



**IDC: Inter-Discipline Check**  
**IFC: Issued For Comment**  
**IFA: Issued For Approval**  
**AFD: Approved For Design**  
**AFC: Approved For Construction**  
**AFP: Approved For Purchase**  
**AFQ: Approved For Quotation**  
**IFI: Issued For Information**  
**AB-R: As-Built for CLIENT Review**  
**AB-A: As-Built –Approved**

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض  عمومی و مشترک								
شماره پیمان:  ۰۵۳ - ۰۷۳ - ۹۱۸۴	SPECIFICATION FOR LV SWITCHGEAR & MOTOR CONTROL CENTERS								شماره صفحه: ۲ از ۹
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GNRAL	PEDCO	000	EL	SP	0001	D03	

### REVISION RECORD SHEET

PAGE	D00	D01	D02	D03	D04
1	X	X	X	X	
2	X	X	X	X	
3	X		X		
4	X		X		
5	X				
6	X	X	X		
7	X				
8	X				
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					

PAGE	D00	D01	D02	D03	D04
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62					
63					
64					
65					
66					
67					
68					
69					
70					
71					
72					
73					
74					
75					
76					
77					
78					
79					
80					
81					
82					
83					
84					
85					
86					
87					
88					
89					
90					
91					
92					
93					
94					
95					
96					
97					
98					
99					
100					

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک</p> <p>سطح الارض و ابنیه تحت الارض</p> <p>عمومی و مشترک</p>																									
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	<table><tr><th colspan="8">SPECIFICATION FOR LV SWITCHGEAR &amp; MOTOR CONTROL CENTERS</th></tr><tr><th>نسخه</th><th>سریال</th><th>نوع مدرک</th><th>رشته</th><th>تسهیلات</th><th>صادرکننده</th><th>بسته کاری</th><th>پروژه</th></tr><tr><td>D03</td><td>0001</td><td>SP</td><td>EL</td><td>000</td><td>PEDCO</td><td>GNRAL</td><td>BK</td></tr></table>	SPECIFICATION FOR LV SWITCHGEAR & MOTOR CONTROL CENTERS								نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه	D03	0001	SP	EL	000	PEDCO	GNRAL	BK	شماره صفحه : ۳ از ۹
SPECIFICATION FOR LV SWITCHGEAR & MOTOR CONTROL CENTERS																										
نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه																			
D03	0001	SP	EL	000	PEDCO	GNRAL	BK																			

## CONTENTS

<b>1.0</b>	<b>INTRODUCTION .....</b>	<b>4</b>
<b>2.0</b>	<b>SCOPE .....</b>	<b>5</b>
<b>3.0</b>	<b>NORMATIVE REFERENCES .....</b>	<b>5</b>
3.1	LOCAL CODES & STANDARDS.....	5
3.2	INTERNATIONAL CODES & STANDARDS .....	5
3.3	ENVIRONMENTAL DATA .....	5
3.4	GUIDANCE FOR USE OF THIS DOCUMENT .....	5
3.5	ORDER OF PRECEDENCE .....	6
<b>4.0</b>	<b>SERVICE CONDITION .....</b>	<b>6</b>
<b>5.0</b>	<b>UNITS .....</b>	<b>6</b>
<b>6.0</b>	<b>APPLICATION.....</b>	<b>6</b>
<b>7.0</b>	<b>GENERAL REQUIRMENTS .....</b>	<b>7</b>
<b>8.0</b>	<b>MAJOR COMPONENT .....</b>	<b>7</b>
<b>9.0</b>	<b>AUXILIARY COMPONENTS .....</b>	<b>8</b>
<b>10.0</b>	<b>TEST &amp; INSPECTION .....</b>	<b>8</b>
<b>11.0</b>	<b>SPARE PARTS .....</b>	<b>8</b>
<b>12.0</b>	<b>DOCUMENTATION .....</b>	<b>8</b>
<b>13.0</b>	<b>SHIPMENT .....</b>	<b>9</b>
<b>14.0</b>	<b>GUARANTEE .....</b>	<b>9</b>

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک</p> <p>سطح الارض و ابنیه تحت الارض</p> <p>عمومی و مشترک</p>								
شماره پیمان:	SPECIFICATION FOR LV SWITCHGEAR & MOTOR CONTROL CENTERS							شماره صفحه : ۴ از ۹	
۰۵۳ - ۰۷۳ - ۹۱۸۴	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GNRAL	PEDCO	000	EL	SP	0001		D03

## 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 – General Facilities
EPD/EPC CONTRACTOR (GC):	Petro Iran Development Company (PEDCO)
EPC CONTRACTOR:	Joint Venture of : Hirgan Energy – Design & Inspection(D&I) Companies
VENDOR:	The firm or person who will fabricate the equipment or material.
EXECUTOR:	Executor is the party which carries out all or part of construction and/or commissioning for the project.
THIRD PARTY INSPECTOR (TPI):	The firm appointed by EPD/EPC CONTRACTOR(GC) and approved by COMPANY (in writing) for the inspection of goods.
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 COMPANY rather than by an EPC/EPD CONTRACTOR, supplier or VENDOR.
MAY:	Is used where a provision is completely discretionary.

