DNV·GL

Certificate No:
TAD00000VK

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Mud and Cementing Equipment

with type designation(s)
Batch Mixer Skid

Issued to
Halliburton Energy Services
Duncan OK, USA

is found to comply with
DNVGL-OS-E101 – Drilling plant, Edition July 2015

Application :

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

Issued at **Houston** on **2017-12-21**
This Certificate is valid until **2022-12-20**.
DNV GL local station: **Certification & Inspection Services**

Approval Engineer: **Kairy Otero**

for **DNV GL**

Nick Prokopuk
Team Lead

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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Job Id: **262.1-007204-3**
Certificate No: **TAD00000VK**

Product description

- Batch Mixer Skid, Twin Centrifugal Pump, Zone 2, 160 Kw Electric Motor P/N 102034609
- Batch Mixer Skid, Twin Centrifugal Pump, Zone 2, 160 Kw Electric Motor P/N 102146864
- Batch Mixer Skid, Twin Centifugal Pump, Safe Area Cat C7, P/N 102034608
- Batch Mixer Skid, Twin Centrifugal Pump, Zone 2, 160 Kw Electric Motor, 690V, Heat exchanger P/N 102102458

Application/Limitation

- Min. Design Temperature : 0 °C (32 °F)
- Max. Design Temperature : 45 °C (113 °F)
- Max. Working Pressure (Low Pressure Piping) : 150 psi
- Service : Cementing
- Hazardous Area Classification : Zone II, Group IIB, Temp. T3
- Dynamic Operating Conditions : 0.1g pitch, 0.1g roll, 1.1g heave w/ Tanks Full
- Dynamic Survival Conditions : 0.2g pitch, 0.2g roll, 1.2g heave w/ Tanks Empty

Note:

1. Lifting of equipment skids is not included in this certificate.
2. Tank design shall be considered part of the lifting frame.
3. Lifting frame and skid assembly shall be reviewed for lifting application and be supplied with appropriate lifting certificate
4. Diesel driven packages and related controls must be installed in a safe area.
5. Tanks must be empty during Survival Conditions.
6. See comments for required batch mixer skid supports.

Type Approval documentation

Description	Part No.	Rev	Drwg. No.	Rev
Installation, 160/185 KW Motor & Starter, 480V	102112988	A	D00583710	A
Installation, 160 KW Motor & Starter, 690V	101538616	G	D00265094	D
Installation Shell and Tube Heat Exchanger, 160KW Motor	101364508	A	D00119744	A
Left Tank Assembly, 50 Bbl., Batch Mixer	101354434	J	D00119701	K
Right Tank Assembly, 50 Bbl., Batch Mixer	101354435	J	D00119702	K
Control Stand, Electrical Equipment, Safe Area, Diesel	101357340	K	D00129075	F
Installation, Batch Tanks, Platform, Control Stand & Grate	101358028	F	D00119769	E
Frame Assembly, Batch Mixer Skid	101358046	AA	D00100857	W
Weldment, Hydraulic Power Package Base	101360248	G	D00119741	G
Piping, Air, Complete	101360824	B	D00119762	B
Module, 160 KW Motor, Single Centr. Pump, Complete	101360842	G	D00119760	D
Stock Module Cat C7, Single Centr. Pump, Complete	101633049	D	D00302069	C
Stock Module 160 KW Motor, Twin Cent. Pump	101633893	D	D00302331	C
Stock Module Left Tank Assembly	101749784	F	D00119701	K
Stock Module Right Tank Assembly	101749781	F	D00119702	K
Installation, Hydraulic Piping, Complete	101633356	B	D00302144	B
Installation, Motor Module, 160 KW Motor, Batch Skid	101361348	C	D00119756	C
Control Stand, Single Pump, Safe Area Diesel	101378702	D	D00138418	C
Control Stand, Twin Pump, 160KW Motor Zone II	101379927	N	D00146367	H
Control Stand, Electrical Equip., 160 KW Motor, Zone II	101380601	C	D00146373	B
Installation, Densiometer, AC, Micro-Motion, DL200	101381848	E	D00146375	B
Installation, Engine Module, Cat C7	101597795	B	D00286045	A

Calculations:

Date	Title
27 September 2006	50 Barrel Batch Mixer Tanks and Skid Job No. 06-104
06 December 2006	Electric Driven Batch Mixer Skid

Fabrication Procedures

Procedures related to testing, welding, NDT, traceability, etc are to be reviewed/approved by DNV's local surveyor

Tests carried out

Test unit in accordance with Halliburton test procedure D00162858, D00295462 rev.C.

Certificate retention survey

The arrangement is to be in accordance with Certification Notes No. 1.2, dated December 1996, paragraph 4.3.

Documentation to be accompanied with each product/delivery

1. Data book index
2. Equipment name, number, purchaser, etc.
3. Manufacturer's statement of compliance
4. Assembly drawing
5. Actual material certificates as purchased and Charpy impact test records as applicable
6. Heat treatment records/charts when applicable
7. Load, pressure and performance test reports
8. Electrical equipment hazardous area certifications
9. DNV GL approved welding procedures
10. DNV GL Product Certificate
11. DNV GL Type Approval Certificate

Other conditions/comments

- Electrical equipment must be delivered with hazardous area certification and must be installed in accordance with manufacturer's recommendations and certifying agency restrictions.
- Electrical equipment and wiring must be installed, supported and grounded in accordance with DNV OS-D201.
- All welding procedures are to be properly qualified to the appropriate code and reviewed/accepted by DNV's local surveyor.
- NDE to be carried out in accordance with DNVGL-OS-E101.
- All interpretation of NDE results shall be made by operator qualified to SNT-TC-1A level II or equivalent.
- Material traceability of primary members to be maintained during all stages of manufacturing.
- Bolts and nuts to be secured against unintentional unscrewing and pre-stressed according to recognized procedures.
- Functional testing and inspection to be carried out after final installation to the satisfaction of DNV GL's local surveyor.
- Batch mixer skid must be supported at the ends and at two equally spaced points along each side.

END OF CERTIFICATE