

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض</p> <p>خرید مخازن ذخیره ایستگاه تقویت فشار گاز بینک (قرارداد BK-HD-GCS-CO-0026_00)</p>							
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							V01	

طرح نگهداشت و افزایش تولید ۲۷ مخزن

VACUUM & OIL LEAK TEST PROCEDURE

نگهداشت و افزایش تولید میدان نفتی بینک

V01	Jan.2025	IFA	IDrill M.E.	M.Fakharian	M.Sadeghian	
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Status:

IFA: Issued For Approval
IFI: Issued For Information
AFC: Approved For Construction

 <p>NISOC</p>	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض</p> <p>خرید مخازن ذخیره ایستگاه تقویت فشار گاز بینک (قرارداد BK-HD-GCS-CO-0026_00)</p>																	
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 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض</p> <p>خرید مخازن ذخیره ایستگاه تقویت فشار گاز بینک (قرارداد BK-HD-GCS-CO-0026_00)</p>								
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1.0 INTRODUCTION

Binak oilfield in Bushehr province is a part of the southern oilfields of Iran, is located 20 km northwest of Genaveh city.

With the aim of increasing production of oil from Binak oilfield, an EPC/EPD Project has been defined by NIOC/NISOC and awarded to Petro Iran Development Company (PEDCO). Also, PEDCO (as General Contractor) has assigned the EPC-packages of the Project to "Hirgan Energy - Design and Inspection" JV.

GENERAL DEFINITION

The following terms shall be used in this document.

CLIENT:	National Iranian South Oilfields Company (NISOC)
PROJECT:	Binak Oilfield Development – Manufacturing (w/Engineering & Material Supply) of Gas Dehydration Package.
EPD/EPC CONTRACTOR (GC):	Petro Iran Development Company (PEDCO)
EPC CONTRACTOR/PURCAHSE:	Joint Venture of: Hirgan Energy – Design & Inspection Companies (HE/DI)
VENDOR:	iDrill Middle East (iDrill M.E)
EXECUTOR:	Executor is the party which carries out all or part of construction and/or commissioning for the project.
TPI:	Third-Party Inspector
SHALL:	Is used where a provision is mandatory.
SHOULD:	Is used where a provision is advisory only.
MAY:	Is used where a provision is completely discretionary.

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2.0 SCOPE

The purpose of this procedure is providing a guide line to carry out the Vacuum box test to check soundness of annular joints, bottom (long seam & short seam) and defines the requirements to be allowed for Oil Leak Test of parts the shell to bottom weld, after finish weld from inside the shell for Lean Glycol Storage Tank (TK-2102) and Fire Water Tanks (TK-2301A/B).

3.0 REFERENCES CODE AND STANDARD

- API-650
- IPS-G-ME-100

4.0 OPERATOR

The Manufacturer shall determine that each vacuum-box operator meets the following requirements:

- a. has vision (with correction, if necessary) to be able to read a Jaeger Type 2 standard chart at a distance of not less than 300 mm (12 in.). Operators shall be checked annually to ensure that they meet this requirement; and
- b. is competent in the technique of the vacuum-box testing, including performing the examination and interpreting and evaluating the results; however, where the examination method consists of more than one operation, the operator performing only a portion of the test need only be qualified for that portion the operator performs.

5.0 PERSONNEL AND RESPONSIBILITY

The personnel shall be competent and have through knowledge in performing this method.

The personnel of QC Inspector shall execute the Oil Test Examination according to this procedure and the applicable codes.

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6.0 VACCUME TEST

6.1 PURPOSE

All bottom plate welds shall be tested using a vacuum box which enables any leak in the seams to be positively located by visual examination (in accordance with section 8.6 of API standard 650).

6.2 EQUIPMENT



6.2.1 Vacuum testing is performed using following equipment:

6.2.1.1 The Vacuum box test is performed by using a box with visible window of fiber glass (i.e. 6" Wide by 30" long metallic box with a fiber glass). The open bottom is sealed against the tank surface by a sponge rubber gasket. The test scheme shall have suitable connections, necessary valve and calibrated Vacuum gauge. The gauge shall have a range of 0 psi to 15 psi or equivalent Pressure limits such as 0 in.Hg to 30 in.Hg.

6.2.1.2 The Test scheme shall be demonstrated with sample test block by application bubble solution at site before conduction the test on the job. The bubble forming solution shall produce a film that does not break away from the area to be tested, and the bubbles formed shall not break rapidly due to air drying or low surface tension, soaps or detergents designed specifically for cleaning shall not be used for the bubble forming solution.

