VCM Tank Farm Modifications

Operating Manual

Work by: _____
Al Barfield
Process Engineer

Approved by: _____
L. D. Honeycutt
Yard Supervisor

Approved by: _____
Nelson E. Messick
Sr. Process Engineer

DTH 000107016

Made by
Checked By
Date
Page of

Calculation Sheet

Job No.
Title
Field
State

VCM Tank Farm Modifications

Operating Manual

Table of Contents

Made By
Checked By
Date
Page of

Conoco Inc.
Calculation Sheet

Title

Job No
Field
State

VCM Tank Farm Modifications

Operating Manual

I. Function of Knockout Pot (T-202)

A new knockout pot, T-202, has been installed in the vapor line from the sphere. This pot will remove condensed VCM and prevent liquid slugging of the unloading compressors. The pot is equipped with level switches that will automatically remove accumulated liquid to the sphere using the VCM recycle pump located below it. The knockout pot also has a relief valve, which relieves to the emission recovery pot, T-201, located nearby.

In order to bring the knockout pot on line, three valves must be operated. These valves are numbered ①, ②, and ③ on the attached sketch. Valve ① will be called the knockout pot inlet valve, valve ② will be the knockout pot outlet valve, and valve ③ will be the vapor header block valve. The vapor header block valve is located on the vapor header just south of the 4" main vapor valve (valve ⑨ on the sketch). The inlet and outlet valves to the knockout pot are located just above the vapor header block valve.

To unload liquid VCM from the railcar, complete valve set-up as usual. Then close valve ③, the vapor header block valve, and open valves ① and ②. Leave the main vapor valve (valve ⑨) open as usual. When the compressors are started up, this will allow the vapor to flow through the new knockout pot before entering the compressors. These are the only valve changes that need to be made during liquid unloading.

When vapor is being recovered from the railcars, the knockout pot needs to be bypassed. When switching the compressors over to pull vapor from the railcars, immediately after turning the compressor 4-way valves, open the vapor header block valve (valve ③), then close valves ① and ②. This will allow the recovered vapor to bypass the knockout pot.

Why?

The knockout pot, T-202, is equipped with automatic level control which will keeps the pot from overfilling. A high level and low level switch are located on the south side of the pot. When the level in the pot reaches the high level switch, the VCM recycle pumps will automatically start to pump the contents to the sphere. When the low level switch is reached, the pump will automatically shut off. A local panel, in between the emission recovery pot and the knockout pot, provides indicator lights for when the level switches or pump are activated. It also provides a manual switch to operate the recycle pumps. During normal (automatic) operation, the 3-inch pump suction valve (valve ⑤) and the 1½-inch pump discharge valve (valve ⑥) will be locked open. The recirculation valve (valve ⑦) should be kept closed. This will allow the recycle pump to pump liquid from T-202 to the top of the sphere.

Made By
Checked By
Date
Page of

Calculation Sheet

Job No.
Title
Field
State

VCM Tank Farm Modifications

Operating Manual

II. Manual Draining of the Knockout Pot

In the event of the failure of the high / low level switches on the knockout pot, the liquid level in the pot will become too high. This can be observed when the level shown by the attached sight glass rises above the high level switch. Should this happen the pot must be drained manually. This is best done when no VCM unloading is taking place. To manually drain the knockout pot, simply place the pump switch, (located on the panel next to the pot), in the 'hand' position. This will start the pump. When the level shown by the sight glass lowers to approximately even with the low level switch, place the pump switch back in the 'auto' position. This will shut off the pump and complete the manual draining of the knockout pot. However, do not let the pot run dry as this will damage the pump.

DTH 000107020

Calculation Sheet

Job No.

Checked By

Date

Title

Field

Page

State

VCM Tank Farm Modifications

Operating Manual

III. The Evacuation of the New Knockout Pot

T-202 is equipped with a 3-inch line to the emission recovery system. This line will allow for the isolation and evacuation of the knockout pot should this become necessary for maintenance, etc. The pot can be isolated by closing valves ①, ②, ⑤, & ⑦. These represent the inlet and outlet valves to the knockout pot, the recycle pumps suction valve, and the pump recirculation valve, respectively. Then open valve ④ to the emission recovery system to evacuate T-202. If it is necessary to evacuate the VCM recycle pump, open valve ⑤, make sure valve ⑥ is closed, and evacuate the pump through the knockout pot.

