DocuSign Envelope ID: F344D483-EF36-4314-90A7-505D7DB4ED0C

Debutaniser Duplex Piping Repair

Upstream PS Controlled Document

No. 4900-HS-H0071-03

Revision 0

Issue date: 30/01/2017

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A537413

Revision history

s 22 irrelevant information

Rev.	Issue date	Revision summary	Originator	Reviewer	Approver
0	30/01/2017	Issued for information			

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UPSTREAM PRODUCTION SOLUTIONS

OFFSHORE PIPE REPAIR

NTW Job: 70355
PO:M100214

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NTW JOB# 70355

CONTENTS

- MATERIAL CERTIFICATION
- CONSUMABLE CERTIFICATES
- WELDING PROCEDURE SPECIFICATION
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- RT REPORTS
- HYDRO REPORTS
- PICKLING / PASSIVATING REPORT
- PURCHASE ORDER

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MATERIAL CERTIFICATION

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INSPECTION CERTIFICATE
EN 10204:2004 / 3.1

Number: 649963 Page: 1 / 3	Rev:
Created on: Date: 21.07.2016	Modified on:

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CUSTOMER DESCRIPTION

CLIENT SOLD TO	CLIENT SHIP TO
s 47G business information	s 47G business information

CLIENT ORDER: 53317
SALES ORDER: 184620

MATERIAL:SEAML. STAINL. STEEL TUBES/PIPES
HEAT-TREATED, PICKLED, PASSIVATED
GRADE: S31803,S32205,
STANDARD: ASME SECT.II PART.A SA790/SA790M-2015 ED.
ASTM A790/A790M-14a
NORSOK M630 REV.6 MDS D41 REV.5
NACE MR0175/ISO 15156-3:2009
CORROSION TESTED ACC. TO ASTM G48 TEST METHOD A
CHECK ANALYSIS (2 PER LOT)
TOLERANCES: ASME SECT.II PART.A SA999/SA999M-2010 ED. 2011 ADD.
ASTM A999/A999M-13
RANDOM LENGTHS 5.000/7.000 MM
PLAIN ENDS,
DIMENSIONS: 6" SCH 10S
HOT FINISHED

Sales Item	Client Item	Delivery No	Lot No.	Heat No	Pieces	Weight	Tot Lgth	Un Lgth
20		8170064846	253073	49735	3	266 KG	18,35 M	5000-7000 MM

RAW MATERIAL

Heat Nr:	Supplier	Method
49735	ACERALAVA (SPAIN)	Electric furnace+AOD

CHEMICAL COMPOSITION (%) *L: Ladle C:Products

*	Heat	Seq	C	Mn	Si	P	S	Ni	Cr	Mo	N	Pren
L	49735	1	0,012	1,04	0,250	0,021	0,0004	5,40	22,50	3,20	0,1775	35,9000
C	49735	12	0,015	1,05	0,270	0,023	0,0010	5,36	22,70	3,20	0,1820	
C	49735	13	0,014	1,04	0,260	0,023	0,0010	5,35	22,76	3,21	0,1800	

HEAT TREATMENT

SOLUTION ANNEALED AT 1080 °C , 10 min , WATER

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TÜV SÜD

Certified Management System acc. to ISO 9001, ISO 14001 and OHSAS 18001 by LRQA

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We heroby certify that the material herein described has been manufactured, sampled, tested, and inspected in accordance with above standards and specifications and satisfies orderds requirements. This certificate is issued by a computerized system and it is valid without original signature. In case the owner of the certificate would release as a copy of it, he must attest its conformity to the issued, assuming the responsibility for any unlawful or s not allowed use. Any forgery or falsification of this certificate shall legally prosecuted.

(WORKS INSPECTOR)

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INSPECTION CERTIFICATE
EN 10204:2004 / 3.1

Number: 649963 Page: 2 / 3	Rev:
Created on: Date: 21.07.2016	Modified on:

TENSILE TEST

Lot No	Sample	T	Rp0.2	Rm	A2"
		°C	MPa	MPa	%
Min		20	485	655	25
Max		20		880	
253073	1	20	508	716	25
	2	20	548	734	28

HARDNESS TEST

Lot No	Sample	HRC
Min		
Max		28
253073	1	22
	2	22

METALURGICAL TESTS
PITTING CORROSION TEST ACCORDING TO ASTM G48 METHOD A
TEST TEMPERATURE 30°C TEST DURATION: 24 HRS
NO SIGNS OF PITTING ARE PRESENT. WEIGHT LOSS: 0,1056g/m2

NON-DESTRUCTIVE TESTS
POSITIVE MATERIAL IDENTIFICATION TEST ON EACH TUBE/PIPE BY "X-RAY-FLUORESCENCE-ANALYZER": SATISFACTORY

HYDROSTATIC PRESSURE TESTED AT 90 bar, 1300 psi DURING 10 SEC ON EACH TUBE/PIPE: SATISFACTORY

TECHNOLOGICAL TESTS
FLATTENING TEST: SATISFACTORY

THE TUBES/PIPES CONFORM ALSO TO NACE STANDARD MR0175-2009

VISUAL INSPECTION AND CHECKING OF DIMENSIONS: SATISFACTORY

FOR MICROGRAPHIC EXAMINATION SEE ENCLOSED REPORT

QUALIFIED ACCORDING TO NORSOK M650 / QTR 001 FOR HOT FORMED PRODUCTS

MARKING
s 47G business T/A
6" SCH 10S ASME SA790 ASTM A790 S31803 S32205 HF SMLS HEAT/ PMI-AV LOT NO/ AUSTRIA

TÜV SÜD

Certified Management System acc. to ISO 9001, ISO 14001 and OHSAS 18001 by LRQA

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INSPECTION CERTIFICATE
EN 10204:2004 / 3.1

Number: 649963 Page: 3 / 3	Rev:
Created on: Date: 21.07.2016	Modified on:

REMARKS

MECHANICAL TESTS WERE PERFORMED IN LONGITUDINAL DIRECTION IF NOT OTHERWISE STATED.

NO WELD REPAIR HAS BEEN PERFORMED ON THE MATERIAL.

MATERIAL MANUFACTURER APPROVED WITH CERTIFICATE NR. 245/2004/MUC BY TÜV SÜDDEUTSCHLAND (NOTIFIED BODY 0036)TO ISSUE CERTIFICATES OF SPECIFIC PRODUCT CONTROL IN ACCORDING TO PRESSURE EQUIPMENT DIRECTIVE 97/23/EC ANNEX I POINT 4.3.

