Type), 24 Inch, ANSI 150 lb. Set Pressure: 0.284 psig, along--with Complete Set of Standard Spare Kit. | Number | 4 | | | | | |

Note:

1. Standard warranty and guarantee for all the items should be provided.
2. All items to be supplied must be newly manufactured and free from defects. A certificate in this regard to be provided by the bidder.
3. Standard test quality control certificates should be provided (where applicable).
4. **The delivery period must be quoted to the most minimum possible extent however delivery period should not exceed seven (07) months from the date of establishment of letter of credit**
5. Payment will be made on following payment milestones:
 - a. **Seventy (70%) percent of Material LC/Purchase Order Price shall be paid by OGDCL on shipment of the complete material.**
 - b. **Thirty (30%) percent of the Material LC/Purchase Order Price shall be released under the L/C upon delivery of Complete Equipment/material at Karachi Port, Pakistan and after inspection/acceptance of material confirming complete delivery on submission of balance payment invoice.**
6. The bid validity period of **180 days** is required from the date of bid submission/opening. Bid bond amounting to PKR 200,000/- or equivalent should be enclosed with the technical bid valid for 210 days.
7. Certificate of incorporation showing name/designation/contact details of the person signing it must be enclosed with the bid.

PROC-FC/CB/P&P/UCH-4691/2020

Item 1

Description

Model No. B100 Open

Combined Pressure & Vacuum relief valve, open vent to atmosphere

Tag No.

Size 8" (DN200) Constructed with stainless steel body, seats and trim, PTFE diaphragm, Set pressure 0.213 psig, Set vacuum – 0.0725 psig. Flange connection to be drilled ANSI 150RF.

Quantity 2 off

Spare Parts

Description

Model B100 Open Vent

Standard Spares Kit – Size 8"

- 2 x Diaphragms
- 2 x Backing Discs
- 2 x Spacer Discs
- 1 x O'ring

one kit per two years operation and one kit for commissioning purposes.

Item 2

Description

Model No. B400

Emergency Relieving Manway

Tag No.

Size 24" (DN600) Constructed with stainless steel body and cover, stainless steel seat. PTFE diaphragm. Set pressure 0.284 psig. Flanges to be drilled only ANSI 150FF.

Quantity 4 off

Note

Manway arm lengths may vary depending on setting, please advise of any restrictions.

Spare Parts

Description

Model B400 Emergency Manway

Standard Spares Kit – Size 24"

1 x Diaphragm

1 x Backing Disc

one kit per two years operation and one kit for commissioning purposes.

Commercial Summary

Delivery time

Delivery

C&F Karachi By SEA

Documentation

Material certification to EN10204

Functional test certificate

Installation & Operation Manual

Atex certificate of conformity

Painting

Not Applicable

Payment Terms

Validity

Valve Capacity Calculation Based on API 2000

Date : 02/01/19
Our reference :
Author : PH

Customer :
Your reference :

Tag Numbers : Serial Numbers :
:
:
:
:
:

Operating Conditions

Valve Model No. : B100 OV Medium : Air
Valve Size : 8 Inches
Set Pressure : 14.7 mbarg Over Pressure : 10 %
Set Vacuum : 5 mbarg Over Vacuum : 10 %

Calculated Results

Pressure Flow : 2,901
Vacuum Flow : 827
Flow Type : Nm³/hr

$$Nm^3/h = 12,503 P_1 A \sqrt{\frac{k}{MTZ(k-1)} \left[\left(\frac{P_2}{P_1} \right)^{\frac{2}{k}} - \left(\frac{P_2}{P_1} \right)^{\frac{k+1}{k}} \right]}$$

Valve Capacity Calculation Based on API 2000

Date : 02/01/19
Our reference :
Author : PH

Customer :
Your reference :

Tag Numbers : Serial Numbers :
:
:
:
:
:

Operating Conditions

Valve Model No. : B400 Medium : Air
Valve Size : 24 Inches
Set Pressure : 19.6 mbarg Over Pressure : 10 %
Set Vacuum : mbarg Over Vacuum : %

