



Certificate No:
TAD00001JU

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Miscellaneous

with type designation(s)
Locking system for SPM

Issued to

Enhanced Drilling AS
Straume, 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 :

System for locking SPM (Subsea Pump Module) to the MRJ (Modified Riser Joint).

Issued at **Høvik** on **2023-05-11**

This Certificate is valid until **2028-05-10**.

for **DNV**

DNV local unit: **Oslo Drilling Systems & Lifting Appliances**

Approval Engineer: **Hallvard Thune Uglande**

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.



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Codes and Standards used as reference

API Spec 6A, Specification for Wellhead and Christmas Tree Equipment, 21st edition

ISO 13628-7:2005 Design and operation of subsea production systems Part 7: Completion/workover riser systems

Product description

The SPM Locking System is a manually operated mechanism which restrains the SPM (Subsea Pump Module) to the MRJ (Modified Riser Joint). The SPM is structurally supported and restrained in all directions, however it is free to move in the upward vertical direction due to the inherent design which allows it to be installed and removed from the MRJ.

Application/Limitation

Min design temperature	-15 deg C (Deployment) / -4 deg C (Subsea)
Max SPM discharge pressure	69 bar (1000 psi)
Wave loads (0 SPM discharge pressure)	165 kN (max vertical slamming force)

Type Approval documentation

Tests to be carried out

- Charpy testing shall be performed in accordance with DNV-OS-E101, Ch.2, Sec.2.
- NDE/NDT shall be performed in accordance with DNV-OS-E101, Ch.2, Sec.8.3.
- Functional and pressure testing shall be performed in accordance with DNV-OS-E101, Ch.2, Sec.8.3.

Marking of product

Marking shall be in accordance with DNV-OS-E101, Ch.2, Sec.8.2.

Other conditions/comments

- Fabrication records shall be maintained by the manufacturer in accordance with DNVGL-OS-E101, Ch.3, Sec.3.2.
- All main load bearing components are to be delivered with 3.1 material traceability certificate per EN 10204.

Periodical assessment

For retention of the Type Approval Certificate, DNV Surveyor shall perform a survey – every second year and before expiry date of this certificate. This is in order to verify that the conditions for the type approval are complied with, ref. DNV-CP-0338, DNV Type approval scheme.

END OF CERTIFICATE