MATERIAL IS FREE OF RADIOACTIVE CONTAMINATION

TÜV SÜD

Certified Management System acc. to ISO 9001, ISO 14001 and OHSAS 18001 by LRQA

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(WORKS INSPECTOR)

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INSPECTION CERTIFICATE
ABNAHMEPRÜFZEUGNIS
EN 10204 3.1

Number: 649963 Page: 1 / 1	Rev:
Created on: Date: 21.07.2016	Modified on: 21.07.2016

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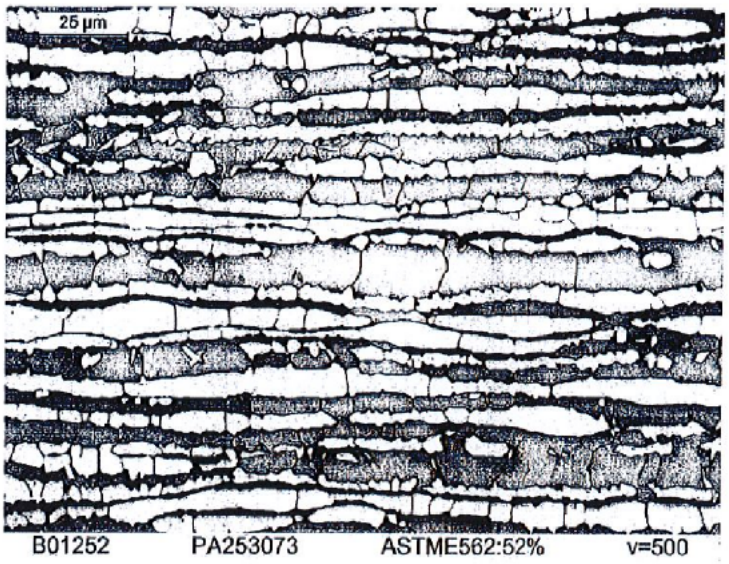
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s 22 irrelevant material

MICROGRAPHIC EXAMINATION REPORT

WORK ORDER NO.: 184620 / 20

MICROSTRUCTURE: UNIFORM STRUCTURE ACROSS FULL WALLTHICKNESS, FREE FROM CARBIDES, NITRIDES AND INTERMETALLIC PHASES.

FERRITE CONTENT TO ASTM E562: 52%



Certified Management System acc. to ISO 9001, ISO 14001 and OHSAS 18001 by LRQA

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We hereby certify that the material herein described has been manufactured, sampled, tested, and inspected in accordance with above standards and specifications and satisfies orders requirements. This certificate is issued by a computerized system and it is valid without original signature. In case the owner of the certificate would release as a copy of it, he must attest its conformity to the issued, assuming the responsibility for any unlawful or s not allowed use. Any forgery or falsification of this certificate shall legally prosecuted.

(WORKS INSPECTOR)

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CONSUMABLE CERTIFICATION

A537413

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Material Compliance Certificate

Certificate Number:	6640	Date Issued:	11/10/2011

Grade:	2209 STAINLESS STEEL TIG WIRE		
Size:	2.40MM		
Standard:	EN ISO 14343-A:2007 EN ISO 14343-B:2007	22 9 3 N L AWS 5.9 2209	WNr 1.4462
Heat No.:	218950		

C	Mn	Si	S	P	Cr	Ni	Mo	Al	Cu
0.013	1.620	0.450	0.001	0.018	22.810	8.930	3.140	0.005	0.070
Co	**N**	**Ti**	**Nb**	**B**	**W**	**V**	**Ca**	**As**	**Ta**
0.070	0.1310	0.014	0.005	0.0023	0.010	0.070	0.007	-	-

We certify hereby, that the information contained in this certificate is a true and correct record of the manufacturer's original inspection certificate.

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WELDING PROCEDURE SPECIFICATION

DocuSign Envelope ID: 7BEE5AB0-C96C-4C8C-A51D-75327D88B659

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Welding Procedure – Debutaniser Duplex Piping Repair

Upstream PS Controlled Document

No. 4900-FP-T0002

Revision 0

Issue date: 20/01/2017

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- When saved electronically to an area outside of the IMS

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Revision history

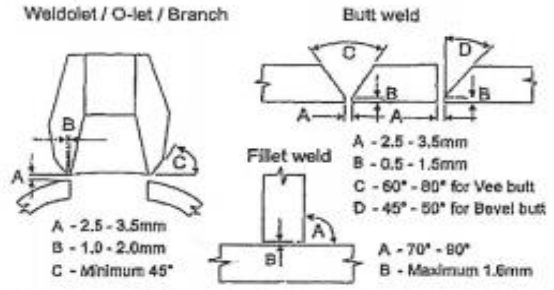
Rev.	AL	Issue date	Revision summary	Originator	Reviewer	Approver
0	-	20/01/2017	Issued for information	s 22 irrelevant material		

DocuSign Envelope ID: 7BEE5AB0-C96C-4C8C-A51D-75327D88B659

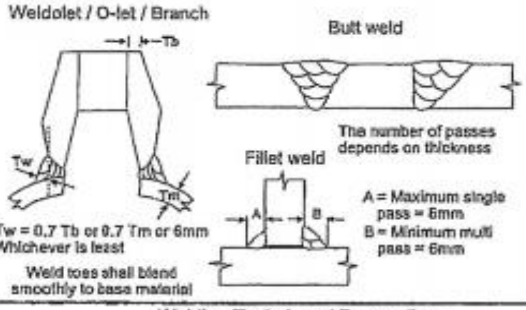
Inspector:	Signed:
WO Number: M220050499	Date:

WPS NO	DS 3001	Rev No	2	From WPQR	02-01	2nd WPQR	92-01
JobNo	M220050499			Project	Debutaniser pipe repair		
Applicable Code Specifications	ASME IX / ASME B31.3			Material 1	SAF 2205 (UNS S31803)		P10H
				Material 2	SAF 2205 (UNS S31803)		P10H
Welding Process	GTAW			Thickness	Min: 2.77mm	Max:	11.08mm
Joint Type	See note 2			Diameter	Unlimited		
Position	All - VU positional						

Joint Preparation



Welding Sequence



Thermal Condition		Welding Technique / Preparation	
Min Preheat	10°C if < 10°C heat to 40°C.	Preparation Method	Machined, Plasma cut & grind
Method	LPG / Air torch	Gouge Method	N/A
Temp. Check	Calibrated contact pyrometer	Interpass Cleaning	Grind (iron free), SS wire brush
Max Interpass	125°C	Max Bead Width	8mm
PWHT	None	Electrical Stickout	N/A
		Shielding Gas Flow	10 LPM - 15 LPM
		Purge Gas Flow	Effective flow to ensure < 0.5% O2

Ref	Consumable Brand	Consumable Classification	Consumable Treatment
A	Sandvik 22.8.3.L or approved equivalent	AWS A5.9: ER 2209 ASME IX: F6 - A8	Use from original package - Solvent wipe Store > 20°C < 35% RH
B	Welding grade argon	Minimum 99.99% purity	Store / use upright and secured

Weld Details					Electrode / Filler		Flux	Welding Parameters			Travel Spd	Heat Input
Pass	Process	Side	Pos	Dir	Ref	Size	or Gas	Pol	Amps	Volts	(mm/min)	(kJ/mm)
Root	GTAW	1	All	VU	A	1.6-2.4	B	DCEN	70 - 90	9 - 10	45 - 80	0.47 - 1.20
Pass 2	GTAW	1/2	All	VU	A	1.6-2.4	B	DCEN	90 - 110	10 - 11	70 - 100	0.54 - 1.04
Fill/Cap	GTAW	1/2	All	VU	A	2.4mm	B	DCEN	130 - 160	12 - 13	100 - 160	0.59 - 1.25