Calculated Results

Pressure Flow : 29,764
Vacuum Flow :
Flow Type : Nm³/hr

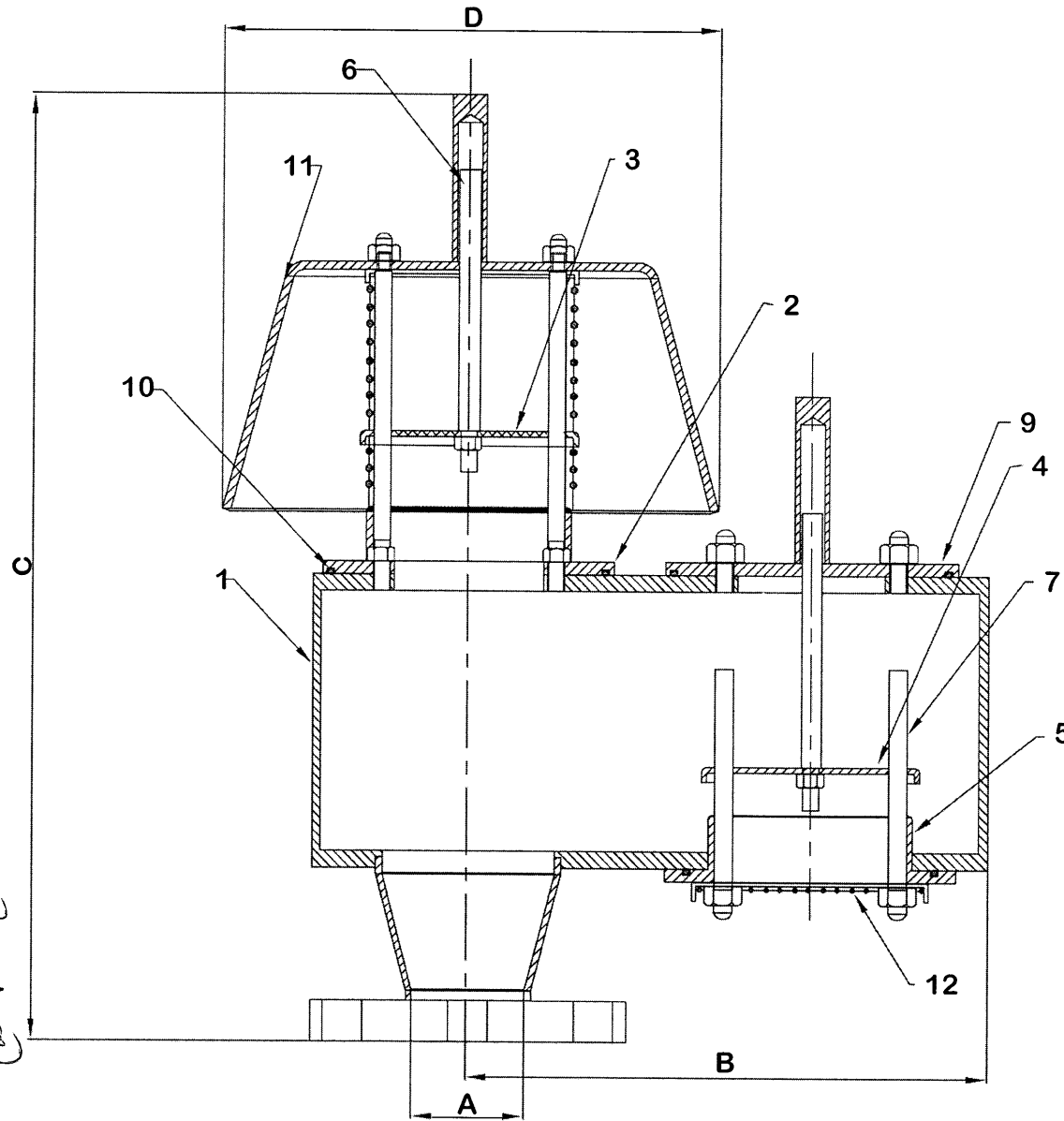
$$Nm^3/h = 12,503 P_1 A \sqrt{\frac{k}{MTZ(k-1)} \left[\left(\frac{P_2}{P_1} \right)^{\frac{k}{k-1}} - \left(\frac{P_2}{P_1} \right)^{\frac{k+1}{k}} \right]}$$

