

EXHIBIT A

FIRE AND EXPLOSION INDEX

DOW

LOCATION	LAD	DATE	5/89
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PLANT	Chlorine	PROCESS UNIT	Rectifier	EVALUATED BY	SEL	REVIEWED BY	
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MATERIALS IN PROCESS UNIT

MATERIALS AND PROCESS

STATE OF OPERATION

☐ START-UP ☐ SHUT-DOWN ☒ NORMAL OPERATION

BASIC MATERIAL(S) FOR MATERIAL FACTOR

Mineral

MATERIAL FACTOR (SEE TABLE I OR APPENDICES A OR B) Note requirements when unit temperature over 140°F)

4.0

1. GENERAL PROCESS HAZARDS

PENALTY

PENALTY USED

BASE FACTOR	1.00	1.00
A. EXOTHERMIC CHEMICAL REACTIONS (FACTOR .30 to 1.25)		
B. ENDOTHERMIC PROCESSES (FACTOR .20 to .40)		
C. MATERIAL HANDLING & TRANSFER (FACTOR .25 to 1.05)		
D. ENCLOSED OR INDOOR PROCESS UNITS (FACTOR .25 to .90)		
E. ACCESS	.35	
F. DRAINAGE AND SPILL CONTROL (FACTOR .25 to .50) Gals.		0.25
GENERAL PROCESS HAZARDS FACTOR (F ₁)		1.25

2. SPECIAL PROCESS HAZARDS

PENALTY

PENALTY USED

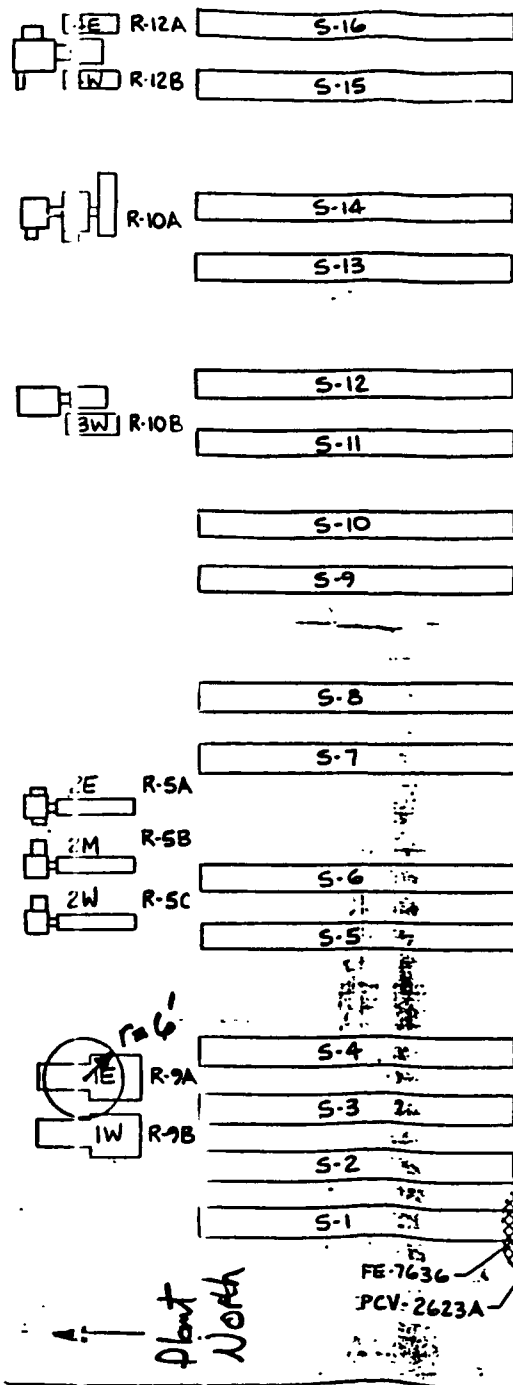
BASE FACTOR	1.00	1.00
A. TOXIC MATERIAL(S) (FACTOR 0.20 to 0.80)		
B. SUB-ATMOSPHERIC PRESSURE (< 500 mm Hg)	.50	
C. OPERATION IN OR NEAR FLAMMABLE RANGE ☐ INERTED ☐ NOT INERTED		
1. TANK FARMS STORAGE FLAMMABLE LIQUIDS	.50	
2. PROCESS UPSET OR PURGE FAILURE	.30	
3. ALWAYS IN FLAMMABLE RANGE	.80	
D. DUST EXPLOSION (FACTOR .25 to 2.00) (SEE TABLE II)		
E. PRESSURE (SEE FIGURE 2) OPERATING PRESSURE _____ psig RELIEF SETTING _____ psig		
F. LOW TEMPERATURE (FACTOR .20 to .30)		
G. QUANTITY OF FLAMMABLE/UNSTABLE MATERIAL: QUANTITY _____ lbs., H _c _____ BTU/lb		
1. LIQUIDS, GASES AND REACTIVE MATERIALS IN PROCESS (SEE FIG. 3)		
2. LIQUIDS OR GASES IN STORAGE (SEE FIG. 4)		
3. COMBUSTIBLE SOLIDS IN STORAGE, DUST IN PROCESS (SEE FIG. 5)		
H. CORROSION AND EROSION (FACTOR .10 to .75)		
I. LEAKAGE - JOINTS AND PACKING (FACTOR .10 to 1.50)		
J. USE OF FIRED HEATERS (SEE FIG. 6)		
K. HOT OIL HEAT EXCHANGE SYSTEM (FACTOR .15 to 1.15) (SEE TABLE III)		
L. ROTATING EQUIPMENT	.50	
SPECIAL PROCESS HAZARDS FACTOR (F ₂)		1.0
UNIT HAZARD FACTOR (F ₁ x F ₂ = F ₃)		1.25

