

VCM TANK FARM COMPRESSOR UPGRADE

ABERDEEN PLANT

CLASS "A" DESIGN

JANUARY 09, 1992

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I. PROBLEM DEFINITION

On several occasions the rail car unloading system has shut down. There has been a catastrophic failure of the compressors causing damage to compressor housing and internals. Most failures have caused some emission of VCM. These failures have been caused by liquid entering the compression chamber or the compressor running above its design conditions.

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II. PROJECT DESCRIPTION

This project will install instrumentation for safer operation of the Corken compressors in the VCM tank farm. The instrumentation installed will shut down the rail car unloading system should one of the switches be triggered.

The tank farm instrumentation will include the following:

1. INDIVIDUAL COMPRESSOR SHUT DOWN
 - e. High temp of compressor shutdown. TSH106-TSH110*
 - A. Low oil pressure switch on each compressor PSL 101-PSL 105 crank case.
 - B. Low pressure switch on the compressor inlet. *LO PRESS ON COMP K.O. POTS. PSL 106-PSL 110*
 - C. High temperature switch on each compressor discharge line. *TSH 101 - TSH 105*
 - D. High liquid level switch on each compressor LSH 101-LSH 105 knock-out pot discharge line.
2. ALL COMPRESSOR SHUTDOWN
 - A. High pressure switch on each compressor PSH 101-105 discharge line. *High Comp Direct from*
 - B. High high level switch on VCM storage sphere *LSHH 101* knock out pot.
 - C. Interlocks with existing instrumentation:*
 1. Sphere isolation valve. — *add limit switch*
 2. Sphere deluge system. — *this signal should already go to DCS*
 3. Rail car deluge. — " " " " " "

Each of the above switches will provide an input to the DCS. The DCS will also be responsible for providing the output for energizing the compressors. Software can be easily implemented for interlocking the above compressor shut downs.

*add interlocking
Relay in starter.*

*The above will require a
new function box.*

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III. JUSTIFICATION

Installing supplementary instrumentation and alarms in the tank farm will decrease the hazards associated with the unloading of liquid VCM rail cars. The end result of every malfunction of the unloading system is a VCM leak. It is necessary to know where the source of the malfunction came from and that the system will be shut down once a malfunction has occurred.

This safety and health project will reduce the possibility of a compressor shutting down and the system continuing to run and cause a VCM leak.

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VI. PROCESS DESCRIPTION

The existing high temperature switches, TSH-¹⁰⁶~~(103-110)~~, will be tied into the DCS (see P&I diagram). The individual compressors will be shut down at 340 degrees F.

Compressors CP-(102-105) have existing low pressure switches on their discharge line. These switches, PSL-¹⁰⁶~~(107-110)~~, will be moved to the inlet line of the compressor. A low pressure switch, PSL-106, will be installed on CP-101. The switches will be tied into the DCS. The DCS will shut down the individual compressor at 8 psig. *Low pressure switch mounted on top of K.O. pot.*

The existing high pressure switch, PSH-106, on the emissions recovery system (ERS) knock-out pot, will be tied into the DCS. All compressors will shut down when the ERS pressure reaches 75 psig.

High temperature switches, TSH-(101 and 105), will be installed on the discharge of compressors, CP-101 and CP-105. The other compressors have existing switches, TSH-(102-104). These switches will be tied into the DCS. The individual compressors will be shut down at 230 degrees F.

High liquid level switches, LSH-(101-105), will be installed on the discharge line of the compressor knock-out pots. These switches will be tied into the DCS. The DCS will shut down the individual compressor when a high level of liquid VCM is detected (see DCS interlocks list).

Low pressure switches, PSL-(101-105), will be installed on each compressor crank case. These switches will be tied into the DCS. The individual compressors will be shut down at 12 psig.

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VI. PROCESS DESCRIPTION (Continued...)

High pressure switches, PSH-(101-105), will be installed on the discharge line of each compressor. These switches will be tied into the DCS. All compressors will be shut down if any of the discharge lines reach 125 psig. A HAZOP of the VCM tank farm determined the flex hoses the weak link in the unloading system. All compressors will be shut down before the flex hoses reach a hazardous pressure.

A high-high level switch, LSHH-101, will be installed on an existing nozzle on the sphere knock-out pot. This switch will be tied into the DCS. All compressors will be shut down if high liquid VCM level is detected. This will keep the sphere knock-out pot from overflowing into the compressor inlet.