| SERIAL No. | TAG No. |
|------------|---------|
| | |
| | |
| | |
| | |

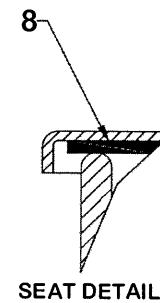
FLANGES SUPPLIED IN ACCORDANCE WITH ANSI / DIN

OTHER FLANGE STANDARDS AVAILABLE ON REQUEST

| ITEM No. | QTY | DESCRIPTION | MATERIAL |
|----------|-----|-----------------|----------|
| 1 | 1 | VALVE BODY | SS/CS/AL |
| 2 | 1 | PRESSURE SEAT | SS |
| 3 | 1 | PRESSURE PALLET | SS |
| 4 | 1 | VACUUM PALLET | SS |
| 5 | 1 | VACUUM SEAT | SS |
| 6 | 2 | PALLET STEM | SS |
| 7 | 8 | GUIDE POSTS | SS |
| 8 | 2 | DIAPHRAGM | PTFE |
| 9 | 1 | VACUUM COVER | SS/CS/AL |
| 10 | 3 | O'RING SEAL | NITRILE |
| 11 | 1 | WEATHERHOOD | CS/SS/AL |
| 12 | 2 | SCREENS | SS |



| NOM SIZE | A | B | C | D |
|----------|-----|-----|-----|-----|
| 50(2") | 54 | 250 | 440 | 208 |
| 80(3") | 84 | 302 | 515 | 305 |
| 100(4") | 108 | 366 | 623 | 380 |
| 150(6") | 161 | 516 | 721 | 535 |
| 200(8") | 211 | 626 | 677 | 600 |
| 250(10") | 255 | 681 | 750 | 650 |
| 300(12") | 305 | 717 | 835 | 700 |



NOTE : DIMENSIONS ARE ± 10 mm

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3B CONTROLS

| | | | |
|---------|---------------|--------------------------|---------|
| DRAWN | DRG No. | B100-00-GA | |
| CHECKED | TITLE | B100 SAFETY RELIEF VALVE | |
| SCALE | ASSEMBLY | | |
| NTS | | | |
| DATE | | | |
| 2061/18 | | | |
| REV | APPROVAL DATE | ORDER REF | OUR REF |
| 4 | | | |

Page 1 of 1

| NOM SIZE | A | B | C | D |
|-----------|-----|------|-----|----|
| 200 (8") | 203 | 343 | 185 | 40 |
| 250(10") | 254 | 406 | 205 | 40 |
| 300 (12") | 305 | 483 | 205 | 40 |
| 400 (16") | 406 | 597 | 205 | 40 |
| 450 (18") | 457 | 635 | 205 | 40 |
| 508 (20") | 508 | 699 | 205 | 40 |
| 600 (24") | 610 | 813 | 205 | 40 |
| 750 (30") | 762 | 984 | 205 | 40 |
| 900 (36") | 920 | 1168 | 205 | 40 |

| ITEM No. | QTY | DESCRIPTION | MATERIAL |
|----------|-----|-----------------|----------|
| 1 | 1 | HOOP | SS/CS/AL |
| 2 | 1 | COVER | SS/CS/AL |
| 3 | 1 | DRIP RING | SS/CS/AL |
| 4 | 1 | SEAT | SS/CS/AL |
| 5 | 1 | FLANGE | SS/CS/AL |
| 6 | 1 | ARM | SS/CS/AL |
| 7 | 2 | ARM LUGS | SS/CS/AL |
| 8 | 2 | HINGE | SS/CS/AL |
| 9 | TBA | SETTING WEIGHT | LEAD/CS |
| 10 | 1 | LIFT HANDLE | SS/CS/AL |
| 11 | 1 | RETAINING NUT | SS |
| 12 | TBA | CLAMPING SCREWS | SS |
| 13 | 1 | DIAPHRAGM | PTFE |

