TYPE APPROVAL CERTIFICATE

Certificate No:
TAD00006R

This is to certify:

That the Mud and Cementing Equipment

with type designation(s)
Cementing Skid

Issued to
SJS Limited
Jingzhou City Hubei, China

is found to comply with
DNV-OS-E101 Drilling Plant October 2013

Application :

See next page.

This Certificate is valid until **2019-11-18**.

Issued at **Høvik** on **2015-11-19**

for **DNV GL**

DNV GL local station: **Wuhan CMC**

Approval Engineer: **Nishant Koti**

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.

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Reference Standards

- API Spec 7K – Specification for Drilling and Well Servicing Equipment, 5th Edition
- Eurocode 3 Design of steel structures, April 2006

Product description

- The PCS-522B Twin pump cementing skid is designed for offshore cementing, acidizing, pressure test and other fluid pumping jobs.

Application/Limitation

	Value		Equivalent
Min Working Temperature	-4°F		-20°C
Max Working Temperature	122°F		50°C
Max Working Pressure for P40-44-751	11,200 Psi		772 Bar
Test Pressure for P40-44-751	16,800 Psi		1158 Bar
Max Working Pressure for P40-40-751	15,000 Psi		1034 Bar
Test Pressure for P40-40-751	22,500 Psi		1551 Bar
Max Slurry Density	11-20.9 lb/gal		1.3-2.5 g/cm3
Mixing Capacity range	2-14.4 bpm		0.3-2.3 m3/min
Max Displacement			2.7 m3/min
Area Classification	Zone 2		
Condition	A_X [m/s²]	A_Y [m/s²]	A_Z [m/s²]
Max. accelerations	3.0	5.7	13.0

Type Approval documentation

Material Specification

Fabrication Procedures

Test Procedures

- Pressure testing to 1.5xWP shall be performed in accordance with DNV-OS-E101, Ch.2 Sec.6 §4
- Charpy testing shall be conducted at or below the minimum design temperature, and shall be in accordance with DNV-OS-E101, Ch.2 Sec.2 §2.

NDE Procedures

- NDE/NDT procedures shall be in accordance with DNV-OS-E101, Ch.2 Sec.6 §3

Welding Procedure

- Qualification of welding procedures and welders shall be in accordance with DNV-OS-E101, Ch.2, Sec.6 §2

Tests carried out

- Prototype testing shall comply with the testing requirements noted above

Marking of product

For traceability the following narking is to be carried out on each product:
- Part No.
- Serial No.
- Pipe No
- Rated Pressure Capacity
- Material Identification
- Manufacturers Name or Mark

Other conditions and comments

– This approval includes only the structural integrity of the fluid end (D/NO P40-44-751 Rev D and P40-40-751 Rev B) and frame assembly (D/No B01-21-760 Rev A), not the functionality of the pump.

– High Pressure manifold and release manifold (P.No B01-13-556) shall be delivered with DNV GL Product certificate.

– Hydraulic system is not included in this approval.

– Electrical system is not included in this approval.

– Centrifugal pumps (P.No B01-27-486, B01-27-487, B01-27-488) shall be delivered with 'works certificate' prepared by the manufacturer.

– Two CAT C15 diesel engines shall be delivered with 'works certificate' prepared by the manufacturer.

– EX documentation shall be submitted to DNV GL surveyor at site. For EX certificates with certificate number that is ending with 'U' or 'X', a document stating compliance with the special conditions given in the certificate shall be presented and demonstrated to local DNV GL Surveyor.

– Each product is to be surveyed during fabrication in accordance with the requirements for equipment of Category 1 as defined in DNV's Offshore Standard DNV-OS-E101 Drilling Plant, followed by issuance of Product Certificate. If the intended installation is DNV classed, then this

automatically means DNV Product Certificate. Fabrication records are to be maintained in accordance with DNV-OS-E101 Ch.3, Sec.3, 2.

Periodical assessment

For retention of the Type Approval, DNV GL's representative shall carry out biennial Product Audits in accordance with Standard for certification No. 1.2, Chapter 4, dated January 2013.

END OF CERTIFICATE