

DOW

(1) For no penalty use 0.00.

DO A 037035
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LOSS CONTROL CREDIT FACTORS

1. Process Control Credit Factor (C1)

Feature	Credit Factor Range	Credit Factor Used (2)	Feature	Credit Factor Range	Credit Factor Used (2)
a. Emergency Power	0.98	0.98	f. Inert Gas	0.94 to 0.96	0.96
b. Cooling	0.97 to 0.99	1.00	g. Operating Instructions/Procedures	0.91 to 0.99	0.91
c. Explosion Control	0.84 to 0.88	1.00	h. Reactive Chemical Review	0.91 to 0.98	0.91
d. Emergency Shutdown	0.96 to 0.99	0.98	i. Other Process Hazard Analysis	0.91 to 0.98	0.98
e. Computer Control	0.93 to 0.99	0.93			

C1 Value (3) 0.696

2. Material Isolation Credit Factor (C2)

Feature	Credit Factor Range	Credit Factor Used (2)	Feature	Credit Factor Range	Credit Factor Used (2)
a. Remote Control Valves	0.96 to 0.98	0.96	c. Drainage	0.91 to 0.97	1.00
b. Dump/Blowdown	0.96 to 0.98	0.96	d. Interlock	0.98	1.00

C2 Value (3) 0.922

3. Fire Protection Credit Factor (C3)

Feature	Credit Factor Range	Credit Factor Used (2)	Feature	Credit Factor Range	Credit Factor Used (2)
a. Leak Detection	0.94 to 0.98	0.98	f. Water Curtains	0.97 to 0.98	1.00
b. Structural Steel	0.95 to 0.98	1.00	g. Foam	0.92 to 0.97	1.00
c. Fire Water Supply	0.94 to 0.97	0.97	h. Hand Extinguishers/Monitors	0.93 to 0.98	0.97
d. Special Systems	0.91	1.00	i. Cable Protection	0.94 to 0.98	1.00
e. Spnnkler Systems	0.74 to 0.97	1.00			

C3 Value (3) 0.922

Loss Control Credit Factor = C1 x C2 x C3 (3) = 0.591

PROCESS UNIT RISK ANALYSIS SUMMARY

1. Fire and Explosion Index (F&EI)	(See Front)	37	
2. Radius of Exposure	(Figure 7)	31	ft
3. Area of Exposure		3,028	sq.ft.
4. Value of Area of Exposure 1968 Dollars			\$MM 4.50
5. Damage Factor	(Figure 8)	0.48	
6. Base Maximum Probable Property Damage - (Base MPPD) [4 x 5]			\$MM 2.15
7. Loss Control Credit Factor	(See Above)	0.59	
8. Actual Maximum Probable Property Damage - (Actual MPPD) [6 x 7] ...			\$MM 1.27
9. Maximum Probable Days Outage - (MPDO)	(Figure 9)	20	days
10. Business Interruption - (BI)			\$MM 3.0

(2) For no credit factor enter 1.00

(3) Product of all factors used

Refer to "Fire & Explosion Index Hazard Classification Guide" (Form #471-00001) for details

Print Date: 1/16/97, Work File: C:\WINDOWS\Profiles\239601\Desktop\Fei7denw\ca2_1997.xls\FEI7_TMP MF
 BACK OF FORM C-22380 Rev 01-94 (471-00036) - FEI-7 System Ver 2.3 4/4/96
 Data File: C:\WINDOWS\Profiles\239601\Desktop\Fei7denw\FEI7_DAT.XLS

DO A 037036
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FIRE & EXPLOSION INDEX - DATA AND COMMENTS

Material Factor

Material Is From Database
Material Name - Hydrogen
Base Material Factor = 21
Adjusted Material Factor = 21
Heat of Combustion (BTU/lb) = 51800
Nh = 0
Nf = 4
Nr = 0
Flash Point (°F) = Gas
Boiling Point (°F) = -423
Process Unit Temperature (°F) = 15
Exotherm Temperature (°F) = 1000000
Autoignition Temperature (°F) = 1000000

Data For User Specified Material

General Process Hazards

- A. Exothermic Chemical Reactions
Process Unit NOT A REACTOR and/or NO EXOTHERM occurs (Penalty=0)
Comment 0
- B. Endothermic Processes
Process Unit NOT A REACTOR ==> Penalty=0
Comment 0
- C. Material Handling and Transfer
None of the following situations apply (Penalty=0)
Comment 0
- D. Enclosed or Indoor Process Units
Process is NOT ENCLOSED (Penalty=0)
Comment 0
- E. Access
Access determined adequate for emergency equipment (Penalty=0)
Comment 0
- F. Drainage and Spill Control
Diking and drainage which meets all criteria (see help) (Penalty=0)
Comment 0

Special Process Hazards

- A. Toxic Material(s)
Equals two tenths of the Nh
- B. Sub-Atmospheric Pressure (< 500 mm Hg)
Greater than 500 mmHg (Penalty=0)
Comment 0
- C. Operation In or Near Flammable Range
Process can reach flammable range only in the event of instrument
Comment 0
- D. Dust Explosion
Process does not include dusts (Penalty=0)
Comment 0
- E. Pressure
Comment 0
- F. Low Temperature
Temperatures remain safely above the ductile/brittle
Comment 0
- G. Quantity of Flammable/Unstable Material
In Process
Comment 0
- H. Corrosion and Erosion
Corrosion rate between 0.5 and 1.00 mm/yr (Penalty=0.20)
Comment External and Localized Corrosion
- I. Leakage - Joints and Packing
Leakage of flammables/combustibles is insignificant
Comment 0
- J. Use of Fired Equipment
DOES NOT exist in the plant with the Process Unit
Comment 0
- K. Hot Oil Heat Exchange System
Process does not use a hot oil exchange system, or the hot oil is not above it's boiling point
Comment 0
- L. Rotating Equipment
No rotating equipment deemed to be a hazard (No Penalty)
Comment 0

(FE-7 System Ver-2.8 - 4/4/98)

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LOSS CONTROL CREDIT FACTORS - DATA AND COMMENTS

Process Control Credit Factor (C1)

- a) Emergency Power
Automatic switch to emergency power for CRITICAL SERVICES
Comment: 0
- b) Cooling
No credit (Factor=1.0)
Comment: 0
- c) Explosion Control
No credit (Factor=1.0)
Comment: 0
- d) Emergency Shutdown
Redundancy system that initiates a shutdown (Factor=0.98)

Comment: 0
- e) Computer Control
Computer with "fail-safe" logic and at least one of the
Comment: 0
- f) Inert Gas
Inert gas pad employed (Factor=0.96)
Comment: 0
- g) Operating Instructions/Procedures
1. Startup, 2. Routine Shutdown, 3. Normal operating conditions, 4. Turndown operating conditions,
Comment: 0
- h) Reactive Chemical Review
Reactive Chemical program is a continuing part of operations
Comment: Annual refresher training for all plant employees
- i) Other Process Hazard Analysis
Management of Change Review (Factor=0.98)
Comment: 0

Material Isolation Credit Factor (C2)

- a) Remote Control Valves
Remotely operated isolation valves exist AND are cycled at
Comment: 0
- b) Dump/Blowdown
Process employs an emergency flare system OR a closed vent
Comment: 0
- c) Drainage
0
Comment: 0
- d) Interlock
No credit (Factor=1.0)
Comment: 0

Fire Protection Credit Factor (C3)

- a) Leak Detection
Gas detectors alarm and identify a zone only (Factor=0.98)
Comment: 0
- b) Structural Steel
No credit (Factor=1.0)
Comment: 0
- c) Fire Water Supply
Firefighting water can be supplied for 4 hours at less than 100
Comment: 0
- d) Special Systems
No credit (Factor=1.0)
Comment: 0
- e) Sprinkler Systems
No credit (Factor=1.0)
Comment: 0
- f) Water Curtains
No credit (Factor=1.0)
Comment: 0
- g) Foam
No credit (Factor=1.0)
Comment: 0
- h) Hand Extinguishers/Monitors
The process is protected by monitor guns (Factor=0.97)
Comment: 0
- i) Cable Protection
No credit (Factor=1.0)
Comment: 0

DO A 037038
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#2

FIRE & EXPLOSION INDEX

DOW

AREA/COUNTRY	DIVISION	LOCATION	DATE
North America	Louisiana	Plaquemine	1/6/97
SITE	MANUFACTURING UNIT	PROCESS UNIT	
Plaquemine	Chlor-Alkali 2	Hydrogen Trailer	
PREPARED BY:	APPROVED BY: (Superintendent)	BUILDING	
John Dizer	Gretchen C. Leblanc	3601	
REVIEWED BY: (Management)	REVIEWED BY: (Technology Center)	REVIEWED BY: (Safety & Loss Prevention)	
		Buck Bailey	
MATERIALS IN PROCESS UNIT			
Hydrogen			
STATE OF OPERATION		BASIC MATERIAL(S) FOR MATERIAL FACTOR	
_____ DESIGN _____ START UP _____ X _____ NORMAL OPERATION _____ SHUTDOWN		Hydrogen	
MATERIAL FACTOR (See Table 1 or Appendices A or B) Note requirements when unit temperatures over 140 °F (50 °C)			21
1. General Process Hazards		Penalty Factor Range	Penalty Factor Used (1)
Base Factor		1.00	1.00
A. Exothermic Chemical Reactions		0.30 to 1.25	0.00
B. Endothermic Processes		0.20 to 0.40	0.00
C. Material Handling and Transfer		0.25 to 1.05	0.85
D. Enclosed or Indoor Process Units		0.25 to 0.90	0.00
E. Access		0.20 to 0.35	0.00
F. Drainage and Spill Control <u>0 gallons</u>		0.25 to 0.50	0.00
General Process Hazards Factor (F1)		1.85	
2. Special Process Hazards			
Base Factor		1.00	1.00
A. Toxic Material(s)		0.20 to 0.80	0.00
B. Sub-Atmospheric Pressure (< 500 mm Hg)		0.50	0.00
C. Operation In or Near Flammable Range _____ INERTED _____ X _____ NOT INERTED			
1. Tank Farms Storage Flammable Liquids		0.50	0.00
2. Process Upset or Purge Failure		0.30	0.00
3. Always in Flammable Range		0.80	0.80
D. Dust Explosion (See Table 3)		0.25 to 2.00	0.00
E. Pressure (See Figure 2)		Operating Pressure <u>2,200 psig</u> Relief Setting <u>2,500 psig</u>	1.15
F. Low Temperature		0.20 to 0.30	0.00
G. Quantity of Flammable/Unstable Material		Quantity <u>320 lb</u> Hc = <u>51,600 BTU/lb</u>	
1. Liquids or Gases in Process (See Figure 3)			0.00
2. Liquids or Gases in Storage (See Figure 4)			0.07
3. Combustible Solids in Storage, Dust in Process (See Figure 5)			0.00
H. Corrosion and Erosion		0.10 to 0.75	0.00
I. Leakage - Joints and Packing		0.10 to 1.50	0.00
J. Use of Fired Equipment (See Figure 6)			0.05
K. Hot Oil Heat Exchange System (See Table 5)		0.15 to 1.15	0.00
L. Rotating Equipment		0.50	0.00
Special Process Hazards Factor (F2)		3.07	
Process Unit Hazards Factor (F1 x F2) = F3		5.68	
Fire and Explosion Index (F3 x MF = F&EI)		119	

(1) For no penalty use 0.00.