10

9 11

CAPTIVE NUT

2

13

12

7

3

4

6

CAPTIVE NUT

FLANGES SUPPLIED IN ACCORDANCE WITH ANSI / API 650

OTHER FLANGE STANDARDS AVAILABLE ON REQUEST

FLANGES ARE DRILLED ONLY

8 ARM LENGTHS VARY DEPENDING ON SET PRESSURE

D

1

5

C

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A

DRAWN

DRG No.

B400-00-GA

CHECKED

TITLE

EMERGENCY RELIEF
MANWAY

SCALE

NTS

ASSEMBLY

DATE
14/05/2017



UCH-II Development Project
 AMINE GAS SWEETENING UNIT
 & INCINERATOR Package

PROJECT No. 14-4985
 OGDCL Oil & Gas Development Company Limited

Job N°: 1896/12 Unit: 300/310

BELLELLI ENGINEERING S.p.A.
 Doc.No:

Rev.

3-TK103-IN-DI-002

03

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Originator Company

BELLELLI ENGINEERING S.p.A.

**DATA SHEET FOR TANK TK103 VENTING VALVES
 AND RESTRICTION ORIFICE**

| | | | | | | | |
|---------------|------------|-------------------------|-----------------------------|----------|------------|----------|----------|
| 03 | 7/3/2014 | ISSUED FOR CONSTRUCTION | PM | SDO | SV | | |
| 02 | 15/04/2013 | ISSUED FOR APPROVAL | PM | SDO | SV | | |
| 01 | 1/15/2013 | ISSUED FOR APPROVAL | LP | SDO | VR | | |
| 00 | 11/27/2012 | ISSUED FOR COMMENTS | LP | SDO | VR | | |
| Rev. | Date | Description | Prepared | Verified | Approved | Approved | Approved |
| Document Data | | | BELLELLI ENGINEERING S.p.A. | | Contractor | Company | |

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UCH-II Development Project
AMINE GAS SWEETENING UNIT
& INCINERATOR Package
 PROJECT No. 14-4985
 OGDCL Oil & Gas Development Company Limited

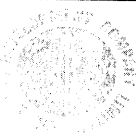
| | |
|-----------------------------|---------------|
| Job N°: 1896/12 | Unit: 300/310 |
| BELLELLI ENGINEERING S.p.A. | Rev. |
| Doc.No: 3-TK103-IN-DI-002 | 03 |
| Sheet / of 2 / 4 | |

