

INTEROFFICE COMMUNICATION

Westlake, Louisiana
September 30, 1970

TO: R. H. Gerlach

SUBJECT: Revisions to VCM Tank Car Unloading Facilities

Attached is a design for conversion of VCM tank car unloading to direct pumping from the present method of utilizing plant nitrogen.

Basically, this design proposes the installation of a new VCM unloading pump below the south rack for transferring liquid VCM from up to six tank cars into any of the existing storage spheres. An average pumping rate of 400 gpm will allow transfer of at least 3 MM pounds of liquid VCM in a 24-hour period, with car switching time taken into account. Provision is made for use of the Corkin vent gas compressor to provide adequate suction pressure of VCM at the pump inlet. This is accomplished by taking vinyl chloride vapor from a sphere and compressing the gas to superheat conditions. The gas would then be discharged into the tank car at elevated temperature and pressure. New equipment, piping revisions, and other aspects of this design are given in the body of this report and on the attached P&I diagram.

Justification of this project is on the basis of an average savings of \$316 in nitrogen for every 3 MM pounds of VCM unloaded. Based on past operating experience, VCM is unloaded at the rate of about 10 MM pounds every 3 months. Therefore, the estimated capital investment of \$3500 before taxes for this project would be recovered in 10 months, or before the projected completion of additional VCM storage by the end of 1971 eliminates unloading problems. OMS costs associated with this project are estimated to be \$3000. Finally, it should be mentioned that no provision is made for insulating the vapor line from the Corkin compressor to the loading rack. However, if heat losses to vapor do inhibit operation of the new unloading pump, insulation can then be installed for an estimated \$2400 OMS cost.

C. L. Shaddock, Jr.
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CLS-MC
Attachment
cc: LNV
JDM
DKP
RDG
RLH

CWH 000005490

WORK LIST

1. Install new unloading pump P-426 at grade directly below the point where the south rack meets the main pipe stanchion.
2. Run a new 6" schedule 40 carbon steel line down from 8" VCA-3410 to the suction of P-426, installing the required gate valve.
3. Run a new 4" schedule 40 carbon steel line from the discharge of P-426 directly up to 8" VCA-908 on the main stanchion, allowing a few feet below this tie-in for the bypass gate valve to be installed. Install PG-1, SV-342, 4" check and gate valves on the new pump discharge line, and an 8" gate valve on line 908 just below the previous tie-in.
4. Run a new 6" schedule 40 carbon steel line from line 8" VCA-908 at the point where this line drops down on the north end of the overhead stanchion and turns eastward. Tie the new 6" line into 6" VCA-1901 at its southernmost edge (near T-411 C).
5. Install safety relief valves SV-343 and SV-344 at locations designated on the P&I diagram.
6. Readjust the set pressure on Corkin compressor discharge relief valve SV-654 at 200 psig plus 250 degrees F.

CWH 000005491



CENTRAL ENGINEERING DEPARTMENT

PONCA CITY, OKLAHOMA

SPECIFICATION SHEET

PRESSURE GAGES AND DIAPHRAGM SEALS

A.F.E. NO. _____

DATE 9-22-70

W. O. NO. _____

MADE BY CLS

INQ. NO. _____

APP'D BY _____

REQ. NO. _____

B. M. NO. _____

P. O. NO. _____

PLANT VCM; WESTLAKE, LA. PROJECT REVISIONS TO VCM UNLOADING FACILITIES

ITEM NO.		PG-1		
		VCM LIQUID AT P-426 DISCHARGE		
PRESSURE GAGE	RANGE	0-160 PSIG		
	TUBE MATERIAL			
	MOVEMENT: NYLON - S.S.			
	BEARING MATERIAL			
	CASE DIAMETER: 4 1/2" OR 6"	4 1/2"		
	ACCESSORIES:			
	OPERATING TEMPERATURE, °F	70		
	MANUFACTURER			
	MODEL NO.			
PRICE				

GENERAL - PRESSURE GAGES

TYPE ELEMENT: BOURDON TUBE

CASE: SURFACE MOUNTED, PHENOL TURRET TYPE WITH BLOWOUT DISC. OVERRANGE PROTECTION. SNAP DESIGN CASE RING AND BLACK FINISH.

DIAL: PLASTIC

FINISH: WHITE WITH BLACK MARKINGS

POINTER: ADJUSTABLE MICROMETER TYPE

DISPHRAGM SEAL	TYPE: SCR'D. - FLG'D.			
	BOTTOM HOUSING MATERIAL			
	TOP HOUSING MATERIAL			
	DIAPHRAGM MATERIAL			
	PROCESS CONN. SIZE & RATING			
	GAGE CONN. SIZE			
	LIQUID FILL FLUID			
	PROCESS OPERATING TEMP.			
	PROCESS PRESS. RANGE			
	MANUFACTURER			
	MODEL NO.			
PRICE				
TOTAL PRICE GAGE AND SEAL				

NOTES:

