

Interoffice
Communication

To: M. L. Ashby

From: J. B. Chorn - Alliance Engineering
Date: February 11, 1987

Subject: Pressure Control Loop for VCM Loading Lines -
Final Issue - Design No. 240-400-287-JBC

VISTA

A VCM release occurred on 2/28/86 when the line to the shiploading dock overpressured and caused the relief valve on S-402 to relieve momentarily. The attached control loop design will enable the dock loading line pressure to be maintained above the normal loading pressure but below the relieving pressure (200 psig) of the Bauxite Dryer, S-402. The excess pressure will be relieved into the VCM recirculation line and recovered in the sphere being loaded from. An operating procedure is attached as a part of the design.

By copy of this design to J. R. Holcomb, a definitive estimate is requested. If you have any questions, please call me at 5075. Since the comments from the review issue were few and minor, they were addressed in the final issue and no review meeting was held.



J. B. Chorn
Alliance Engineering

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cc: RAC-PEM-GEH-SRA-MLA(4)-JRH(4)-WPS-MGH-ERT-BED-SCR
DKH-HEK-RDH-SVC

CWH 000005528

Work List

Reference: VCM shiploading Line Pressure Control Loop Drawings
1 and 2

This project should be done when the dock loading line can be out of service for a week.

Preparatory Work

- 1) Mount the local controller, PIC-701, at a convenient spot.
- 2) Run instrument air supply, signal and output lines to and from PIC-701.
- 3) Run instrument air supply and signal lines to approximate PCV-701 location.

Project Execution

- 1) Close valves 2, 3, 4, 5, 6, and 7.
- 2) Depressure and clear Line C for removal per normal VCM line clearing procedures.
- 3) Remove line to a safe location for welding.
- 4) Install 2 4"-300# flanges at a convenient spot on Line C and install the Durco valve with actuator.
- 5) Put a numbered VCM VHAP tag on the valve for future monitoring.
- 6) Reinstall Line C with the new valve in the original position.
- 7) Hook up supply and signal lines to the actuator and controller.
- 8) Using the controller, open and close the new valve to verify operability.
- 9) Re-commission Line C to VCM service per normal commissioning procedures.
- 10) Open valve 2 and seal it open.
- 11) Install a red plastic sign with white letters near Valve 3 which reads:
"Open Only For Dock Loading Operations"
- 12) Install a red plastic sign with white letters near Valve 1 which reads:
"Close Only for Dock Loading Operations"

Design Basis and Discussion

A pressure control loop will be added which will prevent the pressure on the VCM line to the shiploading dock from reaching the relieving pressure (200 psig) of the Bauxite Dryer, S-402. The loop will consist of (1) an existing pressure recorder-indicator, (2) a locally mounted pneumatic indicator-controller, and (3) a 4"-300# Durco G-4 valve with an actuator and positioner. An operator can set the controller at 175 psig. Should the dock line pressure reach that point, an alarm will sound in the control room and the pressure control valve will relieve the excess pressure to the existing VCM recirculation line. When the dock line is not in use, the pressure control valve or an alternate valve should be opened to allow the pressure to relieve to the recirculation line. Valve 2 (see P&ID) must be sealed open.

Operation

When a vessel is to be loaded at the dock, valve 1 must be closed, valve 3 must be open (see P&ID), and the pressure controller set at 175 psig. If the line pressure reaches 175, the pressure control valve (PCV-702) will open and an alarm will sound in the control room.

When dock loading is complete, valve 3 should be closed to prevent accidentally refilling the dock line and valve 1 should be opened to allow the dock line and recirculation line pressures to equalize. The pressure controller setting can remain at 175 psig.

Energy Impact Statement

This project will have no effect on plant energy consumption. A Process Design Energy Checklist has been completed and is on file.

Environmental Impact Statement

The possibility of emergency releases of vinyl chloride to the atmosphere due to overpressurization of the dock loading line at the loading rack will be eliminated. The environmental checklist has been completed and is on file.