DATA SHEET FOR TANK TK103 VENTING VALVES

| | | | | | |
|--------------------------------------|------------------------|--|-----------------------------|----------------|--|
| SECTION (NUMBER / NAME) | | Train 300 / Train 310 - Amine Gas Sweetening Unit | | | |
| TAG NUMBER | | 300-PSV026 / 310-PSV026 (Note 1) | | | |
| NUMBER | | 2 (1 For Each Train) | | | |
| PID NUMBER | | 3-TK103-PR-DI-001 sheet 1 of 1 | | | |
| PROTECTED EQUIPMENT | | 300/310-TK103 Amine Inventory Storage Tank | | | |
| DESIGN PRESSURE | psig | -5 mbar (-0.0725 psig) / 200 mmH2O (0.284 psig) | | | |
| DESIGN TEMPERATURE | °F | 30 / 180 | | | |
| | | INBREATHING | OUTBREATHING | | |
| | | Vacuum relief (note 2) | Pressure relief (note 3) | | |
| FLUID TYPE | | Air | Air + Nitrogen | | |
| FLUID STATE | | Gas | Gas | | |
| CORROSIVE COMPONENT | | | | | |
| UPSTREAM LINE | | 8" - 150# - RF ✓ | | | |
| DOWNSTREAM LINE | | to/from atmosphere | | | |
| UPSTREAM RELIEVING CONDITIONS | | | | | |
| Vapor Phase | FLOW RATE | lb/h | 1600 | 380 | |
| | MOLECULAR WEIGHT | | 28.9 | 28.0 | |
| | COMPRESSIBILITY FACTOR | | 1.00 | 1.00 | |
| | SPECIFIC HEAT RATIO | | 1.41 | 1.40 | |
| | VISCOSITY | cP | 0.020 | 0.0171 | |
| Liquid Phase | FLOW RATE | lb/h | | | |
| | LIQUID DENSITY | lb/ft ³ | | | |
| | VISCOSITY | cP | | | |
| | VAPOUR PRESSURE | psig | | | |
| | CRITICAL PRESSURE | psia | | | |
| SERVICE CONDITIONS | | | | | |
| EQUIPMENT DESIGN PRESSURE | psig | -5 mbar (-0.0725 psig) / 200 mmH2O (0.284 psig) | | | |
| SET PRESSURE | psig | -5 mbar (-0.0725 psig) / 150 mmH2O (0.213 psig) | | | |
| UPSTREAM RELIEVING TEMP | °F | 131 max | 131 max | | |
| VALVE DATA | | | | | |
| BASIS OF SELECTION | | | | | |
| MATERIAL | | Body: Carbon steel | Nozzle: Carbon steel | Bonnet: BY MFR | |
| SPARE REQUIRED | | Disc: By MFR | Guide & Ring: By MFR | | |
| MANUFACTURER'S MODEL NO. | | | | | |
| ACCESSORIES | | | | | |
| OTHER | | | | | |

NOTES

- (1) Tank breathing valve (not for emergency conditions).
- (2) Inbreathing resulting from maximum outflow of liquid from the tank and from contraction of vapours caused by the maximum decrease in vapor space temperature (thermal breathing) (API STD. 2000).
- (3) Outbreathing resulting from maximum inflow of liquid into the tank from maximum increase in vapor space temperature (thermal breathing) (API STD. 2000).



**UCH-II Development Project
AMINE GAS SWEETENING UNIT
& INCINERATOR Package**

PROJECT No. 14-4985

OGDCL Oil & Gas Development Company Limited

Job N°: 1896/12 Unit: 300/310

BELLELLI ENGINEERING S.p.A.
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DATA SHEET FOR TANK TK103 VENTING VALVES

| SECTION (NUMBER / NAME) | | Train 300 / Train 310 - Amine Gas Sweetening Unit | | | |
|--------------------------------------|------------------------|---|--------|--------|--------|
| TAG NUMBER | | 300/310-PSE072 A/B (Note 1) | | | |
| NUMBER | | 4 (2 For Each Train) | | | |
| PID NUMBER | | 3-TK103-PR-DI-001 sheet 1 of 1 | | | |
| PROTECTED EQUIPMENT | | 300/310-TK103 Amine Inventory Storage Tank | | | |
| DESIGN PRESSURE | psig | -5 mbar (-0.0725 psig) / 200 mmH2O (0.284 psig) | | | |
| DESIGN TEMPERATURE | °F | 30 / 180 | | | |
| RISK | | CASE 1 FIRE (Wet Area) | CASE 2 | CASE 3 | CASE 4 |
| | | | | | |
| FLUID TYPE (note 5) | | H2O+Amine | | | |
| FLUID STATE | | Vapour | | | |
| CORROSIVE COMPONENT | | - | | | |
| UPSTREAM LINE | | (NOTE2) - 150# - RF | | | |
| DOWNSTREAM LINE | | to atmosphere | | | |
| UPSTREAM RELIEVING CONDITIONS | | | | | |
| Vapor Phase | FLOW RATE | lb/h | 16457 | | |
| | MOLECULAR WEIGHT | | 18.07 | | |
| | COMPRESSIBILITY FACTOR | | 0.99 | | |
| | SPECIFIC HEAT RATIO | | 1.33 | | |
| | VISCOSITY | cP | 0.013 | | |
| Liquid Phase | FLOW RATE | lb/h | | | |
| | LIQUID DENSITY | lb/ft ³ | | | |
| | VISCOSITY | cP | | | |
| | VAPOUR PRESSURE | psig | | | |
| | CRITICAL PRESSURE | psia | | | |
| SERVICE CONDITIONS | | | | | |
| EQUIPMENT DESIGN PRESSURE | psig | -5 mbar (-0.0725 psig) / 200 mmH2O (0.284 psig) | | | |
| SET PRESSURE | psig | 200 mmH2O (0.284 psig) | | | |
| UPSTREAM RELIEVING TEMP | °F | 219.7 | | | |
| VALVE DATA | | | | | |
| BASIS OF SELECTION | | API STANDARD 2000 LAST EDITION (6th Ed.) | | | |
| MATERIAL | | Carbon steel | | | |
| SPARE REQUIRED | | - | | | |
| EMERGENCY VENT SIZE | | 24" Internal Diameter (TBC) (Note 2) | | | |
| MANUFACTURER'S MODEL NO. | | | | | |
| ACCESSORIES | | | | | |
| OTHER | | | | | |

