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# DET NORSKE VERITAS

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## DESIGN VERIFICATION REPORT

(Independent Review Certificate)

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MANUFACTURER : Type B Solutions, LLC  
 LOCATION : Seabrook, Texas – USA  
 PURCHASE ORDER NO. : GE/ORDER/NORB X/XI  
 END USER : Nobre X  
 VESSEL ID : D30748  
 DNV FILE NO. : EP030995

*This is to certify that the design of:*

**Class 300 4-in. Valve (P/N: 3143290-03 & Model No: 4E5-3-JI-30-H25-ML-IN)**

**Class 300 6-in. Valve (P/N: 3143423-06 & Model No: 6E5-3-JI-30-H25-ML-IN)**

**Class 300 16-in. Valve (P/N: 3143287-04 & Model No: 16E5-3-JI-30-H10-ML-IN)**

*has been reviewed and found to comply with:*

- Det Norske Veritas' Offshore Standard DNV-OS-E101, 'Drilling Plant', October 2009

**The verification is based on the following:****A. The following were used as references:**

- ASME Boiler & Pressure Vessel Code Section VIII Division 1 'Rules for Construction of Pressure Vessels' 2007 Edition
- ASME B16.34 'Valves – Flanged, Threaded, and Welding End' 2004 Edition
- API 6D 'Specification for Pipeline Valves' 23<sup>rd</sup> Edition, April 2008

**B. Design Limitations**

- Maximum Design Pressure : 51 bar (740 psi)
- Minimum Design Temperature : 38 °C (100 °F)
- Service : Sour/H<sub>2</sub>S

**C. Design Specifications**

Drawings:

<u>Drwg. No.</u>	<u>Rev.</u>	<u>Description</u>
- BS3R-SW,A105N/NO.75333-B7M/2HM	-	Class 300 Size 6~24"
- BS3R-FU V1,A105N/NO.15333-INC-B7M/2HM	-	Class 300 Size 4"

**D. Calculations**

<u>Doc. No.</u>	<u>Date</u>	<u>Description</u>
- N/A	12 March 2009	4" – 300 lbs Valve Parameters, Data, Dimensions, Moments & Stresses
- N/A	23 February 2009	6" – 300 lbs Valve Parameters, Data, Dimensions, Moments & Stresses
- N/A	12 March 2009	16" – 300 lbs Valve Parameters, Data, Dimensions, Moments & Stresses
- N/A	12 March 2009	4" – 300 lbs Trunnion Ball Valve Calculations of Strength
- N/A	23 February 2009	6" – 300 lbs Trunnion Ball Valve Calculations of Strength
- N/A	15 March 2010	16" – 300 lbs Trunnion Ball Valve Calculations of Strength

**E. Material Specifications**

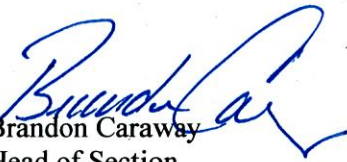
<u>Component</u>	<u>Material</u>	<u>Minimum Yield</u>
- Body, Bonnet, Flange, Top Flange, Gland	ASTM A105N	36,000 psi (248 MPa)
- Ball, Seat Retainer, Stem, Trunnion	ASTM A105N/ENP	36,000 psi (248 MPa)
- Washer, Seal Gasket, Gland & Body Gasket	316 S.S. + Graphite	205,000 psi (1,413 MPa)
- Studs, Screws, Bolts	ASTM A193 – B7M	105,000 psi (724 MPa)
- Nuts	ASTM A194 – 2HM	

**F. Comments**

1. Certificate 3.1 to show compliance with Charpy values in Table B1 from DNV's Offshore Standard DNV-OS-E101 'Drilling Plant' October 2009.
2. Procedures related to testing, welding, NDT, etc are to be reviewed/approved by DNV's local surveyor.
3. Inspection and testing of the valve shall be in accordance to API 6D.
4. The lifting lugs were not reviewed and therefore excluded in this report.
5. Materials for pressure-containing and pressure-controlling shall meet the requirements of ISO 15156.

Houston, 16 September 2010

for DET NORSKE VERITAS (USA), INC.

  
Brandon Caraway  
Head of Section

  
Monique Annette Canales  
Project Engineer



**Distribution:**

Orig: Type B Solutions, LLC (Attn: W.H. Stewart III)

CC: File; NPS