طرح نگهداشت و افزایش تولید ۲۷ مخزن

Process Data Sheets For 2nd Stage Gas Air Coolers

نگهداشت و افزایش تولید میدان نفتی بینک

D04	NOV.2022	IFA	M.Aryafar	M.Fakharian	M.Mehrshad	
D03	AUG.2022	IFA	M.Aryafar	M.Fakharian	M.Mehrshad	
D02	JUN.2022	IFA	M.Aryafar	M.Fakharian	M.Mehrshad	
D01	DEC.2021	IFA	M.Aryafar	M.Fakharian	M.Mehrshad	
D00	NOV.2021	IFC	M.Aryafar	M.Fakharian	M.Mehrshad	
Rev.	**Date**	**Purpose of Issue / Status**	**Prepared by:**	**Checked by:**	**Approved by:**	**CLIENT Approval**

Class: 2 **CLIENT Doc. Number: F0Z-708750**

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

CHANGE RECORD SHEET

PAGE	D00	D01	D02	D03	D04
1	X	X	X	X	X
2	X	X	X	X	X
3	X	X	X		X
4	X	X	X		X
5	X	X	X		
6					X
7					
8					
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	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض Process Data Sheets For 2nd Stage Gas Air Coolers	HIRGAN ENERGY

شماره پیمان:	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	شماره صفحه: ۳ از ٦
۰۵۳ – ۰۷۳ – ۹۱۸٤	BK	GCS	PEDCO	120	PR	DT	0005	D04	

	Note										Rev
1											
2		Service Of Unit	2nd Stage Gas Compression Cooler			Case	Summer Case				
3		Service Type	Sour Service			Tag No.	AE-2102 A/B/C				
4	7	Heat Duty(Normal x Overdesign)	MW	0.493	x 1.1	No. Req'd	3	Working	2	Standby 1 Total 3	
5		Draught	Induced Draft Type			Winterization Control		□ Yes	■ No		
6		Cyclic Service	-			Misc. Conn's:		□ TI	□ PI		
7		P&ID Number	BK-GCS-PEDCO-120-PR-PI-0011								
8		**TUBE SIDE PERFORMANCE OF ONE UNIT**									
9		Fluid Name	Hydrocarbon								
10		Fluid Quantity Total (Normal)	kg/hr	8664					IN	Out	
11				IN	Out	Molecular Weight	(V) -		24.52	24.56	
12		- Vapor	kg/h	8664.0	8626.3		(L)		-	18.05	
13		- Liquid	kg/h	-	37.4	Density	(V)	kg/m^3	42.92	59.39	
14							(L)			981.90	
15		- Water	kg/h	-		Thermal Cond.	(V)	W/m-K	0.047	0.037	
16							(L)		-	0.652	
17		Temperature	°C	142.3	60	Specific Heat	(V)	kJ/kgmol°C	59.25	58.95	
18		Operating Pressure	barg	54.8	54.1		(L)		-	77.81	
19		Pressure Drop	bar Allowable		0.7	Viscosity	(V)	cP	0.016	0.014	
20		Pour Point/Freeze Point	°C	-	/ -		(L)		-	0.494	
21						Latent Heat	kJ/kg		-	-	
22						Fouling Resistance	m^2 °C/W		0.0002		
23		**AIR SIDE PERFORMANCE OF ONE UNIT**									
24		Inlet Air Temperature	°C	50.26		Min. Ambient Air Temperature	°C		5		
25		Barometric Pressure	milibar	990.7 -914.2		Altitude	m		12.5		
26		Air Side Fouling Resistance	m^2°C/W	0.00035							
27		**Type Of Control**									
28		Louver	■ Yes	□ No		Action Control		□ Auto	■ Manual		
29		Fan Pitch	■ Yes	□ No		Action Control		■Auto	□ Manual		
30		VFD	□ Yes	■ No							
31		**CONSTRUCTION**									
32		Design Pressure	barg	62		Header Material			SS 316L		
33		Vacuum Pressure @ Temp. of		-		Header Corr. Allow.	-	mm			
34		Design Temperature	°C	175		Tube Material			SS 316L		
35		MDMT	°C	-28		P.W.H.T.(Process Reason)					
36		Slope	%	Note2		Nozzle Size	in	-Inlet	6		
37		Chemical Cleaning	□ Yes	■ No		Nozzle Size	in	-Outlet	6		
38		**Heating Fluid**									
39		Heating Fluid				Flow Rate	kg/s				
40		Temperature(in/out)	°C	/		Inlet Pressure	barg		/		
41		Design Temperature	°C			Pressure Drop(allowable)	bar				
42		Inlet/Outlet Nozzle	in	/		Design Pressure	barg				
43		**NOTES**									
44	1	It will be finalized after receiving compressor supplier data.									
45	2	Bundle to be self draining. The last row should 1% sloped.									
46	3	Design requirement should be in compliance with Process Design Criteria "BK-GNRAL-PEDCO-000-PR-DC-0001" and IPS-E-PR-785.									04
47	4	Deleted.									
48	5	For maximum, minimum and average temperature, min design relative humidity refer to "BK-GNRAL-PEDCO-000-PR-DB-0001".									
49	6	Material requirement should be in compliance with NACE MR 0175/ISO 15156 and Technical Specification for Material Requirements in Sour service									
50		BK-GNRAL-PEDCO-000-PI-SP-0008, ***IPS-MPM-200.***									
51	7	Air coolers over sizing shall be considered 10 % on maximum duty or flow rate, whichever is greater.									