NOTES

- (1) Emergency vent (hatch type).
- (2) Dimension of PSE072 A/B to be defined by Manufacturer.



UCH-II Development Project
AMINE GAS SWEETENING UNIT
& INCINERATOR Package

PROJECT No. 14-4985
OGDCL Oil & Gas Development Company Limited
BELLELLI ENGINEERING S.p.A.

| | | | |
|-----------------------------|---------|-------------------|---------|
| Job No.: | 1896/12 | Unit: | 300/310 |
| BELLELLI ENGINEERING S.p.A. | | Rev. | |
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Originator Company

BELLELLI ENGINEERING S.p.A.

DATA SHEET FOR
AMINE INVENTORY STORAGE TANK
Items : (300/310-TK103)

| Rev. | Date | Description | Prepared | Verified | Approved | Approved | Approved |
|---------------|------------|---------------------|-----------------------------|----------|------------|----------|----------|
| 02 | 15/04/2013 | ISSUED FOR APPROVAL | PM | SDO | SV | | |
| 01 | 1/15/2013 | ISSUED FOR APPROVAL | LP | SDO | VR | | |
| 00 | 11/27/2012 | ISSUED FOR COMMENTS | LP | SDO | VR | | |
| Document Data | | | Bellelli Engineering S.p.A. | | Contractor | Company | |



UCH-II Development Project
AMINE GAS SWEETENING UNIT
& INCINERATOR Package

PROJECT No. 14-4985

OGDCL Oil & Gas Development Company Limited

Job No.: 1896/12 Unit: 300/310

BELLELLI ENGINEERING

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Originator Company

BELLELLI ENGINEERING S.p.A.

AMINE INVENTORY STORAGE TANK Items : (300/310-TK103)

ITEM: AMINE INVENTORY STORAGE TANKS - 300-TK103 / 310-TK103 (Note 10)

SERVICE: STORAGE OF REGENERATED (LEAN) AMINE

CAPACITY: WORKING= 152688 (@ 90% max. of total volume) GEOMET.= 169584 (TBC) ft³

INTERNAL DIAMETER : 30 (TBC) ft

HEIGHT: = 24 (TBC) ft

DESIGN DATA (note 5)

CODE : API STD. 650 11th edition + API STD. 2000 6th edition

APPENDIX (VTC) A E F H J M N O P

SHELL CALCULAT. ONE FOOT METHOD

AVERAGE DESIGN POINT METHOD

APP.K

AMBIENT TEMPERATURE : MIN. = 30 °F

MAX. = 131 °F

TEMPERATURE : DESIGN = 30 / 180 °F

OPERAT. = ATM (Note 3)

PRESSURE : DESIGN = -5mbar / 200 mmH2O

OPERAT. = ATM (Note 3)

PRODUCT STORED : WATER + FORMULATED AMINE

DENSITY : 65.7 lb / ft³ @ 30 °F

FLASH POINT : > 100 °F (Note 4)

PUMP FLOW RATES : IN= 65 USgpm

OUT= (Note 8)

