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Leakage Test Report of NORSOK L-005 Compact Flange

Verified by BUREAU VERITAS

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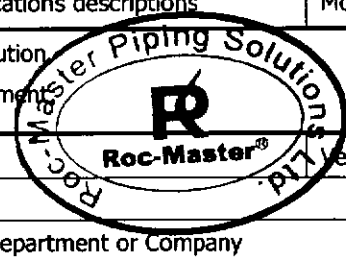

Process	Name	Department or Company	Date
Operated by	Chen xin	Quality testing department of Roc-Master	5th Sep,2012
Prepared by	Xie jianchang, Chen xin	R&D department and QT of Roc-Master Xie jianchang	8th Nov, 2012
Verified by	Zhang wei	Bureau Veritas	18th Oct, 2012
third party	Li jian	Bureau Veritas	9th Nov, 2012
Approved by		Roc-Master	2012.11.9
Checked by		Helium turbine and fan research office, Institute of Nuclear And New Energy Technology, Tsinghua University	
Submitted to		Offshore Oil Engineering Co., Ltd	

NORSOK L-005 compact flange leakage testing

For:
Offshore Oil Engineering Co.,Ltd
No.1078 Danjiang Road,
Tanggu District,
Tianjin, P.R.China

Roc-Master Piping Solutions Ltd.
Block A, No.1835 Duhui Road,
Minhang District,
Shanghai 201108,P.R.China
Tel: 021-3430 4280
Fax:021-3430 4003
www.roc-master.com

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Summary:

To meet the request of leakage test for the South China sea deep natural gas development project of Offshore Oil Engineering Co., Ltd, we had a technical cooperation with Helium turbine and fan research office, Institute of Nuclear And New Energy Technology, Tsinghua University. The NORSOK L-005 flanges and IX seal ring and Stud Bolts & Nuts are produced by Roc-Master Piping Solutions Ltd.
The value of leakage rate should be less than 10^{-7}Pa.m^3/s.

The first test began on 5th Sep, 2012. Flange（NORSOK L-005, ASTM A694 , F65 SCH140, WN-IX , 14", 2500LB, HBW187）, seal ring (NORSOK L-005, CS360LT, 14", IX350, Xylan1424 , HBW 171) and bolts (ASME B1.1, ASTM A193, B7 , 1-7/8" , L=425mm) were used, under 1MPa pressure, compressed air was injected into flange match system, which immerged into water box, held up 10 minutes, and no bubble appearance; leakage rate test by helium was carried out, and no gas leakage, the value of leakage was up to 10^{-10} Pa.m^3/s, all the test results by Roc-master met the requirements.

The Second test began on 18th Oct, 2012, leakage rate test by helium was carried out with the third party BUREAU VERITAS, and no gas leakage, the value of leakage was up to 10^{-10} Pa.m^3/s, all the test results met the requirements.

The Third test began on 9th Nov, 2012, mainly consider the installation operation of NORSOK L-005 flange, seal ring and bolts influence on the leakage rate and reliability of repeated use of seal ring; after reinstallation, repeatability test had been done, After disassemble and reinstall which was strict with NORSOK flange installation process, tested by Roc-master and then leakage rate test by helium was carried out with the third party BUREAU VERITAS, and test run smoothly, the value of leakage was up to 10^{-10} Pa.m^3/s , the test results met requirements.

Xie jianchang 9th NOV. 2012 2012.11.9

Notes: all the detecting equipments are calibrated.

Process	*Name*	*Position*	*Signature*	*Date*
Operated by	*Chen xin*	*Quality Engineer*		
Prepared by	*Xie jianchang*	*Cladding Product Technical Engineer*		2012.11.8
Verified by third party	Mark Zhang	BV inspector		2012.11.8
	Jacko Li	BV Surveyor		2012.11.9
Approved by	Chen Sun			2012.11.9
Checked by				
Submitted to				

☑	No distribution without permission from the Client or responsible organization unit	Key Words	Compact flange, Leakage 10^{-7} Pa.m^3/s