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک</p> <p>سطح الارض و ابنیه تحت الارض</p> <p>عمومی و مشترک</p>								
شماره پیمان:	SPECIFICATION FOR LV SWITCHGEAR & MOTOR CONTROL CENTERS							شماره صفحه : ۵ از ۹	
۰۵۳ - ۰۷۳ - ۹۱۸۴	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GNRAL	PEDCO	000	EL	SP	0001		D03

## 2.0 SCOPE

This document gives amendment and supplement to IPS-M-EL-143 (3) "Materials and Equipment Standard for Low Voltage Switchgear & Controlgear" used in "Binak Oilfield Development".

## 3.0 NORMATIVE REFERENCES

### 3.1 Local Codes & Standards

No amendments or supplements are to state.

### 3.2 International Codes & Standards

No amendments or supplements are to state.

### 3.3 Environmental Data

The installation site is in south of Iran with corrosive, hot and high humid atmosphere. Therefore, all equipment shall be designed to fully comply with the performance specification in the environmental conditions. For more information refer to "Process Basis Design; section 11".

### 3.4 Guidance for Use of This Document

The amendments/supplement to the related IPS Standard(s) given in this document are directly related to the equivalent sections or clauses in the IPS Standard(s). For clarity, the section and paragraph numbering of the IPS Standard(s) has been used as long as possible. Where clauses in IPS are referenced within this document, it shall mean those clauses are amended by this document. Clauses in "IPS" that are not amended by this document shall remain valid as written.

For ease of reference, the clause or section numbering of the related IPS Standard(s) has been used throughout this specification. For the purpose of this specification, the following definitions shall hold:

**Sub. (Substitution):** The IPS Std. clause is deleted and replaced by a new clause.

**Del. (Deletion):** The IPS Std. clause is deleted without any replacement.

**Add. (Addition):** A new clause with a new number is added.

**Mod. (Modification):** Part of the IPS Std. clause is modified, and/or a new description and/or condition are added to that Clause.

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک</p> <p>سطح الارض و ابنیه تحت الارض</p> <p>عمومی و مشترک</p>								
شماره پیمان:	SPECIFICATION FOR LV SWITCHGEAR & MOTOR CONTROL CENTERS							شماره صفحه : ۶ از ۹	
۰۵۳ - ۰۷۳ - ۹۱۸۴	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GNRAL	PEDCO	000	EL	SP	0001		D03

### 3.5 Order of Precedence

In case of conflict between requirements specified herein & the requirements of any other referenced document, the most approved stringent requirements of below listed items shall be considered based on the approval given by the owner's representative:

- Purchase order
- Material Requisition
- MTO & Data Sheet
- This Specification
- Drawing & Other Specification
- Reference Project Specification
- Iranian Petroleum Standard (IPS)
- sReference international Code & Standards

When the term "Authorized", "Authorization", "Approval", or "Approved" are used in this specification, it shall mean authorization or Approval from OWNER.

In case of any conflict between the project documents, the most stringent one shall be considered.

### 4.0 SERVICE CONDITION

The low voltage switchgear specified herein shall be installed indoor in air-conditioned substation building. (Mod)

### 5.0 UNITS

No amendments or supplements are to state.