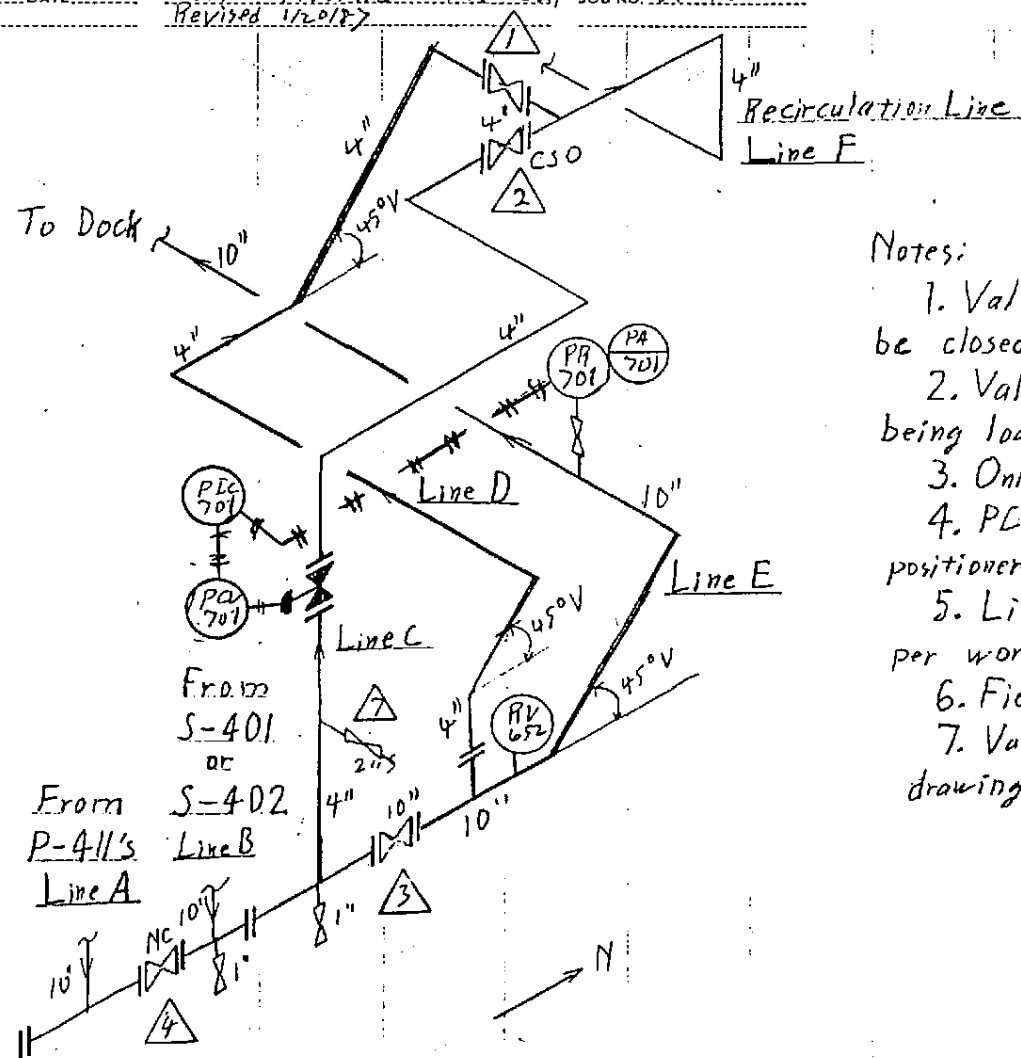
Safety & Health Impact Statement

The likelihood of exposure to VCM in the loading rack area will be reduced since overpressurization of the dock loading line will be relieved into the closed recirculation system. The safety checklist has been completed and is on file.

BY J.B. Charn DATE 1/6/87
CHKD. BY DATE

SUBJECT VCM Ship Loading
Line Pressure Control Loop
Revised 1/20/87

SHEET NO. 2 OF 2
JOB NO. VA-17



Notes:

1. Values $\Delta 2$ & $\Delta 3$ must be open and valve $\Delta 1$ must be closed during ship loading.
2. Valve $\Delta 1$ may be open when a ship is not being loaded.
3. Only PCV-701 and PIC-701 are new.
4. PCV-701 is a 4"-300# G-4 Durco with a positioner.
5. Line C to be cleared and removed for welding per work list.
6. Field locate PCV-701 and PIC-701 on Line C.
7. Valve $\Delta 5$ on Line B is not shown by this drawing. See sheet no. 1.

