VIII. LOSS PREVENTION INSURANCE REPORT
(Including F&EI Risk Analysis)

Contact your Loss Prevention Contact for instructions to assist you in filling out this document.

LOSS PREVENTION INSURANCE REPORT
II. UNIT LOSS PREVENTION INFORMATION

1. Summary of Unit Features and Status

Area/Country North America	Division Louisiana	Location Plaquemine, LA	Date 1-6-97
Site Plaquemine	Unit Chlor-Alkali 2	Building Number/s 3601	Date of Previous Inspection 10-28-94
Unit Superintendent G. C. LeBlanc		Type of Operation Manufacturing - Chlorine / Caustic	
Inspected By (from Safety & Loss Prevention) Buck Bailey		Inspected by (from Plant) John Dizor	

Give a written summary including overall evaluation comments, comparison to previous inspection, and summary of recommendations:

LOSS PREVENTION INSURANCE REPORT

2. Summary of Ratings and Recommendations for Unit

UNIT RISK FEATURES	R	F	G	E	NA	RECOMMENDATION NUMBER(S)
3. Plant Condition and Appearance						
4. Unit Risk Analysis Package						
5. Changes Since Last Inspection						
6. Features for Areas in Unit						
7. Drainage and Containment						
8. Tank Storage						
9. Electrical & Instrument Conditions						
10. Chemical Inventory & Isolation						
11. Management Considerations						
12. Plant Reliability						

R = Recommend Upgrading G = Good NA = Not Applicable
F = Fair E = Excellent

Refer to Guideline for definitions of ratings. For recommendations see Pages

Give a brief narrative background summary including history of unit with details on age, construction phases, original plant, etc.
Chlor-Alkali 2 was started up in 1969 as a completely integrated chlorine/caustic production facility. The original plant has a two (2) rectifier/circuit operation with M-80 vintage cells.

The 1970's
- New liquefaction train installed and started up.

The 1980's
- Hydrogen collection trains installed and started up.
- MOD 5 control system installed on cell area.
- New ecology system with WP-800 and D-803 above ground tanks installed.
- Chlorine evaporation train installed.
- Bird centrifuges replaced flatbed filters for sulfate salt removal from caustic.

The 1990's
- Completed MOD 5 conversion of chlorine and caustic areas.
- Sodium bisulfite replaced sodium thiosulfate for hypochlorite reduction in cell effluent.
- Electrolytic metals removal cells (iron cells) shutdown and demo'd.
- Eliminated C-201-B, spare dry chlorine compressor.
- Replaced CTW interstage coolers with air cooled fin fan interstage coolers.
- New R-123 freon system.
- Sped chlorine compressor, C-201A, gear box up.
- Demo'd weak sulfuric acid tanks (D-210, D-211).
- New vacuum breaker, VRD-201, replaced old vacuum breaker.
- Replaced brine salt column, D-108.

- Rebuilt Sump-1.

LOSS PREVENTION INSURANCE REPORT

3. General Unit Information

Plant Unit			Date
Chlor-Alkali 2			1/6/97
Unit Products			
Chlorine (gas & liquid), 50% Caustic, and Hydrogen			
Raw Materials			
Brine, Fuel Gas (Methane), Cell Effluent, Hydrochloric Acid, Sulfuric Acid			
Operating Days/Week?	Operating Hours/Day?	No. of Shifts?	Hours per Shift?
7	24	2	12
Plant Condition & Appearance - Description			
Operationally plant condition is acceptable, although, corrosion in the plant is noticeable in some areas. An active maintenance painting program is in place to address this situation.			

4. Unit Risk Analysis Package

Items which must be attached as part of Risk Analysis Package (Check if attached/Give any explanations)			
Block Flow Sheets OK	Process Description OK	Plot Plan with Areas of Exposure and Protection Features OK	F. & E. I. Risk Analysis Summary OK
F. & E. I. Calc. Sheets for Highest MPPD and Highest MPDO & BI OK	C. E. I. Summary Sheets OK	Business Interruption Data OK	Replacement Value $99 MM

Interdependencies with Other Dow Facilities & Which Facilities?
Brine is supplied by Brine Production 30 miles south of Plaquemine. Hydrochloric acid is supplied by Solvents. Chlorine 1 supplies sulfuric acid via pipeline. Fuel gas is supplied by Power & Utilities via pipeline. Chlorine 1 supplies some cell effluent, the rest is produced internally. Chlorine 1 takes all chlorine (gas & liquid) and hydrogen to distribute. Caustic 1 takes all 50% caustic to distribute.

Interdependencies with Non-Dow Facilities - Raw Material supplier, Utility Supplier, Final Processing, Sole Supplier, etc.
Power can be supplied by the outside grid. Hydrogen to distribute is sent to Air Products just outside the Dow fenceline via pipeline from Chlorine 1.

Spare Parts Available for Critical Equipment? Which Critical Equipment?	List Top 3 Critical Items	Spares Available?
Yes	1. C-201A 2. C-520 3. RT-1/2 A/B	Yes

5. Changes Since Last Loss Prevention Inspection

Significant Changes to Plant Since Last Loss Prevention Inspection? Any Incidents Since Last Inspection?

- Eliminated undersized spare chlorine compressor, C-201B
- Sped up chlorine compressor gearbox, GR-201A
- Replaced cooling tower water / chlorine cross exchange interstage coolers with air / chlorine fin fan interstage coolers
- New R-123 freon system
- No incidents.

Management of Change Program Established?
Yes, in compliance with US Area standard and LAD supplement.

Significant Capital Projects in Progress or Planned? Give Title and Amount of Capital.		L/P Review Done/Planned?	Date?
• CA-2, Gas Turbine Control System	$1,500 M	Done	11/96
• CA-2, Acid Area Upgrade	$ 846 M	Done	7/96
• CA-2, First Effect Cross Exchanger	$ 300 M	Done	7/95

LOSS PREVENTION INSURANCE REPORT

6. Features for Areas in Unit

REFER TO PLOT PLAN WHICH IS TO BE ATTACHED. (CHANGE TOP HEADING NAME IF NEEDED.)

