

BFGoodrich

The BFGoodrich Company
Chemical Group
6100 Oak Tree Boulevard
Cleveland, Ohio 44131
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December 6, 1982

RECEIVED
DEC 21 1982
C. A. GELLNER

Mr. C. A. Gellner
Plant Manager
CertainTeed Corp.
Pipe & Plastics Group
PO Box 253
Sulphur, Louisiana 70663

RE: Vinyl Chloride Storage Tank Safety Standard

Dear Mr. Gellner:

BFG's "Hazardous Material Storage Tank Corrective Action Team" has completed the vinyl chloride portion of our hazardous storage tank safety standard. The highlights of this standard were presented at the Vinyl Chloride Safety Association Meeting in Toronto. At that time, we agreed to send our completed vinyl chloride safety standard to any company that was interested. A copy is enclosed with this letter.

BFG has developed an Action Plan for implementing this safety standard over a four year period. We are interested in knowing what your plans are to implement this complete standard or sections of this standard. We plan to have this topic on the agenda for the October 20, 21, 1983 Vinyl Chloride Safety Association Meeting in New Orleans.

Sincerely,

The BFGoodrich Company
Chemical Group

Mark D. Tawney
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Chairman, Hazardous Materials Storage Tank
Corrective Action Team

Herm Waltemate
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Manager Safety, Chemical Group

MDT/vs/5018h

pc R. J. Kelly 1/5/82
Rod Bollard
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CTL021287

BFGOODRICH CHEMICAL GROUP

SAFETY STANDARD

Hazardous Material Storage Tank Standard

Vinyl Chloride Storage Tanks
(Non-Process)

RECEIVED
11/27/82
C. A. GELLNER

Tank Valves and Nozzles

- I. All tank nozzles must have one of the following:
1. If Not In Use - Blank on the tank nozzle flange.
 2. Vapor Service Nozzles - Ball valve mounted on tank nozzle flange. Valves in conjunction with relief valves will be covered in the relief valve section.
 3. Liquid Service Nozzles (usually on bottom of tank, but would also include top entering dip pipes) - Remote air actuated ball valve mounted on tank nozzle flange. The following exceptions apply:
 - (a) Tank nozzles with thermowells.
 - (b) A manually operated ball valve that meets criteria in Appendix I, mounted between the tank nozzle flange and the air actuated ball valve is optional.
 - (c) Fill lines into the VCM spheres at Calvert City. These lines require a check valve that is inspected annually and an air actuated valve that is activated only by a remote air switch.

Air actuators must include the following features:

- (a) Air to open, spring to close.
- (b) Contain section of burn-through tubing.
- (c) Valve, with air actuators mounted on them, bench tested for leaks before installed on tank and during vessel turnaround.

wp8/1551q-1
12/10/82

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- II. Valve requirements for Section I and a list of valves that meet these requirements are in Appendix I.
- III. Air actuated valves are required to have two local and one remote manual air switch. The two local air switches will be 180° apart and located just outside the tank containment system. A LEL vapor detector, discussed later, will also operate these valves.
- IV. It is required that all air actuated valves be cycled weekly.
- V. Excess flow valves may be used in conjunction with air actuated valves.

Vapor Detectors

- I. LEL type vapor monitor with continuous sampling that alarms at a maximum of 25% and closes air valves and activates deluge system at 50% are required.
- II. Three LEL detectors will be located below tank and one at pump. It is not required that the LEL detector at the pump activate the deluge system.

Fire Protection

- I. An automatic deluge fire water system is required for each tank.
- II. Vessel supports need either a deluge system or fire proofing with a 3 HR rating.

Relief Valves

- I. One of the following two, (a) or (b), may be used for vessel pressure relieving systems:

- (a) A three-way valve with two relief valves.
- (b) Two-way valves, multi-nozzle with "Castell" locking system.

See Appendix II for relief valve design and installation requirements.

wp8/1551q-2
12/10/82

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- II. Manual valves below relief valves must be mounted on tank nozzle flange. Valves for this service must meet the requirements in Appendix I.
- III. Each relief valve will be bench tested every three years.
- IV. Rupture discs will continue to be used per the EPA Regulations.
- V. Sizing of relief valves must adhere to BFG Policy ST-1317.