FIRE AND EXPLOSION INDEX (F₃ x MF = F & EI)DO A 023165
CONFIDENTIAL

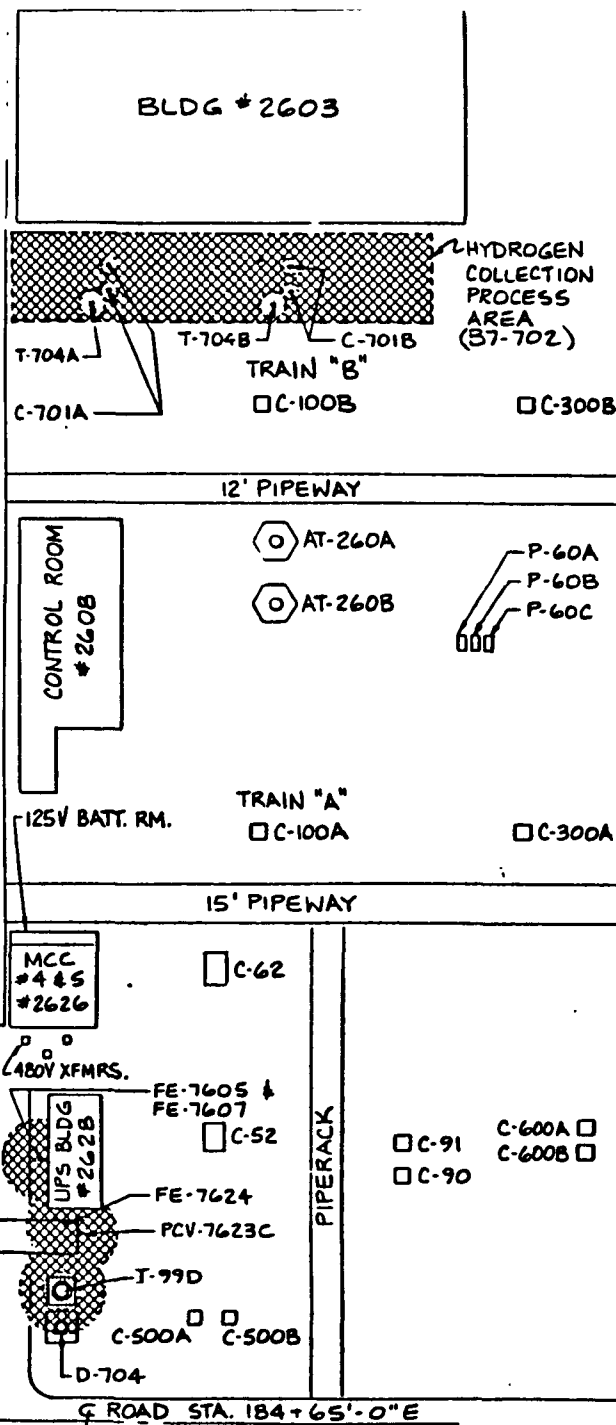
5.0

Q ROAD STA. 38+26'-8"N

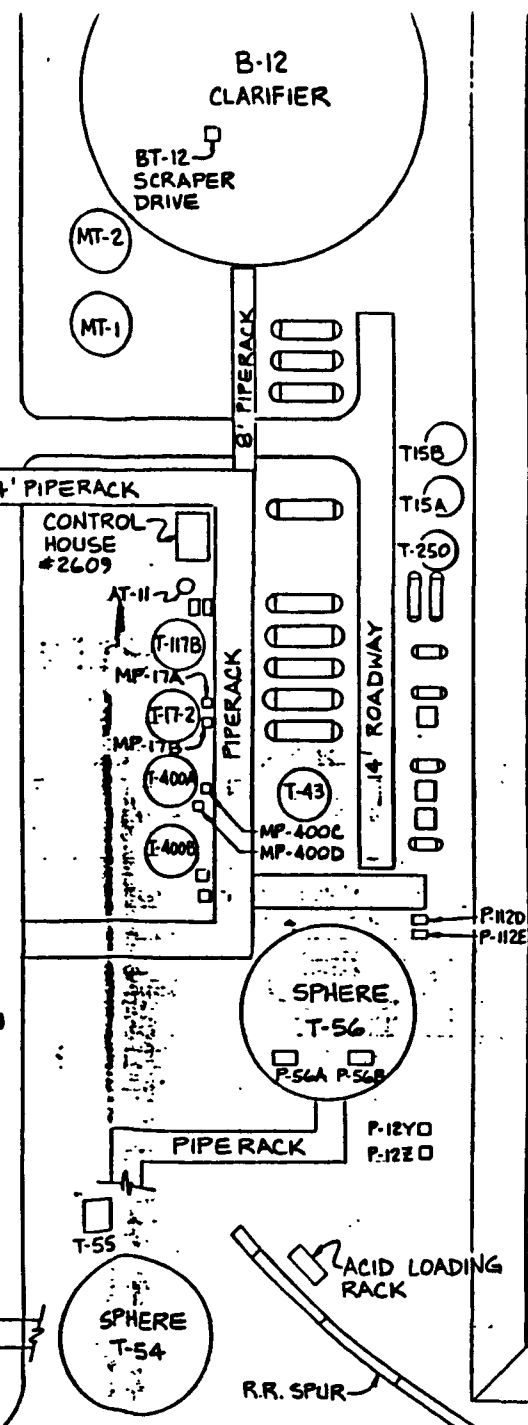
9A
9B
RS



OVERHEAD PIPERACK - ROADWAY UNDER



Q 20' ROAD STA. 92+85'-0"N



CHLORINE LOADING RACK # 2612

Scale: 1" = 5'

EXHIBIT B

LOSS CONTROL CREDIT FACTORS

1. Process Control (C₁)

a) Emergency Power	<u>.98</u>	f) Inert Gas	.94 to .96
b) Cooling	.97 to <u>.99</u>	g) Operating Instructions/ Procedures	.91 to .99 <u>0.95</u>
c) Explosion Control	.84 to <u>.98</u>	h) Reactive Chemical Review	.91 to <u>.98</u>
d) Emergency Shutdown	<u>.96</u> to .99		
e) Computer Control	.93 to .99		

C₁ Total 0.85 *

2. Material Isolation (C₂)

a) Remote Control Valves	.96 to .98	c) Drainage	.91 to .97
b) Dump/Blowdown	.96 to .98	d) Interlock	.98

C₂ Total 1.0 *

3. Fire Protection (C₃)

a) Leak Detection	.94 to .98	f) Sprinkler Systems	.74 to <u>.97</u>
b) Structural Steel	.95 to .98	g) Water Curtains	.97 to .98
c) Buried Tanks	.84 to .91	h) Foam	.92 to .97
d) Water Supply	.94 to <u>.97</u>	i) Hand Extinguishers/Monitors	.95 to .98
e) Special Systems	.91	j) Cable Protection	.94 to .98

C₃ Value 0.94 *

Credit Factor = C₁ X C₂ X C₃ = 0.80 Enter on Line D Below

UNIT ANALYSIS SUMMARY

A-1. F & EI	<u>5.0</u>	
A-2. Radius of Exposure	<u>6.0</u> ft.	
A-3. Value of Area of Exposure		\$MM <u>1.8</u>
B. Damage Factor	<u>0.05</u>	
C. Base MMPD (A-3 X B)		\$MM <u>0.09</u>
D. Credit Factor	<u>0.80</u>	
E. Actual MMPD (C X D)		\$MM <u>0.072</u>
F. Days Outage (MPDO)		<u>< 5.5</u> days.
G. Business Interruption Loss (BI)		\$MM _____

* Product of all factors used.