All switches, both new and existing will be tied into DCS (see DCS tie-in list). A DCS controller card and three additional TRIO blocks will be purchased, as part of this project, to handle the 32 additional discreet inputs and 5 additional discreet outputs that must be tied into the DCS. A VCM unloading graphic will be created. The switches will generate alarms on the DCS when engaged. These alarms will be included in the ladder logic for energizing the compressors. This will provide compressor shut downs when the given alarm condition occurs (see DCS interlocks list).

Interlocks with other equipment will be created to shut down the compressors in the following instances:

1. The ~~sphere isolation valve~~ is closed (DCS NUMBER: ~~00X120~~).
2. The sphere deluge system is activated (DCS NUMBER: ~~00HA001~~).
3. The rail car deluge system is activated (DCS NUMBER: ~~00HA105~~).

00H001

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VI. PROCESS DESCRIPTION (Continued...)

The vinyl operator will use two-way radios to communicate with the yard operator. Although the compressors will be energized from the DCS, the yard operator will be required to start the compressors from a local hand switch. The compressors' hand switches will be located at the shed.

A drain line, 1-HX-101-N-A2-1, will be run from the vapor header of the sphere to the ERS knock-out pot. This line will be used to drain any liquid out of the vapor line before the compressors are started. This line will be tied into the vapor header at the existing bleeder valve west of compressor CP-103. A check valve will be installed in this line.

? All lines down stream of the new drain line, 1-HX-101-N-A2-1, including the compressor knock-out pots and inlets to the compressors, will be heat traced and insulated.

This design will keep the compressors operating within their designed parameters. The compressors will be shut down before serious problems occur.

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V. ECONOMIC EVALUATION

This project has a projected cost of \$50M - \$100M.

VI. SAFETY AND ENVIRONMENTAL EVALUATION

This project will provide a safer operation of the compressors during the rail car unloading procedure. The ultimate result of the project will be a reduced chance for a VCM emission. This provides an added security to plant workers and the community.

EQUIPMENT AND INSTRUMENTATION LIST

ITEM	NEW EXISTING RELOCATED	SPEC. SHEET NUMBER	DESCRIPTION
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LEVEL SWITCHES

LSH-101	NEW	1	ULTRA SONIC LEVEL SWITCHES. INDICATE HIGH LIQUID LEVEL IN DISCHARGE LINE OF THE COMPRESSOR KNOCK-OUT POTS.
LSH-102	NEW	1	
LSH-103	NEW	1	
LSH-104	NEW	1	
LSH-105	NEW		
LSHH-101	NEW	1	CAPACITANCE PROBE LEVEL SWITCH. LOCATED IN SPHERE KNOCK-OUT POT.

TEMPERATURE SWITCHES

TSH-101	NEW	3	HIGH TEMPERATURE SWITCH FOR COMPRESSOR DISCHARGE LINES. SET POINT IS 230 DEGREES F.
TSH-102	EXISTING		
TSH-103	EXISTING		
TSH-104	EXISTING		
TSH-105	NEW	3	
TSH-106	EXISTING		HIGH TEMPERATURE FOR COMPRESSOR HEADS. SET POINT IS 340 DEGREES F.
TSH-107	EXISTING		
TSH-108	EXISTING		
TSH-109	EXISTING		
TSH-110	EXISTING		

PRESSURE SWITCHES

PSL-101	NEW	2	LOW PRESSURE SWITCH FOR COMPRESSOR CRANK CASE. SET POINT IS 12 PSIG. <i>Low oil pressure</i>
PSL-102	NEW	2	
PSL-103	NEW	2	
PSL-104	NEW	2	
PSL-105	NEW	2	
PSL-106	NEW	2	LOW PRESSURE SWITCHES FOR DISCHARGE OF COMPRESSOR KNOCK-OUT POT. SET POINT IS 8 PSIG.
PSL-107	RELOCATED	2	
PSL-108	RELOCATED	2	
PSL-109	RELOCATED	2	
PSL-110	RELOCATED	2	
PSH-101	NEW	2	HIGH PRESSURE SWITCHES FOR COMPRESSOR DISCHARGE LINES. SET POINT IS 125 PSIG.
PSH-102	NEW	2	
PSH-103	NEW	2	
PSH-104	NEW	2	
PSH-105	NEW	2	
PSH-106	EXISTING		PRESSURE SWITCH FOR THE ERS. SET POINT IS 75 PSIG.