USgpm

WIND VELOCITY : 120 Mph

mph

EARTHQ. ZONE = (Note 2)

ZONE COEFFIC. =

AMP. FACTOR. =

ESSENT. FACT. =

RAINFALL : (Note 3) mm / h

SNOW : N / m²

SETTING VALVES

BREATHER + 0.213 (150 mmH2O)

-0.0725 (-5 mbar) psig

EMERGENCY + 0.284 (200 mmH2O) (Note 7)

psig

PRESS. / VACUUM +

psig

MATERIALS

BOTTOM PLATES PERIPHERAL RING ASTM A516 Gr. 70

CENTRAL PLATES ASTM A516 Gr. 70

FROM 1st COURSE TO TOP ASTM A516 Gr. 70

Y. S. = (TBC) T. S. = (TBC) N / mm²

SHELL PLATES FROM - 1st COURSE TO -

Y. S. = - T. S. = - N / mm²

FROM - 1st COURSE TO -

Y. S. = - T. S. = - N / mm²

ROOF PLATES ASTM A516 Gr. 70

STRUCTURES CARBON STEEL

WINDGIRD. STRUCT. EXTERNAL CARBON STEEL

PIPES ASTM A 106 Gr.B

FLANGES ASTM A 105

GASKETS Spiral Wound CS + Graphite

BOLTS SA-193 Gr.B7 (Zinc yellow Bichromated)

NUTS SA-194 Gr.2H (Zinc yellow Bichromated)

INTERNAL NUTS SA-194 Gr.2H (Zinc yellow Bichromated)

JOINT EFFICIENCY -

RADIOGRAPHY -

HYDRAULIC TEST WATER FILLING

CORROSION ALLOWANCE

BOTTOM TYPE PERIPHERAL RING 1.5 mm 02

CENTRAL PLATES 1.5 mm 02

SHELL FROM 1st COURSE TO TOP COURSE= 1.5 mm 02

FROM COURSE TO COURSE= mm 02

FROM COURSE TO COURSE= mm 02

ROOF PLATES 1.5 mm 02

SUPPORT. STRUCTURES 1.5 mm 02

CONSTRUCTION DATA

BOTTOM TYPE: SLOPE (Note 6) % MASS ton.

PERIPH. RING Thk. in W= in

CENTRAL PLATES Thk. in BUTT LAP

SHELL THK. Mm HEIGHT. mm

1st COURSE

2nd COURSE

3rd COURSE

4th COURSE

5th COURSE

6th COURSE

7th COURSE

8th COURSE

9th COURSE

10th COURSE

TOP ANGLE

STIFFERING RINGS

CALCULATED WITH SHELL: CORRODED

UNCORRODED

TOP INTERMEDIATE INTERMEDIATE

A = mm A = m A = mm

B = mm B = m B = mm

C = mm C = m C = mm

Thk. = mm Thk. = m Thk. = mm

SHELL TOTAL MASS

ROOF TYPE: SLOPE (TBC) % R = D

PLATES Thk. = mm BUTT LAP

SUPPORTED WITH: RAFTERS TRUSSES COLUMNS (TBC)

ROOF TOTAL MASS

INTERNAL FLOATING ROOF YES NO

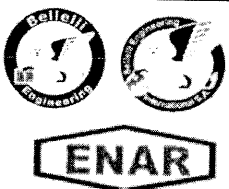
ACCESSORIES TOTAL MASS

TANK TOTAL MASS

NOTES :

- 1) TBC = to be confirmed/defined.
- 2) The region in which the UCH Field is located does not experience earthquakes. However, the recommended earthquake factor for structural design is g/10 (corresponding to Zone 1 according to UBC standard).
- 3) Refer to section 5.5 of Design Basis, doc. no. 3-PU101-PR-PR-027
- 4) Process fluid flash point higher than 100 °F.
Normal boiling point lower than 300 °F.
- 5) Tank design shall be in accordance with document 4985-SA-7500 Specification for storage tank design
- 6) Slope 1 : 120.
- 7) Self closing hatch type pressure relief device (emergency vent).
- 8) Gravity flow to Amine Sump Drum 300/310-V107. Maximum expected flow rate is 430 USgpm (98 m3/h).