FEATURE / AREA	Caustic Area	Power Area	Cell Area	Chlorine Area	Hydrogen Recovery Area	Ecology Area	Warehouse	Office / Control Room
SEPARATION PER LPP 2.2?	YES	NO	YES	YES	NO	YES	YES	YES
FIRE WALLS FOR SEPARATION? HOUR RATINGS?								
PERCENT OF PLANT VALUE?	20	30	25	15	5	2	1	2
STRUCTURE AREA?(sqft)	130,800 29.5%	108,000 24.3%	67,200 15.1%	50,400 11.4%	24,000 5.4%	26,400 6.0%	4,800 1.0%	32,400 7.3%
STRUCTURE HEIGHT?(ft)	50	40	15	50	30	50	30	15
NUMBER OF OPERATING LEVELS?	3	2	2	4	3	4	1	1
TYPE OF CONSTRUC-TION? (COMBUSTIBLE OR NOT?)	NC	NC	NC	NC	NC	NC	PARTIAL	PARTIAL
OPEN OR CLOSED CONSTRUCTION? (PERCENT OPEN?)	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	CLOSED	CLOSED
FIREPROOFING USED? (TYPE?)								
DELUGE & DRAINAGE IN LIEU OF FIRE-PROOFING?								
SPRINKLER SYSTEMS?				C-201A WATER				
DELUGE SYSTEMS?								
FOAM SYSTEMS?								
AUTOMATIC OR MANUAL TRIGGERING OF SYSTEMS?				MANUAL				
HYDRANTS IN AREA?	NO	YES	YES	NO	YES	NO	NO	NO
FIRE WATER MONITORS?	NO	YES	YES	NO	YES	NO	NO	NO
INERTING SYSTEMS?		Steam in turbine tunnels	N2 Purge	N2 Purge	N2 Purge			
FIRE EXTINGUISHING SYSTEMS? (CO_2HALON, ETC.)								Halon in Computer Room
OTHER FIRE PROTECTION SYSTEMS?								Smoke detectors-Computer and Lunch Rooms

OTHER SYSTEMS? SPECIFY.(portable fire extinguishers)	YES	YES	YES	YES	YES	YES	YES	YES

LOSS PREVENTION INSURANCE REPORT

7. Drainage and Containment

Type of Impoundment - Remote Pit Vs Dike Dike	Volume per LPP 7.6.2.G? Yes	Tank separation distances per LPP 7.6.6? Yes
Testing of Drainage System? Yes	Firewater Containment Considered? N/A	Worst Rainfall Considered? Yes, 24" / 24 hrs
Open Trenches or Closed Drains? Open Trenches	Drainage Away from Tanks & Equipment? Yes	Impervious Containment Surfaces? Yes
Plans/Equipment for emptying Pits/Dikes? Yes	Vapor Suppression of Pit/Dike using Foam? Available from Fire Protection Dept.	Operating Discipline to Keep Pits/Dikes Empty? Yes

8. Tank Storage

Types of Tanks (Press. Vessels, Atm. tanks, etc.) Pressure Vessels and Atmospheric Tanks		Codes Observed(A.P.I., A.S.M.E. U.L., T.U.V., etc.) API and ASME	
Redundant High Level Alarms? Yes		Interlock Between High Level Alarms & Pumping? No	
Pressure Relief? PSV's, open vents, seal pots		Vacuum Relief? VRD's, open vents, seal pots	
Vessel Registration Program? Yes	With Inspection & Testing? Yes	Pressure Vessel Relief Registration? Yes	With Inspection & Testing? Yes

9. Electrical and Instrument Conditions

Electrical Classifications Areas Well Defined?(See LPP 3.1) Yes		El. Classification Drawing Up- To Date? Last Revision Date? Yes, 12/96
Redundant Electrical Feeds? Yes	Backup Generators? No	Grounding with Inspection Program? Yes, 1Q94. 5 year frequency.
Oil Filled Electrical Equipment? Yes	Oil Filled Equip. Indoors or Outdoors? Outdoors	Cable Penetrations Sealed? Yes
Cable Trays Exposed to Potential Fires? No	Cable Trays Sprinkler Protected? No	
Type of Process Control - MOD Control? MOD 5, pneumatic		Process Information Systems? GPI Vax
Periodic Review of MOD Program? Yes		Audits of MOD Program and Alarms? No

10. Chemical Inventory & Isolation

Handling Flammable, Toxic or Corrosive Liquids and/or *Gases*	Are There Flammable Liquids/Gases? Yes	What are they? Hydrogen and fuel gas (methane)
	Is There Flammable Gas Detection? No	Frequency of Testing Gas Detectors? N/A
Hazard Ratings Shown on Tanks? No	Are there Toxic Liquids/Gases? Yes	What are they? Chlorine
NFPA Ratings or Other Shown? No	Are there Corrosive Liquids/Gases? Yes	What are they? Chlorine, Hydrochloric Acid, Caustic, & Sulfuric Acid
Emergency Block Valves	Are EBV's Identified in Drawings?Yes, P&ID's and MOD graphics	Are EBV's Identified in Field? Partially
	Frequency of Testing of EBV's? Bi-weekly	Are EBV's Fire Rated in Flammable Service? N/A

Other Special Hazards	Any Other Special Hazards which Increase Risk of Operation? No

LOSS PREVENTION INSURANCE REPORT

11. Management Considerations

Last Loss Prevention Inspection? 11/94	Last Consolidated Audit? 11/94	Other Audits or Reviews of Plant? (e.g. T/C) 6/96 - Tech Center
Implementation of Minimum Requirements? Yes	Operator Training Procedures Written & Current? Yes	Operating Procedures Written & Current? Yes
Emergency Plans Written for Unit? Yes	Date of Last Hypothetical Emergency? 4Q96	Emergency Plans Shared with Other Units & Off Site? No
Written Plans for Fire Protection Impairment? Yes, per LAD S&LP Standard	Critical Instrument Program Established? Yes	Testing of Critical Instruments? Yes
Preventative Maintenance Program in Place? Yes	Reactive Chemicals Program? Yes	Date of Last Reactive Chemicals Review? 10/94
Plant Contact Person for Loss Prevention? Gretchen LeBlanc	Contractor Safety Program Established? Yes	Smoking Regulations & Enforcement? Yes, LAD smoking policy

Other Management Programs in Place Affecting Loss Prevention? List - e. g., Fire Protection Inspections, Insurance Inspections

- S&LP Audits - LAD C-9 Audit Program
- Safety Committee
- Training - IPT Program
- MOC Program
- Behavior Based Safety Program

12. Plant Reliability

Production Capacity 720.0 MMlbs/yr Chlorine 839.0 MMlbs/yr Caustic		Per Cent of Capacity for Year (1996) 102.4% Chlorine 105.6% Caustic
Theoretical Hours/Year for Production Capacity?	Hours/Year Loss Due to Outages or Reduced Rates	Percent Reliability (Hours Operation at Theoretical Rate) / (Total Hours Available)

VIII. LOSS PREVENTION INSURANCE REPORT
(Including F&EI Risk Analysis)

Contact your Loss Prevention Contact for instructions to assist you in filling out this document.