DTH 000107021

Made By
Checked By
Date
Page of

Calculation Sheet

Job No.
Title
Field
State

VCM Tank Farm Modifications

Operating Manual

IV. Function of the Low Pressure Switches

New low pressure switches have been installed on the vapor lines between the compressors and railcars. The hand controls for these switches are located on the local panel just below the compressors' on/off switches. These switches were installed to shut off the compressors at the end of vapor recovery from the railcars, when the pressure in the cars is lowered to 6 psig.

When setting up the compressors to recover vapor from the railcars, place the local controls for the pressure switches in the 'OFF' position, and recover as usual. When the pressure in the lines, and presumably the railcars, lowers to 6 psig, the switches will automatically shut off the compressors. Then the cars can be valved off, and the lines pulled down to vacuum using the emission recovery system.

Should it become necessary for any reason to operate the compressors when the pressure in the lines is 6 psig or below, place the pressure switch controls in the 'ON' position. This will bypass the pressure switches and allow the compressors to run.

VCM Dual Loop Modification

Operating Manual

Equipment Under

A. VCM Knockout Pot (T-202) - Conoco No. 45-061

Purpose: To remove VCM from the vapor line and prevent liquid slugging of the compressors.

Description: Vertically mounted on supports 6 feet above grade, 5-foot straight wall height, 2.5-foot diameter, with capacity of 150 gallons.

Normal Operating Conditions: 70°F and 40 psig.

Design Conditions: 150 psig @ 200°F

Relief Valve Setting: 150 psi

B. VCM Recycle Pump (P-250)

Purpose: Removal of knockout pot contents to sphere

Description: CMP model # 3x1½x5, canned centrifugal pump, 1½ HP driver. 3 HP

Normal Operating Conditions: 10 GPM @ 58 feet of differential head.

Relief Valve Setting: 170 psi

DTH 000107023

Drawn By
Checked By
Date
Page of

Conoco Inc.
Calculation Sheet

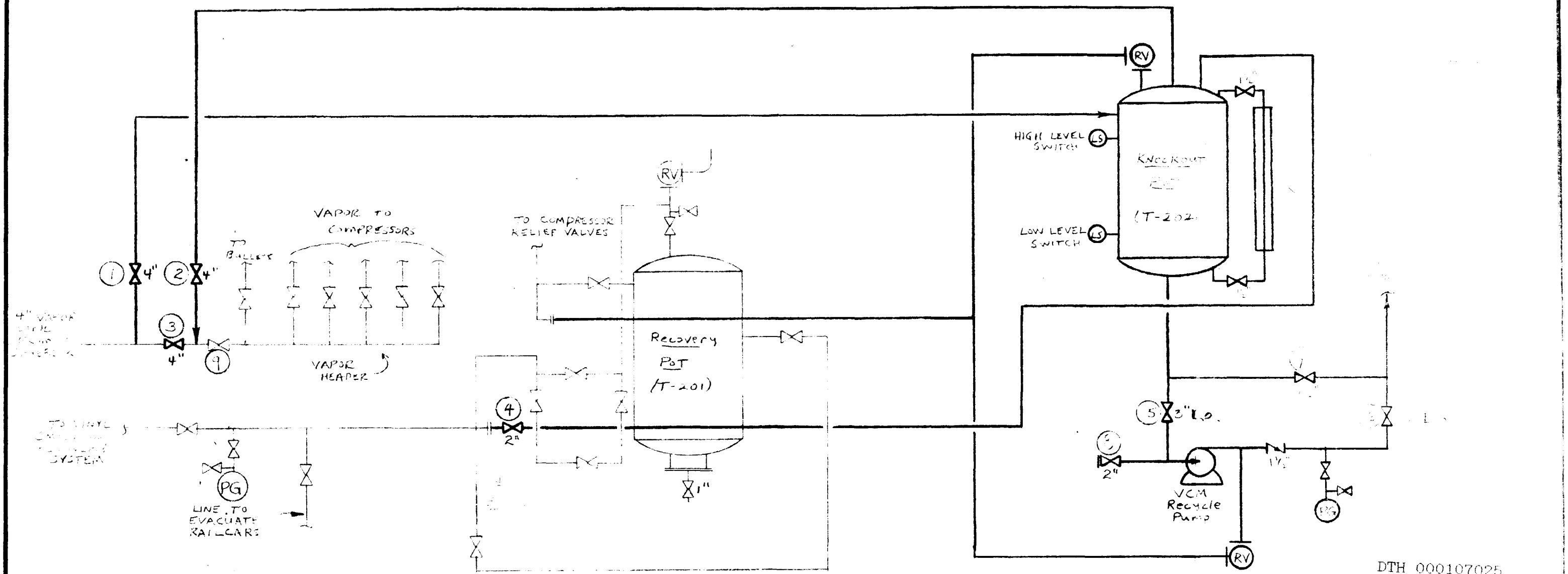
Job No.
Title
Field
State

C. Compressor Low Pressure Switches

Purpose: To shut off compressors at the end of vapor recovery from railcars.