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LOSS CONTROL CREDIT FACTORS

1. Process Control Credit Factor (C1)

Feature	Credit Factor Range	Credit Factor Used (2)	Feature	Credit Factor Range	Credit Factor Used (2)
a. Emergency Power	0.98	1.00	f. Inert Gas	0.94 to 0.96	1.00
b. Cooling	0.97 to 0.99	1.00	g. Operating Instructions/Procedures	0.91 to 0.99	0.91
c. Explosion Control	0.84 to 0.88	1.00	h. Reactive Chemical Review	0.91 to 0.98	0.91
d. Emergency Shutdown	0.96 to 0.99	1.00	i. Other Process Hazard Analysis	0.91 to 0.98	0.98
e. Computer Control	0.93 to 0.99	1.00			

C1 Value (3) 0.811

2. Material Isolation Credit Factor (C2)

Feature	Credit Factor Range	Credit Factor Used (2)	Feature	Credit Factor Range	Credit Factor Used (2)
a. Remote Control Valves	0.96 to 0.98	1.00	c. Drainage	0.91 to 0.97	1.00
b. Dump/Blowdown	0.96 to 0.98	1.00	d. Interlock	0.98	1.00

C2 Value (3) 1.000

3. Fire Protection Credit Factor (C3)

Feature	Credit Factor Range	Credit Factor Used (2)	Feature	Credit Factor Range	Credit Factor Used (2)
a. Leak Detection	0.94 to 0.98	1.00	f. Water Curtains	0.97 to 0.98	1.00
b. Structural Steel	0.95 to 0.98	1.00	g. Foam	0.92 to 0.97	1.00
c. Fire Water Supply	0.94 to 0.97	0.97	h. Hand Extinguishers/Monitors	0.93 to 0.98	0.97
d. Special Systems	0.91	1.00	i. Cable Protection	0.94 to 0.98	1.00
e. Sprinkler Systems	0.74 to 0.97	1.00			

C3 Value (3) 0.941

Loss Control Credit Factor = C1 x C2 x C3 (3) = 0.763

PROCESS UNIT RISK ANALYSIS SUMMARY

1. Fire and Explosion Index (F&EI)	(See Front)	119		
2. Radius of Exposure	(Figure 7)	100	ft	
3. Area of Exposure		31,544	sq. ft.	
4. Value of Area of Exposure 1968 Dollars			\$MM	2.00
5. Damage Factor	(Figure 8)	0.77		
6. Base Maximum Probable Property Damage - (Base MPPD) [4 x 5]			\$MM	1.54
7. Loss Control Credit Factor	(See Above)	0.76		
8. Actual Maximum Probable Property Damage - (Actual MPPD) [6 x 7]			\$MM	1.17
9. Maximum Probable Days Outage - (MPDO)	(Figure 9)	13	days	
10. Business Interruption - (BI)			\$MM	1.90

(2) For no credit factor enter 1.00

(3) Product of all factors used

Refer to "Fire & Explosion Index Hazard Classification Guide" (Form #471-00001) for details

Print Date: 1/20/97 Work File: C:\WINDOWS\Profiles\lu239601\Desktop\Fel7denw\CA2 97 D..._T.MP MF
Data File: C:\WINDOWS\Profiles\lu239601\Desktop\Fel7denw\FE17_DAT.XLS

DO A 037040
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FIRE & EXPLOSION INDEX - DATA AND COMMENTS

Material Factor

Material is From Database
Material Name - Hydrogen
Base Material Factor = 21
Adjusted Material Factor = 21
Heat of Combustion (BTU/lb) = 51600
Nh = 0
Nf = 4
Nr = 0
Flash Point (°F) = Gas
Boiling Point (°F) = -423
Process Unit Temperature (°F) = 120

Exotherm Temperature (°F) = 1000000
Autoignition Temperature (°F) = 1000000

Data For User Specified Material

General Process Hazards

- A. Exothermic Chemical Reactions
Process Unit NOT A REACTOR and/or NO EXOTHERM occurs (Penalty=0)
Comment 0
- B. Endothermic Processes
Process Unit NOT A REACTOR ==> Penalty=0
Comment 0
- C. Material Handling and Transfer
Warehouse or yard storage (Penalty=0.25 to 0.85)
Comment 0
- D. Enclosed or Indoor Process Units
Process is NOT ENCLOSED (Penalty=0)
Comment 0
- E. Access
Access determined adequate for emergency equipment (Penalty=0)
Comment 0
- F. Drainage and Spill Control
Diking and drainage which meets all criteria (see help) (Penalty=0)
Comment 0

Special Process Hazards

- A. Toxic Material(s)
Equals two tenths of the Nh
- B. Sub-Atmospheric Pressure (< 500 mm Hg)
Greater than 500 mmHg (Penalty=0)
Comment 0
- C. Operation In or Near Flammable Range
Process that is by nature ALWAYS in or near the flammable
Comment 0
- D. Dust Explosion
Process does not include dusts (Penalty=0)
Comment 0
- E. Pressure
Comment 0
- F. Low Temperature
Temperatures remain safely above the ductile/brittle
Comment 0
- G. Quantity of Flammable/Unstable Material
In Storage
Comment 0
- H. Corrosion and Erosion
Corrosion rates below 0.5 mm/yr WITHOUT risk of pitting
Comment -
- I. Leakage - Joints and Packing
Leakage of flammables/combustibles is insignificant
Comment 0
- J. Use of Fired Equipment
DOES exist in the plant with the Process Unit
Comment 0
- K. Hot Oil Heat Exchange System
Process does not use a hot oil exchange system, or the hot oil is not above it's boiling point
Comment 0
- L. Rotating Equipment
No rotating equipment deemed to be a hazard (No Penalty)
Comment 0

FEI-7 System Ver-2.5 - 4/98

DO A 037041
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LOSS CONTROL CREDIT FACTORS - DATA AND COMMENTS

Process Control Credit Factor (C1)

- a) Emergency Power
No credit (Factor=1.0)
Comment: 0
- b) Cooling
No credit (Factor=1.0)
Comment: 0
- c) Explosion Control
No credit (Factor=1.0)
Comment: 0
- d) Emergency Shutdown
No credit (Factor=1.0)
Comment: 0
- e) Computer Control
No credit (Factor=1.0)
Comment: 0
- f) Inert Gas
No credit (Factor=1.0)
Comment: 0
- g) Operating Instructions/Procedures
1. Startup, 2. Routine Shutdown, 3. Normal operating conditions, 4. Turndown operating conditions.
Comment: 0
- h) Reactive Chemical Review
Reactive Chemical program is a continuing part of operations
Comment: Annual refresher training for all plant employees.
- i) Other Process Hazard Analysis
Management of Change Review (Factor=0.88)
Comment: 0

Material Isolation Credit Factor (C2)

- a) Remote Control Valves
No credit (Factor=1.0)
Comment: 0
- b) Dump/Blowdown
No credit (Factor=1.0)
Comment: 0
- c) Drainage
0
Comment: 0
- d) Interlock
No credit (Factor=1.0)
Comment: 0

Fire Protection Credit Factor (C3)

- a) Leak Detection
No credit (Factor=1.0)
Comment: 0
- b) Structural Steel
No credit (Factor=1.0)
Comment: 0
- c) Fire Water Supply
Firefighting water can be supplied for 4 hours at less than 100
Comment: 0
- d) Special Systems
No credit (Factor=1.0)
Comment: 0
- e) Sprinkler Systems
No credit (Factor=1.0)
Comment: 0
- f) Water Curtains
No credit (Factor=1.0)
Comment: 0
- g) Foam
No credit (Factor=1.0)
Comment: 0
- h) Hand Extinguishers/Monitors
The process is protected by monitor guns (Factor=0.97)
Comment: 0
- i) Cable Protection
No credit (Factor=1.0)
Comment: -