Tank Internal Inspection

- I. Storage tanks will be inspected a minimum of once in five years; tanks in rework VCM service every two years.
- II. The minimum inspection requirements are:
 - (a) Visually inspect for internal corrosion, especially around flange welds, thermowells, level indicators, etc.
 - (b) Ultrasonically test wall thickness in several representative locations.
 - (c) Record results of each inspection and thickness measurement and compare with previous inspections.
- III. Connecting piping will be inspected at the same time tank is inspected.

wp8/1551q-3
12/10/82

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RECOMMENDED VALVES FOR STORAGE SPHERES AND BULLETS

SPECIFICATION: BALL VALVES - SPLIT BODY
 150 lb. Flanged, Fire Test, Blowout Proof Stem
 Grounded Ball

MANUFACTURER & MODEL NO.	PORT SIZE	AVAIL. MAT'L	AVAILABLE SIZES	ACTUATOR MOUNTING PAD PROV.
<u>KITZ</u>				
K-150-UTBM-FS	Full	SS	1½"-10"	Yes
K-150-SCTB-FS	Full	CS	1½"-10"	Yes
<u>KTM OMNI</u>				
E0132-32GT-15L	Full	SS	1½"-8"	Yes
E0832-32GT-15L	Std.	SS	3"-10"	Yes
E0162-32GT-15L	Full	CS	1½"-8"	Yes
E0862-32GT-15L	Std.	CS	3"-10"	Yes
<u>JAMESBURY</u>				
6150-31-3600	Full	SS	2"-20"	Yes
6150-31-2236	Full	CS	2"-20"	Yes
5150-31-3600	Std.	SS	6"-20"	Yes
5150-31-2236	Std.	CS	6"-20"	Yes
<u>WATTS</u>				
SF-2800-150	Full	SS	1½"-6"	Yes
CF-1800-150	Full	CS	1½"-6"	Yes
<u>COOPER</u>				
FIG 415	Full	Alloys Only	1½"-12"	Yes
<u>KAMYR</u>				
PC	Full	CS	1½"-24"	Yes
PC	Full	SS	1½"-24"	Yes

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RECOMMENDED VALVES FOR STORAGE SPHERES AND BULLETS

SPECIFICATION: BALL VALVES - END ENTERING
 150# Flanged, Fire Rest, Blowout Proof
 Stem - Grounded Ball

MANUFACTURER & MODEL NO.	PORT SIZE	AVAIL. MAT'L	AVAILABLE SIZES	ACTUATOR MOUNTING PAD PROV.
<u>MARPAC</u>				
SS-C470-RF	Std.	SS	1½"-4"	Yes
CS-470-RF	Std.	CS	½"-4"	Yes
<u>WORCESTER</u>				
AF51-66	Std.	SS	½"-8"	
AF51-46	Std.	CS	½"-8"	Yes
AF-55-66	Full	SS	½"-8"	Yes
AF-55-46	Full	CS	½"-8"	Yes
<u>JAMESBURY</u>				
5150-31-3600	Std.	SS	½"-4"	Yes
5150-31-2236	Std.	CS	½"-4"	Yes
6150-31-3600	Full	SS	½"-1½"	Yes
6150-31-2236	Full	CS	½"-1½"	Yes
<u>HILLS McCANNA</u>				
McCannaflo F151	Std.	SS	½"-12"	Yes
McCannaflo F151CS	Std.	CS	½"-12"	Yes
<u>MARWIN</u>				
5233R	Std.	CS	½"-12"	Yes
5333R	Std.	SS	½"-12"	Yes
5233F	Full	CS	½"-12"	Yes
5333F	Full	SS	½"-12"	Yes
<u>WKM</u>				
310C-B136-CS-02-S1	Std.	CS	½"-4"	Yes
310C-B136-S1-02-S1	Std.	SS	½"-4"	Yes
310C-B138-CS-02-S1	Full	CS	½"-4"	Yes
310C-B138-S1-02-S1	Full	SS	½"-4"	Yes

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RECOMMENDED VALVES FOR STORAGE SPHERES AND BULLETS
UNDER RELIEF VALVES ONLY