DCS HARDWARE

A DCS CONTROLLER CARD WILL BE PURCHASED FOR THIS PROJECT.
THREE ADDITIONAL TRIO BLOCKS MUST BE PURCHASED FOR THIS PROJECT.

VISTA
VISTA CHEMICAL COMPANY
 GENERAL ENGINEERING
 HOUSTON, TEXAS

 SPECIFICATION SHEET
LIQUID LEVEL DEVICES

 A.F.E. NO. _____
 DATE 4/29/91 W.O. NO. _____
 MADE BY HTH INQ. NO. _____
 APP'D BY _____ REQ. NO. _____
 B.M. NO. _____ P.O. NO. _____
PLANT ABERDEENPROJECT VCM TANKFARM COMPRESSOR UPGRADE

1	ITEM NUMBER	LSHH - 101	LSH-101,102,103,104,105		
2	SERVICE	HIGH LEVEL SWITCH	HIGH LEVEL SWITCH		
3	LOCATION	DM-061	COMP. K.O. POT		
4	FUNCTION LIG. LEVEL SP. OR INTERFACE LEVEL	LIQUID LEVEL	LIQUID LEVEL		
5	OPERATING CONDITIONS	2-70 psi 40-100°F	100 psi 200°F		
6	UPPER FLUID	VCM VAPOR	VCM VAPOR		
7	LOWER FLUID	VCM LIQUID	VCM LIQUID		
8	DENSITY @ T. & P. UPPER LOWER				
9	TEMP., °F PRESSURE, PSIG				
10	DIELECTRIC CONSTANT				
11					
12	SENSOR				
13	TYPE DISPLACEMENT OR EXT. FLOAT, d/p CELL, PROBE	CAPACITOR PROBE	ULTRASONIC		
14	RANGE				
15	DIMENSIONS				
16	MATERIAL				
17	EXTENSION LENGTH				
18	BODY MATERIAL				
19	CONNECTIONS SIZE				
20	LOCATION				
21					
22	MODEL NUMBER				
23	TRANSMITTER				
24	PNEU - ELEC	ELECTRICAL	ELECTRICAL		
25	OUTPUT SIGNAL				
26	ELECTRICAL POWER SUPPLY				
27	CLASSIFICATION				
28					
29	MODEL NUMBER				
30	SWITCH				
31	TYPE: MERC OR SNAP ACTING				
32	QUANTITY FORM (SPDT, ETC.)				
33	CONDUIT CONN. SIZE TYPE				
34	RATING VOLTS CY or DC				
35	AMPS WATTS				
36	LOAD TYPE (INDUCTIVE YES, NO)				
37	DIFFERENTIAL FIXED ADJUST				
38	ADJUSTMENT INT EXT				
39	CONTACTS OPEN CLOSE ON LEVEL INC	CLOSE ON LEVEL INC	CLOSE ON LEVEL INC	ON LEVEL	ON LEVEL
40	MODEL NUMBER				
41	CONTROLLER				
42	PNEU - ELEC				
43	PROP % RESET				
44	INPUT OUTPUT				
45	ON LEVEL INC: OUTPUT INC				
46	ELECTRICAL POWER SUPPLY				
47	CLASSIFICATION	CLASS I DIV II	CLASS I DIV II		
48					
49	MODEL NUMBER				
50	ACCESSORIES				
51	FILTER REGULATOR				
52					
53	MANUFACTURER	ROBERT SHAW	SENSALL		

NOTES

 LSHH-101 WILL SHUT DOWN
 ALL THE COMPRESSORS AND
 WILL HAVE AN ALARM ON
 AP-101

 LSH-101 WILL SHUT DOWN
 THE COMPRESSOR IT IS
 SERVING AND WILL HAVE
 AN ALARM ON AP-101

 MAKE SURE INST. ON
 AGO'S WORK ON 610'S
SHEET 1 OF 3 REV. _____

VISTA**Vista Chemical Company**GENERAL ENGINEERING
HOUSTON, TEXAS**Pressure Instruments****SPECIFICATION DATA SHEET**