LOSS PREVENTION INSURANCE REPORT
II. UNIT LOSS PREVENTION INFORMATION

1. Summary of Unit Features and Status

Area/Country *North America*	Division Louisiana	Location Plaquemine, LA	Date 1/7/97
Site Plaquemine	Unit Caustic 1	Building Number/s 2901	Date of Previous Inspection 2/22/94
Unit Superintendent G. C. Leblanc		Type of Operation Caustic Manufacturing	
Inspected By (from Safety & Loss Prevention) Buck Bailey		Inspected by (from Plant) John Dizor	

Give a written summary including overall evaluation comments, comparison to previous inspection, and summary of recommendations:

LOSS PREVENTION INSURANCE REPORT

2. Summary of Ratings and Recommendations for Unit

UNIT RISK FEATURES	R	F	G	E	NA	RECOMMENDATION NUMBER(S)
3. Plant Condition and Appearance						
4. Unit Risk Analysis Package						
5. Changes Since Last Inspection						
6. Features for Areas in Unit						
7. Drainage and Containment						
8. Tank Storage						
9. Electrical & Instrument Conditions						
10. Chemical Inventory & Isolation						
11. Management Considerations						
12. Plant Reliability						

R = Recommend Upgrading G = Good NA = Not Applicable
F = Fair E = Excellent

Refer to Guideline for definitions of ratings. For recommendations see Pages

Give a brief narrative background summary including history of unit with details on age, construction phases, original plant, etc.

The Caustic plant was built in 1958 with one (1) evaporator train and a capacity of 100,000 lbs/day.

In 1967, the second evaporator train was started up and the plant capacity was increased to 1,000,000 lbs/day.

The train 1 evaporators were shut down in 1976.

In 1984, the fourth effect evaporator was installed raising the capacity to 2,100,000 lb/day.

In 1988, an evaporator area capacity upgrade increased plant capacity to 2,500,000 lb/day.

73% caustic production was stopped in 1990.

In 1992-93, a new evaporator cross exchanger and expansion project increased the capacity to 3,300,000 lb/day.

LOSS PREVENTION INSURANCE REPORT

3. General Unit Information

Plant Unit			Date
Caustic Plant			1/7/97
Unit Products			
50% Caustic			
Raw Materials			
Cell Effluent			
Operating Days/Week?	Operating Hours/Day?	No. of Shifts?	Hours per Shift?
7	24	2	12
Plant Condition & Appearance - Description			
The plant is in very good condition. The product storage tank farm needs a little work on drainage, however.			

4. Unit Risk Analysis Package

Items which must be attached as part of Risk Analysis Package (Check if attached/Give any explanations)			
Block Flow Sheets Yes	Process Description Yes	Plot Plan with Areas of Exposure and Protection Features Yes	F. & E. I. Risk Analysis Summary N/A
F. & E. I. Calc. Sheets for Highest MPPD and Highest MPDO & BI N/A	C. E. I. Summary Sheets N/A	Business Interruption Data N/A	Replacement Value $82.3 MM
Interdependencies with Other Dow Facilities & Which Facilities? Steam and power supplied by Power 1. Condensate returned to Power 1. Cell effluent supplied by Chlorine 1.			
Interdependencies with Non-Dow Facilities - Raw Material supplier, Utility Supplier, Final Processing, Sole Supplier, etc. None.			

Spare Parts Available for Critical Equipment? Which Critical Equipment?	List Top 3 Critical Items	Spares Available?
Yes.	1. P-201 2. MP-201 3. P-204	Yes.

5. Changes Since Last Loss Prevention Inspection

Significant Changes to Plant Since Last Loss Prevention Inspection? Any Incidents Since Last Inspection?

- Installed HE-201X, evaporator cross exchanger.
- Replaced primary salt column, D-205.
- No incidents.

Management of Change Program Established?
Yes.

Significant Capital Projects in Progress or Planned? Give Title and Amount of Capital.		L/P Review Done/Planned?	Date?
• CAU, Tank Farm Sump Upgrade	$145 M	Planned	
• CAU, Square D Switchgear	$350 M	Planned	
• E-201 Replacement (expense)	$4000 M	Done	3/94

LOSS PREVENTION INSURANCE REPORT

6. Features for Areas in Unit

REFER TO PLOT PLAN WHICH IS TO BE ATTACHED. (CHANGE TOP HEADING NAME IF NEEDED.)

FEATURE / AREA	UNLOAD-ING/ LOADING	TANK FARM	CELL EFFLUENT STORAGE	EVAPORA TION	CAUSTIC FINISHING	CAUSTIC STORAGE	WARE-HOUSE	OFFICE/ CONTROL ROOM
SEPARATION PER LPP 2.2?	Yes	Yes	Yes	Yes	Yes	Yes		
FIRE WALLS FOR SEPARATION? HOUR RATINGS?								
PERCENT OF PLANT VALUE?	4.5%	9.0%	5.8%	47.1%	28.1%	4.3%	0.6%	0.6%
STRUCTURE AREA? (sqft)	80,000	400,000	163,000	80,000	73,000	41,000	50,000	19,500
STRUCTURE HEIGHT? (ft)	20	50	40	80	30	40	20	15
NUMBER OF OPERATING LEVELS?	2	1	2	4	2	1	1	1
TYPE OF CONSTRUC-TION? (COMBUSTIBLE OR NOT?)	NC	NC	NC	NC	NC	NC	Partial	Partial
OPEN OR CLOSED CONSTRUCTION? (PERCENT OPEN?)	Open	Open	Open	Open	Open	Open	Closed	Closed
FIREPROOFING USED? (TYPE?)								
DELUGE & DRAINAGE IN LIEU OF FIRE-PROOFING?								
SPRINKLER SYSTEMS?								
DELUGE SYSTEMS?								
FOAM SYSTEMS?								
AUTOMATIC OR MANUAL TRIGGERING OF SYSTEMS?								
HYDRANTS IN AREA?								
FIRE WATER MONITORS?								
INERTING SYSTEMS?								
FIRE EXTINGUISHING SYSTEMS? (CO_2 HALON, ETC.)								Halon in Computer Room
OTHER FIRE PROTECTION SYSTEMS?								
OTHER SYSTEMS? SPECIFY.								Smoke Detectors