DO A 037042
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#3

FIRE & EXPLOSION INDEX

DOW

AREA/COUNTRY	DIVISION	LOCATION	DATE
North America	Louisiana	Plaquemine	1/6/97
SITE	MANUFACTURING UNIT	PROCESS UNIT	
Plaquemine	Chlor-Alkali 2	Taffy Pot	
PREPARED BY:	APPROVED BY: (Superintendent)	BUILDING	
John Dizor	Gretchen C. Leblanc	3601	
REVIEWED BY: (Management)	REVIEWED BY: (Technology Center)	REVIEWED BY: (Safety & Loss Prevention)	
		Buck Bailey	
MATERIALS IN PROCESS UNIT			
Nitrogen Trichloride, Chlorine, Carbon Tet			
STATE OF OPERATION		BASIC MATERIAL(S) FOR MATERIAL FACTOR	
DESIGN ☐ START UP ☐ ☒ NORMAL OPERATION ☐ SHUTDOWN		Nitrogen Trichloride	
MATERIAL FACTOR (See Table 1 or Appendices A or B) Note requirements when unit temperatures over 140 °F (60 °C)			40
1. General Process Hazards		Penalty Factor Range	Penalty Factor Used (1)
Base Factor		1.00	1.00
A. Exothermic Chemical Reactions		0.30 to 1.25	0.00
B. Endothermic Processes		0.20 to 0.40	0.00
C. Material Handling and Transfer		0.25 to 1.05	0.00
D. Enclosed or Indoor Process Units		0.25 to 0.90	0.00
E. Access		0.20 to 0.35	0.00
F. Drainage and Spill Control		0 gallons	0.25 to 0.50
General Process Hazards Factor (F1)			1.00
2. Special Process Hazards			
Base Factor		1.00	1.00
A. Toxic Material(s)		0.20 to 0.80	0.60
B. Sub-Atmospheric Pressure (< 500 mm Hg)		0.50	0.00
C. Operation In or Near Flammable Range ☐ INERTED ☒ NOT INERTED			
1. Tank Farms Storage Flammable Liquids		0.50	0.00
2. Process Upset or Purge Failure		0.30	0.30
3. Always in Flammable Range		0.80	0.00
D. Dust Explosion (See Table 3)		0.25 to 2.00	0.00
E. Pressure (See Figure 2)		Operating Pressure 70 psig Relief Setting 150 psig	0.14
F. Low Temperature		0.20 to 0.30	0.00
G. Quantity of Flammable/Unstable Material		Quantity 1 lb Hc = 0 BTU/lb	
1. Liquids or Gases in Process (See Figure 3)			0.00
2. Liquids or Gases in Storage (See Figure 4)			0.00
3. Combustible Solids in Storage, Dust in Process (See Figure 5)			0.00
H. Corrosion and Erosion		0.10 to 0.75	0.75
I. Leakage - Joints and Packing		0.10 to 1.50	0.00
J. Use of Fired Equipment (See Figure 6)			0.00
K. Hot Oil Heat Exchange System (See Table 5)		0.15 to 1.15	0.00
L. Rotating Equipment		0.50	0.00
Special Process Hazards Factor (F2)			2.79
Process Unit Hazards Factor (F1 x F2) = F3			2.79
Fire and Explosion Index (F3 x MF = F&EI)			111

(1) For no penalty use 0.00.

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LOSS CONTROL CREDIT FACTORS

1. Process Control Credit Factor (C1)

Feature	Credit Factor Range	Credit Factor Used (2)	Feature	Credit Factor Range	Credit Factor Used (2)
a. Emergency Power	0.98	0.98	f. Inert Gas	0.94 to 0.96	0.94
b. Cooling	0.97 to 0.99	1.00	g. Operating Instructions/Procedures	0.91 to 0.99	0.91
c. Explosion Control	0.84 to 0.88	1.00	h. Reactive Chemical Review	0.91 to 0.98	0.91
d. Emergency Shutdown	0.96 to 0.99	0.98	i. Other Process Hazard Analysis	0.91 to 0.98	0.98
e. Computer Control	0.93 to 0.99	0.93			

C1 Value (3) 0.681

2. Material Isolation Credit Factor (C2)

Feature	Credit Factor Range	Credit Factor Used (2)	Feature	Credit Factor Range	Credit Factor Used (2)
a. Remote Control Valves	0.96 to 0.98	0.96	c. Drainage	0.91 to 0.97	1.00
b. Dump/Blowdown	0.96 to 0.98	1.00	d. Interlock	0.98	1.00

C2 Value (3) 0.960

3. Fire Protection Credit Factor (C3)

Feature	Credit Factor Range	Credit Factor Used (2)	Feature	Credit Factor Range	Credit Factor Used (2)
a. Leak Detection	0.94 to 0.98	0.98	f. Water Curtains	0.97 to 0.98	1.00
b. Structural Steel	0.95 to 0.98	1.00	g. Foam	0.92 to 0.97	1.00
c. Fire Water Supply	0.94 to 0.97	0.97	h. Hand Extinguishers/Monitors	0.93 to 0.98	0.97
d. Special Systems	0.91	1.00	i. Cable Protection	0.94 to 0.98	1.00
e. Sprinkler Systems	0.74 to 0.97	1.00			

C3 Value (3) 0.922

Loss Control Credit Factor = C1 x C2 x C3 (3) = 0.603

PROCESS UNIT RISK ANALYSIS SUMMARY

1. Fire and Explosion Index (F&EI)	(See Front)	111		
2. Radius of Exposure	(Figure 7)	94	ft	
3. Area of Exposure		27,513	sq. ft.	
4. Value of Area of Exposure 1968 Dollars			\$MM	2.00
5. Damage Factor	(Figure 8)	0.78		
6. Base Maximum Probable Property Damage - (Base MPPD) [4 x 5]			\$MM	1.55
7. Loss Control Credit Factor	(See Above)	0.60		
8. Actual Maximum Probable Property Damage - (Actual MPPD) [6 x 7]			\$MM	0.93
9. Maximum Probable Days Outage - (MPDO)	(Figure 9)	21	days	
10. Business Interruption - (BI)			\$MM	3.08

(2) For no credit factor enter 1.00

(3) Product of all factors used

Refer to "Fire & Explosion Index Hazard Classification Guide" (Form #471-00001) for details

Print Date: 1/21/97, Work File: C:\WINDOWS\Profiles\user239601\Desktop\Fei7denw\CA2 97 D-227 Taffy Pot.xls MF
 Data File: C:\WINDOWS\Profiles\user239601\Desktop\Fei7denw\FEI7_DAT.XLS

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FIRE & EXPLOSION INDEX - DATA AND COMMENTS

Material Factor

Material is User Specified (NOT in Database)

Material Name - Nitrogen Trichloride

Base Material Factor = 40

Adjusted Material Factor = 40

Heat of Combustion (BTU/lb) = 0

Nh = 3

Nf = 0

Nr = 4

Flash Point (°F) = N/A

Boiling Point (°F) = N/A

Process Unit Temperature (°F) = 80

Exotherm Temperature (°F) = 100

Autoignition Temperature (°F) = 1000000

Data For User Specified Material

Nr Selection. Based On Qualitative Input

-

Nf Selection Based On: Non-combustible

Nh Selection Based On: Nh=3 Materials causing serious temporary or residual injury

Input Heat Of Combustion (BTU/lb) = 0

Comment -

General Process Hazards

A Exothermic Chemical Reactions

Process Unit NOT A REACTOR and/or NO EXOTHERM occurs (Penalty=0)

Comment 0

B Endothermic Processes

Process Unit NOT A REACTOR ==> Penalty=0

Comment 0

C Material Handling and Transfer

None of the following situations apply (Penalty=0)

Comment 0

D Enclosed or Indoor Process Units

Process is NOT ENCLOSED (Penalty=0)

Comment 0

E Access

Access determined adequate for emergency equipment (Penalty=0)

Comment 0

F Drainage and Spill Control

Diking and drainage which meets all criteria (see help) (Penalty=0)

Comment 0

Special Process Hazards

A Toxic Material(s)

Equals two tenths of the Nh

B Sub-Atmospheric Pressure (< 500 mm Hg)

Greater than 500 mmHg (Penalty=0)

Comment 0

C Operation In or Near Flammable Range

Process can reach flammable range only in the event of instrument

Comment 0

D Dust Explosion

Process does not include dusts (Penalty=0)

Comment 0

E Pressure

Comment 0

F Low Temperature

Temperatures remain safely above the ductile/brittle

Comment 0

G Quantity of Flammable/Unstable Material

No Flammable/Unstable Material

Comment 0

H Corrosion and Erosion

A potential for stress-corrosion cracking exists (Penalty=0.75)

Comment -

I Leakage - Joints and Packing

Leakage of flammables/combustibles is insignificant

Comment 0

J Use of Fired Equipment

DOES NOT exist in the plant with the Process Unit

Comment 0

K Hot Oil Heat Exchange System

Process does not use a hot oil exchange system, or the hot oil is not above its boiling point

Comment 0

L Rotating Equipment

No rotating equipment deemed to be a hazard (No Penalty)

Comment 0

(FIE-7 System Ver-2.0 - 4/4/96)

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LOSS CONTROL CREDIT FACTORS - DATA AND COMMENTS

Process Control Credit Factor (C1)

- a) Emergency Power
Automatic switch to emergency power for CRITICAL SERVICES
Comment: 0
- b) Cooling
No credit (Factor=1.0)
Comment: 0
- c) Explosion Control
No credit (Factor=1.0)
Comment: 0
- d) Emergency Shutdown
Redundancy system that initiates a shutdown (Factor=0.98)
Comment: 0
- e) Computer Control
Computer with "fail-safe" logic and at least one of the
Comment: 0
- f) Inert Gas
Inert gas system can automatically purge total volume of unit
Comment: 0
- g) Operating Instructions/Procedures
1. Startup, 2. Routine Shutdown, 3. Normal operating conditions, 4. Turndown operating conditions.
Comment: 0
- h) Reactive Chemical Review
Reactive Chemical program is a continuing part of operations
Comment: Annual refresher training for all plant employees.
- i) Other Process Hazard Analysis
Management of Change Review (Factor=0.98)
Comment: 0

Material Isolation Credit Factor (C2)

- a) Remote Control Valves
Remotely operated isolation valves exist AND are cycled at
Comment: 0
- b) Dump/Blowdown
No credit (Factor=1.0)
Comment: 0
- c) Drainage
0
Comment: 0
- d) Interlock
No credit (Factor=1.0)
Comment: 0

Fire Protection Credit Factor (C3)

- a) Leak Detection
Gas detectors alarm and identify a zone only (Factor=0.98)
Comment: 0
- b) Structural Steel
No credit (Factor=1.0)
Comment: 0
- c) Fire Water Supply
Firefighting water can be supplied for 4 hours at less than 100
Comment: 0
- d) Special Systems
No credit (Factor=1.0)
Comment: 0
- e) Sprinkler Systems
No credit (Factor=1.0)
Comment: 0
- f) Water Curtains
No credit (Factor=1.0)
Comment: 0
- g) Foam
No credit (Factor=1.0)
Comment: --
- h) Hand Extinguishers/Monitors
The process is protected by monitor guns (Factor=0.97)
Comment: --
- i) Cable Protection
No credit (Factor=1.0)
Comment: --