PROJECT NO. _____

A.F.E. NO. _____

P.O. NO. _____

MADE BY H.T. HARRISDATE 4/29/91 APP'D BY _____PLANT ABERDEENPROJECT VCM TANK FARM COMPRESSOR UPGRADE

GENERAL	1	TAG NO.		PSH-101,102,103,104,105		PSL-101,102,103,104,105		PSL-106,107,108,109,110			
	2	SERVICE		HIGH PRESSURE SWITCH		LOW PRESSURE SWITCH		LOW PRESSURE SWITCH			
	3	LOCATION		CP-101,102,103,104,105		CP-101,102,103,104,105		CP-101,102,103,104,105			
	4	INSTRUMENT TYPE		SWITCH		SWITCH		SWITCH			
	5	LOCATION		COMPRESSOR OUTLET		COMPRESSOR CRANK CASE		COMPRESSOR INLET			
	6			VAPOR PRESSURE		OIL PRESSURE		VAPOR PRESSURE			
ELEMENT	7	TYPE									
	8	LOCATION		CP-101,102,103,104,105		CP-101,102,103,104,105		CP-101,102,103,104,105			
	9										
	10	TEMPERATURE, °F	NORMAL	DESIGN		350		350			
	11	PRESSURE, PSIG	NORMAL	DESIGN	65-95	280	65-95	280	65-95		
	12	MATERIAL		STAINLESS STEEL		STAINLESS STEEL		STAINLESS STEEL			
	13	TRANSMITTER: PNEU OR ELECT.		ELECTRICAL		ELECTRICAL		ELECTRICAL			
	14	RANGE, PSIG		50-150		0-50		0-150			
	15	ALARM SET POINT	INC. OR DEC.		125	INC.	10	DEC.	8		
	16										
VALVE	17	MFR	MODEL		(1)						
	18	LOCATION									
	19	SIZE	BODY	PORT							
	20	MATERIAL	BODY	TRIM							
	21	TRIM FORM									
	22	Cv (Cg) FULL OPEN	C1								
	23	END CONN AND ANSI CLASS									
	24	LEAKAGE CLASS REQ'D									
	25	FAILURE POSITION									
	26										
VALVE SERVICE CONDITIONS	27	FLUID (NOTE: LIQ/VAP)		VAPOR		VAPOR		VAPOR			
	28	TEMPERATURE, °F	NORMAL	DESIGN							
	29	PRESSURE, PSIG	NORMAL	DESIGN							
	30	ΔP, PSI	MIN. RATE	NORM. RATE	MAX. RATE						
	31	MAX. SHUTOFF ΔP, PSI									
	32	RATE, MIN.	Cv (Cg)								
	33	RATE, NORMAL	Cv (Cg)								
	34	RATE, MAX.	Cv (Cg)								
	35	ΔP ALLOW. PSI	K _{vs}								
	36	*API (MM)									
	37	SP. GR. (LB/CU FT) AT T&P									
	38	VAPOR PRES. AT TEMP.	CRIT. PRES.								
	39	OPER. VISC., cp	VOL. % VAPOR								
	40	SUPERHEAT, °F	WT. % SOLID								
	41	WT. % VAPOR: IN	OUT								
	42	MAX. PRED. SND LEVEL, dBA	AT RATE								
	43										
NOTES	44	(1) OR CONOCO APPROVED EQUAL									
	45	PSL-107 → 110 IS AN EXISTING SWITCH ON THE COMPRESSOR									
	46	DISCHARGE LINE. THIS WILL BE MOVED TO THE OUTLET OF THE									
	47	COMPRESSOR KNOCK OUT POT.									
	48										
	49	MAKE SURE INSTRUMENTS PUT ON THE 490'S CAN BE USED ON A 690.									
	50										
51											

(X) INDICATES MANUFACTURER TO GIVE INFORMATION IN HIS QUOTATION.

SPEC NO. _____ REV. _____
SHEET 2 OF 3

VISTA
VISTA CHEMICAL COMPANY
 GENERAL ENGINEERING
 HOUSTON, TEXAS

SPECIFICATION SHEET
Temperature Instruments

 A.F.E. NO. _____
 DATE 4-29-91 W.O. NO. _____
 MADE BY HTH INQ. NO. _____
 APP'D BY _____ REQ. NO. _____
 B.M. NO. _____ P.O. NO. _____
PLANT ABERDEENPROJECT VCM TANK FARM COMPRESSOR UPGRADE