Description: Static-O-Ring diaphragm type

Set point: 6 psig. DECREASING



DTH 000107025

LEGEND

EXISTING

NEW

VALVE NUMBER

AFE

ISU	DATE	DESCRIPTION	BY	CKD	APD
	11/28/84				

CONOCO CHEMICALS

ABERDEEN MISSISSIPPI

VCM TANK [illegible]

SKETCH FOR [illegible]

SCALE: [illegible]

APPD:
DATE:

No.

BRUNING 40-534 50237

P & I Check for VCM Jack Farm Expansion 2/1/82

S.A. 1) Liquid line has no sight glass.

2) Why is check valve on expansion liquid line located differently than on existing liquid lines?

S.A. 3) Compressor knockout pot drain not connected.

S.A. 4) Vacuum breaker valves on platform still have plugs in them.

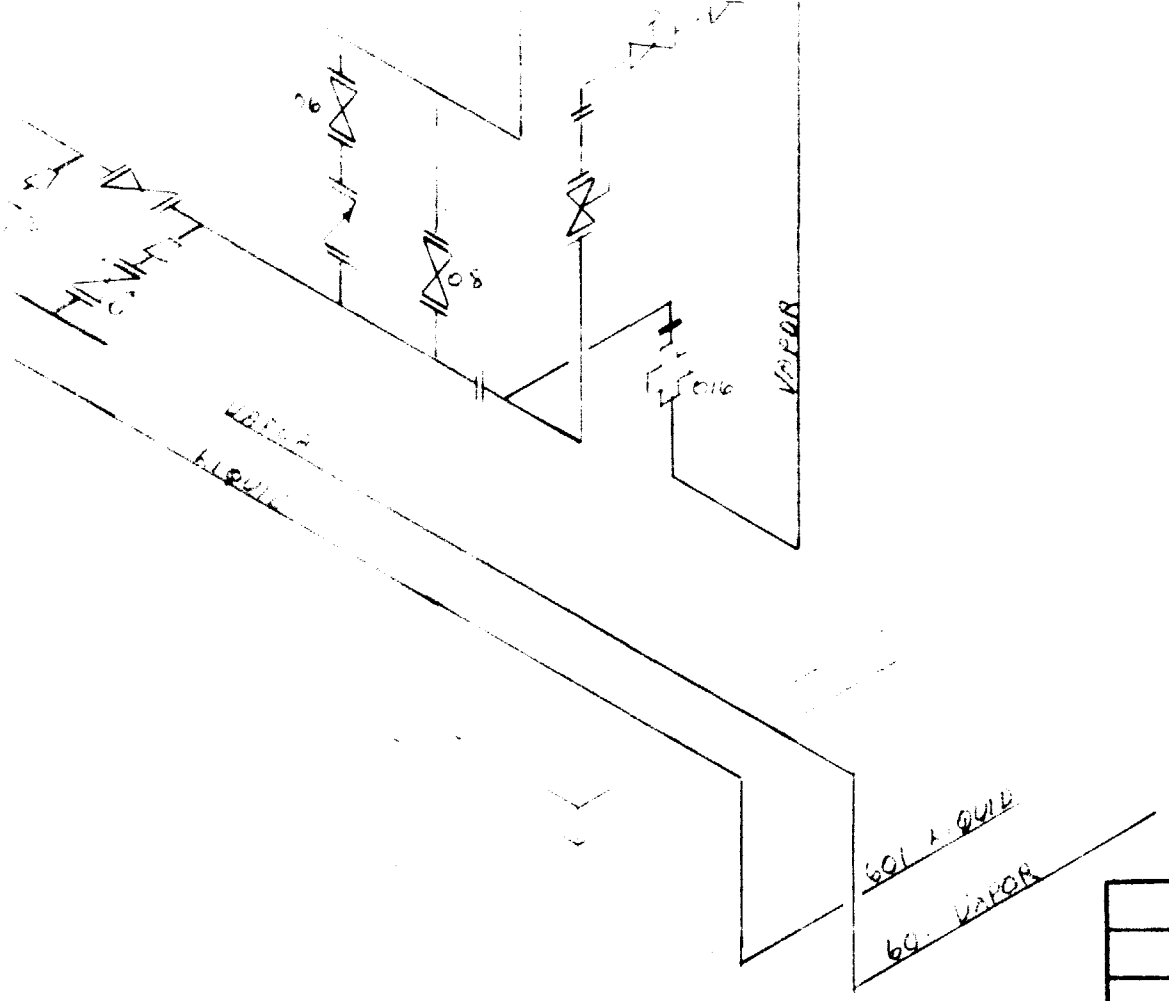
5) 1 P.G. is on each liquid line (east) on the platform. No P.G.'s are on west liquid line at platform.