CWH 000005532

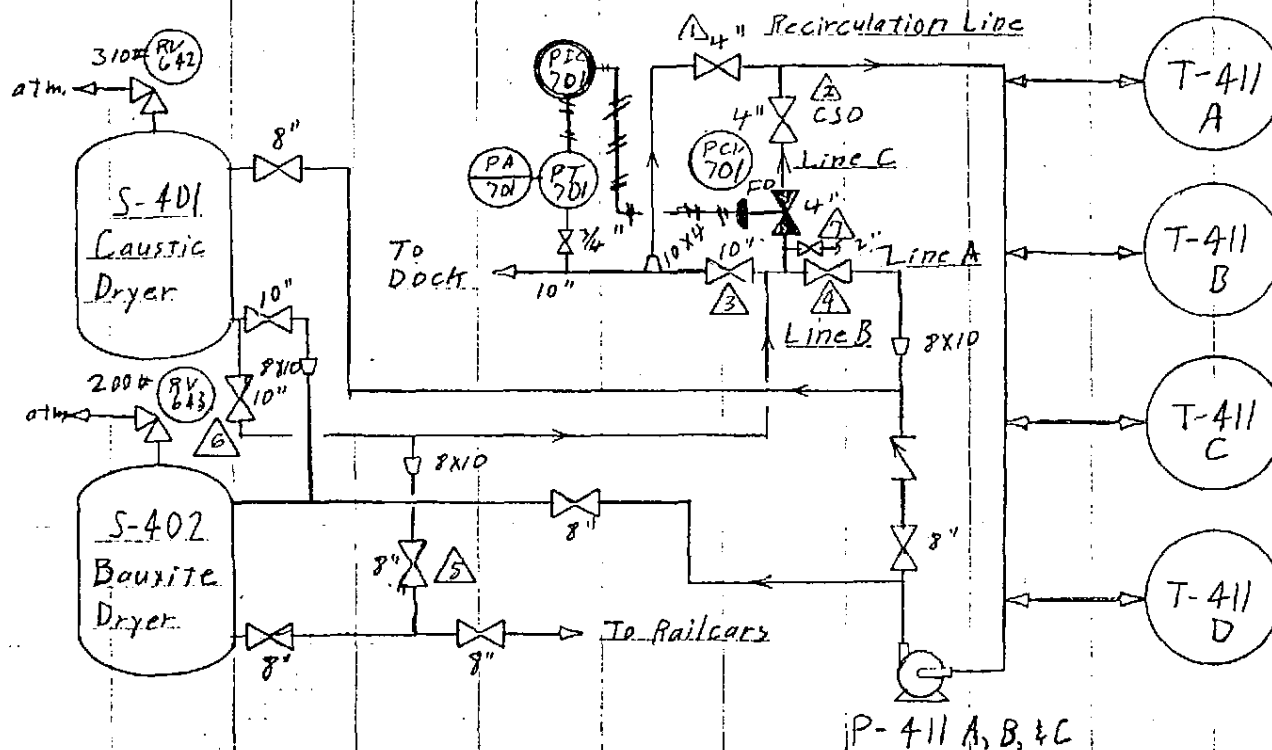
Notes:

1. Valves $\Delta 2$ & $\Delta 3$ must be open and valve $\Delta 1$ must be closed during ship loading.

2. Valve $\Delta 1$ may be opened when a ship is not being loaded.

3. Only PCV-701 and PIC-701 are new.

4. PCV-701 is a 4" 300 Durco G-4 with a positioner.



TA TEMPERATURE ALARM
 TW TEMPERATURE WELL
 TI TEMPERATURE INDICATOR
 TR TEMPERATURE RECORDER
 TIC TEMP. INDICATING CONTROLLER
 TNC TEMP. RECORDING CONTROLLER
 PG PRESSURE GAUGE
 PR PRESSURE RECORDER
 PIC PRESSURE INDICATING CONTROLLER
 PAC PRESSURE RECORDING CONTROLLER
 PCV DIRECT ACTING PRESSURE CONTROLLER
 PS PRESSURE ACTUATED SWITCH
 PCVY PRESS. DIFFERENTIAL CONTROL VALVE
 PA PRESSURE ALARM
 PI PRESSURE INDICATOR
 FI FLOW RECORDER
 FI FLOW INDICATOR
 FIC FLOW RECORDING CONTROLLER
 FIC FLOW INDICATING CONTROLLER