NISOC	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض	HIRGAN ENERGY
شماره پیمان: ۰۵۳ – ۰۷۳ – ۹۱۸٤	**Process Data Sheets For 2nd Stage Gas Air Coolers**	شماره صفحه: ٤ از ٦

پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
BK	GCS	PEDCO	120	PR	DT	0005	D04

	Note											Rev
2		Service Of Unit	2nd Stage Gas Compression Cooler			Case	Winter Case					
3		Service Type	Sour Service			Tag No.	AE-2102 A/B/C					
4	7	Heat Duty(Normal x Overdesign)	MW	0.449	x 1.1	No. Req'd	3	Working	2	Standby	1 Total 3	
5		Draught	Induced Draft Type			Winterization Control	□ Yes	■ No				
6		Cyclic Service	-			Misc. Conn's:	□ TI	□ PI				
7		P&ID Number	BK-GCS-PEDCO-120-PR-PI-0011									
8		**TUBE SIDE PERFORMANCE OF ONE UNIT**										
9		Fluid Name	Hydrocarbon									
10		Fluid Quantity Total (Normal)	kg/hr	7585						IN	Out	
11				IN	Out	Molecular Weight	(V) -			21.56	21.56	
12		- Vapor	kg/h	7585	7585		(L)			-	-	
13		- Liquid	kg/h	-	-	Density	(V)	kg/m^3		36.11	49.41	
14							(L)			-	-	
15		- Water	kg/h	-		Thermal Cond.	(V)	W/m-K		0.050	0.039	
16							(L)			-	-	
17		Temperature	°C	149.5	60	Specific Heat	(V)	kJ/kgmol°C		53.12	51.31	
18		Operating Pressure	barg	54.8	54.1		(L)			-	-	
19		Pressure Drop	bar Allowable		0.7	Viscosity	(V)	cP		0.016	0.014	
20		Pour Point/Freeze Point	°C	-	/ -		(L)			-	-	
21						Latent Heat	kJ/kg			-	-	
22						Fouling Resistance	m^2 °C/W			0.0002		
23		**AIR SIDE PERFORMANCE OF ONE UNIT**										
24		Inlet Air Temperature	°C	50.26		Min. Ambient Air Temperature	°C			18.75		
25		Barometric Pressure	milibar	1005.43 -1007.77		Altitude	m			12.5		
26		Air Side Fouling Resistance	m^2°C/W	0.00035								
27		**Type Of Control**										
28		Louver	■ Yes	□ No		Action Control	□ Auto	■ Manual				
29		Fan Pitch	■ Yes	□ No		Action Control	■Auto	□ Manual				
30		VFD	□ Yes	■ No								
31		**CONSTRUCTION**										
32		Design Pressure	barg	60		Header Material	SS 316L					
33		Vacuum Pressure @ Temp. of		-		Header Corr. Allow.	-	mm				
34		Design Temperature	°C	175		Tube Material	SS 316L					
35		MDMT	°C	3.24		P.W.H.T.(Process Reason)						
36		Slope	%	Note2		Nozzle Size	in	-Inlet		6		
37		Chemical Cleaning	□ Yes	■ No		Nozzle Size	in	-Outlet		6		
38		**Heating Fluid**										
39		Heating Fluid				Flow Rate	kg/s					
40		Temperature(in/out)	°C	/		Inlet Pressure	barg			/		
41		Design Temperature	°C			Pressure Drop(allowable)	bar					
42		Inlet/Outlet Nozzle	in	/		Design Pressure	barg					
43		**NOTES**										
44	1	It will be finalized after receiving compressor supplier data.										
45	2	Bundle to be self draining. The last row should 1% sloped.										
46	3	Design requirement should be in compliance with Process Design Criteria "BK-GNRAL-PEDCO-000-PR-DC-0001" and IPS-E-PR-785.										04
47	4	Deleted.										
48	5	For maximum, minimum and average temperature, min design relative humidity refer to "BK-GNRAL-PEDCO-000-PR-DB-0001".										
49	6	Material requirement should be in compliance with NACE MR 0175/ISO 15156 and Technical Specification for Material Requirements in Sour service										
50		BK-GNRAL-PEDCO-000-PI-SP-0008, ***IPS-MPM-200.***										
51	7	Air coolers over sizing shall be considered 10 % on maximum duty or flow rate, whichever is greater.										