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#5

FIRE & EXPLOSION INDEX

DOW

AREA/COUNTRY	DIVISION	LOCATION	DATE
North America	Louisiana	Plaquemine	1/6/97
SITE	MANUFACTURING UNIT	PROCESS UNIT	
Plaquemine	Chlor-Alkali 2	Chlorine Cells	
PREPARED BY:	APPROVED BY: (Superintendent)	BUILDING	
John Dizor	Gretchen C. Leblanc	3601	
REVIEWED BY: (Management)	REVIEWED BY: (Technology Center)	REVIEWED BY: (Safety & Loss Prevention)	
		Buck Bailey	
MATERIALS IN PROCESS UNIT			
Chlorine, Caustic, and Hydrogen			
STATE OF OPERATION		BASIC MATERIAL(S) FOR MATERIAL FACTOR	
DESIGN ☐ START UP ☐ NORMAL OPERATION ☒ SHUTDOWN		Hydrogen	
MATERIAL FACTOR (See Table 1 or Appendices A or B) Note requirements when unit temperatures over 140 °F (60 °C)			21
1. General Process Hazards			
Base Factor			1.00
A. Exothermic Chemical Reactions			0.30 to 1.25
B. Endothermic Processes			0.20 to 0.40
C. Material Handling and Transfer			0.25 to 1.05
D. Enclosed or Indoor Process Units			0.25 to 0.90
E. Access			0.20 to 0.35
F. Drainage and Spill Control 0 gallons			0.25 to 0.50
General Process Hazards Factor (F1)			1.70
2. Special Process Hazards			
Base Factor			1.00
A. Toxic Material(s)			0.20 to 0.80
B. Sub-Atmospheric Pressure (< 500 mm Hg)			0.50
C. Operation In or Near Flammable Range ☐ INERTED ☒ NOT INERTED			
1. Tank Farms Storage Flammable Liquids			0.50
2. Process Upset or Purge Failure			0.30
3. Always in Flammable Range			0.80
D. Dust Explosion (See Table 3)			0.25 to 2.00
E. Pressure (See Figure 2) Operating Pressure 0 psig			
Relief Setting 0 psig			0.16
F. Low Temperature			0.20 to 0.30
G. Quantity of Flammable/Unstable Material Quantity 51 lb			
Hc = 51,600 BTU/lb			
1. Liquids or Gases in Process (See Figure 3)			0.00
2. Liquids or Gases in Storage (See Figure 4)			0.00
3. Combustible Solids in Storage, Dust in Process (See Figure 5)			0.00
H. Corrosion and Erosion			0.10 to 0.75
I. Leakage - Joints and Packing			0.10 to 1.50
J. Use of Fired Equipment (See Figure 6)			0.00
K. Hot Oil Heat Exchange System (See Table 5)			0.15 to 1.15
L. Rotating Equipment			0.50
Special Process Hazards Factor (F2)			2.26
Process Unit Hazards Factor (F1 x F2) = F3			3.84
Fire and Explosion Index (F3 x MF = F&EI)			81

(1) For no penalty use 0.00.

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LOSS CONTROL CREDIT FACTORS

1. Process Control Credit Factor (C1)

Feature	Credit Factor Range	Credit Factor Used (2)	Feature	Credit Factor Range	Credit Factor Used (2)
a. Emergency Power	0.98	1.00	f. Inert Gas	0.94 to 0.96	0.94
b. Cooling	0.97 to 0.99	1.00	g. Operating Instructions/Procedures	0.91 to 0.99	0.95
c. Explosion Control	0.84 to 0.88	0.98	h. Reactive Chemical Review	0.91 to 0.98	0.91
d. Emergency Shutdown	0.96 to 0.99	0.98	i. Other Process Hazard Analysis	0.91 to 0.98	0.98
e. Computer Control	0.93 to 0.99	0.93			

C1 Value (3) 0.711

2. Material Isolation Credit Factor (C2)

Feature	Credit Factor Range	Credit Factor Used (2)	Feature	Credit Factor Range	Credit Factor Used (2)
a. Remote Control Valves	0.96 to 0.98	1.00	c. Drainage	0.91 to 0.97	0.91
b. Dump/Blowdown	0.96 to 0.98	0.96	d. Interlock	0.98	0.98

C2 Value (3) 0.856

3. Fire Protection Credit Factor (C3)

Feature	Credit Factor Range	Credit Factor Used (2)	Feature	Credit Factor Range	Credit Factor Used (2)
a. Leak Detection	0.94 to 0.98	0.98	f. Water Curtains	0.97 to 0.98	1.00
b. Structural Steel	0.95 to 0.98	1.00	g. Foam	0.92 to 0.97	1.00
c. Fire Water Supply	0.94 to 0.97	0.97	h. Hand Extinguishers/Monitors	0.93 to 0.98	0.97
d. Special Systems	0.91	1.00	i. Cable Protection	0.94 to 0.98	1.00
e. Sprinkler Systems	0.74 to 0.97	1.00			

C3 Value (3) 0.922

Loss Control Credit Factor = C1 x C2 x C3 (3) = 0.561

PROCESS UNIT RISK ANALYSIS SUMMARY

1. Fire and Explosion Index (F&E)	(See Front)	81		
2. Radius of Exposure	(Figure 7)	68	ft	
3. Area of Exposure		14,420	q.ft.	
4. Value of Area of Exposure 1968 Dollars			\$MM	3.00
5. Damage Factor	(Figure 8)	0.53		
6. Base Maximum Probable Property Damage - (Base MPPD) [4 x 5]			\$MM	1.58
7. Loss Control Credit Factor	(See Above)	0.56		
8. Actual Maximum Probable Property Damage - (Actual MPPD) [6 x 7]			\$MM	0.89
9. Maximum Probable Days Outage - (MPDO)	(Figure 9)	12	ays	
10. Business Interruption - (BI)			\$MM	1.74

(2) For no credit factor enter 1.00

(3) Product of all factors used

Refer to "Fire & Explosion Index Hazard Classification Guide" (Form #471-00001) for details

Print Date: 1/21/97 Work File: C:\WINDOWS\Profiles\u239601\Desktop\Fei7denw\CA2 97 - 5 Chlorine Cells.xls MF
 BACK OF FORM C-22380 Rev 01/94 (471-00001) (FEI-7 System Ver. 2.5, 1/1/95)
 Data File: C:\WINDOWS\Profiles\u239601\Desktop\Fei7denw\FEI7_DAT.XLS

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FIRE & EXPLOSION INDEX - DATA AND COMMENTS

Material Factor

Material is From Database
Material Name - Hydrogen
Base Material Factor = 21
Adjusted Material Factor = 21
Heat of Combustion (BTU/lb) = 51800
Nh = 0
Nf = 4
Nr = 0
Flash Point (°F) = Gas
Boiling Point (°F) = -423
Process Unit Temperature (°F) = 180

Exotherm Temperature (°F) = 1000000
Autoignition Temperature (°F) = 1000000

Data For User Specified Material

General Process Hazards

- A. Exothermic Chemical Reactions
Process Unit NOT A REACTOR and/or NO EXOTHERM occurs (Penalty=0)
Comment 0
- B. Endothermic Processes
REACTOR with ELECTROLYSIS REACTION ==> Penalty=0.20
Comment 0
- C. Material Handling and Transfer
Potential for introduction of air into process (Penalty=0.50)
Comment 0
- D. Enclosed or Indoor Process Units
Process is NOT ENCLOSED (Penalty=0)
Comment 0
- E. Access
Access determined adequate for emergency equipment (Penalty=0)
Comment 0
- F. Drainage and Spill Control
Diking and drainage which meets all criteria (see help) (Penalty=0)
Comment 0

Special Process Hazards

- A. Toxic Material(s)
Equals two tenths of the Nh
- B. Sub-Atmospheric Pressure (< 500 mm Hg)
Greater than 500 mmHg (Penalty=0)
Comment 0
- C. Operation in or Near Flammable Range
Process can reach flammable range only in the event of instrument
Comment 0
- D. Dust Explosion
Process does not include dusts (Penalty=0)
Comment 0
- E. Pressure
Comment 0
- F. Low Temperature
Temperatures remain safely above the ductile/brittle
Comment 0
- G. Quantity of Flammable/Unstable Material
In Process
Comment 0
- H. Corrosion and Erosion
Corrosion rate greater than 1.00 mm/yr (Penalty=0.50)
Comment Cells made from corrosion resistant materials
- I. Leakage - Joints and Packing
Regular leakage problems exist at pumps, compressors, and
Comment 0
- J. Use of Fired Equipment
DOES NOT exist in the plant with the Process Unit
Comment 0
- K. Hot Oil Heat Exchange System
Process does not use a hot oil exchange system, or the hot oil is not above it's boiling point
Comment 0
- L. Rotating Equipment
No rotating equipment deemed to be a hazard (No Penalty)
Comment 0

FE-7 System Ver 2.3 - 4/4/96

DO A 037049
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LOSS CONTROL CREDIT FACTORS - DATA AND COMMENTS

Process Control Credit Factor (C1)

- a) Emergency Power
No credit (Factor=1.0)
Comment: 0
- b) Cooling
No credit (Factor=1.0)
Comment: 0
- c) Explosion Control
Rupture diaphragms or explosion vents (Factor=0.98)
Comment: 0
- d) Emergency Shutdown
Redundancy system that initiates a shutdown (Factor=0.98)
Comment: 0
- e) Computer Control
Computer with "fail-safe" logic and at least one of the
Comment: 0
- f) Inert Gas
Inert gas system can automatically purge total volume of unit
Comment: 0
- g) Operating Instructions/Procedures
1. Startup, 2. Routine Shutdown, 3. Normal operating conditions, 4. Turndown operating conditions,
Comment: 0
- h) Reactive Chemical Review
Reactive Chemical program is a continuing part of operations
Comment: Annual refresher training for all plant employees.
- i) Other Process Hazard Analysis
Management of Change Review (Factor=0.98)
Comment: 0

Material Isolation Credit Factor (C2)

- a) Remote Control Valves
No credit (Factor=1.0)
Comment: 0
- b) Dump/Blowdown
Process employs a REMOTELY LOCATED emergency blowdown
Comment: 0
- c) Drainage
0
Comment: 0
- d) Interlock
Process is provided with an interlock system which prevents
Comment: 0

Fire Protection Credit Factor (C3)

- a) Leak Detection
Gas detectors alarm and identify a zone only (Factor=0.98)
Comment: 0
- b) Structural Steel
No credit (Factor=1.0)
Comment: 0
- c) Fire Water Supply
Firefighting water can be supplied for 4 hours at less than 100
Comment: 0
- d) Special Systems
No credit (Factor=1.0)
Comment: 0
- e) Sprinkler Systems
No credit (Factor=1.0)
Comment: 0
- f) Water Curtains
No credit (Factor=1.0)
Comment: --
- g) Foam
No credit (Factor=1.0)
Comment: --
- h) Hand Extinguishers/Monitors
The process is protected by monitor guns (Factor=0.97)
Comment: --
- i) Cable Protection
No credit (Factor=1.0)
Comment: --