SPECIFICATION: 3 WAY - 150# FALNGED VALVES
Full Port

MANUFACTURER & MODEL NO.	PORT SIZE	AVAIL. MAT'L	AVAILABLE SIZES
<u>COOPER (BALL)</u> 3 Piece T Port	Full	Alloys Only	1/2"-12"
<u>KAMYR (BALL) (Y)</u>			
Y2	Full	CS	3"-12"
Y2	Full	SS	3"-12"

CTL021293

BFGOODRICH CHEMICAL GROUP ENGINEERING DEPARTMENT					RELIEF VALVE INSTALLATION	ENG. STD.
REV.	ORIG	A				ST-528
DATE	02/81	10/82				
BY	DGA	TPH				
APPD.	DGA	TPH				Sheet 1 of 5 0031S/86

1.0 SCOPE

- 1.1 This standard covers the allowed methods of relief valve installation on vessels.
- 1.2 This standard is an adjunct to ST-1317 Relief Valve Policy.
- 1.3 Rupture Disk-Relief Valve combinations are covered in greater detail in ST-524.
- 1.4 This standard does apply to two rupture disks in series when all provisions of ST-524 have been met.

2.0 PURPOSE

- 2.1 To establish Group policy due to lack of complete clarity in the ASME code.

3.0 SOURCE

- 3.1 ASME Boiler and Pressure Vessel Code Section VIII, Paragraph UG-125 to UG-136, Addendum M.

4.0 DEFINITIONS

- 4.1 Valves are understood to mean hand operated shutoff valve either 2-port or 3-port.
- 4.2 Relief valves are understood to mean the reclosing pressure relieving device.
- 4.3 Dual relief valves are two relief valves of equal size and each capable of satisfying the vessel relief requirements.

5.0 INLET INSTALLATION

- 5.1 The distance between the relief valve and the vessel outlet nozzle shall be kept as short as possible. Direct connection is preferred.
- 5.2 Installations where dual relief valves (on one nozzle) are required for continued operation may have a 3-port valve installed between the relief valves and the vessel outlet nozzle if the following conditions are met:
 - 5.2.1 The valves and intervening piping must have an area equal to the area of the inlet flange of the relief valve.
 - 5.2.2 The valves must not be of top entering construction.

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BFGOODRICH CHEMICAL GROUP ENGINEERING DEPARTMENT					RELIEF VALVE INSTALLATION	ENG. STD.
REV.	ORIG	A				ST-528
DATE	02/81	10/82				
BY	DGA	TPH				
APPD.	DGA	-				Sheet 2 of 6 0031S/86

5.2.3 The pressure drop between the vessel and the intervening piping and valve must not be greater than 3% of the set pressure of the relief valves at full flow (See Sketch A). The relief valve must be set accordingly so that the maximum pressure in the vessel cannot exceed the maximum allowable working pressure plus accumulation.

5.2.3.1 Alternate I may be used where the ΔP is less than 3% of relief valve set pressure to either valve.

5.2.3.2 Alternate II may be used when the symmetrical arrangement cannot be used due to ΔP limitations. The pressure drop through the valve set at straight through flow must not exceed 3% of the relief valve setting.

5.3 Installations where multiple relief devices (on separate nozzles) are required--locking valves may be used between the vessel outlet nozzles and the relief devices, as follows:

5.3.1 The installation shall be according to the sketch on page 6 of this standard. The lock shall be mounted to lock the valve in the open position.

5.3.2 The valves and any spool pieces, if used, must have an area equal to the area of the inlet flange of the relief valve.

5.3.3 The valve lock shall be Type KC/QKC as manufactured by CASTELL SAFETY, INC., specified to fit the particular valve to be used.

5.3.4 Only one key shall be furnished for each vessel/installation. The key shall be unique for that installation and shall operate all locks. The key shall be captured upon opening the lock, which allows the valve to be closed. This permits only one valve to be closed at any one time--the others being locked open and the key trapped at the closed valve.