CWH 000005493

SUPPLIER TO COMPLETE FORM BY FURNISHING
INFORMATION FOR BLANK SPACESSHEET 1 OF 1 REV. _____



CENTRAL ENGINEERING DEPARTMENT

PONCA CITY, OKLAHOMA

SPECIFICATION SHEET

RELIEF VALVES

A.F.E. NO. _____

DATE 9-25-70 W. O. NO. _____MADE BY CLS INQ. NO. _____

APP'D BY _____ REQ. NO. _____

B. M. NO. _____ P. O. NO. _____

PLANT VCM; WESTLAKE, LA. PROJECT REVISIONS TO VCM UNLOADING FACILITIES

GENERAL		SV-342	SV-343	SV-344	
1	ITEM NO. & TAG	SV-342	SV-343	SV-344	
2	RELIEVES EQUIPMENT NO.	P-426	6" VCM TRANSFER LINE	8" HDR. AT SOUTH RACK	
3	MANUFACTURER				
4	MODEL NO.				
5					
SERVICE CONDITIONS					
6	FLUID	VINYL CHLORIDE	VINYL CHLORIDE	VINYL CHLORIDE	
7	STATE	LIQUID	LIQUID	LIQUID	
8	REQUIRED CAPACITY				
9	MOL. WT.	62.5	62.5	62.5	
	SP. GR.	0.92	0.92	0.92	
10	VISCOSITY	0.2 cp	0.2 cp	0.2 cp	
11	COMPRESSIBILITY FACTOR				
12	DESIGN PRESS. OF EQUIPMENT				
13	PRESS. OPERATING	150	110	100	
	RELIEVING	250	250	200	
14	TEMP. °F FLOWING	100	100	100	
	RELIEVING	100	100	100	
15	BACK PRESSURE	0	0	0	
16	DIFFERENTIAL SET PRESSURE	250	250	250	
17	ACCUMULATION %				
18	BLOW DOWN %				
19					
BASIS OF SELECTION					
20	CODE REQUIREMENT				
21	FIRE EXPOSED AREA				
22	INSULATION THICKNESS				
23	OTHER BASIS	THERMAL RELIEF	THERMAL RELIEF	THERMAL RELIEF	
24					
DESIGN DETAILS					
25	DESIGN TYPE				
26	SEAT TYPE				
27	BONNET (OPEN OR CLOSED)				
28	INLET SIZE, RATING, FACING	3/4"	3/4"	3/4"	
29	OUTLET SIZE, RATING, FACING	1"	1"	1"	
30	CALCULATED AREA				
31	ORIFICE LETTER				
	ACTUAL AREA	0.04 IN ²	0.04 IN ²	0.04 IN ²	
MATERIALS					
32	BODY	C.S.	C.S.	C.S.	
	BONNET	C.S.	C.S.	C.S.	
33	SEAT & DISK				
34	GUIDE & RING				
35	SPRING				
36	BELLOWS				
ACCESSORIES					
37	LIFTING LEVER (PLAIN OR PACKED)				
38	GAG				
39	CODE STAMP				
40	CAP (SCREWED OR BOLTED)				
41	OTHER				

NOTES:

MANUFACTURER SHALL VERIFY SELECTION OF ORIFICE SIZE AND MATERIALS.

VALVES SHALL MEET DIMENSION REQUIREMENTS OF API RP-526.

VALVES SHALL MEET TEST REQUIREMENTS OF API RP-527.

SUPPLIER TO COMPLETE FORM BY FURNISHING
INFORMATION FOR BLANK SPACES

CWH 000005494

SHEET 1 OF 1 REV. _____

CORKIN COMPRESSOR FOR VENT RECOVERY SYSTEM

The Corkin compressor is designed to evacuate the T-401 and T-411 spheres and railroad tank cars down to atmospheric pressure so that the VCM vapors in these tanks can be reclaimed. One of the T-411 spheres contains about 72,800 lbs. of VCM gas (based on 40 psig pressure and 60 degrees F) of which 73 percent can be recovered by evacuating down to 14.7 psia. The 53,600 lbs. of recovered VCM (6950 gals.) is worth 3.3 cents per pound or \$1,780/sphere. The T-401 spheres under the same conditions would generate 5,360 lbs. of VCM (695 gals.) or \$178 worth of recovered VCM. Tank cars would allow recovery of from 1/8 to 1/2 as much material as the T-401 spheres.

The compressor used is a Corkin, Model D. 690-109 which has a minimum suction pressure of 2 psia and a maximum of 225 psig. Outlet pressure can vary from vent recovery tank pressure (about 30 psig minimum) up to 250 psig. A safety valve is furnished on the compressor discharge and is set at 250 psig. The compressor is driven at 825 rpm by a belt-connected 1800 rpm, 10 HP motor. It will compress from 55 Acfm gas (inlet conditions 40 psig plus 60 degrees and outlet at 95 psig and 180 degrees F) down to 36 Acfm (inlet conditions 14.7 psia and 60 degrees F and outlet at 60 psig and 325 degrees F). This is equivalent to 34.7 lbs/min VCM at 40 psig or 6.0 lbs/min VCM at 14.7 psia. The compressor has an inlet liquid separator with a built in internal shutoff valve to protect the unit against possible liquid slugs.

CWH 000005495