DNV·GL

Certificate No:
TAD00000VV

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Valves

with type designation(s)
3-1/16 15K T-HB Hydraulic Gate Valves
Part Numbers: See Page 2

Issued to
National Oilwell Varco
Houston, Texas, USA

is found to comply with
DNVGL-OS-E101 – Drilling plant, Edition July 2015
DNVGL-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2015

Application :

See Page 2

Issued at **Houston, TX** on **2018-01-15**
This Certificate is valid until **2023-01-14**.
DNV GL local station: **Approval CMC**

Approval Engineer: **Kevin Bui**

for **DNV GL**

Meindert Van Mierlo
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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Design Codes/Standards Used as References

- API Spec 6A, Specification for Wellhead and Christmas Tree Equipment, 20th Ed
- NACE MR0175, Materials for Use in H_2S-containing Environments in Oil & Gas Production, 2015 Ed

Product Descriptions

Part No./Rev.	Equiv. Part No.	Drawing No./Rev.	Description
17460209-001/1.2		17460209-ASM/1	Valve Assembly
20073349-3G/2		20072572-3D/-	Valve Assembly
51008365/1		51008365-ASM/1	Valve Assembly
51009014/1		720046D/E	Valve Assembly
719794-6A3-300/E	11126814-300	720046D/E	Valve Assembly
719804-6A3/A		720046D/E	Valve Assembly
M991001661/6	17463127-001	M991001661-ASM-001/1	Valve Assembly
M991005761/4	10309659-001	M991001661-ASM-001/1	Valve Assembly
M991005890-300/4	10309674-300	M991001661-ASM-001/1	Valve Assembly

Application/Limitation

Design Parameter	17460209-001	20073349-3G	51008365
Valve			
Max Working Pressure (psi)	15,000	15,000	15,000
Shell Test Pressure (psi)	22,500	22,500	22,500
Temperature Class (°F)	P+U	P+U	P+U
Material Class	DD-NL	DD-NL	EE-NL
Product Spec Level	3	3G	3
Performance Requirement	1	1	1
Actuator			
Max Working Pressure (psi)	3,000	3,000	3,000
Shell Test Pressure (psi)	4,500	4,500	4,500
Temperature Class (°F)	-20 to 150	-20 to 150	-20 to 150
Material Class	AA	AA	AA
Performance Requirement	1	1	1

Design Parameter	51009014	719794-6A3-300	719804-6A3
Valve			
Max Working Pressure (psi)	15,000	15,000	15,000
Shell Test Pressure (psi)	22,500	22,500	22,500
Temperature Class (°F)	P+U	P+X	P+U
Material Class	DD-NL	DD-NL	DD-NL
Product Spec Level	3G	3	3
Performance Requirement	1	1	1
Actuator			
Max Working Pressure (psi)	3,000	3,000	3,000
Shell Test Pressure (psi)	4,500	4,500	4,500
Temperature Class (°F)	-20 to 150	-20 to 150	-20 to 150
Material Class	AA	AA	AA
Performance Requirement	1	1	1

Design Parameter	M991001661	M991005761	M991005890-300
Valve			
Max Working Pressure (psi)	15,000	15,000	15,000
Shell Test Pressure (psi)	22,500	22,500	22,500
Temperature Class (°F)	P+U	P+U	P+X

Material Class	DD-NL	DD-NL	DD-NL
Product Spec Level	3	3	3
Performance Requirement	1	1	1
Actuator			
Max Working Pressure (psi)	3,000	3,000	3,000
Shell Test Pressure (psi)	4,500	4,500	4,500
Temperature Class (°F)	-20 to 150	-20 to 150	-20 to 150
Material Class	AA	AA	AA
Performance Requirement	1	1	1

Type Approval Documentation

- Drawings:

Drawing No./Rev.	Title
	Body
	Body
	Body
	Bonnet Bolt 1.75-8
	Bonnet Gasket
	Bonnet Gasket
	Cylinder Cap
	Gate
	Gate Bushing
	Operator Body
	Operator Body
	Operator Body Bonnet
	Operator Body Bonnet
	Operator Body Cylinder
	Piston
	Seat
	Seat
	Stem
	Stem Lock Nut
	Stem Spacer
	Tailrod
	Tailrod
	Tailrod
	Tailrod Bonnet
	Tailrod Bonnet
	Tailrod Bonnet

- Calculations:

  See Calculations for Valve, Part No. 719794-6A3.

- Material Specifications:

Title	Spec. No./Rev.	Material	Min YS(ksi)	Min Avg CVN(ft.lb)
Body				
Body				
Bonnet Bolt 1.75-8				
Bonnet Gasket				
Bonnet Gasket				

Cylinder Cap
Gate
Gate
Gate
Gate Bushing
Operator Body Bonnet
Operator Body Bonnet
Operator Body Cylinder
Operator Body Cylinder
Piston
Seat
Seat
Seat
Stem
Stem Lock Nut
Stem Lock Nut
Stem Spacer
Tailrod
Tailrod
Tailrod Bonnet
Tailrod Bonnet

See Material Specifications for additional requirements. See BOM's for alternative materials.

- Notes: Other part numbers or revisions may be acceptable under this TAC provided critical aspects of the design remain the same. Changes shall be documented and approved by NOV Engineering and Quality. DNV GL Surveyor shall verify these changes before issuance of Product Certificates.

Tests Carried Out

- See Test Report for Valve, Part No. 719794-6A3, Serial No. GV5-4109968.

Marking of Products

- Product and data book shall be marked at least with manufacturer name, part and serial numbers.

Periodical Assessments

- For retention of TAC, periodical assessments shall be carried out bi-yearly.

Fabrication Procedures

- Procedures related to testing, NDE, welding, marking, etc. shall be reviewed by DNV GL Surveyor.

Project Description

- Project No. A0478840, Attn. Mike.Nguyen@nov.com.