6.0 OUTLET INSTALLATION

6.1 Stop devices may be installed at the outlet of a relief valve if the valve discharges into a header with other relief valves attached and it is necessary to continue operations. The following conditions must be met:

6.1.1 Stop devices shall not have an area less than that of the relief valve outlet.

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BFGOODRICH CHEMICAL GROUP ENGINEERING DEPARTMENT				RELIEF VALVE INSTALLATION	ENG. STD.	
REV.	ORIG	A				ST-528
DATE	02/81	10/82				
BY	DGA	TPH				
APPD.	DGA	-				
					Sheet 3 of 5	
					00315/86	

6.1.2 Stop devices shall be installed per Sketch B. The order of preference shall be I, II, III, IV. Operations of the vessel that is blanked must be shut down or a responsible person must be in attendance at all times the valve is shut or condition I, II, or III exists.

6.1.3 The stop device must be lockable in open or closed position.

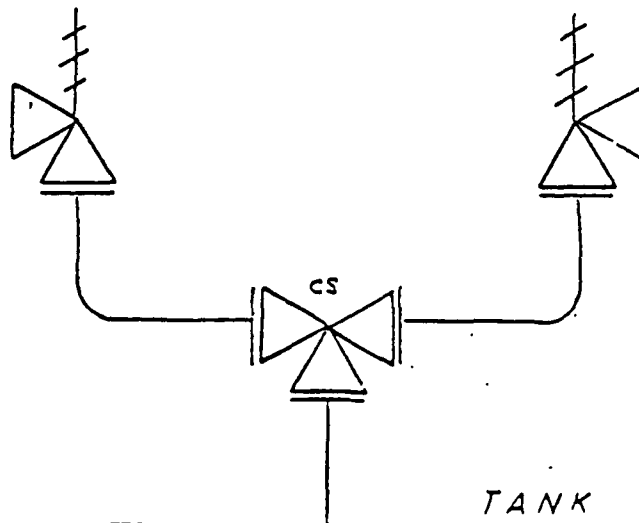
6.1.4 The pressure drop must be calculated for all probable discharge circumstances. The line ΔP should not exceed 10% of set pressure for standard relief valves or 50% of set pressure for bellows type relief valves.

7.0 INLET AND OUTLET INSTALLATION

7.1 Valves or stop devices SHALL NOT be used on both the inlet and outlet of any relief device.

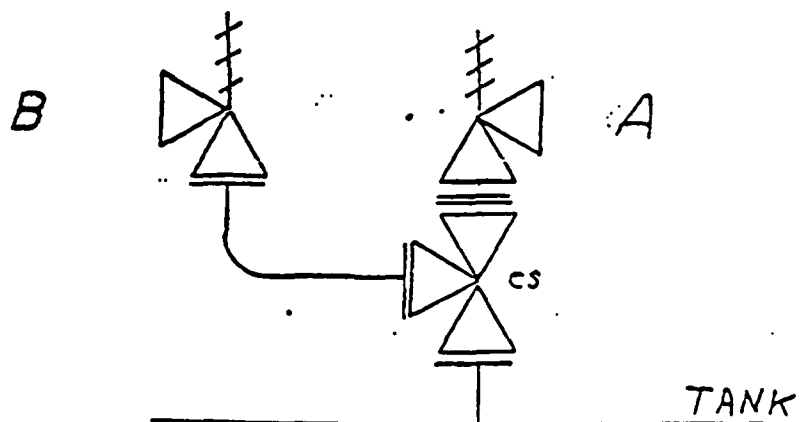
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INLET VALVING--RELIEF VALVES



