Certificate No:
TAD00001GV

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Pressure Vessels

with type designation(s)
SURGE TANK 100 BBL, Type VST-FAC

Issued to
ETUDES ET PRODUCTIONS SCHLUMBERGER SAS
CLAMART, **France**

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 **2022-09-15**
This Certificate is valid until **2027-09-14**.
DNV local station: **VMC UAE**

Approval Engineer: **Nishant Koti**

for **DNV**

Per Esvall
Head of Section

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.

Product description

The vertical twin surge tank has an external diameter of 1900 mm with total length (cylindrical shell + dished ends) of 5956 mm. The tank is divided into two compartments with an 8-mm thick, leak-tight internal wall, which has been reinforced with nine stiffeners of section type UPN 160. This Type Approval Certificate (TAC) covers design, VST-FAC for low temperature -20°C.

The Pressure vessel is designed according to ASME Sec.VIII Div. I, 2013 edition with following main data.

Design pressure	:	10.34 bar (150 psi)
Hydraulic test pressure	:	15 bar
Maximum design temperature	:	100 °C (212 °F)
Minimum design temperature, VST-FAC	:	-20 °C (-4 °F)
Vertical acceleration	:	2.943-m/s^2 (0.3g)
Horizontal acceleration	:	0.196-m/s^2 (0.02g)
Velocity of wind	:	30 m/s
Corrosion allowance	:	2 mm
Joint efficiency	:	1
X-Rays	:	100%
Fluid	:	Hydrocarbons (w/ H_2S content)
Tank capacity	:	16 m^3 (100.6 BBL)
Weight empty	:	approx. 7 000 kg (pressure vessel only)

Application/Limitation

- This tank is mounted vertically in a frame, this frame shall be delivered with DNV Product Certificate.

- The material is to be delivered with material test certificate of level EN 10204-3.1.B or equivalent.

- The materials with reference thickness over 6 mm are to be impact tested at minimum design temperature (MDT) according to DNV-OS-E101 Ch.2 Sec.2 § 2.6.1.3. Materials for piping and pressure containing components are, independent of material thickness and MDT, to meet Charpy V-notch energy values of minimum 27 J at MDT, ref. 2.1.4.

- This document may be used as part of the documentation required to comply with European Union (EU) Directives referenced in PSA's Acts, regulations and provisions for the petroleum's activities. It should however be noted that the scope covered by this document does not necessarily cover all aspects required to issue the EU Declaration of Conformity and to affix the CE-mark. It is the manufacturers/operators responsibility to ensure compliance with relevant EU Directives.

- Each surge tank is to be surveyed during fabrication in accordance with the requirements of Category I as defined in DNV AS' Offshore Standard DNV-OS-E101 "Drilling facilities", followed by issuance of a Product Certificate (PC). If the intended installation is DNV classed, this automatically means DNV Product Certificate. Fabrication records are to be maintained in accordance with DNV-OS-E101 Ch.3, Sec.3, §2.1.2.

- This certificate replaces the earlier issued certificate TAD0000008, dated 2015-06-23, which has identical design.

Type Approval documentation

Marking of product

For traceability of this Type Approval Certificate, the products are to be marked with serial number and this type approval certificates number.
In addition, the marking is to show the following particulars:

a) The name and domicile of the manufacture

b) The manufacture's type designation

c) The year of manufacture

d) The maximum design pressure

e) The maximum/minimum design temperatures in °C

f) The hydraulic test pressure

Periodical assessment

For renewal of TA certificate periodical assessment shall be done by DNV surveyor to verify that the conditions for the TA are not altered since the certificate was issued.

The main scope of the periodical assessment shall be:

— review of the TA documentation and verification that this documentation is still used as basis for the production
— review of possible changes in design, material and performance of the product
— verification of the company's production and quality systems w.r.t. ensuring continued consistent production of the type approved products to the required quality
— verification of that the product marking for identification and traceability to the TA Certificate is not altered.

END OF CERTIFICATE