LOSS PREVENTION INSURANCE REPORT

7. Drainage and Containment

Type of Impoundment - Remote Pit Vs Dike Dikes	Volume per LPP 7.6.2.G? Yes	Tank separation distances per LPP 7.6.6? Yes
Testing of Drainage System? N/A	Firewater Containment Considered? N/A	Worst Rainfall Considered? Per LAD standard.
Open Trenches or Closed Drains? Open	Drainage Away from Tanks & Equipment? N/A	Impervious Containment Surfaces? Block 29 Yes. Tank Farm No.
Plans/Equipment for emptying Pits/Dikes? Yes	Vapor Suppression of Pit/Dike using Foam? N/A	Operating Discipline to Keep Pits/Dikes Empty? Yes

8. Tank Storage

Types of Tanks (Press. Vessels, Atm. tanks, etc.) Atmospheric		Codes Observed(A.P.I., A.S.M.E. U.L., T.U.V., etc.) Yes	
Redundant High Level Alarms? Yes		Interlock Between High Level Alarms & Pumping? No	
Pressure Relief? Yes		Vacuum Relief? Yes	
Vessel Registration Program? Yes	With Inspection & Testing? Yes	Pressure Vessel Relief Registration? Yes	With Inspection & Testing? Yes

9. Electrical and Instrument Conditions

Electrical Classifications Areas Well Defined?(See LPP 3.1) Yes		El. Classification Drawing Up- To Date? Last Revision Date? Yes
Redundant Electrical Feeds? Yes	Backup Generators? No	Grounding with Inspection Program? Yes
Oil Filled Electrical Equipment? Yes	Oil Filled Equip. Indoors or Outdoors? Outdoors	Cable Penetrations Sealed? Yes
Cable Trays Exposed to Potential Fires? No	Cable Trays Sprinkler Protected? N/A	
Type of Process Control - MOD Control? No TDC, Vax, Modicon		Process Information Systems? Vax
Periodic Review of MOD Program? No		Audits of MOD Program and Alarms? No

10. Chemical Inventory & Isolation

Handling Flammable, Toxic or Corrosive Liquids and/or Gases	Are There Flammable Liquids/Gases? No	What are they? N/A
	Is There Flammable Gas Detection? N/A	Frequency of Testing Gas Detectors? N/A
Hazard Ratings Shown on Tanks? No	Are there Toxic Liquids/Gases? No	What are they? N/A
NFPA Ratings or Other Shown? No	Are there Corrosive Liquids/Gases? Yes	What are they? Caustic
Emergency Block Valves	Are EBV's Identified in Drawings? Yes	Are EBV's Identified in Field? No
	Frequency of Testing of EBV's? Per critical instrument program	Are EBV's Fire Rated in Flammable Service? N/A

Other Special Hazards	Any Other Special Hazards which Increase Risk of Operation? No

LOSS PREVENTION INSURANCE REPORT

11. Management Considerations

Last Loss Prevention Inspection? 2/94	Last Consolidated Audit? 2/94	Other Audits or Reviews of Plant? (e.g. T/C) 6/96 - Tech Center
Implementation of Minimum Requirements? Yes	Operator Training Procedures Written & Current? Yes	Operating Procedures Written & Current? Yes
Emergency Plans Written for Unit? Yes	Date of Last Hypothetical Emergency? 4Q96	Emergency Plans Shared with Other Units & Off Site? No
Written Plans for Fire Protection Impairment? N/A	Critical Instrument Program Established? Yes	Testing of Critical Instruments? Yes
Preventative Maintenance Program in Place? Yes	Reactive Chemicals Program? Yes	Date of Last Reactive Chemicals Review? 10/94
Plant Contact Person for Loss Prevention? G. C. Leblanc	Contractor Safety Program Established? Yes	Smoking Regulations & Enforcement? Yes, per LAD Smoking Policy

Other Management Programs in Place Affecting Loss Prevention? List - e. g., Fire Protection Inspections, Insurance Inspections

- S&LP Audits - LAD C-9 Audit Program
- Safety Committee
- Training - IPT Program
- MOC Program
- Behavior Based Safety Program

12. Plant Reliability

Production Capacity 1,190 MMlbs/yr Caustic		Per Cent of Capacity for Year (1996) 79.2%	
Theoretical Hours/Year for Production Capacity?	Hours/Year Loss Due to Outages or Reduced Rates	Percent Reliability	(Hours Operation at Theoretical Rate) / (Total Hours Available)

APPENDIX A

APPENDIX A - OSHA PSM EVALUATION AND DOCUMENTATION

OSHA Process Safety Management of Highly Hazardous Chemicals

These questions are to ascertain if OSHA 1910.119, Process Safety Management, applies to this facility.

1. Yes [X] No [] Does any process or storage area of this facility have any materials on the attached list in excess of the threshold quantity.

2. Yes [X] No [] Does any process or storage area of this facility have any flammable liquids or gases (flashpoint less than 100°F) in quantities greater than 10,000 pounds, **except for**:

   - Hydrocarbon fuels used solely as a fuel if not part of a process containing another highly hazardous chemical

   - Flammable liquids stored in atmospheric tanks or transferred which are kept below their normal boiling point without benefit of chilling or refrigeration.

If the answer to **either** question is Yes, then this facility is covered by the OSHA PSM Standard and all plant action items in the following summary need to be evaluated and specific plant needs determined.

The OSHA Process Safety Management regulations are consistent with Dow requirements. Compliance with Dow requirements will comply with OSHA PSM. Those that have the listed chemicals in the quantities listed by OSHA need to assure that documentation is in order.

Appendix A to 1910.119 -- List of Highly Hazardous Chemicals, Toxics and Reactives (Mandatory)

This Appendix contains a listing of toxic and reactive highly hazardous chemicals which present a potential for a catastrophic event at or above the threshold quantity.

