



Certificate No:
TAD00001GJ

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Mud and Cementing Equipment

with type designation(s)
Skid, PCS-622B DOUBLE PUMP SKID

Issued to
SJS Limited
Jingzhou,, Hubei province,, China

is found to comply with
DNV-OS-E101 – Drilling facilities, Edition July 2021

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Issued at **Houston** on **2023-03-28**

This Certificate is valid until **2028-03-27**.

DNV local unit: **Wuhan NB & CMC**

for **DNV**

Approval Engineer: **Bo Cui**

Mark Miser
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.



Form code: TA 251

Revision: 2022-12

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The following codes and standards were used as a reference:

API Specification 7K, Specification for Drilling and Well Servicing Equipment, 5th Edition

Product description

PCS-622B double cementing pump skid with two configurations, carbon steel joint and stainless steel joint.

Application/Limitation

Design Parameter	Value	Equivalent
Minimum Working Temperature	-20 °C	(-4 °F)
Maximum Working Temperature	50 °C	(122 °F)
Maximum Pressure (High Pressure Side)	105 MPa	(15,000 psi)
Hydraulic System Pressure Rating	34.4 MPa	(5,000 psi)
Maximum Displacement	3.0 m ³	(105.9 ft ³)
Mixing Capacity	0.3 ~ 2.3 m ³ /min	(2 ~ 14.4 bpm)
Range of Mixing Density	1.3 ~ 2.5 g/cm ³	(18.1 lb/ft ³ ~ 156.1 lb/ft ³)
Mud Outlet Joint	2" Fig.1502 Male Union	
Working Area	Zone II, T3, IIA	

Type Approval documentation

Tests carried out

Reference to project A1212758, DNV witnessed proto-type tests.

Marking of product

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

1. Serial Number
2. Manufacturer's name or trademark
3. Additional Marking at the manufacturer's discretion

Periodical assessment

For retention of the Type Approval, DNV's surveyor shall perform periodical assessment after 2 years (+/- 90 days) and after 3.5 years (+/- 90 days) in accordance with DNV's Class Program DNV-CP-0338, Section 4.

Other Comments and Conditions

1. Triplex Pump Model TPD600 has been approved previously on Type Approval Certificate TAD0000162
2. HP Manifold Components have been approved previously on Type Approval Certificate TAD000015E
3. Category I items not named in the drawing section above shall be purchased with a product certificate.
4. Skid frame is reviewed for installation lift only.
5. Scope of certificate does not include flexible cement hoses for discharge.
6. The CAT C15 diesel engines, centrifugal pumps, and other Category II items shall be delivered with a works certificate prepared by the manufacturer.
7. Factory Acceptance Testing of the completed skid must be completed and witnessed by a DNV surveyor prior to the issuance of a Product Certificate.
8. The electrical and control system shall be subject to product testing for prior to the final issue of the type approval certificate.
9. Product testing activities relating to the electrical and control system, shall consist of and shall not be limited to:
 - a. a visual inspection of the assembled electrical and control system
 - b. a visual inspection of the earthing system installed on the package equipment with respect to the electrical earth system and equipotential (frame) earth system, where both earth systems shall be wired as separate networks
 - c. a visual inspection of the installed electrical cables and internal wiring, to ensure that all cables and wires are labeled to assist with circuit identification.
 - d. A visual inspection that all electrical equipment, installed instrumentation, electrical equipment installed inside each panel is labeled for identification purposes.
 - e. Operating voltage and frequency shall be recorded
 - f. functional testing of the assembled equipment (both manual mode & automatic mode)
 - g. functional testing of the assembled equipment (both local mode and remote mode)
 - h. testing of the safety interlocks
 - i. testing of the shutdown functions, both local and remote shutdown, to ensure that the electrical and control system is de-energized in the event of an emergency
 - j. alarm management per DNV-OS-D202
 - k. Verify compliance to D202, Ch.2 Sec. 1, (1.1.2) The failure of any remote or automatic control system shall initiate and audible alarm at manned control station and shall prevent manual control.

l. The system is equipped with control panel containing microprocessor-based equipment such as programmable logic controller and HMI panel. Hardware serial numbers of each microprocessor device (inclusive of input/output and communication cards) and HMI panel shall be recorded.

m. The system is equipped with control panel containing microprocessor-based equipment such as programmable logic controller and HMI panel. The software program version used (downloaded) shall be recorded. Rule reference D202, Ch.2 Sec.3 (2.3, Software and hardware change management)

n. A complete set of technical documentation (inclusive of catalogue product data) shall be made available for review in conjunction with the visual and functional testing activities.

10. DNV Project Ref. A1233206.

END OF CERTIFICATE