DNV·GL

Certificate No:
TAD0000100

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Valve

with type designation(s)
TDX-1000 Lower IBOP PN 17782347-003

Issued to
National Oilwell Varco LP - Rig Technologies Division #638
Orange, CA, USA

is found to comply with
DNVGL-OS-E101 – Drilling facilities, Edition January 2018
DNVGL-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2017

Application :

Products approved by this certificate is/are accepted for installation on all vessels classed by DNV GL when accompanied with a DNV GL Product Certificate (PC).

Issued at **Houston** on **2018-08-30**
This Certificate is valid until **2023-08-29**.
DNV GL local station: **Certification & Inspection Services**

Approval Engineer: **Pari Natarajan**

for **DNV GL**

Christian Nilsen
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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Product description
Family of Kelly Valves as defined in API Specification 7-1

Design codes/standards used as references
1. API RP 7G, Recommended Practice for Drill Stem Design and Operating Limits, 16th Edition
2. API Specification 7-1, Specification for Rotary Drill Stem Elements, 1st Edition
3. API Specification 7-2, Specification for Threading and Gauging of Rotary Shouldered Thread Connections, 1st Edition

Application/Limitation

Design Parameter		Value	(equivalent)
Minimum Design Temperature	:	-4 °F	-20 °C
Sealing System Temperature Range	:	-4 °F to 200 °F	-20 °C to 93 °C
Maximum Working Pressure	:	15,000 psi	103.4 MPa
Maximum Operating Pressure while drilling	:	7,500 psi	51.7 MPa
API RP 7-1 Service Class	:	1	
Maximum Tensile Capacity:* at Maximum Working Pressure and 105,000 ft-lbf maximum torsional load for connection	:	2,000,000 lbf	8,896.4 kN
Maximum Torsional Load for NC77 Connection	:	105,000 ft-lbf	142.36 kN-m
Service	:	BOP Systems, Blowout Prevention Equipment, Valves in Drill String, Standard	

**All operating conditions for the product shall be within the limits specified in the combined loading curves reported by the manufacturer. Capacities may be further limited by end connections.*

Type Approval documentation
Note: Other part numbers or updated revisions may be acceptable under this Certificate, provided critical aspects of the design remain the same. Changes shall be documented and approved (via Engineering Change Notice or similar) by the Manufacturer's Engineering and/or Quality Department as appropriate. DNV GL's local surveyor shall verify the change before issuance of the Product Certificate.

Drawings

Material Specifications

Calculations

Tests carried out
Reviewed the applicable design verification test records for the class 1 valve.
- NOV Report, Equipment Certification and Manufacturing Data Book – Lower IBOP Assembly No. 17782347-003, NOV Ref. No. 17782347-ASM, Serial No. TC-47398396-01, dated Tue–04/19/18.

Marking of product
For traceability the following marking is to be carried out on each product:
1. Serial No.
2. As stated in API 7-1
3. According to the manufacturer's specification(s)

Certificate Retention Survey
- For retention of the Type Approval, DNV GL's surveyor shall perform a survey every second year in accordance with DNV GL Type Approval Scheme DNVGL-CP-0338, October 2015 Edition.

Other conditions/ comments

- Procedures related to testing, welding, NDT, etc. are to be reviewed/approved by DNV GL's local surveyor.
- Fabrication records are to be maintained in accordance with DNVGL-OS-E101 Ch.3 Sec. 3 [2].
- When DNV GL Product Certification is required, each product is to be surveyed during fabrication in accordance with the requirements for Category I equipment as defined in DNV GL's Offshore Standard DNVGL-OS-E101.

End of Certificate