6.2.1.3 A vacuum can be drawn on the box by any convenient method, such as connection to a gasoline or diesel motor intake manifold or to an air ejector or special vacuum pump. The gauge shall register a partial vacuum of at least 2 psi (4in.Hg) (15KPa) below atmospheric pressure.

6.2.1.4 Bubble forming solution (Brand name / Type will be furnished prior to execution) to be established vide 4.2 & to be recorded.

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6.3 SURFACE PREPARATION

The surface to be examined and all adjacent areas shall be cleaned thoroughly and free from all dirt, grease, lint, scale, welding flux, weld spatters, paint, oil and other extraneous matter that could obstruct surface openings or otherwise with the examination. Prior to vacuum testing all joints shall be checked visually.

6.4 TESTING PROCEDURE



- 6.4.1 The metal surface temperature limits shall be between 4 °C (40 °F) and 52 °C (125 °F), unless the film solution is proven to work at temperatures outside these limits, either by testing or Manufacturer's recommendations.
- 6.4.2 condition of the vacuum box and its gasket should be seals.
- 6.4.3 A partial vacuum of 21 kPa ($\frac{3lb_f}{in^2}$, 6 in. Hg) to 35 kPa ($\frac{5lb_f}{in^2}$, 10 in. Hg) gauge shall be used for the test.
- 6.4.4 The vacuum shall be maintained for the greater of either at least 5 seconds or the time required to view the area under test.
- 6.4.5 The vacuum-box test shall have at least 50 mm (2 in.) overlap of previously viewed surface on each application.
- 6.4.6 The weld seam on the test shall be applied with a bubble solution for detecting leaks prior to placing vacuum box.
- 6.4.7 An Overlap of 2" minimum for adjacent placement of the Vacuum box shall be given for each subsequent examination.

6.5 EVALUATION

The presence of a through-thickness leak indicated by continuous formation or growth of a bubble(s) or foam, produced by air passing through the thickness, is unacceptable. The presence of a large opening leak, indicated by a quick bursting bubble or spitting response at the initial setting of the vacuum box is unacceptable. Leaks shall be repaired and retested.

- 6.5.1 A minimum light intensity of 1000 Lux (100 fc) at the point of examination is required during the application of the examination and evaluation for leaks.

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6.5.2 The weld seam on the test shall be applied with a bubble solution for detecting leaks prior to placing vacuum box.

6.6 REPAIR / RETEST

Defects in welds shall be repaired by chipping, grinding or melting out the defects from one side or both sides of the joints, as required and re-welding. Only the cutting out of defective joints that is necessary to correct the defects is required. After repairing retest of Vacuum box test shall be carried out.

6.7 CLEANING

After test the area shall be thoroughly cleaned for the further activities.

6.8 INSPECTION REPORT

The test shall be carried out in presence of the TPI. A record or report of the test including a statement addressing temperature and light intensity shall be completed and furnished to the Purchaser upon request.

Upon satisfactory inspection, a report shall be prepared as per Hiran Energy approved format.

7 OIL LEAK TEST

7.1 PURPOSE



All bottom plate welds shall be tested using a vacuum box which enables any leak in the seams to be positively located by visual examination (in accordance with section 8.6 of API standard 650)

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض</p> <p>خرید مخازن ذخیره ایستگاه تقویت فشار گاز بینک (قرارداد BK-HD-GCS-CO-0026_00)</p>								
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7.2 PREPARATION



The initial weld pass inside the shell shall have all slag and non-metals removed from the surface of the weld and then examined for its entire circumference both visually and

7.3 TESTING PROCEDURE



applying a high flash-point penetrating oil such as light diesel to the gap between the shell and the bottom, letting stand for at least four hours, and examining the weld for evidence of wicking.

NOTE Residual oil may remain on the surfaces yet to be welded even after the cleaning required below and contamination of the subsequent weld is possible

7.4 EVALUTION



Remove defective weld segments and reweld as required. Reexamine the repaired welds and a minimum of 150 mm (6 in.) to either side in the manner described above. Repeat this clean-remove repair-examine-and-clean process until there is no evidence of leaking. Complete all welding passes of the joint both inside and outside the shell. Visually examine the finished weld surfaces of the joint both inside and outside the shell for their entire circumference.