CHEMICAL NAME	CAS*	TQ**
Acetaldehyde	75-07-0	2500
Acrolein (2-Propenal)	107-02-8	150
Acrylyl Chloride	814-68-6	250
Allyl Chloride	107-05-1	1000
Allylamine	107-11-9	1000
Alkylaluminums	Varies	5000
Ammonia, Anhydrous	7664-41-7	10000
Ammonia Solutions (>44% Ammonia By Weight)	7664-41-7	15000
Ammonium Perchlorate	7790-98-9	7500
Ammonium Permanganate	7787-36-2	7500
Arsine (also called Arsenic Hydride)	7784-42-1	100
Bis (Chloromethyl) Ether	542-88-1	100
Boron Trichloride	10294-34-5	2500
Boron Trifluoride	7637-07-2	250
Bromine	7726-95-6	1500
Bromine Chloride	13863-41-7	1500
Bromine Pentafluoride	7789-30-2	2500
Bromine Trifluoride	7787-71-5	15000
3-Bromopropyne (also called Propargyl Bromide)	106-96-7	100
Butyl Hydroperoxide (Tertiary)	75-91-2	5000
Butyl Perbenzoate (Tertiary)	614-45-9	7500
Carbonyl Chloride (see Phosgene)	75-44-5	100
Carbonyl Fluoride	353-50-4	2500
Cellulose Nitrate (Concentration >12.6% Nitrogen)	9004-70-0	2500
Chlorine	7782-50-5	1500
Chlorine Dioxide	10049-04-4	1000

CHEMICAL NAME	CAS*	TQ**
Chlorine Pentrafluoride	13637-63-3	1000
Chlorine Trifluoride	7790-91-2	1000
Chlorodiethylaluminum (also called Diethylaluminum Chloride)	96-10-6	5000
1-Chloro-2,4-Dinitrobenzene	97-00-7	5000
Chloromethyl Methyl Ether	107-30-2	500
Chloropicrin	76-06-2	500
Chloropicrin and Methyl Bromide Mixture	None	1500
Chloropicrin and Methyl Chloride Mixture	None	1500
Cumene Hydroperoxide	80-15-9	5000
Cyanogen	460-19-5	2500
Cyanogen Chloride	506-77-4	500
Cyanuric Fluoride	675-14-9	100
Diacetyl Peroxide (Concentration >70%)	110-22-5	5000
Diazomethane	334-88-3	500
Dibenzoyl Peroxide	94-36-0	7500
Diborane	19287-45-7	100
Dibutyl Peroxide (Tertiary)	110-05-4	5000
Dichloro Acetylene	7572-29-4	250
Dichlorosilane	4109-96-0	2500
Diethylzinc	557-20-0	10000
Diisopropyl Peroxydicarbonate	105-64-6	7500
Dilauroyl Peroxide	105-74-8	7500
Dimethyldichlorosilane	75-78-5	1000
Dimethylhydrazine, 1,1-	57-14-7	1000
Dimethylamine, Anhydrous	124-40-3	2500
2,4-Dinitroaniline	97-02-9	5000
Ethyl Methyl Ketone Peroxide (also Methyl Ethyl Ketone Peroxide; Concentration >60%)	1338-23-4	5000
Ethyl Nitrite	109-95-5	5000
Ethylamine	75-04-7	7500
Ethylene Fluorohydrin	371-62-0	100

CHEMICAL NAME	CAS*	TQ**
Ethylene Oxide	75-21-8	5000
Ethyleneimine	151-56-4	1000
Fluorine	7782-41-4	1000
Formaldehyde (Formalin)	50-00-0	1000
Furan	110-00-9	500
Hexafluoroacetone	684-16-2	5000
Hydrochloric Acid, Anhydrous	7647-01-0	5000
Hydrofluoric Acid, Anhydrous	7664-39-3	1000
Hydrogen Bromide	10035-10-6	5000
Hydrogen Chloride	7647-01-0	5000
Hydrogen Cyanide, Anhydrous	74-90-8	1000
Hydrogen Fluoride	7664-39-3	1000
Hydrogen Peroxide (52% by Weight or Greater)	7722-84-1	7500
Hydrogen Selenide	7783-07-5	150
Hydrogen Sulfide	7783-06-4	1500
Hydroxylamine	7803-49-8	2500
Iron, Pentacarbonyl	13463-40-6	250
Isopropylamine	75-31-0	5000
Ketene	463-51-4	100
Methacrylaldehyde	78-85-3	1000
Methacryloyl Chloride	920-46-7	150
Methacryloyloxyethyl Isocyanate	30674-80-7	100
Methyl Acrylonitrile	126-98-7	250
Methylamine, Anhydrous	74-89-5	1000
Methyl Bromide	74-83-9	2500
Methyl Chloride	74-87-3	15000
Methyl Chloroformate	79-22-1	500
Methyl Ethyl Ketone Peroxide (Concentration >60%)	1338-23-4	5000
Methyl Fluoroacetate	453-18-9	100
Methyl Fluorosulfate	421-20-5	100
Methyl Hydrazine	60-34-4	100
Methyl Iodide	74-88-4	7500

CHEMICAL NAME	CAS*	TQ**
Methyl Isocyanate	624-83-9	250
Methyl Mercaptan	74-93-1	5000
Methyl Vinyl Ketone	79-84-4	100
Methyltrichlorosilane	75-79-6	500
Nickel Carbonly (Nickel Tetracarbonyl)	13463-39-3	150
Nitric Acid (94.5% by Weight or Greater)	7697-37-2	500
Nitric Oxide	10102-43-9	250
Nitroaniline (para Nitroaniline)	100-01-6	5000
Nitromethane	75-52-5	2500
Nitrogen Dioxide	10102-44-0	250
Nitrogen Oxides (NO; NO_2; N_2O_4; N_2O_3)	10102-44-0	250
Nitrogen Tetroxide (also called Nitrogen Peroxide)	10544-72-6	250
Nitrogen Trifluoride	7783-54-2	5000
Nitrogen Trioxide	10544-73-7	250
Oleum (65% to 80% by weight; also called Fuming Sulfuric Acid)	8014-94-7	1000
Osmium Tetroxide	20816-12-0	100
Oxygen Difluoride (Fluorine Monoxide)	7783-41-7	100
Ozone	10028-15-6	100
Pentaborane	19624-22-7	100
Peracetic Acid (Concentration >60% Acetic Acid; also called Peroxyacetic Acid)	79-21-0	1000
Perchloric Acid (Concentration >60% by weight)	7601-90-3	5000
Perchloromethyl Mercaptan	594-42-3	150
Perchloryl Fluoride	7616-94-6	5000
Peroxyacetic Acid (Concentration >60% Acetic Acid; also called Peracetic Acid)	79-21-0	1000
Phosgene (also called Carbonyl Chloride)	75-44-5	100
Phosphine (Hydrogen Phosphide)	7803-51-2	100
Phosphorus Oxychloride (also called Phosphoryl Chloride)	10025-87-3	1000

