



شماره پیمان: 053-073-9184	ESD Philosophy						شماره صفحه : 1 از 8
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	پروژه	BK	SSGRL				

طرح نگهداشت و افزایش تولید 27 مخزن

ESD Philosophy



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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
AB-A: As-Built –Approved

 NISOC	نگهداشت و افزایش تولید میدان نفتی بینک فعالیت های رو زمینی در بسته های کاری تحت الارض عمومی و مشترک																									
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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, construction of well location, access roads, wellhead facilities for 6 new wells (with electric power supply for 2 of them) and required modifications on 4 workover wells (with electric power supply) shall be done. In addition, construction of 6 new flowlines from new wells to Binak B/C unit (with extension of relevant manifold) are in the Project scope of work.

GENERAL DEFINITION

CLIENT:	National Iranian South Oilfields Company (NISOC)
PROJECT:	Binak Oilfield Development – Construction of New Well Locations, Modifications on Workover Wells, Wellhead Facilities, Electrification Facilities, Flowlines and Extension of Binak B/C Manifold
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:	Executer 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.

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2.0 SCOPE

The objective of this document is to define the plant emergency shutdown / F&G philosophy dedicated to ensure that safe conditions are created during different emergency situations in Binak Oilfield Development – Construction of New Well Locations, Modifications on Workover Wells, Wellhead Facilities, Electrification Facilities, Flowlines and Extension of Binak B/C Manifold.

3.0 NORMATIVE REFERENCES

3.1 LOCAL CODES AND STANDARDS

- IPS-E-PR-470 Engineering Standard for Process Design of Emergency Measures
- IPS-G-IN-260 Engineering and Installation Standard for Indicating Lights, Alarms & Protective Systems

3.2 THE PROJECT DOCUMENTS



- Piping & Instrumentation Diagrams of Project

3.3 ENVIRONMENTAL DATA

Refer to "Process Basis of Design; Doc. No.BK-00-HD-000-PR-BD-0001"

4.0 EMERGENCY SHUTDOWN PROVISION

- There are 2 independent ESD system type , one for each new wellhead area and the other for new extension of manifold area with dedicated ESD hierarchy depend on new added equipment. Connection with existing ESD systems shall be reviewed depend on client request
- The control and safety equipment located at wellhead area shall be self- sufficient. The area is un-manned with no electrical power, so pneumatic/Hydraulic WHCP/HPU shall be designed in order to protect the area automatically in absence of personnel and also provide/Indicate enough data during the presence of operators for operation and maintenance purposes.
- Currently, an ESD system is exist in Binak manifold area but a new ESD system for new flow line of Manifold area shall be provided in this project.

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- ESD systems shall be designed and implemented as separate and independent instrumented protection levels, which, in addition to other mechanical over-pressure protective devices (e.g., safety-relief valves), protect plant personnel, surrounding communities and the environment from potential adverse effects of emergencies (e.g., fires, explosions, and hydrocarbon or toxic gas releases).
- ESD systems consist of a structured logic network of sensors or actuating devices, logic solvers, emergency isolation valves, and “permissive” interlocks (e.g., for rotating equipment). These systems react automatically upon detection of an abnormal process, condition or upset, or manually by operator intervention to do the following:
 - Isolate hazardous process streams entering or exiting plant equipment or process units
 - depressurizing of the highly pressurized sections
 - Shutdown associated rotating equipment
 - Electrical power isolation

5.0 DESCRIPTION OF HIERARCHICAL LEVELS FOR BINAK B/C MANIFOLD

The new ESD system for extended manifold area consists of at least 2 hierarchical levels of shutdown and/or isolation, as described in following section.



5.1 LEVEL 0– PLANT EMERGENCY SHUT DOWN WITH DEPRESSURIZING

ESD level 0 is isolates and brings into safe condition, all process and utilities systems throughout the plant along with automatic depressurizing of the highly pressurized sections. It shall be initiated through the below causes:



- UPS failure
- ESD request from existing system (ESD-0 exist)

The effects will be as the followings:

- Trip oil sump pump
- Activation of ESD level 1

5.2 LEVEL 1– EACH FLOW LINE SHUT DOWN WITHOUT DEPRESSURIZING

ESD level 1 is isolates and brings into safe condition, each flow line without depressurizing. It

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shall be initiated through the below causes:

- High High pressure in each flow line.
- Low Low pressure in each flow line.

The effects will be as the followings:

- Close shutdown valves in each flow line.

6.0 WELLHEAD EMERGENCY SHUT DOWN

6.1 DESCRIPTION:

- Emergency shut-down of wellhead area,
- Escape of personnel from the fire zone.

6.2 TYPICAL CAUSES



The panel shall be able to shut-down SSV according to closing sequence in the following modes:

- Low-low pressure in fusible plug line (Fusible plugs activation in fire case)
- Low-low pressure in hydraulic line to S.S.S.V
- Low-low pressure in flow-line
- high-high pressure in hydraulic line to S.S.S.V
- high-high pressure in flow-line
- ESD Push button on panel

And for shut-down SSSV:

- Low-low pressure in fusible plug line (Fusible plugs activation in fire case)
- Low-low pressure in hydraulic line to S.S.S.V
- ESD Push button on pane



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6.3 TYPICAL EFFECTS

- Shutdown of wellhead area through closure of SSV and SSSV.

Closing/opening sequence of SSVs and SSSVs are as follows:

- SSV can be opened after an adjustable time delay of SSSV opening.
- SSSV shall be closed after an adjustable time delay of SSV closing.

7.0 ESD SYSTEM SEGREGATION

ESD systems, associated logic and alarms shall be designed such that they are segregated from, and totally independent of, other regulatory control and monitoring systems.

7.1 ESD SYSTEM FAILURE MODES

All ESD loops and systems shall have a defined failure or fail-safe state. The fail-safe state shall be the de-energized state. This means that all ESD modules, subsystem components, process measuring elements and final control elements shall be designed and implemented in such a manner that there is a defined "de-energized" failure state: fail-open, fail-close, or fail-steady.

7.2 PROCESS CAUSE AND EFFECTS DIAGRAMS

All causes and effects mentioned in this document including , all shut-down commands resulting to actions such as trip of rotating equipment and packages, closing the ESDVs and permissive/ opening of blow-down valves interlocks and resulting actions will be identified on the cause and effects diagrams.

8.0 FIRE AND GAS SYSTEM PROVISION

For manifold area:

A new wall mounted fire alarm panel in existing control room shall be considered for fire and gas alarm which has no action for ESD.

For wellhead area:

Fire detection will be done by fusible plugs installed on nitrogen line around wellhead which will be provided by WHCP vendor and will cause ESD of well.