GENERAL	1	TAG NO.	TSH-101, 105		
	2	SERVICE	HIGH TEMP. SWITCH		
	3	LOCATION	CP-101+105		
	4	INSTRUMENT TYPE			
	5	LOCATION	COMPRESSOR OUTLET		
	6				
ELEMENT	7	TYPE			
	8				
	9	LOCATION	CP-101+105		
	10	TEMPERATURE °F	-350 MAX		
	11	PRESSURE, PSIG	280 MAX		
	12	MATERIAL	STAINLESS STEEL		
	13	TRANSMITTER: PNEU OR ELECT	ELECTRICAL		
	14	RANGE °F	100 - 400		
	15	ALARM SET POINT	230°F INC.		
VALVE	16	TYPE	X		
	17				
	18	LOCATION			
	19	MATERIAL: BODY TRIM			
	20	SIZE: BODY PORT			
	21	NUMBER OF PORTS			
	22	PLUG FORM			
	23	JP: MIN. NORM. MAX.			
	24	CALC. CV — NORMAL FLOW MAX. FLOW			
	25	VALVE CV — FULL OPEN			
	26	FAILURE POSITION			
	27	MAX. SHUT OFF JP			
	28	DESIGN PRESSURE			
29					
VALVE SERVICE CONDITIONS	30	FLUID (NOTE LIQ/VAP)			
	31	TEMP. °F: NORM. MAX.			
	32	PRESSURE, PSIG			
	33	*API (MW)			
	34	SP GR AT STD. COND.			
	35	SP GR AT T&P			
	36	VAPOR PRESS. AT T, PSI			
	37	WEIGHT % VAPOR IN-OUT			
	38	VISCOSITY AT T&P			
	39	% LIQ. IN OUT			
	40	RATE: NORMAL			
	41	RATE: MAX. MIN.			
	42				
NOTES	43	MAKE SURE INSTRUMENTS PUT ON A 490 ARE COMPATABLE W/ 690'S			
	44				
	45				
	46				
	47				
	48				
	49				
	50				
	51				

**VCM TANK FARM COMPRESSOR UPGRADE
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X. WORK LIST

NO VCM UNLOADING SHUT DOWN REQUIRED:

1. Install the controller card and TRIO blocks on the DCS.
2. Create a DCS graphic for VCM unloading.
 - A. Create Alarms for all switches (see DCS tie-in list).
 - B. Create ladder logic for energizing the compressors (see DCS interlocks list).
3. Install wiring between the DCS (vinyl control room) and the compressors and switches.

VCM UNLOADING SHUT DOWN REQUIRED:

1. Install LSH-(101-105) on compressor knock-out pot.
 - A. Connect to the DCS (00LAXX1-5).
2. Install PSL-(106-110) to compressor knock-out pot discharge line. *LD PRESS ON comp Inlet*
 - A. Connect to the DCS (00PAX17-21).
3. Connect TSH-(106-110) to the DCS (00TAXX7-11). *Where are these?*
4. Install PSL-(101-105) to compressor crankcase. *What's type? - Low OIL pres?*
 - A. Connect to the DCS (00PAX22-26).
5. Install TSH-101 and TSH-105 to CP-101 and CP-105 discharge lines.
 - A. Connect TSH-(101-105) to the DCS (00TAX12-16).
6. Install PSH-(101-105) to the compressor discharge line.
 - A. Connect to the DCS (00PAX27-31).
7. Connect PSH-106 to the DCS (00PAX32).
8. Install LSHH-101 to the sphere knock-out pot (in existing nozzle).
 - A. Connect to the DCS (00LAXX6).

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X. WORK LIST (Continued...)

9. Install ²1-HX-101-N-A2-1 from the bleeder valve west of CP-103 to the ERS knock-out pot.
14. Heat trace and insulate all lines from the drain line 1-HX-101-N-A2-1 to the compressor inlet.

DCS TIE – IN LIST

INPUT

DSC NUMBER	SOURCE
00LAXX1	LSH-101
00LAXX2	LSH-102
00LAXX3	LSH-103
00LAXX4	LSH-104
00LAXX5	LSH-105
00LAXX6	LSHH-101
00TAXX7	TSH-106
00TAXX8	TSH-107
00TAXX9	TSH-108
00TAX10	TSH-109
00TAX11	TSH-110
00TAX12	TSH-101
00TAX13	TSH-102
00TAX14	TSH-103
00TAX15	TSH-104
00TAX16	TSH-105
00PAX17	PSL-106
00PAX18	PSL-107
00PAX19	PSL-108
00PAX20	PSL-109
00PAX21	PSL-110
00PAX22	PSL-101
00PAX23	PSL-102
00PAX24	PSL-103
00PAX25	PSL-104
00PAX26	PSL-105
00PAX27	PSH-101
00PAX28	PSH-102
00PAX29	PSH-103
00PAX30	PSH-104
00PAX31	PSH-105
00PAX32	PSH-106