CHEMICAL NAME	CAS*	TQ**
Phosphorus Trichloride	7719-12-2	1000
Phosphoryl Chloride (also called Phosphorus Oxychloride)	10025-87-3	1000
Propargyl Bromide	106-96-7	100
Propyl Nitrate	627-3-4	2500
Sarin	107-44-8	100
Selenium Hexafluoride	7783-79-1	1000
Stibine (Antimony Hydride)	7803-52-3	500
Sulfur Dioxide (liquid)	7446-09-5	1000
Sulfur Pentafluoride	5714-22-7	250
Sulfur Tetrafluoride	7783-60-0	250
Sulfur Trioxide (also called Sulfuric Anhydride)	7446-11-9	1000
Sulfuric Anhydride (also called Sulfuric Trioxide)	7446-11-9	1000
Tellurium Hexafluoride	7783-80-4	250
Tetrafluoroethylene	116-14-3	5000
Tetrafluorohydrazine	10036-47-2	5000
Tetramethyl Lead	75-74-1	1000
Thionyl Chloride	7719-09-7	250
Trichloro (Chloromethyl) Silane	1558-25-4	100
Trichloro (Dichlorophenyl) Silane	27137-85-5	2500
Trichlorosilane	10025-78-2	5000
Trifluorochloroethylene	79-38-9	10000
Trimethyoxysilane	2487-90-3	1500

* Chemical Abstract Service Number
** Threshold Quantity in Pounds (Amount necessary to be covered by this standard.)

Appendix B to 1910.119 - Block Flow Diagram and Simplified Process Flow Diagram (Nonmandatory)

DEPARTMENT VPP/OSHA
PROCESS SAFETY MANAGEMENT PROTOCOL
(Refer to the OSHA PSM Communication)

Compliance to OSHA regulation requirements is a basic tenant for participation in OSHA's Voluntary Protection Program. All elements of the OSHA Process Safety Management regulation must be in compliance as a prerequisite for VPP participation.

I. EMPLOYEE PARTICIPATION

A. Develop a written list of those safety activities that involve employees (examples in the OSHA PSM communication). Be sure employees participate in appropriate Process Hazard Analysis activities.
B. Document the employee's participation in those programs.
C. Provide access to Process Hazard Analyses.

II. PROCESS SAFETY INFORMATION

A. Review plant status on the following Operating Discipline sections.
   Process Technology
   Process Risk Management
   Industrial Hygiene
B. Review the OSHA PSM communication and document the minimum process safety information that is required.

III. PROCESS HAZARD ANALYSIS (Refer to OSHA PSM Communication)

A. Retain the documentation of each Process Hazard Analysis.
B. Assure that recommendations from the process hazard analysis are resolved in a timely manner and the resolution is documented.
C. Communicate the results of the Process Hazard Analysis to affected employees.

IV. OPERATING PROCEDURES

A. Assure that operating procedures are reviewed at least annually and certified. (See Texas Operations Safety Standard T-13; III. E, F, G.)

B. Assure that operating procedures include the elements listed in the U.S. Area Operating Discipline Standard and the OSHA PSM communication.

V. TRAINING

A. Assure that all operating employees in their job as of May 26, 1992, have been certified.

B. Assure that new employees are trained as per the U.S. Area Operating Training Standard and the training is documented.

VI. CONTRACTORS

Assure that plant contractor orientation and safety communication is documented.

VII. PRE-START UP SAFETY REVIEW

A. Assure that projects have pre-start up reviews.

B. Assure that resolution of the finding of these reviews are documented.

APPENDIX C

APPENDIX B - PROCESS SAFETY AND LOSS PREVENTION FIELD VERIFICATION

The Process Safety and Loss Prevention auditor will evaluate the following items during a field inspection. Answer all questions. Explain any questions answered "No" in the Comment Sections.

A. OPERATING DISCIPLINE

1. Yes [X] No [] Is process safety information complete and available to the operating personnel? (Examine Sample Documents for Operating Discipline Questions 4A, 4B, 4C)

2. Yes [X] No [] Are operating procedures complete and available to the operating personnel? (Ask Control Room Operators) (Examine samples of Operating Discipline Questions 5C, 5D)

3. Yes [X] No [] Are operating procedures reviewed annually with documentation of the review? (Ask Operators) (Examine Samples to Verify Updating)

Comments: _____

_____

B. DRAINAGE AND CONTAINMENT

1. Yes [X] No [] Is drainage generally away from the process area? (Field Observation)

2. Yes [] No [X] Are tanks located far enough away from dike walls so that a leak will not spray over the wall? (Field Observation)

3. Yes [X] No [] Are dikes without visible defects? (Field Observation)

4. Yes [] No [X] Area all pumps fitted with deadhead protection (i.e.; temperature or flow)? (Field Observation)

Comments: _____

_____

C. WAREHOUSE STORAGE

1. Yes [X] No [] Are materials stored so as not to restrict the distribution of fire water from a sprinkler head (at least 18")? (Field Observation)

2. Yes [X] No [] Are empty pallets stacked less than eight feet in height? (Field Observation)

Comments: _____

_____

D. BUILDING LOCATION AND FIRE RISK

1. Yes [X] No [] Are buildings of non-combustible construction? (Field Observation)

2. Yes [] No [X] Are fire doors, tracks, hardware and fusible link systems in good condition to allow closing? (Observe Door Operation)

Comments: N/A

_____

E. ELECTRICAL SYSTEMS

1. Yes [X] No [] Are electrical enclosures in classified areas properly assembled? (Field Observation)

2. Yes [] No [X] Are there major cable trays routed through areas where flammable liquids can pool? (Field Observation)

3. Yes [] No [X] Are cable wall penetrations adequately sealed? (Observe Penetrations in Control Room and Switchgear Room)

