EXHIBIT A

FIRE AND EXPLOSION INDEX

DOW

LOCATION	DATE
LAU	5/89

UNIT	PROCESS UNIT	EVALUATED BY	REVIEWED BY
CHLORINE I	One Cell Series	SEL	

MATERIALS AND PROCESS

MATERIALS IN PROCESS UNIT

Chlorine, Hydrogen, Cell Effluent, Brine

STATE OF OPERATION

☐ START-UP ☐ SHUT-DOWN ☑ NORMAL OPERATION

BASIC MATERIAL(S) FOR MATERIAL FACTOR

Hydrogen

MATERIAL FACTOR (SEE TABLE I OR APPENDICES A OR B) Note requirements when unit temperature over 140°F) → 21

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.		
GENERAL PROCESS HAZARDS FACTOR (F_1) →		1.0
2. SPECIAL PROCESS HAZARDS		
BASE FACTOR →	1.00	1.00
A. TOXIC MATERIAL(S) (FACTOR 0.20 to 0.80) $N_H = 3$		
B. SUB-ATMOSPHERIC PRESSURE (< 500 mm Hg)	.50	0.5
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)		0.1
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) →		1.6
UNIT HAZARD FACTOR ($F_1 \times F_2 = F_3$) →		1.6
FIRE AND EXPLOSION INDEX ($F_3 \times MF = F\ \&\ EI$) →		33.6

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EXHIBIT B

LOSS CONTROL CREDIT FACTORS

1. Process Control (C_1)

a) Emergency Power	.98	f) Inert Gas	.94 to .96
b) Cooling	.97 to .99	g) Operating Instructions/ Procedures	.91 to .99 → 0.9
c) Explosion Control	.84 to .98		
d) Emergency Shutdown	.96 to .99 → 0.98	h) Reactive Chemical Review	.91 to .98
e) Computer Control	.93 to .99		

C_1 Total 0.89 *

2. Material Isolation (C_2)

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

C_2 Total 0.96 *

3. Fire Protection (C_3)

a) Leak Detection	.94 to .98	f) Sprinkler Systems	.74 to .97
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 .97	i) Hand Extinguishers/Monitors	.95 to .98
e) Special Systems	.91	j) Cable Protection	.94 to .98

C_3 Value 0.97 *

Credit Factor = C_1 X C_2 X C_3 = 0.83 Enter on Line D Below

UNIT ANALYSIS SUMMARY

A-1. F & EI	33.6	
A-2. Radius of Exposure	28 ft.	
A-3. Value of Area of Exposure		$MM 3.658
B. Damage Factor	0.47	
C. Base MMPD (A-3 X B)		$MM 1.719
D. Credit Factor	0.83	
E. Actual MMPD (C X D)		$MM 1.427
F. Days Outage (MPDO)		25 days
G. Business Interruption Loss (BI)		$MM

* Product of all factors used.

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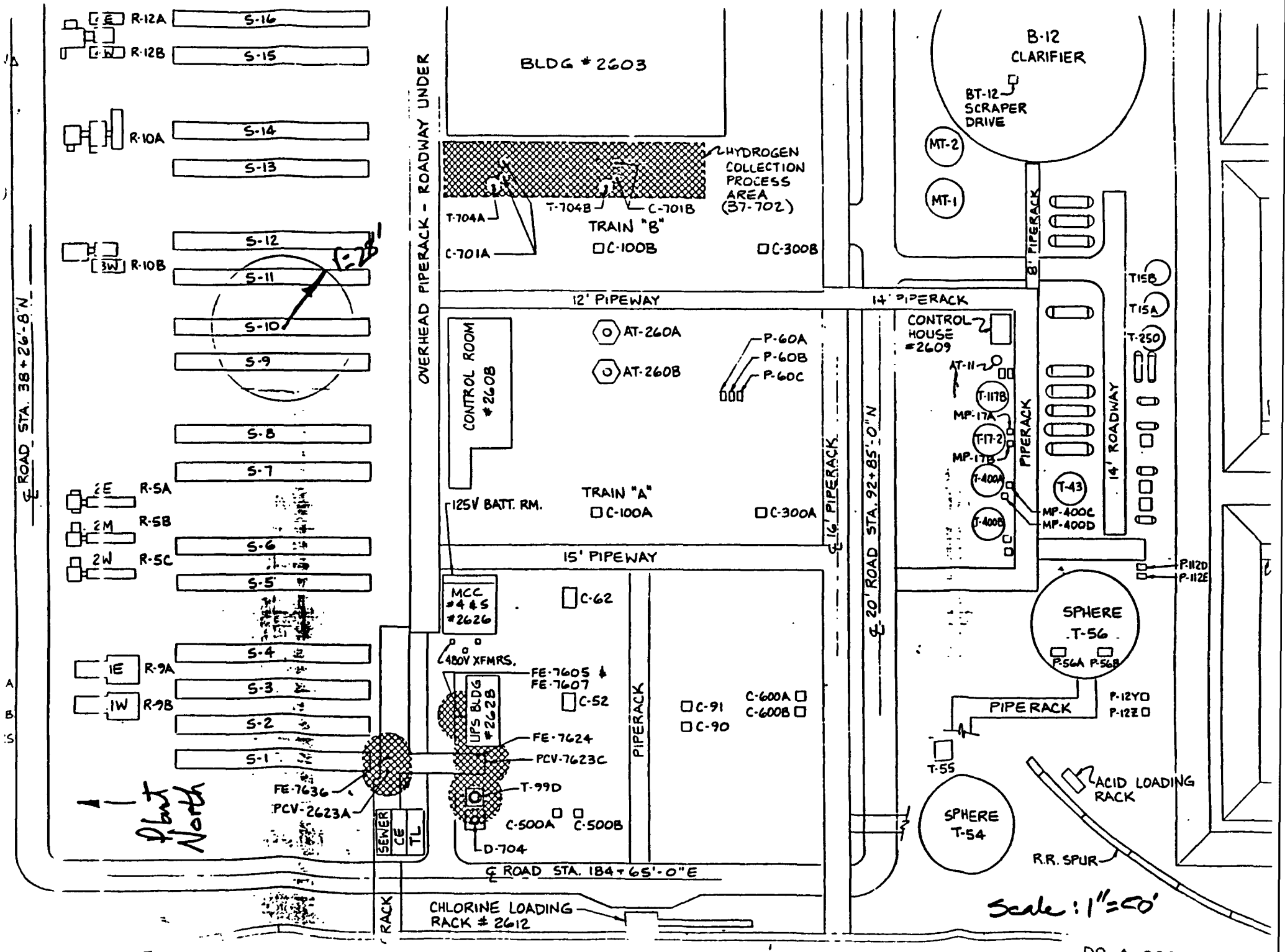

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