(continues on sheet 3)



**UCH-II Development Project
AMINE GAS SWEETENING UNIT
& INCINERATOR Package**

| | |
|--|---------------|
| Job No.: 1896/12 | Unit: 300/310 |
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Originator Company BELLELLI ENGINEERING S.p.A.

AMINE INVENTORY STORAGE TANK - Items : (300/310-TK103)

| POS. | No. | SIZE | TYPE | RATING | FACING | ELEVAT. A DISTANCE R | PROJECT. B / B1 | REFERENCE SH - SPC - STD |
|---------------|--|-------|-------|--------|--------|-------------------------|--------------------|-----------------------------|
| BOTTOM | | | | | | | | |
| 1 | DRAWOFF NOZZLE AND SUMP | | | | | | | |
| 2 | NOZZLE FOR | | | | | | | |
| 3 | NOZZLE FOR LEVEL GAUGE (FLOATING TYPE) | | | | | | | |
| 4 | NOZZLE FOR | | | | | | | |
| 5 | HEATING () | | | | | | | |
| 6 | CATHODIC PROTECTION | | | | | | | |
| 7 | ANCHOR BOLTS | | | | | | | |
| 8 | (TBC) | (TBC) | (TBC) | (TBC) | (TBC) | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| ROOF | | | | | | | | |
| 12 | NOZZLE FOR GAS BLANKETING | | | | | | | |
| 13 | NOZZLE FOR BREATHER VALVE | | | | | | | |
| 14 | N6 | 1 | 8" | WN | 150# | RF | | 02 |
| 15 | NOZZLE FOR VACUUM VALVE | | | | | | | |
| 16 | (note 7) N10A | 1 | 24" | WN | 150# | RF | | 02 |
| 17 | (note 7) N10B | 1 | 24" | WN | 150# | RF | | 02 |
| 18 | NOZZLE FOR | | | | | | | |
| 19 | (Note 12) N5 | 1 | 4" | WN | 150# | RF | | |
| 20 | NOZZLE FOR OPEN VENT | | | | | | | |
| 21 | N7 | 1 | 4" | WN | 150# | RF | | |
| 22 | N8 | 1 | 2" | WN | 150# | RF | | 02 |
| 23 | NOZZLE FOR | | | | | | | |
| 24 | MANHOLE | | | | | | | |
| 25 | | | | | | | | 02 |
| 26 | NOZZLE FOR | | | | | | | |
| 27 | NOZZLE FOR | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |
| 30 | INSP. DOOR FOR EXT. BOARD LEVEL IND. | | | | | | | |
| 31 | CIRCUMFERENTIAL HANDRAIL | | | | | | | |
| 32 | TOP WALKWAY | | | | | | | |
| 33 | INSULATION SUPPORTS | | | | | | | |
| 34 | | | | | | | | |
| 35 | | | | | | | | |
| 36 | OPEN VENT | | | | | | | |
| 37 | BREATHER VALVE | | | | | | | |
| 38 | | | | | | TYPE | DWG | OR EQUIV. |
| 39 | | | | | | TYPE | DWG | OR EQUIV. |
| 40 | | | | | | TYPE | DWG | OR EQUIV. |
| 41 | | | | | | TYPE | DWG | OR EQUIV. |
| 42 | | | | | | TYPE | DWG | OR EQUIV. |

NOTES: (continues from sheet 2)

9) Radar type (LIT + LAHH).

10) Two tank to be provided (one for Train 300 and one for Train 310).
Tank, relevant piping and ancillaries to be provided by ENAR/OGDCL.
Tank's engineering and level transmitter to be provided by BELLELLI.

11) Draw off sump to be designed based on Figure 5-21 of API 650.

12) Provided with bird screen.

13) Manholes to be complete with blind, bolting, gaskets, davit, handles.

14) Locate nozzle N12 (overflow nozzle) above HLL (5849 mm/22 8 ft) at minimum distance from top tangent line of tank.