### 6.0 APPLICATION

The relays and contactors shall be capable of proper operation for maximum short circuit current. (Add)

The low voltage switchgear will be fed from low voltage generator/s or transformer/s with a voltage of 400/230V. (The primary voltage of transformer/s is generally 3.3 kV, 11 kV or 33 kV). (Mod)

The LV Switchgear Shall be capable of proper operation for voltage variation  $\pm 10\%$  & frequency variation of  $\pm 5\%$ . (Add)

In the case where there is low voltage switchgear in existing substation, the new LV switchgears shall be installed in front of existing switchgear in this substation. (For compressor station is valid)

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک</p> <p>سطح الارض و ابنیه تحت الارض</p> <p>عمومی و مشترک</p>								
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	SPECIFICATION FOR LV SWITCHGEAR & MOTOR CONTROL CENTERS							شماره صفحه: ۷ از ۹	
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GNRAL	PEDCO	000	EL	SP	0001		D03

## 7.0 GENERAL REQUIRMENTS

7.1.5 Unless otherwise specified in data sheet, the indoor enclosure shall provide a degree of protection of IP 42 according to IEC 60529 without using the floor of the switch room as part of the enclosure. (Mod)

Wiring inside the switchgears shall be color coded as following: (Add)

- Phase conductors Red-Yellow-Blue
- Neutral Black
- DC positive conductor Red
- DC negative conductor Black
- Control conductor cables Black (with white numbering)
- Earthing conductors Yellow / Green

Mimic lines on the switchgears shall be color coded as following: (Add.)

- 132 kV Orange
- 66 kV Pink
- 33 kV Red
- 11 kV Brown
- 3.3 kV Yellow
- 0.4 kV Green

## 8.0 MAJOR COMPONENT

Each switchgear shall be equipped with a three positions (Manual/Auto/Manual transfer) selector switch: (Add)

- a) In manual mode, two of three transfer switching will be done by operator.
- b) In auto mode, if under voltage fault occur in one incoming, the related circuit breaker shall be opened and bus-tie breaker shall be closed automatically to feed whole load from the other transformer. This case is not reversible when the lost line comes back. (bus-tie breaker will not be allowed to open and the incoming beaker will not be closed automatically).
- c) In manual transfer mode, the operator can replace one of incomer feeders with coupler and vice versa without interrupting the power supply. This shall be done by selector switch, pushbutton and synchronize check relay (25). For example operator may know one of incoming lines planned outage time for network maintenance. In order to avoid any power break, the bus-tie circuit breaker is chosen to replace with the incoming feeder by selector

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک</p> <p>سطح الارض و ابنیه تحت الارض</p> <p>عمومی و مشترک</p>								
شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴	SPECIFICATION FOR LV SWITCHGEAR & MOTOR CONTROL CENTERS							شماره صفحه : ۸ از ۹	
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GNRAL	PEDCO	000	EL	SP	0001		D03

switch. After synchron check relay (25) checks the desired limits of frequency, phase angle and voltage value of two incoming supply feeders, bus tie shall be closed which puts the two transformers in parallel for a short time and the selected incoming breaker will be opened.

This happens by a specific pushbutton.

Spare motor starters and circuit breakers shall be considered based on all rates of outgoing feeders indicated in single line diagram/s. it shall be minimum 10% of total amount of outgoing feeders. Empty compartments (space feeders) shall also be foreseen for future use around 10% of the total surface area of the front of the switchgear enclosure. (Mod)

Outgoing Feeder circuit breakers rated above 400 Ampere shall be air circuit breaker (ACB) type.

Motor type outgoing feeders shall be switch fuse type. (Mod)

## 9.0 AUXILIARY COMPONENTS

Instruments and protections shall be flush mounting type and shall have an enclosure with a degree of protection of IP42 for indoor application. (IP55 for outdoor application). (Mod)

Microprocessor type protective relays shall be equipped with RS 485 to send signals by serial link. (Add)

All protection will be according to IPS-E-EL-100(1). (Add)

The secondary of the current transformers shall be earthed on one side. Where current transformers are connected in Wye, the Wye point shall be earthed. The wiring of the secondary circuits shall have a cross section of 4 mm<sup>2</sup>. (Mod)

The secondary of current transformers shall have two cores, one core for protection and another for measuring. (Add)

Voltage transformers shall be air insulated with accuracy class 1 for measuring and 3P for protection. The wiring of the secondary circuits shall have a cross section of 2.5 mm<sup>2</sup>. (Mod)

## 10.0 TEST & INSPECTION

No amendments or supplements are to state.

## 11.0 SPARE PARTS

No amendments or supplements are to state.

## 12.0 DOCUMENTATION

No amendments or supplements are to state.



 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض و ابنیه تحت الارض  عمومی و مشترک								
شماره پیمان:  ۰۵۳ - ۰۷۳ - ۹۱۸۴	SPECIFICATION FOR LV SWITCHGEAR & MOTOR CONTROL CENTERS							شماره صفحه : ۹ از ۹	
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GNRAL	PEDCO	000	EL	SP	0001		D03

### 13.0 SHIPMENT

No amendments or supplements are to state.

### 14.0 GUARANTEE

No amendments or supplements are to state.