Comments: _____

F. FIRE PROTECTION SYSTEMS

1. Yes [X] No [] Are fire protection systems in good condition? (Field Observation)

2. Yes [] No [X] Is structural steel and tank supports protected with deluge protection or fire proofing? (Field Observation)

3. Yes [X] NO []Is pipe insulation on hot lines in good condition? (Field Observation)

Comments: 2. N/A

G. FIRED EQUIPMENT

1. Yes [] No [X] Is fired equipment adequately separated from the other process hazards (LPP 2.2.6)? (Field Observation)

Comments: _____

_____

H. EMERGENCY BLOCK VALVES

1. Yes [X] No [] Are all incoming and outgoing headers handling flammable or toxic materials fitted with EBV's? (Field Observation, Ask Operators)

2. Yes [] No [X] Are all vessels handling flammables or combustibles with a flashpoint below 140°F fitted with an EBV on the bottom of the tank (within 4 feet)? (Field Observation, Operator Interview) (Fire Rated Valve)

Comments: _____

_____

I. TANK FARMS

1. Yes [X] No [] Is water routinely able to get between the tank foundation and bottom of tank? (Field Observation)

2. Yes [] No [X] Is soil in contact with the tank exterior shell? (Field Observation)

3. Yes [X] No [] Are tank grounds in place? (Field Observation)

J. PRESSURE VESSELS AND RELIEF DEVICES

1. Yes [X] No [] Do file folder(s) on each pressure vessel (Pressure Containing Equipment) have the registration form, calculations, inspection and status change reports, spec sheets, record prints, U-1 forms, mill tests, and visual inspections? (Examine a random 5% sample of pressure vessel folders for complete records.)

2. Yes [X] No [] Are design calculations on all pressure relief devices done? (Examine a random 5% sample of folders for calculations, specifications and piping isometric sketch.)

3. Yes [X] No [] Are glass devices and expansion joints in potentially hazardous service registered and routinely inspected? (Examine a sample of documentation folders for registration and inspection frequency.)

K. CRITICAL INSTRUMENTS

1. Yes [X] No [] Do written test procedures exist? (Examine Several Examples)
   Yes [X] No [] Are they being used?

2. Yes [X] No [] Is testing documentation current? (Examine Testing Schedule vs. Completion)

3. Yes [X] No [] Do test procedures test from the initiating device through final control element? (Have one of the I&E technicians who does the testing explain a procedure.)

L. TANK INSTRUMENTATION

1. Yes [X] No [] Are storage tanks protected with redundant level indicating devices?

   Yes [X] No [] Are storage tank level indicators on separate computer boards? (Verify by having I&E technician show audit example of redundant devices on storage tanks.)

2. Yes [] No [X] Are automatic actions taken from these high level devices? (Have I&E technician explain another operation.)

APPENDIX C

APPENDIX C

Process Safety and Loss Prevention Resource Materials

Guidelines for Burner Management Systems for Boilers & Process Furnaces	June 1993
Guidelines for Safety, Loss Prevention and Security Audits	November 1989
Guidelines for Emergency Planning	September 1985
Guidelines for a Motor Vehicle Accident Prevention Program	May 1992
Guidelines for Accident Investigation	November 1985
Fire and Explosion Index, 7th Edition	(At Printer)1994
Guidelines for Public Warehouse Rating and Risk Analysis	January 1990
Guidelines for Determining Dust Hazard Potential	October 1989
Guidelines for A Reactive Chemicals Program, 2nd Edition	Reprinted November 1990
Guidelines for Business Data & Process Control Computer Systems	March 1982
U.S.A.-2 Safety Standard Management of Change	February 1992
Operating Discipline Standard for Operating Units of Dow U.S.A.	January 1992
Minimum Requirements	June 1989
Chemical Hazard Engineering Guideline	1993
Distribution Emergency Response Process	?
Process Risk Management Guidelines for Facilities and Distribution	1994
Loss Prevention Principles	1991
Chemical Exposure Index	September 1993
NFPA Codes	Continuous
Site Specific Reactive Chemicals Manual - Hazard Evaluation Procedure Manual (Texas Operations Only)	September 1993
Site Specific Safety Standards and Safety References	Continuous
OSHA Process Safety Management of Highly Hazardous Chemicals, Explosives and Blasting Agents	1992
Computer Security Policies & Procedures	February 1990

RISK ANALYSIS
PACKAGE

DO A 037021
CONFIDENTIAL

RISK ANALYSIS PACKAGE
Reference: LPP 1.3.3

The Risk Analysis Package and the Loss Prevention Insurance Report will be sent to the insurance company broker and to Corporate Loss Prevention. Sufficient information should be given concerning the plant to allow the insurance companies to fully understand the process safety and loss prevention aspects of the plant. If there are any questions, contact Loss Prevention. The technology center can help ensure that no proprietary information is included.

The following should be the contents of the Risk Analysis Package:

1. Fire and Explosion Index (F&EI) calculation sheets for the highest F&EI, Maximum Probable Property Damage (MPPD) and Maximum Probable Days Outage (MPDO).
2. Loss Control Credit Factors that apply to the plant. (Back of F&EI Form)
3. Plant Risk Analysis Summary Sheet of F&EI calculations.
4. Block plot plan showing areas of exposure circles for the higher risk process unit areas based on F&EI calculations..
5. Simplified process flowsheet. (Include Emergency Block Valve Location)
6. Summary sheets covering the following information:
   A. Raw materials used with source and means of receipt.
   B. Final product distribution means.
   C. Availability of critical equipment.
   D. Essential utilities and reliability.
   E. Replacement value of the plant.
   F. Interdependence with other Dow facilities.

A copy needs to be sent to your Loss Prevention Representative and it will be forwarded to Corporate Loss Prevention and the insurance company.

Block 36 - Chlor-Alkali 2 Process Summary

Raw material for the chlor-alkali plant is brine supplied by pipeline from salt domes.

The initial operation is an electrolytic reaction using diaphragm cells. Products of this reaction are chlorine gas, hydrogen, and weak caustic cell effluent. Two independent circuits of four cell series are used.

