Certificate no.:
TAD00001MW

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Marine Riser Equipment

with type designation(s)
5'' Manual Gooseneck P/N: SSS-131762

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 **2024-05-13**
This Certificate is valid until **2029-05-12**. 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

This 5” Manual Gooseneck is intended to be used on a Guided Gooseneck Flow Spool (GGS) which is a part of the Weatherford MPD Riser Joint Gen III system.

Application/Limitation

Design Specifications	Value
Gooseneck Minimum Bore ID:	5 in (127 mm)
Maximum Internal Working Pressure:	2000 psi (138 bar)
Maximum external tension / load:	118 kN / 12 mT
Maximum external shear load:	12 kN
Maximum allowable bending moment:	30 kNm
Min. / max design temperature:	-18 ˚C / +121oC (API 16C Rating U)
Corrosion allowance:	3.0 mm
Service:	Sour/Mud
Connection at hose end:	6 GR62 Grayloc Hub
Female end connection:	5 in ID SSS Box

Type Approval documentation

Drawing / Doc.No	Rev.	Title

Materials

Components	Material	Min. Yield Strength
Main Body, Gooseneck	AISI 4130	75 ksi / 517 MPa
Gooseneck Box	AISI 4130	75 ksi / 517 MPa
Connector Grayloc Hub	AISI 4130	75 ksi / 517 MPa
Wing, Gooseneck	S355 (40<t≤63)	47 ksi / 335 MPa
Lifting Plate	S355 (16<t≤40)	50 ksi / 345 MPa

Wing Docking Plate	S355 (100<t≤150)	43 ksi / 295 MPa
Pin-Pin	AISI 4130	75 ksi / 517 MPa
Locking Bolts	S165M	102 ksi / 700 MPa
Socket Head 1.5'' Bolts	L7	105 ksi/ 724 MPa

Design Validation Test per API 16C Annex A is understood covered by earlier design validation tests for similar pin/box designs as used in the end of this Gooseneck although the SSS 5" ID SSS Box female connection design is not covered by DNV Type Approval TAD000017N.

Fabrication/Testing Procedures

Test Procedures:

1. Pressure testing to 1,5 x rated working pressure shall be performed according to DNV-OS-E101, Chapter 2 Section 8, 3.3 and API 16C 7.4.1.

2. Charpy impact testing shall be performed in accordance with DNV-OS-E101, Ch.2, Sec.8 3.2 and Sec.2, 2.6.

NDE Procedures:

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

Welding Procedures:

4. Qualification of welders, and welding (CRA inlay), shall be in accordance with DNV-OS-E101, Ch.2, Sec.8, 2.3 and 2.4.

Marking of product

For traceability the following marking is to be carried out on each product:

- Manufacturers Name or Mark
- Part No.
- Serial No.
- Size
- Pressure Rating
- Temperature Rating
- VL TAD00001MW

Comments

- Lifting and installation of the gooseneck is not part of scope for this Type Approval

- Maximum listed external tension and bending moment includes environmental loads

- This Gooseneck might be used in water depths down to 500m if there is no external overpressure from surrounding seawater, e.g. deployed with at least one open end. For other conditions, with closed ends, additional design calculations shall be submitted to DNV for approval.

- 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

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