TWO EQUAL DUTY VALVES

I



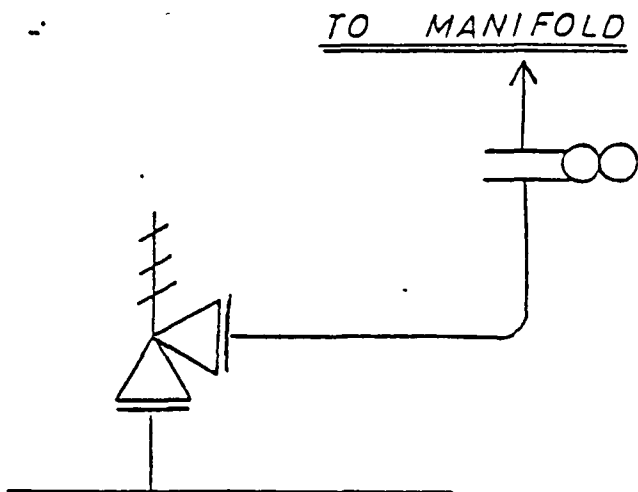
A -- MAIN DUTY VALVE

B -- EMERGENCY STANDBY VALVE

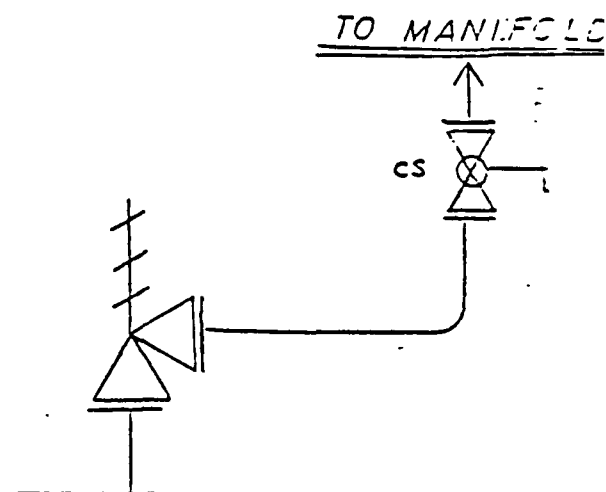
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DUAL INSTALLATIONS