6) East vapor line has pressure gauge w/ range of 30" Hg - 100 psig.
S.A. West vapor line has P.G. w/ range of 0 - 300 psig.

7) Different bleeder type set up on expansion vapor lines than on existing, or on liquid lines.

(check 8) Compressor knockout pot not insulated.

DTH 000107026



OVERSIZED

DTH 000107027

ISU	DATE	DESCRIPTION	BY	CKD	APD

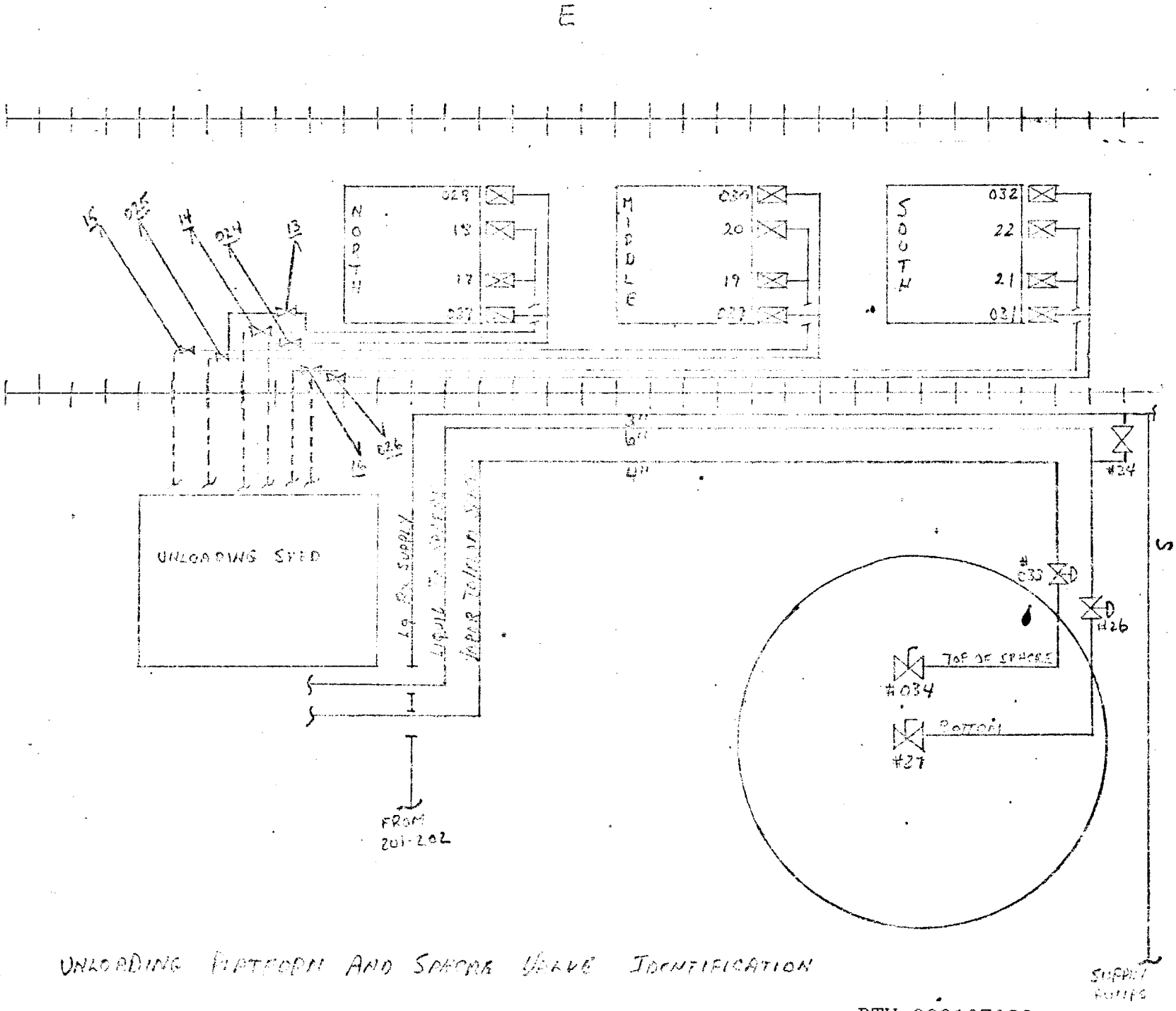
VCM UNLOADING STATION
LINE AND VALVE IDENTIFICATION

