طرح نگهداشت و افزایش تولید ۲۷ مخزن

SPECIFICATION FOR FLEXIBILITY ANALYSIS

نگهداشت و افزایش تولید میدان نفتی بینک

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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

REVISION RECORD SHEET

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2	X	X	X		
3	X	X	X		
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CONTENTS

0.0 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 CLIENT(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.

COMPANY:	National Iranian South Oilfields CLIENT(NISOC)
PROJECT:	Binak Oilfield Development – General Facilities
EPD/EPC CONTRACTOR:	Petro Iran Development CLIENT(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 EPC CONTRACTOR and approved by GC & 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 CLIENTrather than by an EPC/EPD CONTRACTOR, supplier or VENDOR.
MAY:	Is used where a provision is completely discretionary.

GUIDANCE FOR USE OF THIS DOCUMENT

The amendments/supplement to the related IPS Standard(s) given in this document are directly r elated to the equivalent sections or clauses in the IPS Standard(s). For clarity, the section and p aragraph 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 d

ocument. 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 is added to that clause.

1.0 SCOPE (MOD.)

This specification gives amendment and supplement to IPS-E-PI-200(1), "Engineering Standard for Flex ibility Analysis".

It shall be used in conjunction with data/requisition sheets for present document subject.

IPS-E-PI-200(1), covers the basic requirements for the flexibility analysis of piping systems in Oil, Gas an d Petrochemical Industries.

The analysis shall consider the effects of Temperature, Pressure, Vibration, Loads, Fluid, Reactio ns and Environmental Factors.

2.0 NORMATIVE REFERENCES (MOD.)

Following Codes, Standards and Documents shall be added to the IPS-E-PI-200.

2.1 LOCAL CODES AND STANDARDS (ADD.)

- IPS-E-PI-240(2) "Engineering Standard for Plant Piping Systems"

2.2 THE PROJECT DOCUMENTS (ADD.)

- ASME Section VIII Div. 2 (Boiler and Pressure Vessel Codes)
- API 620 "Design and Construction of Large, Welded, Low-Pressure Storage Tanks"
- UBC (1997+Addendum) (Uniform Building Code)
- WRC (Welding Research Council)

- 107/297 "Local Stresses in Cylindrical Shells Due to External Loading on Nozzles"

2.3 THE PROJECT DOCUMENTS (ADD.)

BK-GNRAL-PEDCO-000-PR-DB-0001 Process Basis of Design

2.4 ENVIRONMENTAL DATA

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

3.0 DEFINITION AND TERMINOLOGY

No amendments or supplements are to state.

4.0 UNITS

No amendments or supplements are to state.

5.0 PIPING STRESS ANALYSIS (MOD.)

The following specifications shall be complied with:

a) Pipe support design based on IPS-G-PI-280 and Specification For Pipe Support (BK-GNRAL-PEDCO-000-PI-SP-0014).(MOD)

5.1 DESIGN CONDITIONS (MOD.)

Installation temperature for stress analysis calculation shall be considered 21°C.

6.0 LOAD AND STRESS CONSIDERATION IN PIPE STRESS ANALYSIS (MOD.)

6.1 WEIGHT EFFECT

No amendments or supplements are to state.

6.2 HYDRO TEST

No amendments or supplements are to state.

6.3 THERMAL EXPANSION AND CONTRACTION EFFECTS

No amendments or supplements are to state.

6.4 FRICTION EFFECT

No amendments or supplements are to state.

6.5 DYNAMIC EFFECTS (MOD.)

6.5.2 WIND (MOD.)

6.5.2.1. Wind Load analysis will be performed for exposed lines connected to tall columns and structures.

6.5.3 EARTHQUAKE (MOD.)

6.5.3.1. Acording to site condition, the seismic coefficient with forced acceleration shall be considered. (ADD.)

6.5.3.2. All critical piping systems (Level 3) shall be analyzed for seismic loads. (ADD.)

7.0 FLANGE LEAKAGE CRITERIA (MOD.)

The flange leakage shall be evaluated for all flanges on critical lines with rating >=600#. (ADD.)

The flange load checking shall be considered in operating temperature and operating pressure. (ADD.)

8.0 ALLOWABLE LOADS ON EQUIPMENT NOZZLES (MOD.)

For all nozzle loads calculation shall be based on operating temperature. (MOD.)

9.0 DESIGN CONSIDERATION (MOD.)

9.1 EXPANSION JOINTS (MOD.)

Expansion Joints must be rated and evaluated against manufacture's allowable.

9.2 FIRE CASE (ADD.)

To be considered for flare lines. Temperature for the same to be considered as identified in the line list.

10.0 EXTENT OF ANALYSIS

No amendments or supplements are to state.

11.0 ANALYSIS SOFTWARE (ADD.)

Computer stress analysis for critical systems will be carried out using CAESAR-II (2018).

11.1 GEOMETRIC DATABASE

- CAESAR II library of piping will be utilized with nominal bore and schedule no. For pipe size above 42” and for non-standard schedules, piping material spec. (PMS), relevant pipe/fitting/valves vendor catalogues will be used for entering outside diameter, pipe thickness and weigh.
- Actual density shall be entered as per Line list.
- Insulation thickness shall be entered as per the line list.

11.2 CAESARII CONFIGURATION FILE AND UNIT FILES

- SI units will be followed for this project.
- The load combination cases is also attached in Appendix C

APPENDIX A “STRESS ANALYSIS LEVEL REQUIREMENTS”

No amendments or supplements are to state.

APPENDIX B “STRESS ANALYSIS REPORTS”

No amendments or supplements are to state.

APPENDIX C "LOAD COMBINATION CASES" (ADD.)

SL.NO.	Combinations	Case	Remarks
1	WW+HP	HYD	HYDRO TEST
2	W+T1+P1	OPE	DESIGN
3	W+T2+P1	OPE	OPE.
4	W+T2+P1+U1	OPE	EARTHQUAKE(N/S)
5	W+T2+P1+U2	OPE	EARTHQUAKE(E/W)
6	W+T2+P1+WIN1	OPE	WIND(N)
7	W+T2+P1+WIN2	OPE	WIND(S)
8	W+T2+P1+WIN3	OPE	WIND(W)
9	W+T2+P1+WIN4	OPE	WIND(E)
10	W+T2+P1+F1	OPE	PSV REACTION FORCE
11	W+P1	SUS	SUSTAINED
12	L4-L3	OCC	ALG
13	L5-L3	OCC	ALG
14	L6-L3	OCC	ALG
15	L7-L3	OCC	ALG
16	L8-L3	OCC	ALG
17	L9-L3	OCC	ALG
18	L10-L3	OCC	ALG
19	L11+L12	OCC	SCA
20	L11+L13	OCC	SCA
21	L11+L14	OCC	SCA
22	L11+L15	OCC	SCA
23	L11+L16	OCC	SCA
24	L11+L17	OCC	SCA
25	L11+L18	OCC	SCA
26	L2-L11	EXP	EXPANSION1 (ALG)
27	L3-L11	EXP	EXPANSION2 (ALG)

Designations

W: weight with content
WW: hydro weight
P1: design pressure
HP: hydro pressure
T1: Design Temperature
T2: Ope. temperature
U1: seismic coefficient in N/S direction
U2: seismic coefficient in E/W direction

WIN1: wind pressure in N direction
WIN2: wind pressure in S direction
WIN3: wind pressure in W direction
WIN4: wind pressure in E direction
F1=force
ALG: algebraic
ABS: absolute
SCA: scalar

In addition to the above, WNC (weight with no content) may be added with P1 at appropriate case.