7A FLOW ALARM
 FPR POSITIVE DISPLACEMENT METER
 FPRC FLOW RATIO RECORDING CONTROLLER
 PS FLOW ACTUATED SWITCH
 RO RESTRICTION ORIFICE
 LS LEVEL GAUGE
 LI LEVEL INDICATOR
 LC LEVEL CONTROLLER
 LIC LEVEL INDICATING CONTROLLER
 LRC LEVEL RECORDING CONTROLLER
 LA LEVEL ALARM
 LS LEVEL ACTUATED SWITCH
 SV SAFETY VALVE
 PSV PRESSURE-VACUUM SAFETY VALVE
 HIC REMOTE OPERATED CONTROLLER
 HCV HAND CONTROL VALVE
 PS PUSH BUTTON
 AR ANALYZER RECORDER

LEGEND

DIAPHRAGM VALVE
 GATE VALVE
 GLOBE VALVE
 BALL OR PLUG VALVE
 CHECK VALVE
 NEEDLE VALVE
 VALVE & BLIND OR PLUG
 3-WAY SOLENOID VALVE
 SELF OPER. CONTROL VALVE
 OPENS ON AIR FAILURE
 CLOSERS ON AIR FAILURE

BUTTERFLY VALVE
 SAFETY VALVE
 ROTAMETER
 ORIFICE
 SPECTACLE BLIND
 NOSE CONNECTION
 REDUCER
 SWITCH
 STEAM TRAP
 LOCAL INSTRUMENT
 BOARD INSTRUMENT

TRANSMITTER
 SEWER
 PNEUMATIC INSTRUMENT LEAD
 ELECTRIC INSTRUMENT LEAD
 INSULATED
 STEAM TRACER AND INSULATED
 ABBREVIATIONS
 CWS COOLING WATER SUPPLY
 CWR COOLING WATER RETURN
 S.C. SAMPLE CONNECTION
 L LOW
 H HIGH
 U.C. UTILITY CONNECTION

CWH 000005533

Instrument List

<u>Item No.</u>	<u>No. Required</u>	<u>Description</u>
PCV-701	1	Durco G-4 Valve, Cast Steel, 4"-300#, with actuator
PIC-701	1	Foxboro 43 HP Controller, 0-200 psig

CWH 000005534



Engineering Center
Ponca City, Oklahoma

Indicators, Recorders, Controllers
(Receiver Instruments)

SPECIFICATION DATA SHEET

PROJECT NO. _____

A.F.E. NO. _____

REQ. NO. _____

DATE 1/23/87 APP'D BY _____

MADE BY J B Chorn

PLANT VCN

PROJECT Dock Line Pressure Control

GENERAL	DESIGN DETAILS	INDICATOR-RECORDER	CONTROLLER	ALARMS	ACCESSORIES	NOTES
1	ITEM NO.					
2	SERVICE					
3						
4	MANUFACTURER					
5	MODEL NO.					
6	INSTRUMENT FUNCTION					
7	INSTRUMENT MOUNTING					
8	ELECTRICAL CLASSIFICATION					
9	POWER SUPPLY					
10	INPUT SIGNAL					
11	ACCURACY					
12	REPEATABILITY					
13						
14						
15						
16	NO. OF PENS OR POINTERS					
17	SCALE RANGE					
18	CHART SIZE AND TYPE					
19	CHART RANGE					
20	CHART NUMBER					
21	CHART FACTOR					
22	CHART DRIVE					
23						
24						
25	CONTROL MODE (SEE LINE 44)					
26	CONTROLLER ACTION					
27	SCALE RANGE					
28	SET POINT ADJ.: MAN.—REMOTE					
29	AUTO—MAN. SWITCH AND ADJ.					
30	OUTPUT SIGNAL					
31						
32						
33	ALARM FUNCTION					
34	QUANTITY AND FORM					
35	CONTACT RATING					
36						
37						
38						
39						
40						
41						
42						
43						
44	CONTROL MODES: P = PROPORTIONAL (GAIN), I = INTEGRAL (RESET), D = DERIVATIVE (RATE), BIAS, GAP, RATIO, BATCH					
45	RECORDER INK SUPPLY: CAPILLARY WITH 6 MONTHS MIN. SUPPLY.					
46	<u>Controller action should be to open the valve at pressures</u>					
47	<u>above the set point. Normal set point is 175 psig.</u>					
48						
49						
50						
51						
52						