USE BORDER SCALE:

APPD:
DATE:

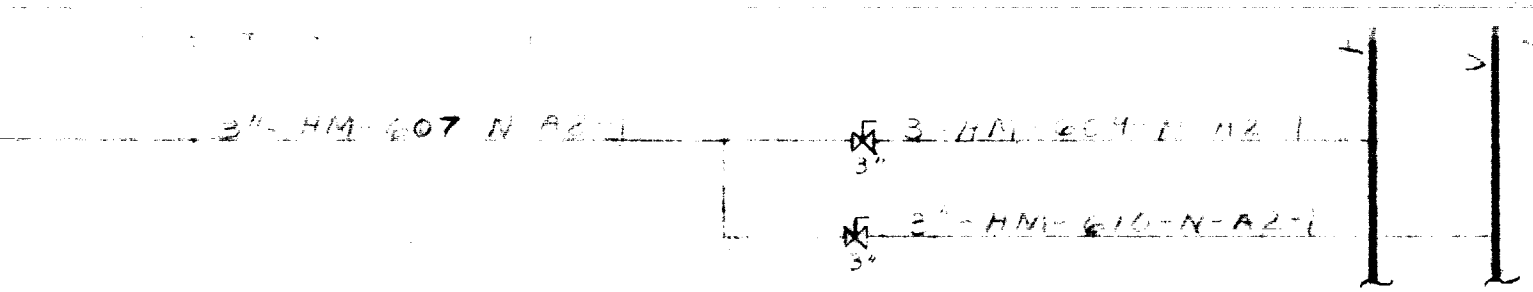
No.

DWR.



UNLOADING PLATFORM AND SPACER VALVE IDENTIFICATION

DTH 000107028



OVERSIZED

NOTES:

1. The instrument air supply tubing is to circle the bottom of the sphere before entering the automatic valves. The tubing is to be high grade, polyethylene with 160°F heat sensitive links.
2. See drawing SD2238-42-1-D for tie-in points.
3. HCIV-601, 602, 603, and 604 are to close on air failure.

DTH 000107029

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
- CLOSES ON AIR FAILURE
- BUTTERFLY VALVE
- SAFETY VALVE
- ROTAMETER
- ORIFICE
- SPECTACLE BLIND
- HOSE CONNECTION
- REDUCER
- SWITCH
- STEAM TRAP
- LOCAL INSTRUMENT
- BOARD INSTRUMENT
- TRANSMITTER
- SEWER
- PNEUMATIC INSTRUMENT LEAD
- ELECTRIC INSTRUMENT LEAD
- INSULATED
- STEAM TRACED AND INSULATED

ABBREVIATIONS

CWS	COOLING WATER SUPPLY
CWR	COOLING WATER RETURN
S.C	SAMPLE CONNECTION
L	LOW
H	HIGH
U.C.	UTILITY CONNECTION

NEW
EXISTING

ISU	DATE	DESCRIPTION	BY	CKD	APD
1	5/7/75		ELH		

P & I DIAGRAM
VCM STORAGE FACILITIES
ABERDEEN, MISS

USE BORDER SCALE:

APPD:
DATE:

No.

DWR.

ISU	DATE	DESCRIPTION	BY	CKD	APD

CONTINENTAL OIL COMPANY
ENGINEERING CENTER
PONCA CITY, OKLAHOMA

USE BORDER SCALE

APPD:
DATE:

No.

OVERSIZED