طرح نگهداشت و افزایش تولید ۲۷ مخزن

PROCESS DATA SHEETS FOR 1ST 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-708748**

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

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PAGE	D00	D01	D02	D03	D04
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3	X	X	X		X
4	X	X	X		X
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	نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض PROCESS DATA SHEETS FOR 1ST STAGE GAS AIR COOLERS							
شماره پیمان:	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه
۰۵۳ – ۰۷۳ – ۹۱۸٤	BK	GCS	PEDCO	120	PR	DT	0003	D04

شماره صفحه: ۳ از ٦

1	Note														Rev
2		Service Of Unit	1st Stage Gas Compression Cooler	Case	Summer Case										
3		Service Type	Sour Service	Tag No.	AE-2101 A/B/C										
4	7	Heat Duty(Normal x Overdesign)	MW	0.332	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-0008												
8		**TUBE SIDE PERFORMANCE OF ONE UNIT**													
9		Fluid Name	Hydrocarbon												
F		Fluid Quantity Total (Normal)	kg/hr	8664					IN	Out					
11				IN	Out	Molecular Weight	(V)	-	24.52	24.52					
12		- Vapor	kg/h	8664	8664		(L)		-	-					
13		- Liquid	kg/h	-	-	Density	(V)	kg/m^3	15.38	18.28					
14							(L)		-	-					
15		- Water	kg/h	-	-	Thermal Cond.	(V)	W/m-K	0.042	0.033					
16							(L)		-	-					
17		Temperature	°C	124.8 (1)	60	Specific Heat	(V)	kJ/kgmol°C	54.53	50.54					
18		Operating Pressure	barg	19	18.3		(L)		-	-					
19		Pressure Drop	bar Allowable		0.7	Viscosity	(V)	cP	0.015	0.013					
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	5								
25		Barometric Pressure	milibar	914.2 -990.7	Elevation from sea level	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	22	Header Material		SS 316L (4)								
33		Vacuum Pressure @ Temp. of		-	Header Corr. Allow.	- mm									
34		Design Temperature	°C	155	Tube Material		SS 316L (4)								
35		MDMT	°C	-28	P.W.H.T.(Process Reason)										
36	2	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.													

نگهداشت و افزایش تولید میدان نفتی بینک
سطح الارض

PROCESS DATA SHEETS FOR 1ST STAGE GAS AIR COOLERS

شماره پیمان: ۰۵۳ – ۰۷۳ – ۹۱۸٤	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	شماره صفحه: ٤ از ٦
	BK	GCS	PEDCO	120	PR	DT	0003	D04	

												REV
1	Note											
2		Service Of Unit	1st Stage Gas Compression Cooler			Case	Winter Case					
3		Service Type	Sour Service			Tag No.	AE-2101 A/B/C					
4	7	Heat Duty(Normal x Overdesign)	MW	0.242	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-0008									
8		**TUBE SIDE PERFORMANCE OF ONE UNIT**										
9		Fluid Name	Hydrocarbon									
10	**P**	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/m³		13.85	15.81		
14							(L)		-	-		
15		- Water kg/h	-	-		Thermal Cond.	(V) W/m-K		0.042	0.035		
16							(L)		-	-		
17		Temperature °C	113.1 (1)	60		Specific Heat	(V) kJ/kgmol°C		48.40	45.63		
18		Operating Pressure barg	19	18.3			(L)		-	-		
19		Pressure Drop bar Allowable		0.7		Viscosity	(V) cP		0.014	0.013		
20		Pour Point/Freeze Point	- / -				(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		5			
25		Barometric Pressure milibar	914.2 -990.7			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	22			Header Material	SS 316L (4)					
33		Vacuum Pressure @ Temp. of	-			Header Corr. Allow.	- mm					
34		Design Temperature °C	155			Tube Material	SS 316L (4)					
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.										

Note

Rev

TUBE SIDE ENTHALPY / PHYSICAL PROPERTIES PROFILES

INLET PRESSURE (19 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)
125	-85942	1.00	15.38	2.22	0.015	0.042	-	-	-	-	-	-	-
118	-86294	1.00	15.67	2.21	0.015	0.041	-	-	-	-	-	-	-
112	-86643	1.00	15.98	2.19	0.014	0.040	-	-	-	-	-	-	-
105	-86990	1.00	16.30	2.17	0.014	0.039	-	-	-	-	-	-	-
99	-87334	1.00	16.63	2.15	0.014	0.038	-	-	-	-	-	-	-
92	-87675	1.00	16.97	2.14	0.014	0.037	-	-	-	-	-	-	-
86	-88014	1.00	17.34	2.12	0.014	0.036	-	-	-	-	-	-	-
79	-88350	1.00	17.72	2.11	0.013	0.036	-	-	-	-	-	-	-
73	-88684	1.00	18.12	2.09	0.013	0.035	-	-	-	-	-	-	-
66	-89015	1.00	18.54	2.08	0.013	0.034	-	-	-	-	-	-	-
60	-89345	1.00	18.99	2.07	0.013	0.033	-	-	-	-	-	-	-

OUTLET PRESSURE (18.3 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)
125	-85927	1.00	14.83	2.22	0.015	0.042	-	-	-	-	-	-	-
118	-86278	1.00	15.11	2.20	0.015	0.041	-	-	-	-	-	-	-
112	-86627	1.00	15.40	2.19	0.014	0.040	-	-	-	-	-	-	-
105	-86973	1.00	15.70	2.17	0.014	0.039	-	-	-	-	-	-	-
99	-87316	1.00	16.02	2.15	0.014	0.038	-	-	-	-	-	-	-
92	-87657	1.00	16.35	2.13	0.014	0.037	-	-	-	-	-	-	-
86	-87995	1.00	16.70	2.12	0.013	0.036	-	-	-	-	-	-	-
79	-88331	1.00	17.06	2.10	0.013	0.036	-	-	-	-	-	-	-
73	-88664	1.00	17.45	2.09	0.013	0.035	-	-	-	-	-	-	-
66	-88995	1.00	17.85	2.07	0.013	0.034	-	-	-	-	-	-	-
60	-89323	1.00	18.28	2.06	0.013	0.033	-	-	-	-	-	-	-

Note:

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

Temperature Class:T3

PROCESS DATA SHEETS FOR 1ST STAGE GAS AIR COOLERS

نگهداشت و افزایش تولید میدان نفتی بینک

NOTES

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