Notes

1. WPS applications - NACE pipe and plate components to -75°C.
2. Weld joints qualified - Single vee or bevel welded from 1 side, Double vee or bevel welded from both sides.
   - Single or multipass fillet welds on unlimited thickness materials.
3. For materials < 6.4mm thickness, use pass 2 paramaters for fill / cap beads and fillet welds.
4. Ensure all oxide is removed by mechanical means at least 10mm from joint edge on OD and bore or plate surfaces.
5. Use either 2% ceriated or 1.5% lanthanated tungsten in diameters as required by welding scenario.
6. Gas lens shall be used. Ceramic shroud diameter as required by selected gas lens.
7. Joint to be purged to achieve < 0.5% O2. Flow as per pipe diameter, dam distances and displacement volume required.
8. Purge to be maintained for at least 3 layers or 8mm weld deposit thickness.
9. Completed welds subject to 100% visual and other NDE methods as per applied standard and/or client specification.

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WELDER QUALIFICATION RECORD

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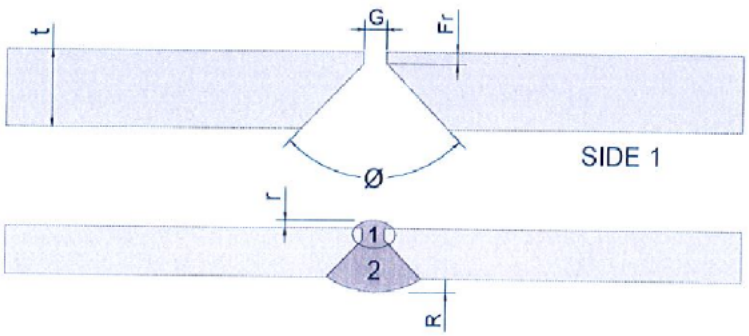
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WELDER QUALIFICATION RECORD

Welder Name:	s 22 irrelevant material	**Welder ID:**	NTW-66	**Date Welded:**	23/09/2016
WPS Followed:	s 47G - business affairs	**Standards/Codes:**	ASME IX / ASME B31.3		

TESTING CONDITIONS & QUALIFICATION LIMITS

ACTUAL VALUES		ASME IX	AS/NZS 3992	AWS D1.1
Welding Process(es):	GTAW	GTAW		
Type(manual or semi-automatic):	Manual	Manual		
Pipe Diameter & Thickness:	100NB Sch10	≥ 73mmOD		
Deposited Weld Metal:	3.05mm	1.5 - 6.1mm		
Weld Type:	Single Sided Butt	Single & double sided butt and fillet welds		
Position:	6G	All Positions		
Direction:	Up	All except down		
Backing(with or without):	N/A	N/A		
Base Metal Group No.	10H	10 H		
Base Metal Type:	Duplex SS			
Base Metal Heat No.	E50348 / 49760			
Consumable SFA:	5.9			
Consumable Classification:	ER2209			
Consumable Batch No.	218950			
Consumable F No.	6	Any F-No.6		
Consumable Insert:	N/A	N/A		



FLUX / GAS	
Shielding Gas Type:	99.9% Argon
Shielding Gas Flow Rate:	13L/min
Purge Gas Type:	N/A
Purge Gas Flow Rate:	N/A
Trailing Gas:	N/A

JOINT VALUES			
t	3.05mm	**G**	3.5mm
Ø	60°	**Fr**	0.5mm
r	1mm	**R**	2mm

ELECTRODE	
Tungsten Type:	Thoriated
Tungsten Size:	2.4mm

WELDING PARAMETERS

PASS No	PROCESS	SIDE	POSITION	DIRECTION	TYPE	FILLER SIZE	POLARITY	AMPS	VOLTS	TRAVEL SPEED mm/min	HEAT INPUT kj/mm	INTERPASS TEMP °C
1	GTAW	1	6G	Vertical up	1	2.4mm	DCEN	78	9.6	50	0.90	32
2	GTAW	1	6G	Vertical up	1	2.4mm	DCEN	94	10.2	62	0.93	65

TEST RESULTS

Test Type	Report No.	Acceptance Criteria	Test Result	Test Date
Visual	DO 427-16 Vis-01	ASME B31.3-2014 Table 341.3.2 Normal and Category M Fluid Service	Complies	23/09/2016
Radiographic	DO 427-16 RT-01	ASME IX Section QW-191.1.2-2015 / ASME B31.3 Table 341.3.2-2014	Complies	23/09/2016
Bend Test	N/A	N/A	N/A	N/A
Nick Break	N/A	N/A	N/A	N/A

APPROVALS

I hereby cerify that the statements in this record are correct and that the test coupons were prepared in accordance with the requirements of ASME IX / B31.3

Certified by:	s 22 irrelevant material	**Signature:**	s 22 irrelevant material	**Authority:**	AU/IWS/00746	**Date:**	1/12/2016

s 47G business information

VISUAL INSPECTION REPORT

FORM: F736 Rev 2 Revised Dec 2014	
Report Compiled By:	s 22 irrelevant material
QA/QC By:	
TEST DATE:	28/09/16
DITS JOB NO. :	DO 427-16
WORKSHEET NO. :	VIS-01
REPORT NO. :	DO 427-16 VIS-01
PAGE NO.	1 OF 1

Accredited for compliance with ISO/IEC 17025. The results of the test, calibrations and/or measurements included in this document are traceable to Australian / national standards.

NATA ACCREDITED FOR TECHNICAL COMPETENCE

Client:	s 47G business information	**Client Job No:**	70352
Client Address:		**Contract / Order No:**	70352
Site:		**Material Type:**	SAF Duplex
Job Identification:	UPS / NE Closed Drain Spool	**Viewing Conditions:**	>1000Lx
Procedure No:	TESP-427	**Measuring Equipment:**	N/A
Inspection Method:	ASME V Art.9-2015	**Sketch:**	N/A
Product Standard Design / Construction Code:	ASME B31.3-2014	**Photographs:**	No
Service History:	New Fabrication	**Surface Preparation:**	As Welded
Acceptance Code:	ASME B31.3-2014 Table 341.3.2 Normal and Category M Fluid Service	**Surface Condition:**	As Welded / Clean
Restrictions / Comments:	Nil		

Inspection Results

DRAWING / SPOOL Nos.	DETAILS / DESCRIPTION	WELDER / WELD PROCESS	C/DNC
DWG: W9680DM001.001 Pipe Spool: Closed Drains Spool	W1, W2, W3, W4, W5 & W6 100NB Sch10S	NTW-66 / GTAW (DS3001)	C

NB: Abbreviations used: C= Complies, DNC = Does Not Comply

Technician s 22 irrelevant material

Signatory Nam s 22 irrelevant material

(Authorised Signatory)

Date of Issue 28/09/2016

Signature s 22 irrelevant material

A537413

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RADIOGRAPHIC WELD TEST REPORT

FORM: F706 Rev 3 Last Revision Feb 2015	
Report Compiled By:	
QA/QC By:	s 22
TEST DATE:	23/09/2016
DITS JOB NO. :	DO 427-16
WORKSHEET NO. :	RT – 01
REPORT NO.:	DO 427-16 RT – 01
PAGE NO.	1 OF 1

Accredited for compliance with ISO/IEC 17025. The results of the test, calibrations and/or measurements included in this document are traceable to Australian / national standards.

