



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. D-3612
This Certificate consists of 4 pages

This is to certify that the
VALVE

with type designation(s)
3 1/16"-10K MODEL 200M W/DF ACTUATOR VALVE
P/N: M1859


Manufactured by
WORLDWIDE OILFIELD MACHINE, INC.
HOUSTON, TEXAS 77035, USA

is found to comply with
DNV's Offshore Standard DNV-OS-E101 "Drilling Plant", 2006 Edition

and Det Norske Veritas' understanding of the implementation and interpretation of:
PSA's "Regulations relating to the Design and Outfitting of Facilities etc. in the Petroleum Activities (the Facilities Regulations)", Chapter IV, Last Amended 20 December 2007

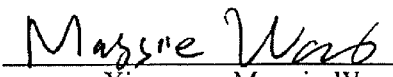
Application
See design limitations on page 2

Place and date
Houston, 2009-05-05
for DET NORSKE VERITAS (USA) INC.


Brandon Caraway
Head of Section



This Certificate is valid until
2013-05-31


Xiangwen Maggie Wang
Project Engineer

Notice: 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.

Any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.



ID No.: 262.1-007737-1
Cert. No.: D-3612
File No.: 523.85
DNV Project No.: EP001739

Product description

- 3 1/16"-10K Model 200M w/DF Actuator Valve Assembly, PN: M1859

The following design codes/standards were used as references:

- API 6A, *Wellhead and Christmas Tree Equipment*, 19th Edition
- ISO 15156-3, *Petroleum and Natural Gas Industries for use in H₂S containing environment in Oil and Gas Production*, 1st Edition
- ASME VIII, Div. 2, *Boiler & Pressure Vessel Code*, current Edition

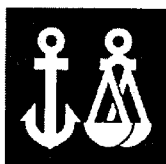
Application/Limitation

- Maximum Working Pressure : 10,000 psi
- Minimum Design Temperature : -20 °F
- Maximum Design Temperature : 250 °F
- Service : H₂S

Type Approval documentation

Drawings:

<u>Drawing No.</u>	<u>Rev.</u>	<u>Title</u>
- M1859	0	"MDL. 200M" Sub-sea Dual Target Block Gate Valve, 3-1/16"-10K W/ #5 Hub Connection BX-154
- M1859-1	1	Valve Assy., 3 1/16" 10K, Model 200M W/DF Actuator
- M1859-2	0	"MDL. 200M" Sub-sea Dual Target Block Gate Valve, 3 1/16"-10K W/ #5 Hub Connection BX-154
- M1859-2W	0	"MDL. 200M" Sub-sea Dual Target Block Gate Valve, 3 1/16"-10K W/ #5 Hub Connection BX-154
- M1859-2A	1	"MDL. 200M" Sub-sea Dual Target Block Gate Valve, 3 1/16"-10K
- M1859-2C	0	"MDL. 200M" Sub-sea Dual Target Block Gate Valve, Body Plug, 3 1/16"-10K
- M1859-2B	3	3 1/16"-10K, #5 Hub w/BX-154 Groove (Semi-Finished) "MDL. 200M" Sub-sea Dual Target Block Gate Valve
- 3167	0	3 1/16"-10M CIW 'DF' R.A. Gate
- SW1062	9	3 1/16"-3/5/10M WC Seat
- SW1071DF	3	3 1/16"-10M 'Magnum' Seat Retainer (WC) DF
- SW2957	0	3 1/16"-10M CIW 'DF' Stem Protector
- M1859-3	1	Actuator Assy., 3 1/16" 10K, Model 200M
- M0648-17	0	Bonnet, 3 1/16"-10K CIW MOD.DF
- 3458	1	Gasket, Bonnet 3 1/16"-10M CIW
- M0648-10	0	Operating Stem, 3 1/16"-10K CIW MOD.DF Actuator



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<u>Drawing No.</u>	<u>Rev.</u>	<u>Title</u>
- M0648-9	0	Piston, 3 1/16"-10K CIW MOD.DF Actuator
- M0648-14	0	Cylinder, 3 1/16"-10K CIW MOD.DF
- M0648-4	0	Cylinder Head, 3 1/16"-10K CIW "DF" Actuator
- M0648-21	0	Packing Gland, 3 1/16"-10K CIW MOD.DF Actuator Valve, Assy. 3-1/16"-10K Model 200M W/DF Actuator