[FIE-7 System Ver-2.5 - 4/4/98]

DO A 037050
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#4

FIRE & EXPLOSION INDEX

DOW

AREA/COUNTRY	DIVISION	LOCATION	DATE
North America	Louisiana	Plaquemine	1/6/97
SITE	MANUFACTURING UNIT	PROCESS UNIT	
Plaquemine	Chlor-Alkali 2	Hydrogen Compressor	
PREPARED BY:	APPROVED BY: (Superintendent)	BUILDING	
John Dizor	Gretchen C. Leblanc	3601	
REVIEWED BY: (Management)	REVIEWED BY: (Technology Center)	REVIEWED BY: (Safety & Loss Prevention)	
		Buck Bailey	
MATERIALS IN PROCESS UNIT			
Hydrogen			
STATE OF OPERATION		BASIC MATERIAL(S) FOR MATERIAL FACTOR	
DESIGN ☐ START UP ☐ NORMAL OPERATION ☒ SHUTDOWN ☐		Hydrogen	
MATERIAL FACTOR (See Table 1 or Appendices A or B) Note requirements when unit temperatures over 140 °F (60 °C)			21
1. General Process Hazards		Penalty Factor Range	Penalty Factor Used (1)
Base Factor		1.00	1.00
A. Exothermic Chemical Reactions		0.30 to 1.25	0.00
B. Endothermic Processes		0.20 to 0.40	0.00
C. Material Handling and Transfer		0.25 to 1.05	0.00
D. Enclosed or Indoor Process Units		0.25 to 0.90	0.00
E. Access		0.20 to 0.35	0.00
F. Drainage and Spill Control		0 gallons	0.25 to 0.50
General Process Hazards Factor (F1)			1.00
2. Special Process Hazards			
Base Factor		1.00	1.00
A. Toxic Material(s)		0.20 to 0.80	0.00
B. Sub-Atmospheric Pressure (< 500 mm Hg)		0.50	0.00
C. Operation In or Near Flammable Range ☐ INERTED ☒ NOT INERTED			
1. Tank Farms Storage Flammable Liquids		0.50	0.00
2. Process Upset or Purge Failure		0.30	0.00
3. Always in Flammable Range		0.80	0.80
D. Dust Explosion (See Table 3)		0.25 to 2.00	0.00
E. Pressure (See Figure 2)		Operating Pressure 10 psig Relief Setting 17 psig	0.20
F. Low Temperature		0.20 to 0.30	0.00
G. Quantity of Flammable/Unstable Material		Quantity 1 lb Hc = 51,600 BTU/lb	
1. Liquids or Gases in Process (See Figure 3)			0.00
2. Liquids or Gases in Storage (See Figure 4)			0.00
3. Combustible Solids in Storage, Dust in Process (See Figure 5)			0.00
H. Corrosion and Erosion		0.10 to 0.75	0.10
I. Leakage - Joints and Packing		0.10 to 1.50	0.10
J. Use of Fired Equipment (See Figure 6)			0.00
K. Hot Oil Heat Exchange System (See Table 5)		0.15 to 1.15	0.00
L. Rotating Equipment		0.50	0.00
Special Process Hazards Factor (F2)			2.20
Process Unit Hazards Factor (F1 x F2) = F3			2.20
Fire and Explosion Index (F3 x MF = F&EI)			46

(1) For no penalty use 0.00.

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LOSS CONTROL CREDIT FACTORS

1. Process Control Credit Factor (C1)

Feature	Credit Factor Range	Credit Factor Used (2)	Feature	Credit Factor Range	Credit Factor Used (2)
a. Emergency Power	0.98	0.98	f. Inert Gas	0.94 to 0.96	0.94
b. Cooling	0.97 to 0.99	0.99	g. Operating Instructions/Procedures	0.91 to 0.99	0.95
c. Explosion Control	0.84 to 0.88	1.00	h. Reactive Chemical Review	0.91 to 0.98	0.91
d. Emergency Shutdown	0.96 to 0.99	0.98	i. Other Process Hazard Analysis	0.91 to 0.98	0.98
e. Computer Control	0.93 to 0.99	0.93			

C1 Value (3) 0.704

2. Material Isolation Credit Factor (C2)

Feature	Credit Factor Range	Credit Factor Used (2)	Feature	Credit Factor Range	Credit Factor Used (2)
a. Remote Control Valves	0.96 to 0.98	1.00	c. Drainage	0.91 to 0.97	1.00
b. Dump/Blowdown	0.96 to 0.98	0.96	d. Interlock	0.98	0.98

C2 Value (3) 0.941

3. Fire Protection Credit Factor (C3)

Feature	Credit Factor Range	Credit Factor Used (2)	Feature	Credit Factor Range	Credit Factor Used (2)
a. Leak Detection	0.94 to 0.98	1.00	f. Water Curtains	0.97 to 0.98	1.00
b. Structural Steel	0.95 to 0.98	1.00	g. Foam	0.92 to 0.97	1.00
c. Fire Water Supply	0.94 to 0.97	0.97	h. Hand Extinguishers/Monitors	0.93 to 0.98	0.97
d. Special Systems	0.91	1.00	i. Cable Protection	0.94 to 0.98	1.00
e. Sprinkler Systems	0.74 to 0.97	1.00			

C3 Value (3) 0.941

Loss Control Credit Factor = C1 x C2 x C3 (3) = 0.623

PROCESS UNIT RISK ANALYSIS SUMMARY

1. Fire and Explosion Index (F&EI)	(See Front)	46		
2. Radius of Exposure	(Figure 7)	39	ft	
3. Area of Exposure		4,721	q.ft.	
4. Value of Area of Exposure 1980 Dollars.....			\$MM	3.80
5. Damage Factor	(Figure 8)	0.51		
6. Base Maximum Probable Property Damage - (Base MPPD) [4 x 5]			\$MM	1.94
7. Loss Control Credit Factor	(See Above)	0.62		
8. Actual Maximum Probable Property Damage - (Actual MPPD) [6 x 7]			\$MM	1.21
9. Maximum Probable Days Outage - (MPDO)	(Figure 9)	30	ays	
10. Business Interruption - (BI)			\$MM	0.20

(2) For no credit factor enter 1.00

(3) Product of all factors used

Refer to "Fire & Explosion Index Hazard Classification Guide" (Form #471-00001) for details

Print Date: 3/21/97, Work File: C:\WINDOWS\Profiles\lu239601\Desktop\Fei7denw\CA2 97 C-601 H2 Compressor.xls MF
 Data File: C:\WINDOWS\Profiles\lu239601\Desktop\Fei7denw\FEI7_DAT.XLS

DO A 037052
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FIRE & EXPLOSION INDEX - DATA AND COMMENTS

Material Factor

Material is From Database
Material Name - Hydrogen
Base Material Factor = 21
Adjusted Material Factor = 21
Heat of Combustion (BTU/lb) = 51600
Nh = 0
Nf = 4
Nr = 0
Flash Point (°F) = Gas
Boiling Point (°F) = -423
Process Unit Temperature (°F) = 120

Exotherm Temperature (°F) = 1000000
Autoignition Temperature (°F) = 1000000

Data For User Specified Material

General Process Hazards

- A. Exothermic Chemical Reactions
Process Unit NOT A REACTOR and/or NO EXOTHERM occurs (Penalty=0)
Comment 0
- B. Endothermic Processes
Process Unit NOT A REACTOR ==> Penalty=0
Comment 0
- C. Material Handling and Transfer
None of the following situations apply (Penalty=0)
Comment 0
- D. Enclosed or Indoor Process Units
Process is NOT ENCLOSED (Penalty=0)
Comment 0
- E. Access
Access determined adequate for emergency equipment (Penalty=0)
Comment 0
- F. Drainage and Spill Control
Diking and drainage which meets all criteria (see help) (Penalty=0)
Comment 0

Special Process Hazards

- A. Toxic Material(s)
Equals two tenths of the Nh
- B. Sub-Atmospheric Pressure (< 500 mm Hg)
Greater than 500 mmHg (Penalty=0)
Comment 0
- C. Operation In or Near Flammable Range
Process that is by nature ALWAYS in or near the flammable
Comment 0
- D. Dust Explosion
Process does not include dusts (Penalty=0)
Comment 0
- E. Pressure
Comment 0
- F. Low Temperature
Temperatures remain safely above the ductile/brittle
Comment 0
- G. Quantity of Flammable/Unstable Material
In Process
Comment 0
- H. Corrosion and Erosion
Corrosion rates below 0.5 mm/yr WITH risk of pitting and/or
Comment -
- I. Leakage - Joints and Packing
Minor leakage likely at pump and gland seals (Penalty=0.10)
Comment 0
- J. Use of Fired Equipment
DOES NOT exist in the plant with the Process Unit
Comment 0
- K. Hot Oil Heat Exchange System
Process does not use a hot oil exchange system, or the hot oil is not above it's boiling point
Comment 0
- L. Rotating Equipment
No rotating equipment deemed to be a hazard (No Penalty)
Comment 0

FEI-7 System Ver:2.3 - 4/4/95

LOSS CONTROL CREDIT FACTORS - DATA AND COMMENTS

Process Control Credit Factor (C1)

- a) Emergency Power
Automatic switch to emergency power for CRITICAL SERVICES
Comment: 0
- b) Cooling
System provides normal cooling for 10 minutes (Factor=0.99)
Comment: 0
- c) Explosion Control
No credit (Factor=1.0)
Comment: 0
- d) Emergency Shutdown
Redundancy system that initiates a shutdown (Factor=0.98)

Comment: 0
- e) Computer Control
Computer with "fail-safe" logic and at least one of the
Comment: 0
- f) Inert Gas
Inert gas system can automatically purge total volume of unit
Comment: 0
- g) Operating Instructions/Procedures
1. Startup, 2. Routine Shutdown, 3. Normal operating conditions, 4. Turndown operating conditions.
Comment: 0
- h) Reactive Chemical Review
Reactive Chemical program is a continuing part of operations
Comment: Annual refresher training for all plant employees.
- i) Other Process Hazard Analysis
Management of Change Review (Factor=0.98)
Comment: 0