NATA TECHNICAL COMPETENCE

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Client:		**Client Address:**		**Location of Test:**	DITS Workshop
Project/Job:	UPS / NE Closed Drains Spool	**Contract/Order No.:**	70352	**Screen Details:**	Pb 0.027mm
Test Procedure No.:	TESP - 415 **Radiation Source:** Ir-192	**Radiation Size:**	2 x 2 **Film Type:** Type I	**IQI Type / s:**	1A ASTM 6
Product Standard:	ASME IX – 2015 / ASME B31.3 – 2014	**Test Standard:**	ASME V Art.2 – 2015	**Acceptance Criteria:**	ASME IX Section QW-191.1.2 – 2015 / ASME B31.3 Table 341.3.2 – 2014
Comments/Restrictions:	Nil	**Surface Condition:**	As Welded **Material:** SAF DUPLEX	**Other:**	Nil

Test Results: All measurements are in millimetres.
Abbreviations used in this report based on: AS 1929 & AS 4749.

Symbol	Definition	Symbol	Definition	Symbol	Definition	Symbol	Definition
A	No defects detected	SGS	Shrinkage Groove	SMG	Grinding Mark	SPT	Surface Pit
SXP	Excess Penetration	SUC	Undercut	SMT	Tool Mark	KL	Longitudinal Crack
DM	Diffraction Mottling	SSP	Spatter	SMH	Hammer Mark	KT	Transverse Crack
SGI	Incompletely Filled Groove	SED	Excessive Dressing	STS	Torn Surface	KE	Edge Crack
LS	Lack of Side Fusion	IO	Oxide Inclusion	PG	Porosity Cluster	KC	Crater Crack
LR	Lack of Root Fusion	IT	Tungsten Inclusion	PL	Linear Porosity	CP	Crater Pipe
LI	Lack of Inter Run Fusion	IC	Copper Inclusion	EC	Elongated Cavity	IN	Slag Inclusion
LP	Lack of Penetration	GP	Gas Pore	WH	Worm Hole	SRC	Root Concavity
IL	Linear Slag Inclusion	PU	Uniform Porosity	BT	Burn Through	AS	Arc Strike
HiLo	Linear Misalignment	HB	Hollow Bead	RS	Re-Shoot	Pd	Processing Defect
DNC	Does Not Comply	C	Complies	N	New Weld	R	Repair

TEST RESULTS

Identification	Weld	Welder	WPS	Process	Size	Thick/ Sch	Film Position	Interpretation	Test Method	IQI (S / F)	Req. wire No. / %	Achieved wire No. / %	Density	C/ DNC
W9680DM001.001 Closed Drains Spool	1	NTW-66	DS3001	GTAW	100NB	3.05	0-120 120-240 240-0	A A A	GR1/DWS1	F	Wire 4	Wire 4	2.6-2.9 2.6-2.9 2.6-2.9	C C C

Technician
(Name, Qualification and Level)

Signatory
(Name, Qualification and Level)

Level 2)

Date of Issue 29/09/2016

Signature

(Authorised Signatory)

s 22 irrelevant material

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Material Compliance Certificate

Certificate Number:	6640	Date Issued:	11/10/2011

Grade:	2209 STAINLESS STEEL TIG WIRE		
Size:	2.40MM		
Standard:	EN ISO 14343-A:2007 EN ISO 14343-B:2007	22 9 3 N L AWS 5.9 2209	WNr 1.4462
Heat No.:	218950		

C	Mn	Si	S	P	Cr	Ni	Mo	Al	Cu
0.013	1.620	0.450	0.001	0.018	22.810	8.930	3.140	0.005	0.070
Co	**N**	**Ti**	**Nb**	**B**	**W**	**V**	**Ca**	**As**	**Ta**
0.070	0.1310	0.014	0.005	0.0023	0.010	0.070	0.007	-	-

We certify hereby, that the information contained in this certificate is a true and correct record of the manufacturer's original inspection certificate.

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T2436

INSPECTION CERTIFICATE
EN 10204:2004 / 3.1

Number: 631880 Page: 1 / 3	Rev: 00
Created on: Date: 09.07.2015	Modified on:

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CUSTOMER DESCRIPTION

CLIENT SOLD TO	CLIENT SHIP TO
s 47G business information	s 47G business information

CLIENT ORDER: 52683
SALES ORDER: 168812

MATERIAL:SEAML. STAINL. STEEL TUBES/PIPES
HEAT-TREATED, PICKLED, PASSIVATED
GRADE: S31803,S32205,
STANDARD: ASME SECT.II PART.A SA790/SA790M-2013 ED.
ASTM A790/A790M-14
NORSOK M650 REV.4
NORSOK M630 REV.6 MDS D41 REV.5 QTR No: 1
MESC SPE 74/014 DECEMBER 2012 WITHOUT US
NACE MR0175/ISO 15156-3:2009
SHELL ES247 REV.2 (WITHOUT DYE PENETRANT TEST)
TOLERANCES: ASME SECT.II PART.A SA999/SA999M-2013 ED.
ASTM A999/A999M-14
RANDOM LENGTHS 5.000/7.000 MM
PLAIN ENDS,
DIMENSIONS: 4" SCH 10S
COLD FINISHED

Sales Item	Client Item	Delivery No	Lot No.	Heat No	Pieces	Weight	Tot Lgth	Un Lgth
40		8110041098	P1500975	49760	17	824 KG	96,74 M	5000-7000 MM
40		8110041098	P1503149	50290	15	796 KG	96,12 M	5000-7000 MM
40		8110041100	P1500975	49760	2	92 KG	10,72 M	5000-7000 MM

RAW MATERIAL

Heat Nr:	Supplier	Method
49760	s 47G business information	Electric furnace+AOD
50290		Electric furnace+AOD

CHEMICAL COMPOSITION (%) *L: Ladle C:Products

*	Heat	Seq	C	Mn	Si	P	S	Ni	Cr	Mo	N	Pren
L	49760	1	0,010	1,05	0,250	0,021	0,0004	5,30	22,45	3,15	0,1615	35,4290
L	50290	1	0,013	1,06	0,310	0,022	0,0004	5,35	22,65	3,10	0,1785	35,7360
C	49760	5	0,015	1,07	0,250	0,021	0,0010	5,30	22,55	3,13	0,1615	35,4630

AENOR ER Empresa Registrada

AENOR Gestión Ambiental

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s 22 irrelevant material

We hereby certify that the material herein described has been manufactured, sampled, tested, and inspected in accordance with above standards and specifications and satisfies order's requirements. This certificate is issued by a computerized system and it is valid without original signature. In case the owner of the certificate would release as a copy of it, he must attest its conformity to the issued, assuming the responsibility for any unlawful or s not allowed use. Any forgery or falsification of this certificate shall legally prosecuted.

