طرح نگهداشت و افزایش تولید ۲۷ مخزن

ELECTRICAL NETWORK (LOAD FLOW, MOTOR STARTING & SHORT CIRCUIT) STUDY REPORT

نگهداشت و افزایش تولید میدان نفتی بینک

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Status:

IDC: Inter-Discipline Check
IFC: Issued For Comment
IFA: Issued For Approval
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AFC: Approved For Construction
AFP: Approved For Purchase
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AB-R: As-Built for CLIENT Review
AB-A: As-Built –Approved

REVISION RECORD SHEET

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CONTENTS

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.

As a part of the Project, a New Gas Compressor Station (adjacent to existing Binak GCS) shall be constructed to gather of 15 MMSCFD (approx.) associated gases and compress & transfer them to Siahmakan GIS.

GENERAL DEFINITION

The following terms shall be used in this document.

CLIENT:	National Iranian South Oilfields CLIENT (NISOC)
PROJECT:	Binak Oilfield Development – Surface Fcilities; New Gas Compressor Station
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 CLIENT (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 CLIENT rather than by an EPC/EPD CONTRACTOR, supplier or VENDOR.
MAY:	Is used where a provision is completely discretionary.

2.0 SCOPE

This document is prepared to report Load Flow, Motor Starting & Short Circuit Study in New Gas Compressor Station of Binak oilfield.

3.0 NORMATIVE REFERENCES

3.1 Local Codes & Standards

- IPS-E-EL-100 (1) Engineering Standard for Electrical System

3.2 International Codes & Standard

This document shall be shall be produced in accordance with the latest editions of the International Electro technical Commission (IEC) and BS standards

3.3 The Project Documents

- BK-GNRAL-PEDCO-000-PR-DB-0001 Process Basis of Design
- BK-GCS-PEDCO-120-EL-LI-0001 Electrical Load List
- BK-GNRAL-PEDCO-000-EL-DC-0001 Electrical System Design Criteria

4.0 PLANT MODEL

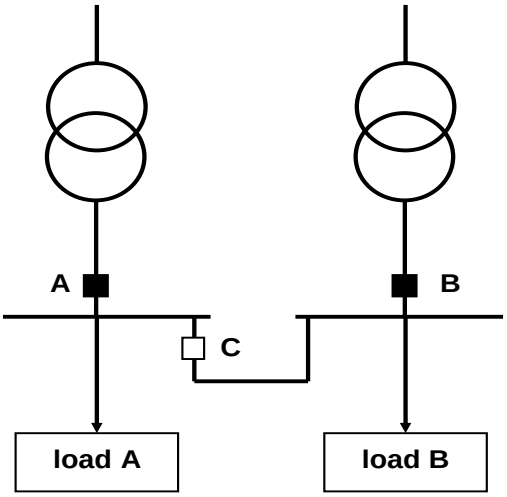
The model used for the calculations of the distribution network for Binak Oilfield Development gas compressor station units includes:

- The 11KV switchgear expansion fed by two 230/11 kV Transformers and 11KV motors.
- The new 0.4 KV switchgear installation fed by two 11/0.42 kV Transformers.
- Emergency bus bar fed by a 0.4 KV, 500 KW diesel generator

5.0 STUDIED CONFIGURATION

5.1 Normal Configuration

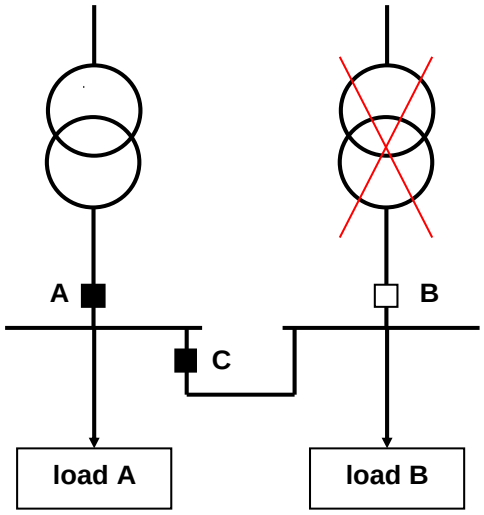
In normal configuration bus-tie breaker is normally open, and each section is fed by its own transformer.



Normal Configuration

5.2 Worst Case Configuration

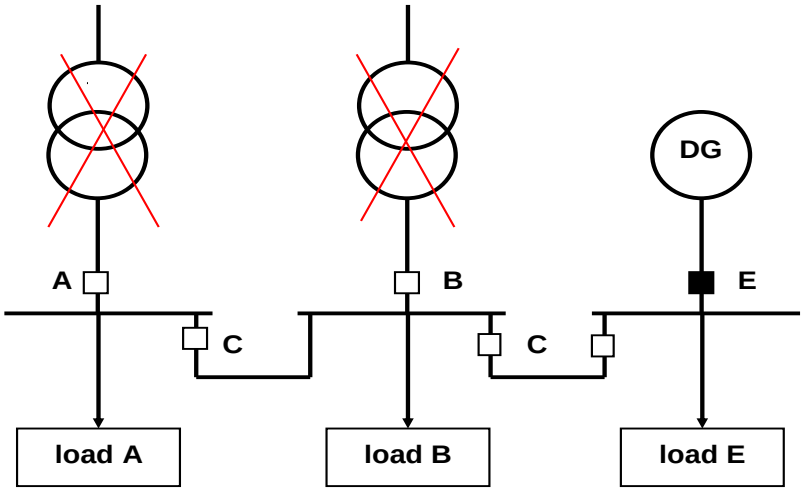
In the worst case condition, or also for maintenance purposes, one transformer can be out of service and whole load feed from the other transformer by closing the bus-tie breaker.



Worst Case Configuration

5.3 Emergency Configuration

In the emergency condition, all transformers are out of service and only emergency loads will be fed from the Diesel generator. The bus-tie breaker “C” is open in this configuration.



Emergency Configuration

6.0 LOAD FLOW STUDY

The load flow study calculates the active and reactive power flow and the bus voltages in different plant configurations. The main goals of the load flow studies are:

- To verify that no cable or transformer is overloaded.
- To check the bus voltages

Result of maximum short circuit currents is reported in Attachment 1, 2 & 3.

7.0 SHORT CIRCUIT ANALYSIS

At this stage, the maximum short circuit values are calculated in worst case operation to verify that the switchgear withstand capacity is higher than the maximum short circuit current. In this configuration the motor contribution for each bus is maximum.

Result of maximum short circuit currents is reported in Attachment 4.

Table below compares the results of the 3ph short circuit studies with the switchgear withstand capacity.

Voltage Level [kV]	Short Circuit Current [kA]	Withstand Capacity [kA for 1s]
	max	
11	11.83	25
3.3	2.4	25

Voltage Level [kV]	Short Circuit Current [kA]	Withstand Capacity [kA for 1s]
	max	
0.4	24.46	50

All the switchgears are able to withstand the expected fault currents.

8.0 MOTOR STARTING ANALYSIS

At this stage, the motor starting analysis is considered for below configurations:

- In worst case configuration and when all of continues loads are connected and the 1250 kW 11 kV induction motor (Mtr2) starts with direct insertion, at the same voltage level.

Result of maximum short circuit currents is reported in Attachment 5.