OUTPUT

DSC NUMBER	TO
00HMX33	CP-101
00HMX34	CP-102
00HMX35	CP-103
00HMX36	CP-104
00HMX37	CP-105

DCS INTERLOCKS LIST

ALL COMPRESSOR SHUT DOWN INTERLOCK

ALARM	DESCRIPTION	SOURCE
00PAX27	HIGH DISCHARGE PRESSURE ON CP-101	PSH-101
00PAX28	HIGH DISCHARGE PRESSURE ON CP-102	PSH-102
00PAX29	HIGH DISCHARGE PRESSURE ON CP-103	PSH-103
00PAX30	HIGH DISCHARGE PRESSURE ON CP-104	PSH-104
00PAX31	HIGH DISCHARGE PRESSURE ON CP-105	PSH-105
00LAXX6	HIGH LEVEL IN THE VCM SPHERE KNOCK-OUT POT	LSHH-101
00PAX32	HIGH PRESSURE IN THE ERS KNOCK-OUT POT	PSH-106
OOX120	SPHERE ISOLATION VALVE CLOSED	
00HA001	SPHERE DELUGE SYSTEM ACTIVATED	
00HA105	RAIL CAR DELUGE SYSTEM ACTIVATED	

CP-101 SHUT DOWN

ALARM	DESCRIPTION	SOURCE
00LAXX1	HIGH COMPRESSOR KNOCK-OUT LIQUID LEVEL	LSH-101
00PAX17	LOW COMPRESSOR KNOCK-OUT POT DISCHARGE PRESSURE	PSL-106
00TAXX7	HIGH COMPRESSOR HEAD TEMPERATURE	TSH-106
00TAX12	HIGH COMPRESSOR DISCHARGE TEMPERATURE	TSH-101
00PAX22	LOW COMPRESSOR OIL PRESSURE	PSL-101
ALL COMPRESSOR SHUT DOWN ACTIVATED		

WHEN ALL ALARMS ARE OFF, DCS WILL ENERGIZE 00HMX33.
AN OPERATOR WILL BE REQUIRED TO START CP-101 THROUGH
A LOCAL HAND SWITCH.

CP-102 SHUT DOWN

ALARM	DESCRIPTION	SOURCE
00LAXX2	HIGH COMPRESSOR KNOCK-OUT LIQUID LEVEL	LSH-102
00PAX18	LOW COMPRESSOR KNOCK-OUT POT DISCHARGE PRESSURE	PSL-107
00TAXX8	HIGH COMPRESSOR HEAD TEMPERATURE	TSH-107
00TAX13	HIGH COMPRESSOR DISCHARGE TEMPERATURE	TSH-102
00PAX23	LOW COMPRESSOR OIL PRESSURE	PSL-102
ALL COMPRESSOR SHUT DOWN ACTIVATED		

WHEN ALL ALARMS ARE OFF, DCS WILL ENERGIZE 00HMX34.
AN OPERATOR WILL BE REQUIRED TO START CP-102 THROUGH
A LOCAL HAND SWITCH.

DCS INTERLOCKS LIST

(CONTINUED...)

CP-103 SHUT DOWN

ALARM	DESCRIPTION	SOURCE
00LAXX3	HIGH COMPRESSOR KNOCK-OUT LIQUID LEVEL	LSH-103
00PAX19	LOW COMPRESSOR KNOCK-OUT POT DISCHARGE PRESSURE	PSL-108
00TAXX9	HIGH COMPRESSOR HEAD TEMPERATURE	TSH-108
00TAX14	HIGH COMPRESSOR DISCHARGE TEMPERATURE	TSH-103
00PAX24	LOW COMPRESSOR OIL PRESSURE	PSL-103
ALL COMPRESSOR SHUT DOWN ACTIVATED		

WHEN ALL ALARMS ARE OFF, DCS WILL ENERGIZE 00HMX35.
AN OPERATOR WILL BE REQUIRED TO START CP-103 THROUGH
A LOCAL HAND SWITCH.