CWH 000005535



Conoco Inc.
Engineering Center
Ponca City, Oklahoma
Pressure Instruments

SPECIFICATION SHEET

PROJECT NO. _____

A.F.E. NO. _____

REQ. NO. _____

DATE 1/23/87 APP'D BY _____

MADE BY JB Chorn

PLANT VCM PROJECT Dock Line Pressure Control

GENERAL	1	TAG NO.		<u>PCV-701</u>		
	2	SERVICE		<u>VCM</u>		
	3					
	4	INSTRUMENT TYPE		<u>Pressure Control</u>		
	5	LOCATION		<u>VCM Load Rack</u>		
	6					
ELEMENT	7	TYPE				
	8					
	9	LOCATION				
	10	TEMPERATURE, °F				
	11	PRESSURE				
	12	MATERIAL				
	13	TRANSMITTER: PNEU OR ELECT.				
	14	RANGE, PSIG				
VALVE	15					
	16	TYPE		<u>Durco G-4</u>		
	17	LOCATION		<u>VCM Recirc. Line</u>		
	18	MATERIAL:	BODY	TRIM	<u>Cast Steel</u> <u>Cast Steel</u>	
	19	SIZE:	BODY	PORT	<u>4" - 316</u> <u>7.4 1/2"</u>	
	20	NUMBER OF PORTS				
	21	PLUG FORM		<u>Equal Percentage</u>		
	22	ΔP:	MIN.	NORM	MAX	<u>110</u> <u>110</u> <u>110</u>
	23	CALC CV — NORMAL FLOW		MAX. FLOW		<u>37</u> <u>110</u>
	24	VALVE CV — FULL OPEN				<u>455</u>
	25	FAILURE POSITION				<u>Open</u>
	26	MAX. SHUT OFF ΔP				<u>200 Psig</u>
	27	DESIGN PRESSURE				<u>700 Psig @ 50°C</u>
	28					
VALVE SERVICE CONDITIONS	29	FLUID (NOTE: LIQ./VAP.)		<u>Liquid</u>		
	30	TEMP. °F:	NORM	MAX	<u>ambient</u> <u>150</u>	
	31	PRESSURE, PSIG		<u>140 - 150</u>		
	32	*API (MW)		<u>62.45</u>		
	33	SP GR AT STD. COND.		<u>-0.91</u>		
	34	SP GR AT T&P		<u>0.92</u>		
	35	VAPOR PRESSURE AT T, PSI A		<u>85.95</u>		
	36	WEIGHT % VAPOR, IN-OUT		<u>0 - 0</u>		
	37	VISCOSITY AT T&P		<u>0.19 CP</u>		
	38	% LIQ.	IN	OUT	<u>100</u> <u>100</u>	
	39	RATE: NORMAL		<u>400 gpm</u>		
	40	RATE:	MAX.	MIN	<u>1200</u> <u>0</u>	
	41					
NOTES	42	<u>Valve should be equipped with a Quadra Power</u>				
	43	<u>operator with a P-22 Honeywell Positioner with</u>				
	44	<u>gases or equivalent.</u>				
	45					
	46	<u>Valve should open wide open at 175 Psig. (on-off action).</u>				
	47	<u>Capability to function as a pressure controller should</u>				
	48	<u>be retained.</u>				
	49					
	50					
	51					

CWH 000005536