



DET NORSKE VERITAS

STATEMENT OF CONFORMITY

DOCUMENT NUMBER: HOU-01-SC-42039783

DNV HOUSTON PROJECT NUMBER: 42039783

THIS STATEMENT IS TO CERTIFY THAT TESTING FOR THE FOLLOWING:

EQUIPMENT: 20 Inch Pipeline and Riser Connector
GMC/SBM Drawing Number (Pin) MCN-TA01-20-PIN-01
GMC/SBM Drawing Number (Box) MCN-TA01-20-BOX-01

MANUFACTURER: General Marine Contractors and SBM Atlantia
1160 Dairy Ashford, Suite 260 1255 Enclave Parkway
Houston, Texas 77079 Houston, Texas 77077

HAS BEEN REVIEWED AND WITNESSED AND FOUND TO COMPLY WITH:

-ISO 21329 (2004) "Petroleum and Natural Gas Industries – Pipeline Transportation Systems – Test Procedures for Mechanical Connectors"

TESTING DOCUMENTS:

- GMC/SBM Document ES0081 Rev 3 "Test Plan for Pipeline Connector Qualification"
- GMC/SBM Document ER0102 Rev P1 "Test Report: Make, Break & Galling Tests for ISO Qualification"
- GMC/SBM Document ER0103 Rev P1 "Torque Test Report – ISO Qualification"
- Stress Engineering / Mohr Engineering Division Report 173926-H "ISO 21329 Qualification Testing of 20-in. Pipeline Connector"
- Holloway Houston, Inc. Document "Bending Test of Test Article 04, Date: 8-24-09"

CONNECTOR TESTING PARAMETERS:

Connector Material: ASTM 4130, 90 ksi (620 MPa) yield strength
Pipe Segment Material: API 5L X65, 20" OD, 18" ID
Design Pressure: 2,250 psi (155 bar)
Maximum / Minimum Test Temperature: 120° F (49° C) / 39° F (4° C)

A complete list of test parameters is found in GMC/SBM Doc. ES0081 Rev 3 Section 4.1



APPLICATION LEVEL:

Test loads were reviewed and calculated according to Application Level 4, as described in Section 5.3 and Table 1 of ISO 21329 (2004).

CONFIDENCE LEVEL:

Confidence levels were based on the requirements given in Section 5.4 and Table 2 of ISO 21329 (2004). The tests below were carried out to the indicated confidence level:

Test	Confidence Level Witnessed
Make Up and Break Out	High
Torque Test	High
Installation Tests	Normal
Hydrostatic Pressure Tests	High
Operational Unrestrained Tests	Normal
Operational Restrained Tests	Normal
Pressure to Failure Test	High
Compression to Failure Test	N/A
Bending to Failure Test	High
Tension to Failure Test	High
Fatigue Tests	Normal

Exceptions:

1. Section 7.5.1 of the ISO 21329 standard describes the requirements for testing the “worst case” connectors based on their respective manufacturing tolerances. Due to the design of these axially made-up connectors with their rows of concentric grooves in addition to the two sealing surfaces, it is not possible to specify the exact pin and box that would make the “worst case” connection for each test. Therefore, “worst case” tolerances as per Section 7.5.1 of ISO 21329 should be based on FEA analysis.
2. For the make up and break out tests, Section 10.1.1 indicates that samples should be made up in accordance with the field make-up procedure. As this is a new product without an established make-up procedure, it is assumed that the field make-up procedure will reflect the procedure and methodology used in the make-up procedure for the tests.

Houston, Texas, January 13, 2010

For Det Norske Veritas (U.S.A.), Inc.

**Travis Wallace
Engineer
Qualification and Verification**



**Lars Buus
Principal Engineer
Director, Qualification and Verification**

**Verified by: Jeff Stanford
Engineer**