CP-104 SHUT DOWN

ALARM	DESCRIPTION	SOURCE
00LAXX4	HIGH COMPRESSOR KNOCK-OUT LIQUID LEVEL	LSH-104
00PAX20	LOW COMPRESSOR KNOCK-OUT POT DISCHARGE PRESSURE	PSL-109
00TAX10	HIGH COMPRESSOR HEAD TEMPERATURE	TSH-109
00TAX15	HIGH COMPRESSOR DISCHARGE TEMPERATURE	TSH-104
00PAX25	LOW COMPRESSOR OIL PRESSURE	PSL-104
ALL COMPRESSOR SHUT DOWN ACTIVATED		

WHEN ALL ALARMS ARE OFF, DCS WILL ENERGIZE 00HMX36.
AN OPERATOR WILL BE REQUIRED TO START CP-104 THROUGH
A LOCAL HAND SWITCH.

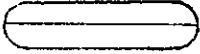
CP-105 SHUT DOWN

ALARM	DESCRIPTION	SOURCE
00LAXX5	HIGH COMPRESSOR KNOCK-OUT LIQUID LEVEL	LSH-105
00PAX21	LOW COMPRESSOR KNOCK-OUT POT DISCHARGE PRESSURE	PSL-110
00TAX11	HIGH COMPRESSOR HEAD TEMPERATURE	TSH-110
00TAX16	HIGH COMPRESSOR DISCHARGE TEMPERATURE	TSH-105
00PAX26	LOW COMPRESSOR OIL PRESSURE	PSL-105
ALL COMPRESSOR SHUT DOWN ACTIVATED		

WHEN ALL ALARMS ARE OFF, DCS WILL ENERGIZE 00HMX37.
AN OPERATOR WILL BE REQUIRED TO START CP-105 THROUGH
A LOCAL HAND SWITCH.

**VCM TANK FARM COMPRESSOR UPGRADE
ABERDEEN PLANT
JANUARY 09, 1992**

LEGEND

	NEW
	EXISTING
	4 WAY VALVE
	VALVE
	CHECK VALVE
	DCS INPUT/OUTPUT
A	ALARM
CP	COMPRESSOR
HM	OUTPUT TO MOTOR
HS	LOCAL HAND SWITCH
L	LEVEL DCS SIGNAL
LSH	HIGH LEVEL SWITCH
LSHH	HIGH-HIGH LEVEL SWITCH
PG	PRESSURE GAUGE
P	PRESSURE DCS SIGNAL
PSH	HIGH PRESSURE SWITCH
LSH	LOW PRESSURE SWITCH
T	TEMPERATURE DCS SIGNAL
TSH	HIGH TEMPERATURE SWITCH

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NOTES

- allow for new A/B switches*
- N1 PSL-(107-110) are existing pressure switches. The switches will be relocated from the compressor discharge line to the compressor knock-out pot discharge line of compressors CP-(102-105). A pressure switch, PSL-104, will be installed on the compressor knock-out pot discharge line for CP-101. 00PAX17-21 will indicate a pressure of 8 psig or below. When the alarm is activated, the individual compressor will be shut down.
- N2 LSH-(101-¹⁰⁵~~110~~) (00LAXX5-10) will shut down the individual compressors when liquid is detected in the discharge line from the knock-out pot.
- N3 TSH-(106-110) (00TAXX7-11) are existing temperature switches located on top of the compressor head. All lines are connected to a control box with a set point of 340 degrees F. The control box will be tied into DCS. This will shut down the individual compressor. *Need to know type of signal being sent. (Contact Closure)*
- N4 TSH-(101 and 105) (00TAX12-16) are new temperature switches. TSH-(102-104) are existing temperature switches located on the discharge line of the compressors. An individual compressor shut down will occur at 230 degrees F. *allow for new temp switches*
- N5 PSL-(101-105) (00PAX22-26) are low pressure switches located on the compressor crankcase. An individual compressor shut down will occur at 12 psig.
- N6 PSH-(101-105) (00PAX27-31) are high pressure switches located on the discharge of the compressor. All compressors will be shut down at 125 psig.
- N7 PSH-106 (00PAX32) will shut down all compressors when the Emission Recovery System knock-out pot builds up pressure to 75 psig.
- N8 LSHH-101 (00PAXX6) will shut down all compressors before the sphere knock-out pot overflows.

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NOTES (Continued...)

- N9 The liquid VCM drain line will tie into a bleeder valve on the VCM vapor line. This bleeder valve is located west of compressor CP-103. A check valve will be installed in this line.
- N10 All lines will be heat traced and insulated from the drain line to the compressor inlet. This includes the compressor knock-out pots.