10BNB SCH10 PIPE

A537413

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OFFICINE NICOLA GALPERTI & FIGLIO S.p.A.

SPETT.LE/MESSRS:

FW3R010S 100NB

CERTIFICATO DI COLLAUDO / TEST CERTIFICATE EN 10204 3.1B

NS. ORDINE/INTERNAL JOB 041359

CERTIFICATO M.T./CERTIFICATE N. 5908/B

DATA/DATE 18/07/2005

VS. ORDINE/YOUR P.O. RC21/RC54

DATA/DATE 15/12/2004

POSIZ.	DESCRIZIONE/DESCRIPTION			QUANTITA' QUANTITY	U.M.	MATERIALE/MATERIAL	N° COLATA/PROVA HEAT N°/TEST N°	ACCIAIERIA STEEL MILL	#
022/122	4" 300 WN RF 10S MESC: 7666292141	F51	B1 F	28	S	ASTM A 182/02 F 51	E50348.A/21	OUTOKUMP/AVESTA	A
038/194	4" 600 WN RF 40S MESC: 7666294641	F51	B1 F	20	S	ASTM A 182/02 F 51	E50333.A/23	OUTOKUMP/AVESTA	B

ANALISI CHIMICA/CHEMICAL ANALYSIS

#		C %	MN %	SI %	P %	S %	CR %	NI %	MO %	CU %	V %	SN %	AL %	NB %	TI %	N %	CO%	B %	PI%
A		0,015	1,400	0,410	0,023	0,001	22,410	5,610	3,320	0,180	0,070	0,011	0,008	0,009	0,005	0,174	0,100	0,0002	36,150
A		0,018	1,428	0,396	0,025	0,001	22,400	5,518	3,242	0,180	0,070	0,011	0,008	0,009	0,005	0,168	0,100	0,0002	35,786
B		0,019	1,300	0,400	0,021	0,001	22,380	5,590	3,300	0,180	0,130	0,010	0,007	0,008	0,005	0,173	0,080	0,0002	36,038
B	C	0,014	1,292	0,449	0,022	0,001	22,286	5,577	3,233	0,180	0,130	0,010	0,007	0,008	0,005	0,182	0,080	0,0002	35,866

NOTE/NOTES
PI=Pitting Index

C = ANALISI DI PRODOTTO/CHICK ANALYSYS

CARATTERISTICHE MECCANICHE/MECHANICAL PROPERTIES

#		TRAZIONE/TENSILE TIPO/TYPE	Ø PROVETTA DIAMETER mm.	SEZIONE AREA mmq.	LUNGHEZZA LENGHT mm.	TEMP. TEMPERATURE C	ROTTURA TENSILE Mpa	SNERVAMENTO YIELD Mpa	ALL. ELONG %	CONTR. REDUCT. %	RESILIENZA/CHARPY TESTES TIPO/TYPE	TEMP. TEMPERATURE C	VALORI/VALUES Joule	DUREZZA HB HARDNESS (AVERAGE)
A	S		12,50	122,70	50,00	20	620	450	26,0	45,0		-50	Min. 31 Med. 40	280
A	O		12,50	122,70	50,00	20	723	533	36,0	72,6		-50	125 - 128 - 131	216
B	S		12,50	122,70	50,00	20	620	450	25,0	45,0		-50	Min. 31 Med. 40	280
B	O		12,50	122,70	50,00	20	723	539	39,6	71,6		-50	140 - 142 - 143	212

NOTE/NOTES

O = OTTENUTI/OBTAINED
S = STANDARD

TRATTAMENTI TERMICI/HEAT TREATMENTS

#	
A	Annealed at 1050 dgr.C for 1 h.-Cooling from 1050 dgr.C in water
A	(Annealed Solution).
B	Annealed at 1050 dgr.C for 1.1/2 h.-Cooling from 1050 dgr.C in water
B	(Annealed Solution).

NOTE GENERALI/GENERAL NOTES

FINITURE/ROUGHNESS
F =STOCK FINISH 125-250 microinch

STANDARD/STANDARD
B1 = ANSI B16.5

NOTE/NOTES
Intergranular Corrosion Test per ASTM A 262 Practice 'E': Satisfactory.

MARCHIO DI FABBRICA / TRADE MARK

DATA COLLAUDO INT. / INT. INSPECT DATE 18/07/2005

COLLAUDATORE INT. / INT. INSPECTOR

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ENTE UFFICIALE DI COLLAUDO / INSPECTION AUTHORITY

IQNR SCH10 WELD NECK FLANGE

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AS BUILT DRAWINGS

s 47 - commercial value

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PT REPORTS

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PENETRANT INSPECTION REPORT

FORM: F705 Rev 2 Last Revision Dec 2014	
Report Compiled By	s 22 irrelevant material
QA/QC By:	
TEST DATE:	11/12/2016
DITS JOB NO. :	DO 545-16
WORKSHEET NO. :	PT -01
REPORT NO. :	DO 545-16 PT-01
PAGE NO.	1 OF 2

Accredited for compliance with ISO/IEC 17025. The results of the test, calibrations and/or measurements included in this document are traceable to Australian / national standards.

NATA ACCREDITED FOR TECHNICAL COMPETENCE

Client:	Upstream Production Solutions	**Order No.:**	M100125
Client Address:	Level 5, 1101 Hay Street, West Perth, WA 6005	**Client Job No.:**	Not Supplied
Job Description:	Debutaniser Exchanger Pipe Repairs	**Request No.:**	Verbal
Location of Job:	Northern Endeavour FPSO	**Material Type:**	Duplex (SAF 2205)
Product Standard:	ASME B31.3 - 2014	**Weld Process:**	GTAW (WPS: DS 3001)
Acceptance Criteria:	ASME B31.3 - 2014	**Test Procedure:**	TESP-413
Inspection Spec:	ASME V Art. 6 – 2015	**Test Method:**	As Per DITS-001
Developer:	Ardrox 9D1B	**Penetrant Time:**	20 Minutes
Penetrant:	Ardrox 907PB	**Developer Time:**	10 Minutes
Cleaner:	Ardrox 9PR50C	**Surface Condition:**	As Welded / Clean
Surface Preparation Method:	Solvent Wipe Technique	**UV Light No:**	N/A
Test Restrictions / Comments :	Nil		

TEST RESULTS

Identification		Area Tested	Interpretation	C/DNC
Drawing / Spool No.	Details / Weld Nos.			
PL3052 PI072	Weld A 100% of Root Weld Run	100% of Weld & HAZ	NRSDD	C
PL3052 PI072	Weld B 100% of Root Weld Run	100% of Weld & HAZ	NRSDD	C
PL3052 PI072	Weld A 100% of Completed Weld	100% of Weld & HAZ	NRSDD	C
PL3052 PI072	Weld B 100% of Completed Weld	100% of Weld & HAZ	NRSDD	C

NB: Abbreviations used are as follows: C = Complies, DNC = Does Not Comply
HAZ=Heat Affected Zone, NRSDD = No Recordable Surface Discontinuity Detected

Technician s 22 irrelevant material

Signatory Name s 22 irrelevant material

Date of Issue 11/12/2016

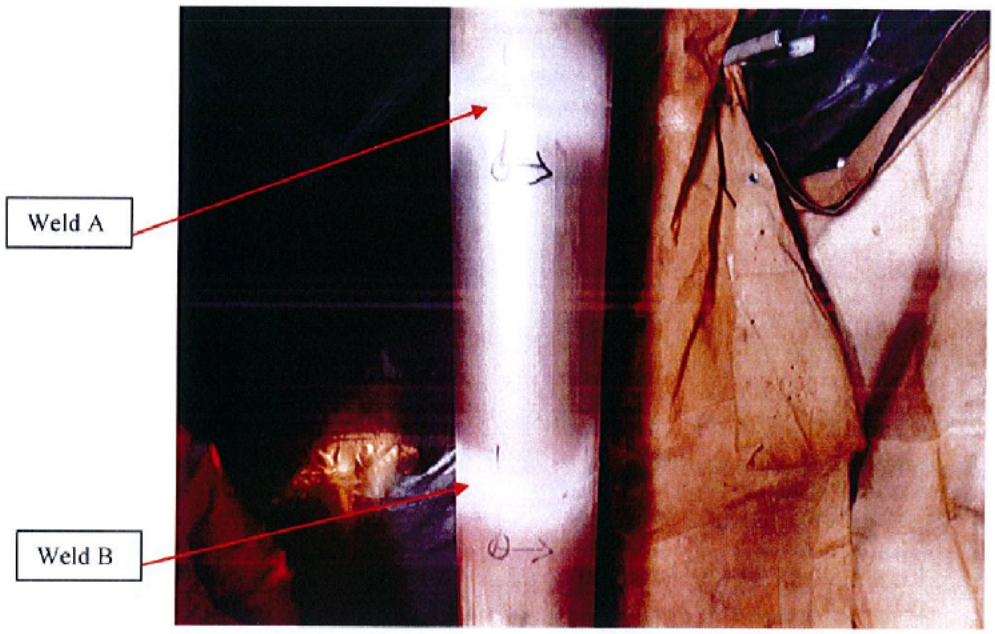
Signature

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PENETRANT INSPECTION REPORT

FORM: F705 Rev 2 Last Revision Dec 2014	
Report Compiled By	s 22 irrelevant material
QA/QC By:	
TEST DATE:	11/12/2016
DITS JOB NO. :	DO 545-16
WORKSHEET NO. :	PT-01
REPORT NO. :	DO 545-16 PT-01
PAGE NO.	2 OF 2

Accredited for compliance with ISO/IEC 17025. The results of the test, calibrations and/or measurements included in this document are traceable to Australian / national standards.



Weld A & B completed Welds

NB: Abbreviations used are as follows: C = Complies, DNC = Does Not Comply
HAZ=Heat Affected Zone, NRSDD = No Recordable Surface Discontinuity Detected

Technician s 22 irrelevant material

Signatory Name s 22 irrelevant material

Date of Issue 11/12/2016

Signature

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RT REPORTS

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RADIOGRAPHIC WELD TEST REPORT

FORM: F706 Rev 3 Last Revision Feb 2015	
Report Compiled By:	
QA/QC By:	
TEST DATE:	11/12/2016
DITS JOB NO. :	DO 545-16
WORKSHEET NO. :	RT – 01
REPORT NO.:	DO 545-16 RT -01
PAGE NO.	1 OF 2

Accredited for compliance with ISO/IEC 17025. The results of the test, calibrations and/or measurements included in this document are traceable to Australian / national standards.

NATA ACCREDITED FOR TECHNICAL COMPETENCE

Client:	Upstream Production Solutions		**Client Address:**	Level 5, 1101 Hay Street, West Perth, WA 6005		**Location of Test:**	Northern Endeavour FPSO
Project/Job:	Debutaniser Exchanger Pipe Repairs		**Contract/Order No.:**	M100215		**Screen Details:**	Pb 0.027mm
Test Procedure No.:	TESP - 415	**Radiation Source:** Ir-192	**Radiation Size:**	2 x 2	**Film Type:** Type I / Fuji IX50	**IQI Type / s:**	ASTMA 1A
Product Standard:	ASME B31.3 - 2014		**Test Standard:**	ASME V, Art. 2 - 2015		**Acceptance Criteria:**	ASME B31.3 Table 341.3.2 Severe Cyclic – 2014
Comments/Restrictions:	Nil		**Surface Condition:**	As Welded / Clean	**Material:** Duplex (SAF 2205)	**Client Request Number:**	Verbal

Test Results: All measurements are in millimetres.
Abbreviations used in this report based on: AS 1929 & AS 4749.

Symbol	Definition	Symbol	Definition	Symbol	Definition	Symbol	Definition
A	No defects detected	SGS	Shrinkage Groove	SMG	Grinding Mark	SPT	Surface Pit
SXP	Excess Penetration	SUC	Undercut	SMT	Tool Mark	KL	Longitudinal Crack
DM	Diffraction Mottling	SSP	Spatter	SMH	Hammer Mark	KT	Transverse Crack
SGI	Incompletely Filled Groove	SED	Excessive Dressing	STS	Torn Surface	KE	Edge Crack
LS	Lack of Side Fusion	IO	Oxide Inclusion	PG	Porosity Cluster	KC	Crater Crack
LR	Lack of Root Fusion	IT	Tungsten Inclusion	PL	Linear Porosity	CP	Crater Pipe
LI	Lack of Inter Run Fusion	IC	Copper Inclusion	EC	Elongated Cavity	IN	Slag Inclusion
LP	Lack of Penetration	GP	Gas Pore	WH	Worm Hole	SRC	Root Concavity
IL	Linear Slag Inclusion	PU	Uniform Porosity	BT	Burn Through	AS	Arc Strike
HiLo	Linear Misalignment	HB	Hollow Bead	RS	Re-Shoot	Pd	Processing Defect
DNC	Does Not Comply	C	Complies	N	New Weld	R	Repair

TEST RESULTS

Identification	Weld	Welder	WPS	Process	Size	Thick/ Sch	Film Position	Interpretation	Test Method	IQI (S / F)	Req. wire No. / %	Achieved wire No. / %	Density	C/ DNC
PL3052 PI072	Weld A	Not Supplied	DS 3001	GTAW	150NB	Sch10S/ 3.4mm	0-180 180-360 360-0	Purge Wire Purge Wire SXP, PD, Purge Wire	GR1/DWSI	F	Wire 4 Wire 4 Wire 4	Wire 4 Wire 4 Wire 4	2.2-2.9 2.0-2.6 2.0-3.0	C C C

Technician
(Name, Qualification and Level) _____

Signatory
(Name, Qualification and Level) s 22 irrelevant material evel 2)

(Authorised Signatory)

Date of Issue 11/12/2016

Signature _____

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RADIOGRAPHIC WELD TEST REPORT

FORM: F706 Rev 3 Last Revision Feb 2015	
Report Compiled By:	
QA/QC By:	
TEST DATE:	11/12/2016
DITS JOB NO. :	DO 545-16
WORKSHEET NO. :	RT – 01
REPORT NO.:	DO 545-16 RT -01
PAGE NO.	2 OF 2

Accredited for compliance with ISO/IEC 17025. The results of the test, calibrations and/or measurements included in this document are traceable to Australian / national standards.

NATA ACCREDITED FOR TECHNICAL COMPETENCE

TEST RESULTS

PL3052 PI072	Weld B	Not Supplied	DS 3001	GTAW	150NB	Sch10S/ 3.4mm	0-180 180-360 360-0	Purge Wire GP, Purge Wire SXP, PD, Purge Wire	GR1/DWSI	F	Wire 4 Wire 4 Wire 4	Wire 4 Wire 4 Wire 4	2.3-2.8 2.3-3.2 2.3-3.2	C C C

Technician
(Name, Qualification and Level)

Signatory
(Name, Qualification and Level)

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Level 2)

(Authorised Signatory)

Date of Issue 11/12/2016

Signature

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HYDRO REPORTS

Upstream Production Solutions

Client:	Upstream Production Solutions	**Job Card No:**	
System:	Debutaniser Feed/Bottoms Exchanger	**Test Facility:**	Northern Endeavour

Equipment being tested

Manufacturer:	N/S	Model:	N/A
Serial No.		Tag/Spool No.	150-PL-3052-03D01-3
Drawing/ISO No.	150-PL-3052-03D01-3-PX17	P&ID No.	M5000-DP-521.04

Status: ☐ New ☐ Existing ☒ Repaired

Description of test gauges and testing parameters

Date of Test:	12/12/16	Serial No. (Gauge 1)	066786
Procedure No.		Serial No. (Gauge 2)	067270

Calibration No.

Calibration No.

Testing Code: ☐ AS1210 ☐ AS4037 ☐ AS4458 ☒ ASME B31.3 ☐ ASME VIII

Test Type: ☒ Hydrostatic ☐ Pneumatic (*attach signed justification from client*)

Test Medium: ☒ Water ☐ Air ☐ Nitrogen

Design Pressure:	2400	kPag	Design Temperature:	140	°C
Test Pressure:	3600	kPag	Test Duration at Test Pressure:	30	mins

Environmental controls

Test Liquid Temp > 10°C ☑ Yes Ambient Temperature: ~~32~~ 34 °C

Corrosion Inhibitor? ☐ Yes Product: Water SDS (sighted) ☐ Yes

Spill Control in place? ☑ Yes What?

Danger Signs in Place? ☑ Yes Exclusion Zone Barricades in Place? ☑ Yes

Approval to proceed with test

Client Representative Upstream PS Supervisor

Test recordings

Time	% Test Pressures (kPa) 25%	50%	75%	100%	Design Pressure	Temperatures (°C) Fluid	Surface
1320	900				2400	34°	34°
1330		1800			2400	34°	34°
1340			2700		2400	34°	34°
1350				3601	2400	34°	34°

Test results

Visual Inspection: ☑ Pass ☐ Fail *(See technician comments below)*

Pressure Test: ☑ Pass ☐ Fail *(See technician comments below)*

Test Technician: s 22 irrelevant material

Upstream Production Solutions

Technician comments:

Tested to 3600 kpa found small weep on blind bleed off. Pressure dropped 30kpa i 30 mins.
Dropped pressure re tightened bleed plug.
Re test ok dropped 150kpa i 30 mins.

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ISO 12/12/16

Marked-up P&ID, ISO and/or General Arrangement drawing attached?	☐ Yes	☐ No
Computer generated pressure/temperature plot attached?	☐ Yes	☐ No
Photographs attached?	☐ Yes	☐ No
Test Gauge Calibration Certificates attached?	☐ Yes	☐ No

The above test was performed to a specific set of conditions, as advised and authorised by the client, and the test should not be considered valid outside of those conditions. Upstream Production Solutions Pty Ltd makes no representation nor offers any warranties regarding these conditions nor the results obtained from this test.

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Technician: **Signature:** **Date:** 12/12/16

Witness: **Signature:** **Date:** 12/12/16

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NATA

NATA Accredited Laboratory No. 14382
Accredited for compliance with ISO/IEC 17025 – Mechanical Testing
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VESSEL/PIPE PRESSURE TEST CERTIFICATE

Document Serial No: DSN-CPS-J25344-4257

CUSTOMER:	Upstream Production Solutions	**DATE ITEMS RECEIVED:**	12/12/16
CUSTOMER LOCATION:	Northern Endeavour	**TEST LOCATION:**	Northern Endeavour
CUSTOMER P.O. No:	M100218	**JOB NUMBER:**	CPSJ25344
CUSTOMER REF:	M5000-DP-521.04	**UNIQUE NUMBER:**	CPSJ25344-034
CUSTOMER W.O. No.:	N/S	**CUSTOMER STOCK No.:**	N/S

Equipment Number:	N/S			
Manufacturer:	N/S	**Serial No./Line No.:**	150-PL-3052-03D01-3	
Valve Type:	N/S	**Design Code:**	ASME B31.3	
Size:	6"	**Design Pressure:**	2400	kPa
Rating:	300#	**Design Temperature:**	140	°C

TEST PRESSURES AND DURATION				**TEST METHOD:**	CLIENT SPECIFICATION		
150-PL-3052-03D01-3	**Tested at:**	3600	kPa	**FOR:**	30	min	
	Tested at:		kPa	**FOR:**		min	
	Tested at:		kPa	**FOR:**		min	
	Tested at:		kPa	**FOR:**		min	
Other Tests: (Specify):							

All tests ☒**COMPLIANT** ☐**NOT COMPLIANT**

Date Reports Issued:	13/12/16				
Date of Test:	13/12/16				
Surveyor/client:	s 22 irrelevant material	**Position:**	MC	**Signature:**	s 22 irrelevant material
Authorising Signatory:		**Position:**	Technician	**Signature:**	

NOTES; HYDRO TEST CARRIED OUT AFTER WELD REPAIR 6" 300# SECTION ONLY.