7.5 REPAIR



When there is some leakage on the weld, the leakages on the weld shall be marked and repaired by welding as per approved main WPS. After completed repaired by welding the area weld have been repaired shall be cleaned before examined by the same test method, When the defect was detected. if leakage on weld found by oil leak test, the treatment for repairing as follow:

- 7.5.1 Mark the leak area using a permanent marker.
- 7.5.2 Clean the area from oil, dirt, etc. using a rag below by air to make sure the leak area is clean and dry.
- 7.5.3 Remove the leak area using grinder.
- 7.5.4 Clean the removed area by grinding or power brush.
- 7.5.5 Re-welded using the same electrode as originally used according to approved main WPS and by certified welder.

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Make sure before re-weld the defect area to be clear.

7.5.6 After visual inspection

7.6 RE-EXAMINATION OF REPAIR AREAS:

Repaired areas shall be re-examined by the Oil Leak Test method examination that were originally required for the affected area.

7.7 POST CLEANING:

Thoroughly clean all residual examination materials from the as yet to be welded surfaces and from the unwelded gap between the shell and bottom.

After completion, clean the surface on which the oil was applied using hand brush, blow by air and/or clean rag.

7.8 REPORT

After completion of Oil Leak Test iDrill Middle East inspector will prepare the Report of Oil Leak Test for Purchaser approval.




8 SAFETY

Safety shall be followed as per HSE specification during test.

9 ATTACHMENTS:

	<p>نگهداشت و افزایش تولید میدان نفتی بینک</p> <p>سطح الارض و ابنیه تحت الارض</p> <p>خرید مخازن ذخیره ایستگاه تقویت فشار گاز بینک</p> <p>(قرارداد BK-HD-GCS-CO-0026_00)</p>							 	
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9.1 VACUUM TEST REPORT FORM. (ATTACHMENT #1)

	<p>Project Name: Binak Oilfield Development of Gas Dehydration Package.</p>			 
	<p>VACUUM TEST REPORT</p>			
<p>Client:</p> <p>NISOC</p>	<p>Vendor:</p> <p>iDrill Middle East</p>	<p>Purchaser:</p> <p>Hirgan Energy – Design & Inspection Companies</p>	<p>Date:</p> <p>.....</p>	
<p>P.O. No.:</p> <p>.....</p>	<p>Procedure No.:</p> <p>.....</p>	<p>Report No.:</p> <p>.....</p>	<p>Page No.:</p> <p>Page 1 of 1</p>	




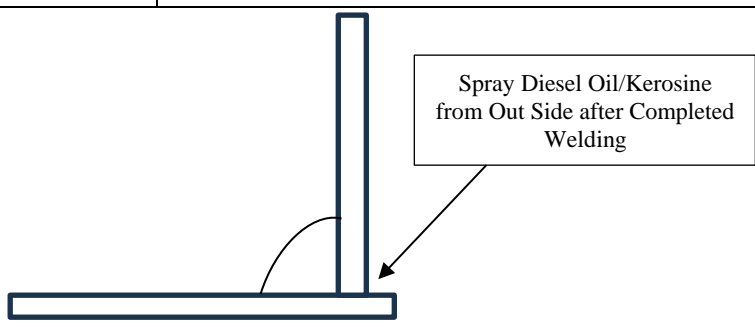
Tank No.:	Test Solution:	Test Vacuum:	Holding Time:
Gauge Identification No.:	Gauge Range:	Gauge Calibration No.:	Test Medium:

Row	Weld Joint No.	THK mm	Weld Type	Observation	Evaluation	Location	Acc/Rej

IDRILL M. E	HIRGAN / DI	PEDCO	TPI	NISOC
Name:	Name:	Name:	Name:	Name:
Date:	Date:	Date:	Date:	Date:
Signature:	Signature:	Signature:	Signature:	Signature:

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9.2 OIL LEAK TEST REPORT FORM. (ATTACHMENT #2)

	Project Name: Binak Oilfield Development of Gas Dehydration Package.			 
	OIL LEAK TEST REPORT			
Client:	Vendor:	Purchaser:	Date:	
NISOC	iDrill Middle East	Hirgan Energy – Design & Inspection Companies	
P.O. No.:	Procedure No.:	Report No.:	Page No.:	
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Tank No.:				
Date of Inspection:				
Location / Area:				
Oil Properties	Type:			
	Method of Application:			
	Temperature:			
	Holding Time:			
Test Location				
Test Result	<input type="checkbox"/> Accept <input type="checkbox"/> Reject			

IDRILL M. E	HIRGAN / DI	PEDCO	TPI	NISOC
Name:	Name:	Name:	Name:	Name:
Date:	Date:	Date:	Date:	Date:
Signature:	Signature:	Signature:	Signature:	Signature: