Certificate no.:
TAD00001N0

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Marine Riser Equipment

with type designation(s)
MPD Guided Gooseneck Flow Spool P/N: SSS-134343

issued to
Sub Sea Services AS
STAVANGER, **Norway**

is found to comply with
DNV-OS-E101 – Drilling facilities, Edition July 2021
DNV statutory interpretations DNV-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2021

Application:

See next page

Issued at **Høvik** on **2024-05-30**
This Certificate is valid until **2029-05-29**. for **DNV**
DNV local unit: **Oslo Drilling Systems & Lifting Appliances**

Approval Engineer: **Jan H. Hansen**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

Reference standards

[1] API 6A, Specification for Wellhead and Christmas Tree Equipment, 21tstEdition, October 2018
[2] API 6X, Design Calculations for Pressure- Containing Equipment, 2nd Edition, 2019
[3] API 16A, Specification for Drill-through Equipment, 4th Edition, April 2017
[4] API 16C, Specification for Choke and Kill Equipment, 3rd edition, February 2021
[5] ISO 15156/NACE MR0175 “Materials for use in H2S-containing environments in oil and gas production”, 4th Ed.

Product description

The Guided Gooseneck Spool (GGS) is part of the Weatherford MPD Riser Joint, Gen III system, which also consists of the Annular Isolation Joint (AID), Rotating Control Device (RCD), Lower Crossover and Upper Crossover. The AID and RCD are Weatherford products and covered by separate DNV Type Approvals. This Type Approval (TAD00001N0) is limited to the design approval of the Sub Sea Services Guided Gooseneck Spool (GGS).

Application/Limitation

Main Pipe	Value	Equivalent
Min. Design Temperature:	-18°C	0°F
Max. Design Temperature:	121°C	250°F
Nominal Pipe Size:	22” OD x 1.5” WT	558.8mm OD x 38.1mm WT
API 6A Flanged coupling in each end:	API 6BX 18 ¾”, 10M, BX-164	N/A
Rated Working Pressure:	2 000 psi	138 Bar
Collapse Pressure with no riser tension:	6 468 psi	446 Bar
Max. Rated Load with no pressure or bending moment:	4 000 000 lbs	17793 kN
Max. Rated Load @2000 psi and no bending moment:	3 500 000 lbs	15 569 kN
Service:	Sour, Mud	N/A
Corrosion/Erosion Allowance:	1.3 mm	0.05 in

Other piping	Value	Equivalent
Min. Design Temperature:	-18°C	0°F
Max. Design Temperature:	121°C	250°F
Rated Working Pressure, Choke & Kil Lines:	15 000 psi	1034 Bar
Rated Working Pressure, Booster Line:	7 500 psi	517 Bar
Rated Working Pressure, Hydraulic Lines:	5 000 psi	345 Bar
Rated Working Pressure, Bleed-Off Lines:	2 000 psi	138 Bar
Rated Working Pressure, Flow Lines:	2 000 psi	138 Bar
Rated Working Pressure, Block Connection:	2 000 psi	138 Bar
Service, Hydraulic lines:	Hydraulic oil	N/A
Service, C&K-, Booster-, Blow-Off and and Flow lines:	Sour, mud	N/A
Corrosion/Erosion Allowance for the Kill-, Choke-, Booster-, Bleed-Off and Flow Lines	3.0 mm	0.12 in

Type Approval documentation

Drwg. / Doc. No.	Rev.	Title

Materials

Component	Material	Min. Yield Strength	Min. Yield Strength
Riser Forgings - Riser Outlet	AISI 8630	80 ksi	551 MPa
Riser Forgings - Gooseneck Terminal	AISI 8630	80 ksi	551 MPa
API End Flanges	AISI 8630	80 ksi	551 MPa
Main Pipe	API 5L X-80	80 ksi	551 MPa
Flow Spool Pipe and Bends	API 5L X-52	52 ksi	358 MPa
Flow Spool Box, T-Piece and Flanges	AISI 4130	75 ksi	517 MPa
Bleed-off Line Pipe and Bends	API 5L X-52	52 ksi	358 MPa
Bleed-off Line Flanges, Pin Insert	AISI 4130	75 ksi	517 MPa
Block Connection	AISI 4130	75 ksi	517 MPa
Docking Plate, Weldment	S355J2G3	47 ksi	325 MPa
Docking Plate Brackets	S355J2G3	50 ksi	345 MPa
Docking Plate Wings	S355J2G3	43 ksi	295 MPa
Stud Bolts	A320 L7	105 ksi	725 MPa
Pin-Pin	AISI 4130	75 ksi	517 MPa
K/C Line	AISI 4130	75 ksi	517 MPa
Hydraulic Line	Duplex	65 ksi	448 MPa
Booster Line	AISI 4130	75 ksi	517 MPa
Gooseneck Locking Bolts	S165M	101.5 ksi	700 MPa
Umbilical Cage / MQC Plate	AISI 316 L	32 ksi	220 MPa

Fabrication/Testing Procedures

Test Procedures:

1. Charpy impact testing shall be performed in accordance with DNV-OS-E101, Ch.2, Sec.2, 2.6
2. Pressure testing shall be performed in accordance with DNV-OS-E101, Ch.2, Sec., 8, 3.3
3. Functional testing shall be performed after installation, in accordance with DNV-OS-E101, Ch.2, Sec.8, 4.2

NDE Procedures:

4. NDE/NDT shall be performed according to DNV-OS-E101, Ch.2, Sec.8,3.1.

Welding Procedures:

5. Qualification of welders, and welding, shall be in accordance with DNV-OS-E101, Ch.2, Sec.8, 2.3 and 2.4

Marking of product

- Manufacturers Name or Mark
- Part No.
- Serial No.
- Size
- Pressure Rating
- Temperature Rating
- VL TAD00001N0

Comments

- Each product to be surveyed during fabrication in accordance with the requirements for equipment of Category 1 as defined in DNV-OS-E101 Ch.3 Sec.3, followed by issuance of a DNV Product Certificate.
- Fabrication records shall be maintained by the manufacturer in accordance with DNV-OS-E101 Ch.3, Sec.3 §2.
- Hardness testing shall be performed, with acceptable results, on parts with surfaces exposed to sour service as per

ISO 15156/NACE MR0175

Some drawings related to this Type Approval consists of components that are covered by several separate DNV Type Approvals. These drawings are related to:

- The Weatherford ‘Annular Isolation Joint’ (AID) covered by DNV Type Approval TAD00001HW.
- The Weatherford ‘Below Tension Ring Marine Riser Rotating Control Device’ (BTR-MR RCD) / Latch Assembly covered by DNV Type Approval TAD00001HZ.
- The Sub Sea Services 5” Manual Gooseneck with a 5” SSS Box connection covered by DNV Type Approval TAD00001MW.
- The Sub Sea Services Pin/Box connections for the Choke and Kill, and auxiliary lines are covered by DNV Type Approval TAD000017N.

- The Upper and Lower Crossovers are not part of this Type Approval. These are specific to each Drilling Rig.
- Electrical components and cabling including pressure and temperature sensors are not covered by this TA.
- Valves are not covered by this Type Approval and shall be delivered with DNV product certificate.
- Accumulators are not covered by this Type Approval and shall be delivered with DNV product certificate.
- Approval of Hydraulic Diagrams, Control system, Risk assessment and global riser analysis is not covered by this TA.

Certification Retention Survey

For retention of the Type Approval Certificate, DNV AS’s representative shall carry out surveys every second year in accordance with DNV Type Approval Scheme DNV-CP-0338.

END OF CERTIFICATE