

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض</p> <p>خرید پکیج پمپ های آب آتشنشانی ایستگاه تقویت فشار گاز بینک (قرارداد BK-HD-GCS-CO-0023_00)</p>																									
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طرح نگهداشت و افزایش تولید ۲۷ مخزن

PERFORMANCE TEST PROCEDURE

نگهداشت و افزایش تولید میدان نفتی بینک

V01	FEB. 2025	AFC	Kalaye Pump	M.Fakharian	S.Faramarzpour	
V00	NOV. 2024	IFA	Kalaye Pump	M.Fakharian	M.Sadeghian	
Rev.	Date	Purpose of Issue/Status	Prepared by:	Checked by:	Approved by:	CLIENT Approval

Status:


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

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REVISION RECORD SHEET

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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.


2.0 GENERAL DEFINITION

The following terms shall be used in this document.

CLIENT:	National Iranian South Oilfields Company (NISOC)
PROJECT:	Binak Oilfield Development – Supply Of Fire Water Pumps
EPD/EPC CONTRACTOR (GC):	Petro Iran Development Company (PEDCO)
EPC CONTRACTOR/PURCHASER:	Joint Venture of: Hirgan Energy – Design & Inspection (D&I) Companies
VENDOR:	Kalaye Pump Company
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.
WILL:	Is normally used in connection with the action by CLIENT rather than by an EPC/EPD CONTRACTOR, supplier or VENDOR.
MAY:	Is used where a provision is completely discretionary.

3.0 SCOPE

This executive method aims to illustrate the way of the test and testing manufactured/repaired pumps in the factory to achieve assurance about their alignment to those determined characteristics as well as their quality.

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4.0 USAGE DOMAIN

The usage domain of this executive instruction includes all projects of Kalay-E-Pump Company and other common productions.

5.0 LIABILITIES

The quality control director is responsible for executing this instruction, furthermore product supervisor and technical office representative are present in the examination (Test) steps entirely, as auditors.

6.0 REFERENCES

The testing operation of pumps/Electro pumps/Diesel Pumps belonging to Kalay-E-Pump Company is accomplished based on derivate tests of creditable global collected standards for centrifugal and fire fighting pumps and gathered movements. (API 610, NFPA 20)

7.0 PROCEEDING DESCRIPTION

The performance tests for all project pumps is carried out according to API 610 and this procedure as well as customer project documents. ”

7.1. Performance Test (Closed Cycle Method):

The purpose of this test is to be sure of the electro pump's technical features such as liquid pressure (Head) and output capacity (Debby) and their alignment with provided curves and characteristics for the customer. The closed cycle method was used in this test and output capacity (Debby) is measured using flow meter equipment.

7.1.1. Place the electro pump on the specific allocated site and attach input-output junctions and electricity connections. Install pressure gauge before input and after output. It should be noted that any knee or corner joints and converters are not used before the gauge.

7.1.2. When the electro pump is starting up you should consider the rotation direction which is clockwise for the pump shaft from the coupling side.

7.1.3. While the test is carried out, performance parameters such as differential head (bar), output capacity (m3/h), electromotor current (A) and voltage (V), and shaft rotation speed (rpm) must be measured and documented in all auditing points.

7.1.4. The job seals and bearings shall be used in the pump for the performance test. The seal (or seals) shall not have any leakage.

7.1.5. The performance curve is based on water (or gasoil) with the specifications of kinematics viscosity 1 cSt, and Specific Gravity 1kg/lit.

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7.1.6. The test point for rated flow shall be within a tolerance band of $\pm 3\%$ of rated flow.

7.1.7. Control the flow with a control valve on the discharge line. Opening the discharge valve will cause to increase in the flow and a decrease in the differential head.

7.1.8. Document all mentioned parameters in 5.1.3 for a range of flow from shut off to 150% of rated flow as follows .

- A) Shut off
- B) Minimum Continuous Flow (MCF)
- C) Midpoint of MCF and rated flow
- D) Between rated flow and 105% of rated flow
- E) Approximately the best efficiency flow (if rated flow is not within 5 % of best efficiency flowrate)
- F) 150% of rated flow

7.1.9. Result of these tests with corresponding curves are provided in the performance test report sheets .

7.1.10. After the test, the casing will be filled with gasoil to prevent oxidation.

7.1.11. The equipment used for this test is pressure gauges, a flow meter, probe to indicate the temperature, vibration, speed (rpm), and noise level indicator.

7.1.12. The power consumed by the electromotor is.

$$\text{Power in (kw)} = (\sqrt{3} \text{ V (voltage)} * I \text{ (amp)} * \cos \phi * \text{motor } \eta) / 1000$$

The hydraulic power produced by pump is.

$$\text{Hydraulic Power (KW)} = (Q(\text{m}^3/\text{h}) * H \text{ (m)}) / 367$$

$$\text{EFF} = \text{Pout} / \text{Pin} * 100$$

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8.0 ACCEPTANCE CRITERIA

Table 16 — Performance tolerances

Condition	Rated point %	Shutoff %
Rated differential head:		
0 m to 75 m (0 ft to 250 ft)	± 3	± 10 ^a
> 75 m to 300 m (> 250 ft to 1 000 ft)	± 3	± 8 ^a
> 300 m (1 000 ft)	± 3	± 5 ^a
Rated power	4 ^b	—
Efficiency	c	
Rated NPSH	0	—
<p>^a If a rising head flow curve is specified (see 6.1.11), the negative tolerance specified here shall be allowed only if the test curve still shows a rising characteristic.</p> <p>^b With test results corrected to rated conditions [see 8.3.3.3 b)] for flow, speed, density (specific gravity) and viscosity, it is necessary that the power not exceed 104 % of the rated value, from all causes (cumulative tolerances are not acceptable).</p> <p>^c The uncertainty of test efficiency by the test code specified is ± 2,5 %; therefore, efficiency is not included in the pump's rated performance. In those applications where efficiency is of prime importance to the purchaser, a specific value and related tolerance should be negotiated at the time of the order (see 8.3.3.4).</p>		