Material Specifications:

<u>Part</u>	<u>Material</u>	<u>Min. Yield Strength</u>
- Body, bonnet, body plug, flange and seat	WOM's 4.6.10/11	60,000 psi
- Stem and seat retainer	WOM's 4.6.15	105,000 psi
- Stem protector	WOM's 4.6.50	36,000 psi
- Gate and actuator housing	WOM's 4.6.11	75,000 psi
- Cylinder head and packing gland	WOM's 4.6.10	60,000 psi
- Bolting	WOM's 4.6.18	105,000 psi

Calculations:

- N/A

Fabrication Procedures

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

Prototype testing

Previously carried out

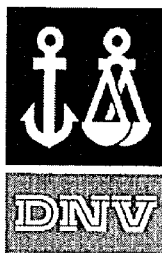
Marking of product

For traceability to this Type Approval Certificate the products are as a minimum to be marked as follows:

1. "NV D-3612"
2. Serial Number
3. Manufacturer's name and trademark
4. Safe Operating Loads

Certificate retention survey

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



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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. DNV Product Certificate
9. DNV Type Approval Certificate

Other conditions/comments

1. Testing and NDE to be carried out to the satisfaction of DNV's local surveyor.
2. All welding procedures to be reviewed/accepted by DNV's local surveyor.
3. 100% traceability required on primary pressure containing and load bearing parts.
4. Charpy impact testing is required on bolting material.
5. Hardness testing on all equipment with wetted surface is required to comply with ISO 15156.
6. This Certificate is based on previously issued Design Verification Report DVR-19172-J-698 Rev. 0 dated 20 August 2007.

END OF CERTIFICATE



DET NORSKE VERITAS

Certificate No
HOU-13-03348

PRODUCT CERTIFICATE

Manufacturer:	Worldwide Oilfield Machine, Inc.
Manufacturer's order No.:	A43475
Purchaser:	Transocean Offshore
Purchaser's order No.:	Globe-0000607510
The product is intended for	
Yard:	Mitsui Engineering & Shipbuilding
Yard No.:	109595
Name of vessel:	"SEDCO 710"
DNV Id. No.:	24594
THIS IS TO CERTIFY:	
that the product:	One (1) 3-1/16" -10K Model 200M w/DF Actuator Valve PN: M1859
Type designation:	3-1/16" -10K Model 200M w/DF Actuator Valve
Intended purpose:	Valve
Serial No(s):	A-28651
Has been built and tested in accordance with the relevant requirements of:	
DNV Rules for Classification:	<input type="checkbox"/> Ships <input type="checkbox"/> HSLC <input type="checkbox"/> Naval <input checked="" type="checkbox"/> Offshore
	<input type="checkbox"/> Other standards: DNV Offshore Std., DNV-OS-E101, "Drilling Plant" October 2009

Remarks (if more than one line, use page 2):

The product was marked: **Serial Number A-28651**

On: **Component**

This field is only to be filled in when the certification is based on a Manufacturing Survey Arrangement (MSA).

The undersigned manufacturer declares that the product/system has been built and tested in accordance with the specification/standard stated above and the conditions referred to in
Manufacturing Survey Arrangement No:
Quality System Certificate No:

For Manufacturer:

Place:

Date:

(name)
(title)

This Certificate is only valid when signed by a DNV surveyor.



Digitally Signed By: Anderson, Victor

Location: DNV Houston, Texas

Signing Date: 4/22/2013

For Det Norske Veritas AS

Place: **Houston, Texas**

Date: **2013-04-15**

Victor Anderson
Surveyor

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

Technical data:

Reference: -DNV Offshore Std., DNV-OS-E101, "Drilling Plant" October 2009

- API 6A, Wellhead and Christmas Tree Equipment, 19th Edition
- ISO 15156-3, Petroleum and Natural Gas Industries for use in H2S containing environment in Oil and Gas Production, 1st Edition
- ASME VIII, Div. 2, Boiler & Pressure Vessel Code, current Edition
- Maximum Working Pressure : 10,000 psi
- Minimum Design Temperature: -20 oF
- Maximum Design Temperature: 250 oF
- Service: H2S

Remarks:

Surveys carried out during manufacturing:

- a. Review/Approve Welding Procedures
- b. Review Final Data Book

Marking and certificate numbers for the different parts:

N/A

Drawings with dates of approval and/or type approval certificate number:

D-3612