Material Isolation Credit Factor (C2)

- a) Remote Control Valves
No credit (Factor=1.0)
Comment: 0
- b) Dump/Blowdown
Process employs an emergency flare system OR a closed vent
Comment: 0
- c) Drainage
0
Comment: 0
- d) Interlock
Process is provided with an interlock system which prevents
Comment: 0

Fire Protection Credit Factor (C3)

- a) Leak Detection
No credit (Factor=1.0)
Comment: 0
- b) Structural Steel
No credit (Factor=1.0)
Comment: 0
- c) Fire Water Supply
Firefighting water can be supplied for 4 hours at less than 100
Comment: 0
- d) Special Systems
No credit (Factor=1.0)
Comment: 0
- e) Sprinkler Systems
No credit (Factor=1.0)
Comment: 0
- f) Water Curtains
No credit (Factor=1.0)
Comment: 0
- g) Foam
No credit (Factor=1.0)
Comment: --
- h) Hand Extinguishers/Monitors
The process is protected by monitor guns (Factor=0.97)
Comment: --
- i) Cable Protection
No credit (Factor=1.0)
Comment: --

[FE-7 System Ver-2.6 - 4/4/88]

FIRE & EXPLOSION INDEX

DOW

#6

AREA/COUNTRY	DIVISION	LOCATION	DATE
North America	Louisiana	Plaquemine	1/6/97
SITE	MANUFACTURING UNIT	PROCESS UNIT	
Plaquemine	Chlor-Alkali 2	Gas Turbine NEW TURBINE	
PREPARED BY:	APPROVED BY: (Superintendent)	BUILDING	
John Dizon	Gretchen C. Leblanc	3601	
REVIEWED BY: (Management)	REVIEWED BY: (Technology Center)	REVIEWED BY: (Safety & Loss Prevention)	
		Buck Bailey	
MATERIALS IN PROCESS UNIT			
Methane and Air			
STATE OF OPERATION		BASIC MATERIAL(S) FOR MATERIAL FACTOR	
☐ DESIGN ☒ START UP ☐ NORMAL OPERATION ☐ SHUTDOWN		Methane	
MATERIAL FACTOR (See Table 1 or Appendices A or B) Note requirements when unit temperatures over 140 °F (60 °C)			21
1. General Process Hazards		Penalty Factor Range	Penalty Factor Used (1)
Base Factor		1.00	1.00
A. Exothermic Chemical Reactions		0.30 to 1.25	1.00
B. Endothermic Processes		0.20 to 0.40	0.00
C. Material Handling and Transfer		0.25 to 1.05	0.00
D. Enclosed or Indoor Process Units		0.25 to 0.90	0.00
E. Access		0.20 to 0.35	0.00
F. Drainage and Spill Control		0 gallons	0.25 to 0.50
General Process Hazards Factor (F1)			2.00
2. Special Process Hazards			
Base Factor		1.00	1.00
A. Toxic Material(s)		0.20 to 0.80	0.20
B. Sub-Atmospheric Pressure (< 500 mm Hg)		0.50	0.00
C. Operation In or Near Flammable Range ☐ INERTED ☒ NOT INERTED			
1. Tank Farms Storage Flammable Liquids		0.50	0.00
2. Process Upset or Purge Failure		0.30	0.00
3. Always in Flammable Range		0.80	0.80
D. Dust Explosion (See Table 3)		0.25 to 2.00	0.00
E. Pressure (See Figure 2)		Operating Pressure 35 psig Relief Setting 0 psig	0.29
F. Low Temperature		0.20 to 0.30	0.00
G. Quantity of Flammable/Unstable Material		Quantity 1 lb Hc = 21,500 BTU/lb	
1. Liquids or Gases in Process (See Figure 3)			0.00
2. Liquids or Gases in Storage (See Figure 4)			0.00
3. Combustible Solids in Storage, Dust in Process (See Figure 5)			0.00
H. Corrosion and Erosion		0.10 to 0.75	0.10
I. Leakage - Joints and Packing		0.10 to 1.50	0.00
J. Use of Fired Equipment (See Figure 6)			0.00
K. Hot Oil Heat Exchange System (See Table 5)		0.15 to 1.15	0.00
L. Rotating Equipment		0.50	0.50
Special Process Hazards Factor (F2)			2.89
Process Unit Hazards Factor (F1 x F2) = F3			5.78
Fire and Explosion Index (F3 x MF = F&EI)			121

(1) For no penalty use 0.00.

LOSS CONTROL CREDIT FACTORS

1. Process Control Credit Factor (C1)

Feature	Credit Factor Range	Credit Factor Used (2)	Feature	Credit Factor Range	Credit Factor Used (2)
a. Emergency Power	0.98	0.98	f. Inert Gas	0.94 to 0.96	1.00
b. Cooling	0.97 to 0.99	1.00	g. Operating Instructions/Procedures	0.91 to 0.99	0.95
c. Explosion Control	0.84 to 0.88	1.00	h. Reactive Chemical Review	0.91 to 0.98	0.91
d. Emergency Shutdown	0.98 to 0.99	0.96	i. Other Process Hazard Analysis	0.91 to 0.98	0.98
e. Computer Control	0.93 to 0.99	0.93			

C1 Value (3) 0.741

2. Material Isolation Credit Factor (C2)

Feature	Credit Factor Range	Credit Factor Used (2)	Feature	Credit Factor Range	Credit Factor Used (2)
a. Remote Control Valves	0.96 to 0.98	0.98	c. Drainage	0.91 to 0.97	1.00
b. Dump/Blowdown	0.96 to 0.98	0.98	d. Interlock	0.98	0.98

C2 Value (3) 0.941

3. Fire Protection Credit Factor (C3)

Feature	Credit Factor Range	Credit Factor Used (2)	Feature	Credit Factor Range	Credit Factor Used (2)
a. Leak Detection	0.94 to 0.98	1.00	f. Water Curtains	0.97 to 0.98	1.00
b. Structural Steel	0.95 to 0.98	1.00	g. Foam	0.92 to 0.97	1.00
c. Fire Water Supply	0.94 to 0.97	0.97	h. Hand Extinguishers/Monitors	0.93 to 0.98	0.97
d. Special Systems	0.91	1.00	i. Cable Protection	0.94 to 0.98	1.00
e. Sprinkler Systems	0.74 to 0.97	1.00			

C3 Value (3) 0.941

Loss Control Credit Factor = C1 x C2 x C3 (3) = 0.656

PROCESS UNIT RISK ANALYSIS SUMMARY

1. Fire and Explosion Index (F&EI)	(See Front)	121	
2. Radius of Exposure	(Figure 7)	102	ft
3. Area of Exposure		32,679	q.ft.
4. Value of Area of Exposure 1968 Dollars			\$MM 60.00
5. Damage Factor	(Figure 8)	0.77	
6. Base Maximum Probable Property Damage - (Base MPPD) [4 x 5]			\$MM 46.29
7. Loss Control Credit Factor	(See Above)	0.66	
8. Actual Maximum Probable Property Damage - (Actual MPPD) [6 x 7]			\$MM 30.37
9. Maximum Probable Days Outage - (MPDO)	(Figure 9)	## 280	days
10. Business Interruption - (BI)			\$MM 11.11

(2) For no credit factor enter 1.00

(3) Product of all factors used

Refer to "Fire & Explosion Index Hazard Classification Guide" (Form #471-00001) for details

Print Date: 1/22/97 Work File: C:\WINDOWS\Profiles\lu239601\Desktop\Fei7denw\CA2 97 - 6 Gas Turbine (replace new).xls MF
 Data File: C:\WINDOWS\Profiles\lu239601\Desktop\Fei7denw\FEI7_DAT.XLS

DO A 037056
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FIRE & EXPLOSION INDEX - DATA AND COMMENTS

Material Factor

Material Is From Database

Material Name - Methane

Base Material Factor = 21

Adjusted Material Factor = 21

Heat of Combustion (BTU/lb) = 21500

NH = 1

Nf = 4

Nr = 0

Flash Point (°F) = Gas

Boiling Point (°F) = -258

Process Unit Temperature (°F) = 1857

Exotherm Temperature (°F) = 998.9

Autoignition Temperature (°F) = 998.9

Data For User Specified Material

General Process Hazards

A. Exothermic Chemical Reactions

REACTOR with CRITICAL-TO-CONTROL EXOTHERM (Penalty=1.00)

Comment 0

B. Endothermic Processes

Process Unit is a REACTOR, but NO ENDOTHERM occurs ==> Penalty=0

Comment 0

C. Material Handling and Transfer

None of the following situations apply (Penalty=0)

Comment 0

D. Enclosed or Indoor Process Units

Process is NOT ENCLOSED (Penalty=0)

Comment 0

E. Access

Access determined adequate for emergency equipment (Penalty=0)

Comment 0

F. Drainage and Spill Control

Diking and drainage which meets all criteria (see help) (Penalty=0)

Comment 0

Special Process Hazards

A. Toxic Material(s)

Equals two tenths of the NH

B. Sub-Atmospheric Pressure (< 500 mm Hg)

Greater than 500 mmHg (Penalty=0)

Comment 0

C. Operation In or Near Flammable Range

Process that is by nature ALWAYS in or near the flammable

Comment 0

D. Dust Explosion

Process does not include dusts (Penalty=0)

Comment 0

E. Pressure

Comment 0

F. Low Temperature

Temperatures remain safely above the ductile/brittle

Comment 0

G. Quantity of Flammable/Unstable Material

In Process

Comment 0

H. Corrosion and Erosion

Corrosion rates below 0.5 mm/yr WITH risk of pitting and/or

Comment -

I. Leakage - Joints and Packing

Leakage of flammables/combustibles is insignificant

Comment 0

J. Use of Fired Equipment

DOES NOT exist in the plant with the Process Unit

Comment: Penalty was taken in exothermic reaction line. No penalty taken here.