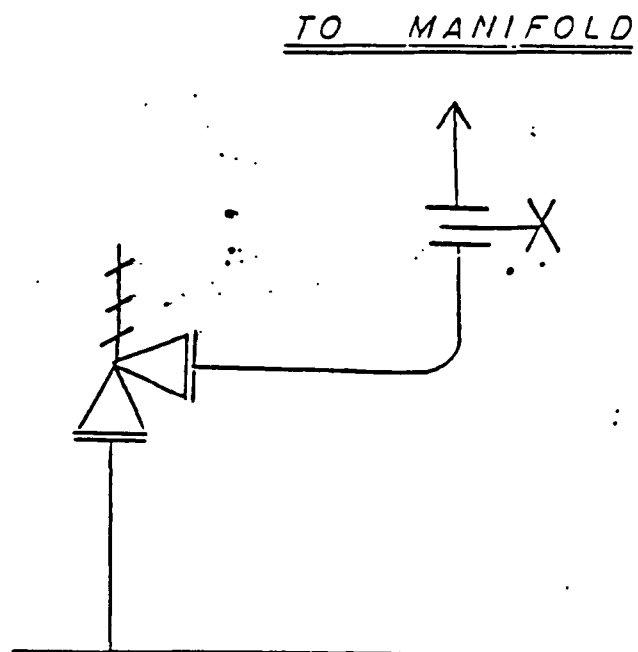
OUTLET VALVING--RELIEF VALVING



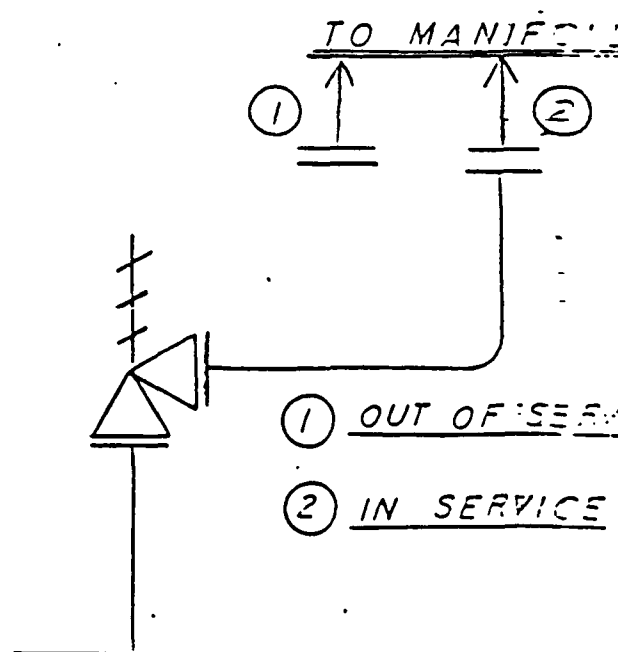
I



II



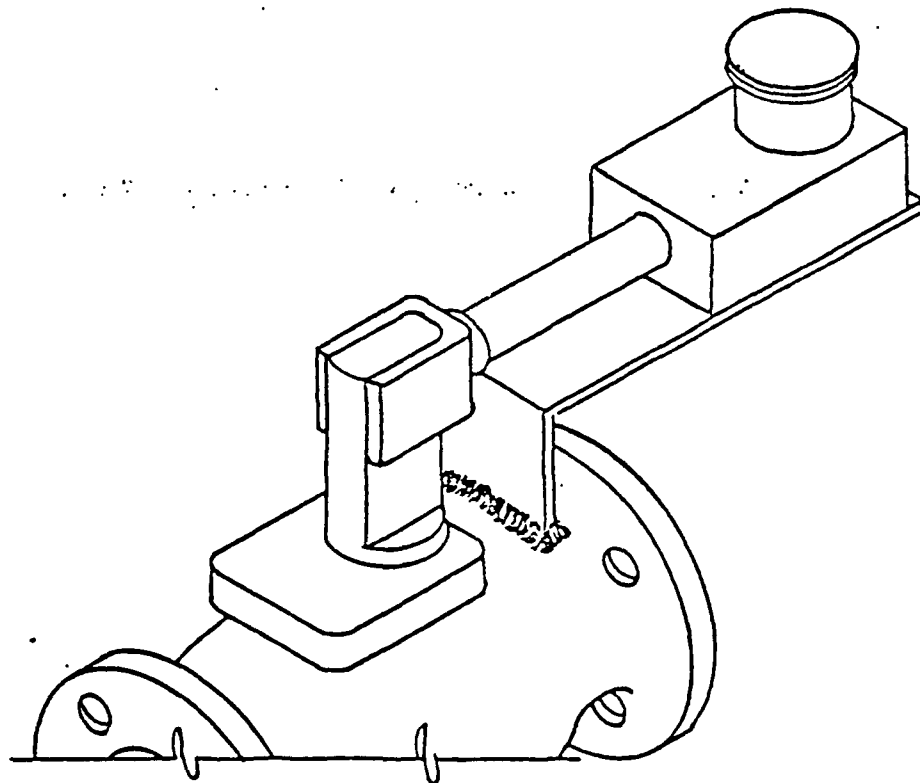
III



IV

CTL021298

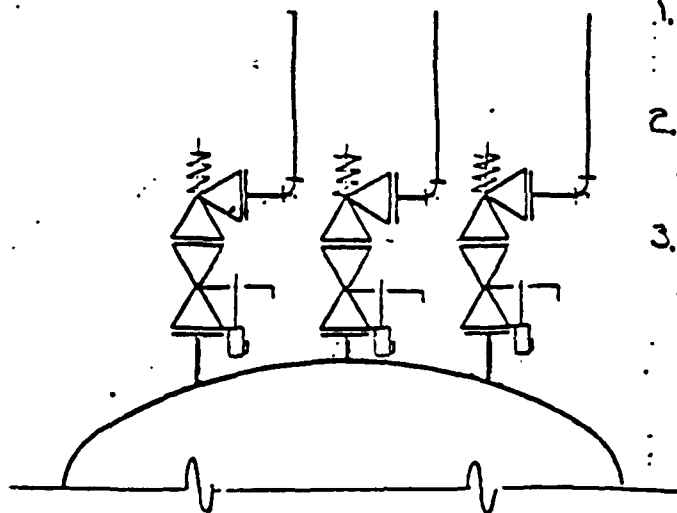
BFGOODRICH CHEMICAL GROUP ENGINEERING DEPARTMENT					VALVE LOCKING METHOD FOR RELIEF VALVES		ENG. STD.
REV.							
DATE	7/82						ST-528
BY	MH						
APPO.							Sheet 0 of 0



CASTELL LOCK MOUNTING DETAIL

NOTES

1. KEY SHALL BE CAPTURED UPON CLOSING OF VALVE
2. ONE UNIQUE KEY SHALL OPERATE ALL LOCKS ON VESSEL
3. LOCK SYSTEM SHALL BE UNIQUE TO A VESSEL



TYPICAL MULTI-NOZZLE
MULTI-VALVE ARRANGEMENT

CTL021299