Copies: 1 – Valve 2 – Q.A. Department 3 – Customer on Request
Document Template Issued: Revision 11

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DIGITAL DEVICE CALIBRATION REPORT (TC90)

Certificate Number: CC16-0103

CLIENT:	s 47G business information	**TEST LOCATION:**	Perth Calibration Lab
CLIENT ADDRESS:		**JOB NUMBER:**	J22994
		CLIENT P.O. NUMBER.:	NA
CLIENT REF:	NA	**ACCURACY REQUIRMENT:**	± 0.5 % FS

DEVICE DESCRIPTION

Manufacturer:	s 47G business information	**Range:**	70 000 kPa
Gauge Serial Number:	066786	**Resolution:**	1 kPa
Model:	XP2i	**Reference Level:**	10 mm
Reference Instrument S/N:	EXT1000 51329	**Reference Instrument Report No:**	16EL-0698
Gauge Position:	Vertical	**Test Medium:**	Oil
Settling Time:	≥ 10 sec	**Warm Up Time:**	15 minutes

Calibration Data kPa

	Nominal	As Found Reference	As Left Reference Mean	Device Reading	Correction
Increasing	0	0	0	0	0
	17500	17506	17508	17500	8
	35000	35018	35020	35000	20
	52500	52523	52527	52500	27
	70000	70035	70040	70000	40
Decreasing	52500	52512	52516	52500	16
	35000	35003	35006	35000	6
	17500	17494	17498	17500	-2
	0	0	0	0	0

Comments: Complies to an accuracy of ±0.5% F.S (MANUFACTURERS or USER)
Tested in accordance with MSA Test Method 1 - 2008, Calibration of Pressure Calibrators, Indicators and Transducers
The results of the tests, calibration and/or measurements included in this document are traceable to Australian/National Standards
The term "Device" Refers to the instrument under test.
Adjustment Performed: No

Uncertainty of Measurement:	33 kPa	**Confidence Level:**	95% (k=2)
Recommended Calibration Interval:	12 months	**Environment Temperature:**	20.1°C (Spec 20°C ± 2°C)

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Technical Support Administrator ____ ____ 14 July 2016 DATE ISSUED

Reviewed and Accepted s 22 irrelevant 20/7/16

Authorising ____ ____ 11 July 2016 DATE CALIBRATED

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Copies: 1 – Equipment, 2 – QA Department, 3 – Client on Request
Document Template Issued: Rev 6

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Accredited for compliance with ISO/IEC 17025
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DIGITAL DEVICE CALIBRATION REPORT (TC90)

Certificate Number: CC15-0106

CLIENT:	s 47G business information	**TEST LOCATION:**	Perth Calibration Lab
CLIENT ADDRESS:		**JOB NUMBER:**	J-20364
		CLIENT P.O. NUMBER.:	NA
CLIENT REF:	NA	**ACCURACY REQUIRMENT:**	± 0.5 % FS

DEVICE DESCRIPTION

Manufacturer:	s 47G business information	**Range:**	70 000 kPa
Gauge Serial Number:	067270	**Resolution:**	1 kPa
Model:	XP2i	**Reference Level:**	100 mm
Reference Instrument S/N:	EXT1000 51329	**Reference Instrument Report No:**	15EL-0750-4
Gauge Position:	Vertical	**Test Medium:**	DI H_2O
Settling Time:	≥ 10 sec	**Warm Up Time:**	15 minutes

Calibration Data kPa

	Nominal	As Found Reference	As Left Reference Mean	Device Reading	Correction
Increasing	0	0	0	0	0
	17500	17506	17508	17500	8
	35000	35008	35009	35000	9
	52500	52508	52511	52500	11
	70000	70004	70012	70000	12
Decreasing	52500	52505	52508	25200	8
	35000	35003	35006	35000	6
	17500	17501	17504	17500	4
	0	0	0	0	0

Comments: Complies to an accuracy of ±0.5% F.S (MANUFACTURERS or USER)
Tested in accordance with MSA Test Method 1 - 2008, Calibration of Pressure Calibrators, Indicators and Transducers
The results of the tests, calibration and/or measurements included in this document are traceable to Australian/National Standards
The term "Device" Refers to the instrument under test.
Adjustment Performed: No

Uncertainty of Measurement:	33 kPa	**Confidence Level:**	95% (k=2)
Recommended Calibration Interval:	12 months	**Environment Temperature:**	21.1°C (Spec 20°C ± 2°C)

s 22 irrelevant material

Technical Support Administrator

07 Jan 2016
DATE ISSUED

Reviewed and Accepted
21/1/16

Authorising

06 Jan 2016
DATE CALIBRATED

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Copies: 1 – Equipment, 2 – QA Department, 3 – Client on Request
Document Template Issued: Rev 6

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PICKLING / PASSIVATING REPORT

s 47G business information

PASSIVATION REPORT

I hereby certify that the Duplex spool repair was pickled / passivated in accordance with A380/A380M-13.

Client:	Upstream Production Solution
Job Description:	Duplex spool repair on board the Northern Endeavour
Fluid type:	Ensitech TB-25
Area of treatment:	All weld area and HAZ
Application method:	Tig Brush
Technician:	s 22 irrelevant material
Rinse medium:	Ensitech TB-40
NTW:	70355

s 22 irrelevant material

Date: 22/12/2016

Production Manager

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PURCHASE ORDER

Purchase Order Details

Upstream Production Solutions Pty Ltd - ABN 26 166 665 952
Head Office: Level 11, 607 Bourke Street, Melbourne, Australia 3000
T: +61 3 8623 9800 - F: +61 3 9620 9938
www.upstreamps.com

PO No: M100214 - LAM NT Welding - Coded Welder and Machine

Mobilise welder and all necessary welding equipment to NORTHERN ENDEAVOUR for Duplex Spool repair 6-12 Dec 16

Company Agreement No. 2600003 including agreed departures to apply.

Please supply the undermentioned Services This order is automatically deemed to have been accepted by the Supplier on receipt, unless the Company is otherwise notified in writing within three (3) working days.

Any change to the agreed scope of work requires prior agreement by the Company Representative in writing prior to the works commencing.

Sufficient supporting documentation must be attached to your invoice including signed timesheets (where applicable), third party receipts, expenses or any other supporting documentation required to substantiate your charges.

Company's Representative s 22 irrelevant material

Contractor Representative:

Revision: 0
Date of Issue: 2/12/16
Requested Delivery Date: 6/12/16
Raised By:
Phone:
Requested By:

Payment Terms: 30 Days
Freight Terms: CPT - "Carriage Paid to Darwin"
Ship Via:
F.O.B.:
Currency Code: AUD

Vendor: s 47G business information
Phone:
Fax:
Attention:

Ship To: s 47G business information
Attention:

Invoice To: Upstream Production Solutions
Level 5, 1101 Hay Street,
West Perth
Western Australia 6005

Attention: Perth.Procurement@upstreamps.com

A537413

Line	Item	Vendor Part No	Description	GL Account	Qty	Units	Unit Cost	Line Cost	Tax	Total
1			Coded Welder and Machine to carry out URGENT repairs	NENDB-03-32000	1	EA	14,010.00	14,010.00	1,401.00	15,411.00 AUD

PIPE SPOOL LINE- 150-PL-3052-03D1-PX17

Mobilise welder and all necessary welding equipment to NORTHERN ENDEAVOUR for Duplex Spool repair . Welding machine, clamps , consumables and Coded Welder rate are all based on a (7) day turn around.

NE to supply Argon. NE to supply TA.

Total Line Cost: 1,401.00 15,411.00 AUD

In case of query refer to the PO Requestor:

Quality Requirements			
Standards:		Traceability:	
Material Certificates:		Inspection Required:	
Pressure Rating:		Other as Attached:	

Special Instructions:

PO Authorised By: s 22 irrelevant material

Signature:

A537413