K. Hot Oil Heat Exchange System

Process does not use a hot oil exchange system, or the hot oil is not above its boiling point

Comment 0

L. Rotating Equipment

Other large, high speed rotating equipment with significant

Comment 0

(FIE-7 System Ver-2.5 - 4/98)

LOSS CONTROL CREDIT FACTORS - DATA AND COMMENTS

Process Control Credit Factor (C1)

- a) Emergency Power
Automatic switch to emergency power for CRITICAL SERVICES
Comment: 0
- b) Cooling
No credit (Factor=1.0)
Comment: 0
- c) Explosion Control
No credit (Factor=1.0)
Comment: 0
- d) Emergency Shutdown
Vibration detectors which initiate a shutdown (Factor=0.96)
Comment: 0
- e) Computer Control
Computer with "fail-safe" logic and at least one of the
Comment: 0
- f) Inert Gas
No credit (Factor=1.0)
Comment: 0
- g) Operating Instructions/Procedures
1. Startup, 2. Routine Shutdown, 3. Normal operating conditions, 4. Turndown operating conditions,
Comment: 0
- h) Reactive Chemical Review
Reactive Chemical program is a continuing part of operations
Comment: Annual refresher training for all plant employees.
- i) Other Process Hazard Analysis
Management of Change Review (Factor=0.98)
Comment: 0

Material Isolation Credit Factor (C2)

- a) Remote Control Valves
Remotely operated valves can isolate equipment or piping in
Comment: 0
- b) Dump/Blowdown
Process employs an emergency blowdown tank that is vented
Comment: 0
- c) Drainage
0
Comment: 0
- d) Interlock
Process is provided with an interlock system which prevents
Comment: 0

Fire Protection Credit Factor (C3)

- a) Leak Detection
No credit (Factor=1.0)
Comment: 0
- b) Structural Steel
No credit (Factor=1.0)
Comment: 0
- c) Fire Water Supply
Firefighting water can be supplied for 4 hours at less than 100
Comment: 0
- d) Special Systems
No credit (Factor=1.0)
Comment: 0
- e) Sprinkler Systems
No credit (Factor=1.0)
Comment: 0
- f) Water Curtains
No credit (Factor=1.0)
Comment: -
- g) Foam
No credit (Factor=1.0)
Comment: -
- h) Hand Extinguishers/Monitors
The process is protected by monitor guns (Factor=0.97)
Comment: -
- i) Cable Protection
No credit (Factor=1.0)
Comment: -

[FIE-7 System Ver-2.0 - 4/4/98]

Print Date: 1/22/97, Work File: C:\WINDOWS\Profiles\w239601\Desktop\Fei7denw\CA2 97 - 6 Gas Turbine (replace new).xls MF
DataFile: C:\WINDOWS\Profiles\w239601\Desktop\Fei7denw\FEI7_DAT.XLS

DO A 037058
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#7

FIRE & EXPLOSION INDEX

DOW

AREA/COUNTRY	DIVISION	LOCATION	DATE
North America	Louisiana	Plaquemine	1/6/97
SITE	MANUFACTURING UNIT	PROCESS UNIT	
Plaquemine	Chlor-Alkali 2	Gas Turbine <i>SPARE TURBINE</i>	
PREPARED BY:	APPROVED BY: (Superintendent)	BUILDING	
John Dizer	Gretchen C. Leblanc	3601	
REVIEWED BY: (Management)	REVIEWED BY: (Technology Center)	REVIEWED BY: (Safety & Loss Prevention)	
		Buck Bailey	
MATERIALS IN PROCESS UNIT			
Methane and Air			
STATE OF OPERATION		BASIC MATERIAL(S) FOR MATERIAL FACTOR	
DESIGN ☐ START UP ☐ NORMAL OPERATION ☐ SHUTDOWN ☐		Methane	
MATERIAL FACTOR (See Table 1 or Appendices A or B) Note requirements when unit temperatures over 140 °F (60 °C)			21
1. General Process Hazards			
Base Factor			1.00
A. Exothermic Chemical Reactions			0.30 to 1.25
B. Endothermic Processes			0.20 to 0.40
C. Material Handling and Transfer			0.25 to 1.05
D. Enclosed or Indoor Process Units			0.25 to 0.90
E. Access			0.20 to 0.35
F. Drainage and Spill Control <i>0 gallons</i>			0.25 to 0.50
General Process Hazards Factor (F1)			2.00
2. Special Process Hazards			
Base Factor			1.00
A. Toxic Material(s)			0.20 to 0.80
B. Sub-Atmospheric Pressure (< 500 mm Hg)			0.50
C. Operation In or Near Flammable Range ☐ INERTED ☒ NOT INERTED			
1. Tank Farms Storage Flammable Liquids			0.50
2. Process Upset or Purge Failure			0.30
3. Always in Flammable Range			0.80
D. Dust Explosion (See Table 3)			0.25 to 2.00
E. Pressure (See Figure 2) <i>operating Pressure 35 psig</i>			
<i>Relief Setting 0 psig</i>			0.29
F. Low Temperature			0.20 to 0.30
G. Quantity of Flammable/Unstable Material <i>Quantity 1 lb</i>			
<i>Hc = 21,500 BTU/lb</i>			
1. Liquids or Gases in Process (See Figure 3)			0.00
2. Liquids or Gases in Storage (See Figure 4)			0.00
3. Combustible Solids in Storage, Dust in Process (See Figure 5)			0.00
H. Corrosion and Erosion			0.10 to 0.75
I. Leakage - Joints and Packing			0.10 to 1.50
J. Use of Fired Equipment (See Figure 6)			0.00
K. Hot Oil Heat Exchange System (See Table 5)			0.15 to 1.15
L. Rotating Equipment			0.50
Special Process Hazards Factor (F2)			2.89
Process Unit Hazards Factor (F1 x F2) = F3			5.78
Fire and Explosion Index (F3 x MF = F&EI)			121

(1) For no penalty use 0.00.

LOSS CONTROL CREDIT FACTORS

1. Process Control Credit Factor (C1)

Feature	Credit Factor Range	Credit Factor Used (2)	Feature	Credit Factor Range	Credit Factor Used (2)
a. Emergency Power	0.98	0.98	f. Inert Gas	0.94 to 0.96	1.00
b. Cooling	0.97 to 0.99	1.00	g. Operating Instructions/Procedures	0.91 to 0.99	0.95
c. Explosion Control	0.84 to 0.88	1.00	h. Reactive Chemical Review	0.91 to 0.98	0.91
d. Emergency Shutdown	0.96 to 0.99	0.96	i. Other Process Hazard Analysis	0.91 to 0.98	0.98
e. Computer Control	0.93 to 0.99	0.93			

C1 Value (3) 0.741

2. Material Isolation Credit Factor (C2)

Feature	Credit Factor Range	Credit Factor Used (2)	Feature	Credit Factor Range	Credit Factor Used (2)
a. Remote Control Valves	0.96 to 0.98	0.98	c. Drainage	0.91 to 0.97	1.00
b. Dump/Blowdown	0.96 to 0.98	0.98	d. Interlock	0.98	0.98

C2 Value (3) 0.941

3. Fire Protection Credit Factor (C3)

Feature	Credit Factor Range	Credit Factor Used (2)	Feature	Credit Factor Range	Credit Factor Used (2)
a. Leak Detection	0.94 to 0.98	1.00	f. Water Curtains	0.97 to 0.98	1.00
b. Structural Steel	0.95 to 0.98	1.00	g. Foam	0.92 to 0.97	1.00
c. Fire Water Supply	0.94 to 0.97	0.97	h. Hand Extinguishers/Monitors	0.93 to 0.98	0.97
d. Special Systems	0.91	1.00	i. Cable Protection	0.94 to 0.98	1.00
e. Sprinkler Systems	0.74 to 0.97	1.00			

C3 Value (3) 0.941

Loss Control Credit Factor = C1 x C2 x C3 (3) = 0.656

PROCESS UNIT RISK ANALYSIS SUMMARY

1. Fire and Explosion Index (F&EI) (See Front)	121	
2. Radius of Exposure (Figure 7)	102	ft
3. Area of Exposure (Figure 8)	32,679	q.ft.
4. Value of Area of Exposure 1968 Dollars.....		\$MM 2.00
5. Damage Factor (Figure 8)	0.77	
6. Base Maximum Probable Property Damage - (Base MPPD) [4 x 5]		\$MM 1.54
7. Loss Control Credit Factor (See Above)	0.66	
8. Actual Maximum Probable Property Damage - (Actual MPPD) [6 x 7]		\$MM 1.01
9. Maximum Probable Days Outage - (MPDO) (Figure 9)	12	ays
10. Business Interruption - (BI)		\$MM 0.48

(2) For no credit factor enter 1.00

(3) Product of all factors used

Refer to "Fire & Explosion Index Hazard Classification Guide" (Form #471-00001) for details

Print Date: 1/22/97, Work File: C:\WINDOWS\Profiles\w239601\Desktop\Fei7denw\CA2 97 - 7 Gas Turbine (replace spare).xls MF
 Data File: C:\WINDOWS\Profiles\w239601\Desktop\Fei7denw\FEI7_DAT.XLS

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FIRE & EXPLOSION INDEX - DATA AND COMMENTS

Material Factor

Material Is From Database
Material Name - Methane
Base Material Factor = 21
Adjusted Material Factor = 21
Heat of Combustion (BTU/lb) = 21500
Nh = 1
Nf = 4
Nr = 0
Flash Point (°F) = Gas
Boiling Point (°F) = -258
Process Unit Temperature (°F) = 1867

Exotherm Temperature (°F) = 998.9
Autoignition Temperature (°F) = 908.9

Data For User Specified Material

General Process Hazards

- A. Exothermic Chemical Reactions
REACTOR with CRITICAL-TO-CONTROL EXOTHERM (Penalty=1.00)
Comment 0
- B. Endothermic Processes
Process Unit is a REACTOR, but NO ENDOTHERM occurs => Penalty=0
Comment 0
- C. Material Handling and Transfer
None of the following situations apply (Penalty=0)
Comment 0
- D. Enclosed or Indoor Process Units
Process is NOT ENCLOSED (Penalty=0)
Comment 0
- E. Access
Access determined adequate for emergency equipment (Penalty=0)
Comment 0
- F. Drainage and Spill Control
Diking and drainage which meets all criteria (see help) (Penalty=0)
Comment 0