Note

Rev

TUBE SIDE ENTHALPY / PHYSICAL PROPERTIES PROFILES

INLET PRESSURE (54.8 BARG)

Vapour Properties							Liquid Properties						
Temperature C	Enthalpy [kJ/kgmol]	Vapor Frac	Vapour Density [kg/m3]	Vapour Mass Specific Heat [kJ/kg-C]	Vapour Viscosity [Cp]	Vapour Thermal Conductivity [W/m K]	Liquid Density [kg/m3]	Liquid Mass Specific Heat [kJ/kg-C]	Liquid Viscosity [Cp]	Liquid Thermal Conductivity [W/m K]	Surface Tension dyn/cm	Pseudo Pc (Barg)	Pseudo Tc (C)
142	-85692	1.00	42.92	2.42	0.016	0.047	-	-	-	-	-	-	-
134	-86178	1.00	44.10	2.40	0.016	0.046	-	-	-	-	-	-	-
126	-86662	1.00	45.36	2.39	0.016	0.045	-	-	-	-	-	-	-
118	-87143	1.00	46.71	2.38	0.016	0.044	-	-	-	-	-	-	-
109	-87623	1.00	48.17	2.37	0.015	0.043	-	-	-	-	-	-	-
101	-88101	1.00	49.74	2.37	0.015	0.042	-	-	-	-	-	-	-
93	-88579	1.00	51.45	2.37	0.015	0.041	-	-	-	-	-	-	-
85	-89056	1.00	53.32	2.37	0.015	0.040	-	-	-	-	-	-	-
76	-89591	1.00	55.40	2.37	0.015	0.039	969.0	4.33	0.385	0.666	62.9	219.9	373.6
68	-90177	1.00	57.72	2.39	0.014	0.038	975.5	4.32	0.435	0.659	64.4	219.9	373.6
60	-90741	0.99	60.30	2.41	0.014	0.037	982.0	4.31	0.494	0.652	65.8	219.9	373.5

OUTLET PRESSURE (51.8 BARG)

Vapour Properties							Liquid Properties						
Temperature C	Enthalpy [kJ/kgmol]	Vapor Frac	Vapour Density [kg/m3]	Vapour Mass Specific Heat [kJ/kg-C]	Vapour Viscosity [Cp]	Vapour Thermal Conductivity [W/m K]	Liquid Density [kg/m3]	Liquid Mass Specific Heat [kJ/kg-C]	Liquid Viscosity [Cp]	Liquid Thermal Conductivity [W/m K]	Surface Tension dyn/cm	Pseudo Pc (Barg)	Pseudo Tc (C)
142	-85679	1.00	42.35	2.41	0.016	0.047	-	-	-	-	-	-	-
134	-86164	1.00	43.51	2.40	0.016	0.046	-	-	-	-	-	-	-
126	-86647	1.00	44.74	2.39	0.016	0.045	-	-	-	-	-	-	-
118	-87128	1.00	46.07	2.38	0.016	0.043	-	-	-	-	-	-	-
109	-87606	1.00	47.50	2.37	0.015	0.042	-	-	-	-	-	-	-
101	-88084	1.00	49.05	2.36	0.015	0.041	-	-	-	-	-	-	-
93	-88560	1.00	50.73	2.36	0.015	0.041	-	-	-	-	-	-	-
85	-89037	1.00	52.56	2.36	0.015	0.040	-	-	-	-	-	-	-
76	-89567	1.00	54.60	2.37	0.015	0.039	969.01	4.33	0.385	0.666	62.9	219.9	373.6
68	-90153	1.00	56.87	2.38	0.014	0.038	975.51	4.32	0.435	0.659	64.4	219.9	373.6
60	-90716	0.99	59.39	2.40	0.014	0.037	981.94	4.31	0.494	0.652	65.8	219.9	373.5

Notes:

Refer to hazardous area classification layout, all instrumentation and electrical devices shall be suitable for: Zone:2 ,Gas Group:IIA ,

Temperature Class:T3

ATTACHMENT 1: API 661 SPEC SHEET

NOTES

1- Design flowrate: 9530.4 kg/h corresponding to 110% of Design Case flowrate for Summer Case.