

	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک																									
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طرح نگهداشت و افزایش تولید 27 مخزن

CALCULATION NOTE FOR TOTAL FLOODING DEMAND FOR EXTENSION OF EXISTING ELECT. BUILDING

نگهداشت و افزایش تولید میدان نفتی بینک

D02	APR. 2023	AFD	A.H.Saber	M.Fakharian	A.M.MOHSENI	
D01	MAR. 2022	AFD	A.H.Saber	M.Fakharian	M.MEHRSHAD	
D00	JAN. 2022	IFC	A.H.Saber	M.Fakharian	M.MEHRSHAD	
Rev.	Date	Purpose of Issue/Status	Prepared by:	Checked by:	Approved by:	CLIENT Approval

Class: 2 CLIENT Doc. Number: F0Z-708986

Status:

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
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	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک																									
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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.

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 Company (NISOC)
PROJECT:	Binak Oilfield Development – Surface Facilities; 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.

	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک																									
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2.0 SCOPE

The objective of this report is to estimate CO₂ requirement for new extension of switchgear room f or Binak Oilfield Development.

3.0 NORMATIVE REFERENCES

3.1 LOCAL CODES AND STANDARDS

- IPS-E-SF-160 Engineering Standard for CO₂ Gas Fire Extinguishing Systems.

3.2 INTERNATIONAL CODES AND STANDARDS

- IEC 60529 Specification for Degrees of Protection Provided by Enclosures
- NFPA 12 CO₂ Fixed Fire Protection Systems
- NFPA 72 National Fire Alarm Code
- ISO 3500 Gas cylinders – Seamless steel CO₂ cylinders for fixed fire-fighting installations on ships
- ISO 3500/A1 Amendment 1 to Standard 3500:2005
- IEC 6183 Fire protection equipment – Carbon dioxide extinguishing systems for use on premises – Design and installation

3.3 THE PROJECT DOCUMENTS

- BK-GNRAL-PEDCO-000-SA-SP-0005 Specification for Total Flooding System

3.4 ENVIRONMENTAL DATA

Refer to "Process Basis of Design; Doc. No. BK-GNRAL-PEDCO-000-PR-DB-0001 ".

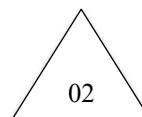
	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک																									
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4.0 CALCULATION

CO₂ SYSTEM

CO₂ total flooding shall be provided for:

- Capacitor Bank Room
- Cable Gallery
- High Voltage Room
- Low Voltage Room

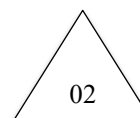


Dimension:

Room	Dimension (Width x Length x Height) - Meters
Capacitor Bank Room	6.3 x 3.7 x 4.1
Cable Gallery	24.7 x 5.3 x 4
High Voltage Room	29.8 x 5.3 x 4
Low Voltage Room	29.8 x 10.8 x 2.2

4.1 CALCULATION REPORT (CAPACITOR BANK ROOM)

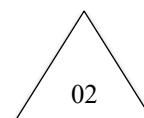
Zone :	Capacitor Bank Room
Equipment:	Electrical Panels & Cables
Volume :	6.3 x 3.7 x 4.1 = 95.6 m ³
Area Classification:	Class C-electrical fire
System :	Automatic CO ₂
Code & Standard :	NFPA 12
Type of System:	Total flooding - Multiple System
Type of Fire :	Deep seated
Flooding factor :	1.33 Kg/ m ³ (according to table 5.4.2.1 NFPA 12)
Safety Factor:	1.1
Discharge Time :	7 Minutes (according to 5.5.2.3 NFPA 12)
Concentration of CO ₂ :	30 % in 2 minutes and 50% in 7 minutes (according to 5.5.2.3 NFPA 12)
Formula :	Total CO ₂ required = (Vol.) x (Flooding Factor) x (Safety Factor)
CO ₂ Required:	140 Kg
Cylinder Capacity :	67 Lit (45 Kg)
No. of Cylinders :	4



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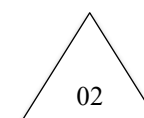
4.2 CALCULATION REPORT (HV ROOM)

Zone :	High Voltage Room
Equipment:	Electrical Panels & Cables
Volume :	24.7 x 5.3 x 4 = 524 m ³
Area Classification:	Class C-electrical fire
System :	Automatic CO ₂
Code & Standard :	NFPA 12
Type of System:	Total flooding - Multiple System
Type of Fire :	Deep seated
Flooding factor :	1.33 Kg/ m ³ (according to table 5.4.2.1 NFPA 12)
Safety Factor:	1.1
Discharge Time :	7 Minutes (according to 5.5.2.3 NFPA 12)
Concentration of CO ₂ :	30 % in 2 minutes and 50% in 7 minutes (according to 5.5.2.3 NFPA 12)
Formula :	Total CO ₂ required = (Vol.) x (Flooding Factor) x (Safety Factor)
CO ₂ Required:	767 Kg
Cylinder Capacity :	67 Lit (45 Kg)
No. of Cylinders :	17



4.3 CALCULATION REPORT (LV ROOM)

Zone :	Low Voltage Room
Equipment:	Electrical Panels & Cables
Volume :	29.8 x 5.3 x 4 = 632 m ³
Area Classification:	Class C-electrical fire
System :	Automatic CO ₂
Code & Standard :	NFPA 12
Type of System:	Total flooding - Multiple System
Type of Fire :	Deep seated
Flooding factor :	1.33 Kg/ m ³ (according to table 5.4.2.1 NFPA 12)



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Safety Factor: 1.1

Discharge Time : 7 Minutes (according to 5.5.2.3 NFPA 12)

Concentration of CO₂: 30 % in 2 minutes and 50% in 7 minutes (according to 5.5.2.3 NFPA 12)

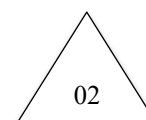
Formula : Total CO₂ required = (Vol.) x (Flooding Factor) x (Safety Factor)

CO₂ Required: 925 Kg

Cylinder Capacity : 67 Lit (45 Kg)

No. of Cylinders : 21

4.4 CALCULATION REPORT (CABLE GALLERY ROOM)



Zone : Cable Gallery Room

Equipment: Electrical Panels & Cables

Volume : 29.8 x 10.8 x 2.2 =708 m³

Area Classification: Class C-electrical fire

System : Automatic CO₂

Code & Standard : NFPA 12

Type of System: Total flooding - Multiple System

Type of Fire : Deep seated

Flooding factor : 1.33 Kg/ m³ (according to table 5.4.2.1 NFPA 12)

Safety Factor: 1.1

Discharge Time : 7 Minutes (according to 5.5.2.3 NFPA 12)

Concentration of CO₂: 30 % in 2 minutes and 50% in 7 minutes (according to 5.5.2.3 NFPA 12)

Formula : Total CO₂ required = (Vol.) x (Flooding Factor) x (Safety Factor)

CO₂ Required: 1036 Kg

Cylinder Capacity : 67 Lit (45 Kg)

No. of Cylinders : 23

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5.0 CONCLUSION

02

With the provision of CO₂ system the summary of calculated CO₂ extinguishing Media demand to protect Rooms in substation building will be as following table:

Area	Total required	No. of Main Cylinders
Capacitor Bank room	140 Kg	4
HV Room	767 kg	17
LV Room	925 Kg	21
Cable Gallery Room	1036 Kg	23

Therefore total number of required cylinder for total flooding system (base on biggest volume) in this building **1036 Kg (23 Cylinders)** of CO₂ gas is needed.