Special Process Hazards

- A. Toxic Material(s)
Equals two tenths of the Nh
- B. Sub-Atmospheric Pressure (< 500 mm Hg)
Greater than 500 mmHg (Penalty=0)
Comment 0
- C. Operation In or Near Flammable Range
Process that is by nature ALWAYS in or near the flammable
Comment 0
- D. Dust Explosion
Process does not include dusts (Penalty=0)
Comment 0
- E. Pressure
Comment 0
- F. Low Temperature
Temperatures remain safely above the ductile/brittle
Comment 0
- G. Quantity of Flammable/Unstable Material
In Process
Comment 0
- H. Corrosion and Erosion
Corrosion rates below 0.5 mm/yr WITH risk of pitting and/or
Comment -
- I. Leakage - Joints and Packing
Leakage of flammables/combustibles is insignificant
Comment 0
- J. Use of Fired Equipment
DOES NOT exist in the plant with the Process Unit
Comment: Penalty was taken in exothermic reaction line. No penalty taken here
- K. Hot Oil Heat Exchange System
Process does not use a hot oil exchange system, or the hot oil is not above it's boiling point
Comment 0
- L. Rotating Equipment
Other large, high speed rotating equipment with significant
Comment 0

[F&E-7 Rev0001 Ver-2.3 - 4/4/95]

LOSS CONTROL CREDIT FACTORS - DATA AND COMMENTS

Process Control Credit Factor (C1)

- a) Emergency Power
Automatic switch to emergency power for CRITICAL SERVICES
Comment: 0
- b) Cooling
No credit (Factor=1.0)
Comment: 0
- c) Explosion Control
No credit (Factor=1.0)
Comment: 0
- d) Emergency Shutdown
Vibration detectors which initiate a shutdown (Factor=0.98)
Comment: 0
- e) Computer Control
Computer with "fail-safe" logic and at least one of the
Comment: 0
- f) Inert Gas
No credit (Factor=1.0)
Comment: 0
- g) Operating Instructions/Procedures
1. Startup, 2. Routine Shutdown, 3. Normal operating conditions, 4. Turndown operating conditions.
Comment: 0
- h) Reactive Chemical Review
Reactive Chemical program is a continuing part of operations
Comment: Annual refresher training for all plant employees.
- i) Other Process Hazard Analysis
Management of Change Review (Factor=0.98)
Comment: 0

Material Isolation Credit Factor (C2)

- a) Remote Control Valves
Remotely operated valves can isolate equipment or piping in
Comment: 0
- b) Dump/Blowdown
Process employs an emergency blowdown tank that is vented
Comment: 0
- c) Drainage
0
Comment: 0
- d) Interlock
Process is provided with an interlock system which prevents
Comment: 0

Fire Protection Credit Factor (C3)

- a) Leak Detection
No credit (Factor=1.0)
Comment: 0
- b) Structural Steel
No credit (Factor=1.0)
Comment: 0
- c) Fire Water Supply
Firefighting water can be supplied for 4 hours at less than 100
Comment: 0
- d) Special Systems
No credit (Factor=1.0)
Comment: 0
- e) Sprinkler Systems
No credit (Factor=1.0)
Comment: --
- f) Water Curtains
No credit (Factor=1.0)
Comment: --
- g) Foam
No credit (Factor=1.0)
Comment: --
- h) Hand Extinguishers/Monitors
The process is protected by monitor guns (Factor=0.97)
Comment: --
- i) Cable Protection
No credit (Factor=1.0)
Comment: --

[FIE-7 System Ver-2.5 - 4/4/98]

Print Date: 1/22/97, Work File: C:\WINDOWS\Profiles\239601\Desktop\Fei7denw\CA2 97 - 7 Gas Turbine (replace spare).xls MF
DataFile C:\WINDOWS\Profiles\239601\Desktop\Fei7denw\FEI7_DAT.XLS

DO A 037062
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DO A 037063
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1. ORIGINAL BLOCK 3C COORDINATES ARE SHOWN IN PARENTHESES.
2. ALL ELEVATIONS, EXCEPT ON LOCATION PLANS, ARE BASED ON GRADE BEING SET OF 1.000000 BLOCK 3C DRAWINGS AND BASED ON GRADE BEING 97.07.

EXISTING DWGS AND KEY GRIDS FOR REFERENCE ONLY

BT-132	BT-132A	BT-134	BT-136
BT-132B	BT-134B	BT-136B	BT-138
BT-131	BT-132	BT-135	BT-137

DC-7A	DC-7C	DC-7E	DC-7G
DC-7	DC-7B	DC-7D	DC-7F

BT-130
BT-130B
BT-130C
BT-130D
BT-130E
BT-130F
BT-130G
BT-130H
BT-130I
BT-130J
BT-130K
BT-130L
BT-130M
BT-130N
BT-130O
BT-130P
BT-130Q
BT-130R
BT-130S
BT-130T
BT-130U
BT-130V
BT-130W
BT-130X
BT-130Y
BT-130Z
BT-130AA
BT-130AB
BT-130AC
BT-130AD
BT-130AE
BT-130AF
BT-130AG
BT-130AH
BT-130AI
BT-130AJ
BT-130AK
BT-130AL
BT-130AM
BT-130AN
BT-130AO
BT-130AP
BT-130AQ
BT-130AR
BT-130AS
BT-130AT
BT-130AU
BT-130AV
BT-130AW
BT-130AX
BT-130AY
BT-130AZ
BT-130BA
BT-130BB
BT-130BC
BT-130BD
BT-130BE
BT-130BF
BT-130BG
BT-130BH
BT-130BI
BT-130BJ
BT-130BK
BT-130BL
BT-130BM
BT-130BN
BT-130BO
BT-130BP
BT-130BQ
BT-130BR
BT-130BS
BT-130BT
BT-130BU
BT-130BV
BT-130BW
BT-130BX
BT-130BY
BT-130BZ
BT-130CA
BT-130CB
BT-130CC
BT-130CD
BT-130CE
BT-130CF
BT-130CG
BT-130CH
BT-130CI
BT-130CJ
BT-130CK
BT-130CL
BT-130CM
BT-130CN
BT-130CO
BT-130CP
BT-130CQ
BT-130CR
BT-130CS
BT-130CT
BT-130CU
BT-130CV
BT-130CW
BT-130CX
BT-130CY
BT-130CZ
BT-130DA
BT-130DB
BT-130DC
BT-130DD
BT-130DE
BT-130DF
BT-130DG
BT-130DH
BT-130DI
BT-130DJ
BT-130DK
BT-130DL
BT-130DM
BT-130DN
BT-130DO
BT-130DP
BT-130DQ
BT-130DR
BT-130DS
BT-130DT
BT-130DU
BT-130DV
BT-130DW
BT-130DX
BT-130DY
BT-130DZ
BT-130EA
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BT-130ET
BT-130EU
BT-130EV
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BT-130EZ
BT-130FA
BT-130FB
BT-130FC
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BT-130FE
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BT-130FG
BT-130FH
BT-130FI
BT-130FJ
BT-130FK
BT-130FL
BT-130FM
BT-130FN
BT-130FO
BT-130FP
BT-130FQ
BT-130FR
BT-130FS
BT-130FT
BT-130FU
BT-130FV
BT-130FW
BT-130FX
BT-130FY
BT-130FZ
BT-130GA
BT-130GB
BT-130GC
BT-130GD
BT-130GE
BT-130GF
BT-130GG
BT-130GH
BT-130GI
BT-130GJ
BT-130GK
BT-130GL
BT-130GM
BT-130GN
BT-130GO
BT-130GP
BT-130GQ
BT-130GR
BT-130GS
BT-130GT
BT-130GU
BT-130GV
BT-130GW
BT-130GX
BT-130GY
BT-130GZ
BT-130HA
BT-130HB
BT-130HC
BT-130HD
BT-130HE
BT-130HF
BT-130HG
BT-130HH
BT-130HI
BT-130HJ
BT-130HK
BT-130HL
BT-130HM
BT-130HN
BT-130HO
BT-130HP
BT-130HQ
BT-130HR
BT-130HS
BT-130HT
BT-130HU
BT-130HV
BT-130HW
BT-130HX
BT-130HY
BT-130HZ
BT-130IA
BT-130IB
BT-130IC
BT-130ID
BT-130IE
BT-130IF
BT-130IG
BT-130IH
BT-130II
BT-130IJ
BT-130IK
BT-130IL
BT-130IM
BT-130IN
BT-130IO
BT-130IP
BT-130IQ
BT-130IR
BT-130IS
BT-130IT
BT-130IU
BT-130IV
BT-130IW
BT-130IX
BT-130IY
BT-130IZ
BT-130JA
BT-130JB
BT-130JC
BT-130JD
BT-130JE
BT-130JF
BT-130JG
BT-130JH
BT-130JI
BT-130JJ
BT-130JK
BT-130JL
BT-130JM
BT-130JN
BT-130JO
BT-130JP
BT-130JQ
BT-130JR
BT-130JS
BT-130JT
BT-130JU
BT-130JV
BT-130JW
BT-130JX
BT-130JY
BT-130JZ
BT-130KA
BT-130KB
BT-130KC
BT-130KD
BT-130KE
BT-130KF
BT-130KG
BT-130KH
BT-130KI
BT-130KJ
BT-130KK
BT-130KL
BT-130KM
BT-130KN
BT-130KO
BT-130KP
BT-130KQ
BT-130KR
BT-130KS
BT-130KT
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#1 D-501
#2 HYDROGEN STORAGE
#3 TAPPY POT
#4 HYDROGEN COMPRESSOR
#5 CHLORINE CELLS
#6 GAS TURBINE

D-501 A2 RADIUS

NOTE:
1. EACH GRID Dwg. TO COVER AN AREA 40' X 40'
THIS Dwg. SUPERSEDES Dwg. OF SAME NO. DATED 1-68

SHADING FOR PAINT LABOR BML
SMA 57-61882

JPK

D-501 A2 RADIUS

DESIGNED BY	DATE
CHECKED BY	DATE
APPROVED BY	DATE
DATE	DATE

DOW CHEMICAL U.S.A.
LOUISIANA DIVISION

FLAT PLAN

51-201

37064

100-100000

CONSOLIDATED AUDIT

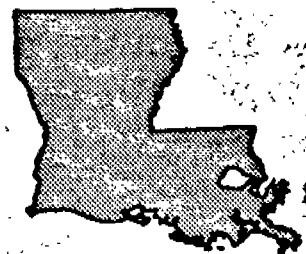
Reactive Chemical Review

March 4, 1994

Audits and Checklists

Caustic

Dow Chemical, Louisiana Operations



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