Cell power is supplied by two 45 megawatt Westinghouse W-501A gas turbine driven generators. Each gas turbine generator is coupled to a steam turbine for startup and power augmentation. Backup power is available through a division tie using two 27 MVA regulating transformers. The cell power turbines are not synchronized to the power grid.

The wet chlorine gas from the cells from the cells is dried, purified, liquefied, and evaporated in a single train system to produce 100% gas and liquid chlorine. The plant produces 1.9> million pounds of chlorine per day. 100% chlorine gas is piped to the division distribution header, and liquid chlorine is sent to the chlorine plant for loading into tank cars.

Fifty six thousand pounds per day of hydrogen from the cells is scrubbed, compressed, and cooled in the hydrogen recovery area. The hydrogen is piped to the division header where the chlorine plant handles distribution to internal and external customers.

Cell effluent is processed in a multiple effect evaporator train to reach a concentration of 50% caustic and remove salt. The caustic is then cooled and filtered to further reduce the salt concentration. 2.3 million pounds per day of caustic are transferred to the division caustic plant where it is shipped by tank truck, tank car, or marine carriers.

This plant typically runs at full capacity with load changes absorbed by the chlorine plant and caustic plant.

There are no automatic sprinklers at CA2, but monitor nozzles are located throughout the block to cover all potential fire hazards. A manual sprinkler exists on the chlorine compressor to combat a chlorine and iron fire if necessary.

Spare equipment is available for all major equipment. A gas turbine outage can be covered using backup power and steam from the division header until repairs are made. Caustic centrifuge has an installed spare. Rotating assemblies are stocked for the freon compressor and starter turbines. A spare rectifier transformer is stored in the Texas Division

BUSINESS INTERRUPTION SUMMARY-CHLOR ALKALI 2

A. Raw Material Supply

Brine is supplied by pipeline from salt dome storage. Hydrochloric, and Sulfiuric acid are supplied by pipeline from other plants in the division.

B. Product Shipping

Chlorine production is delivered to Louisiana Division user plants by a pipeline distribution network, and tank cars are loaded at the chlorine plant for external customers. Caustic is pumped by pipeline to the caustic plant for distribution by tank truck, tank car and marine shipping. Hydrogen is sent by pipeline to the chlorine plant for distribution to internal and external customers.

C. Essential Utilities

Steam, Power, and Fuel Gas are all supplied by division network systems.

D. Critical Equipment

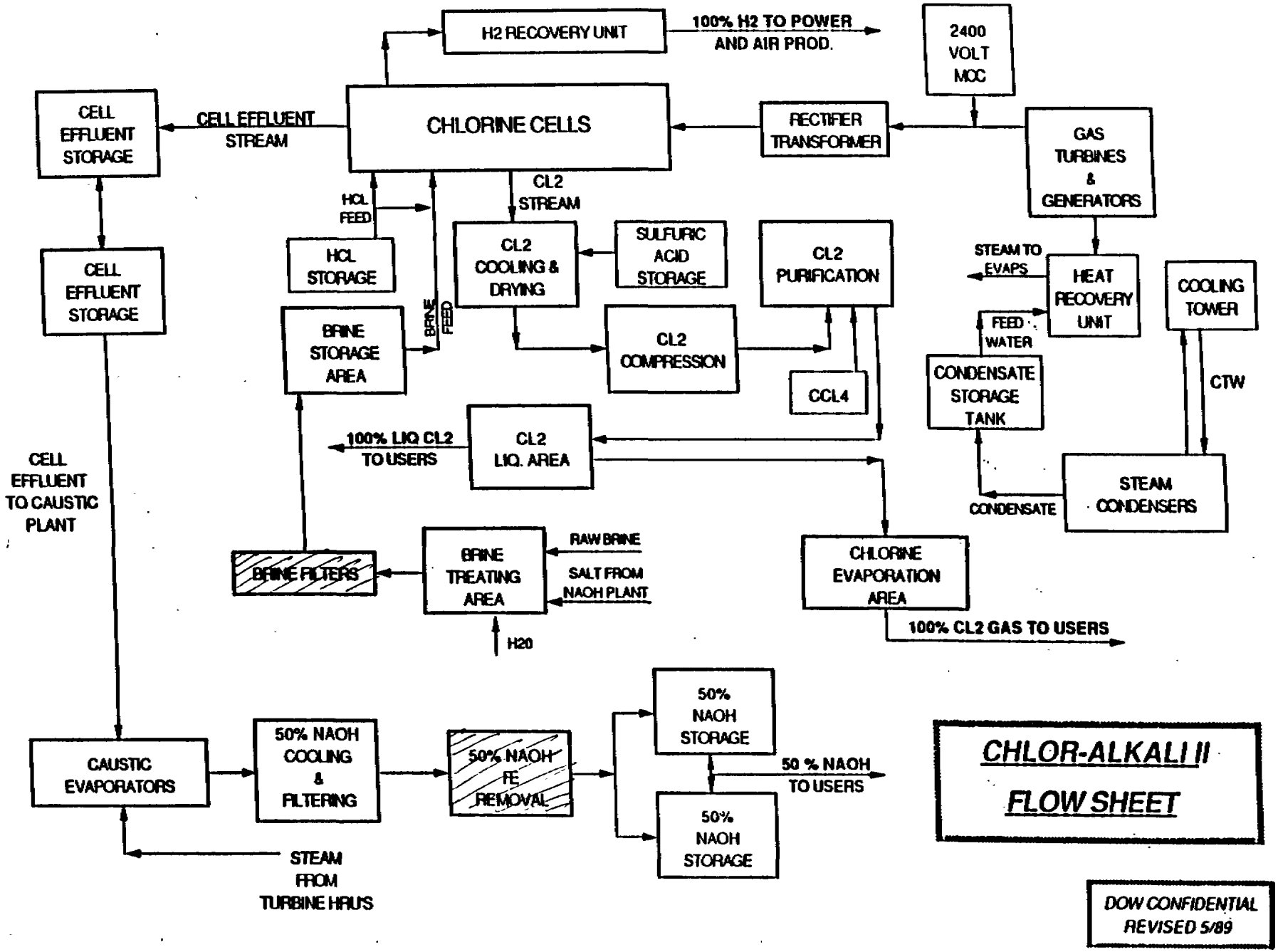
Spare equipment and parts are available in the Louisiana Division and other Dow locations.

E. Loss Control Systems

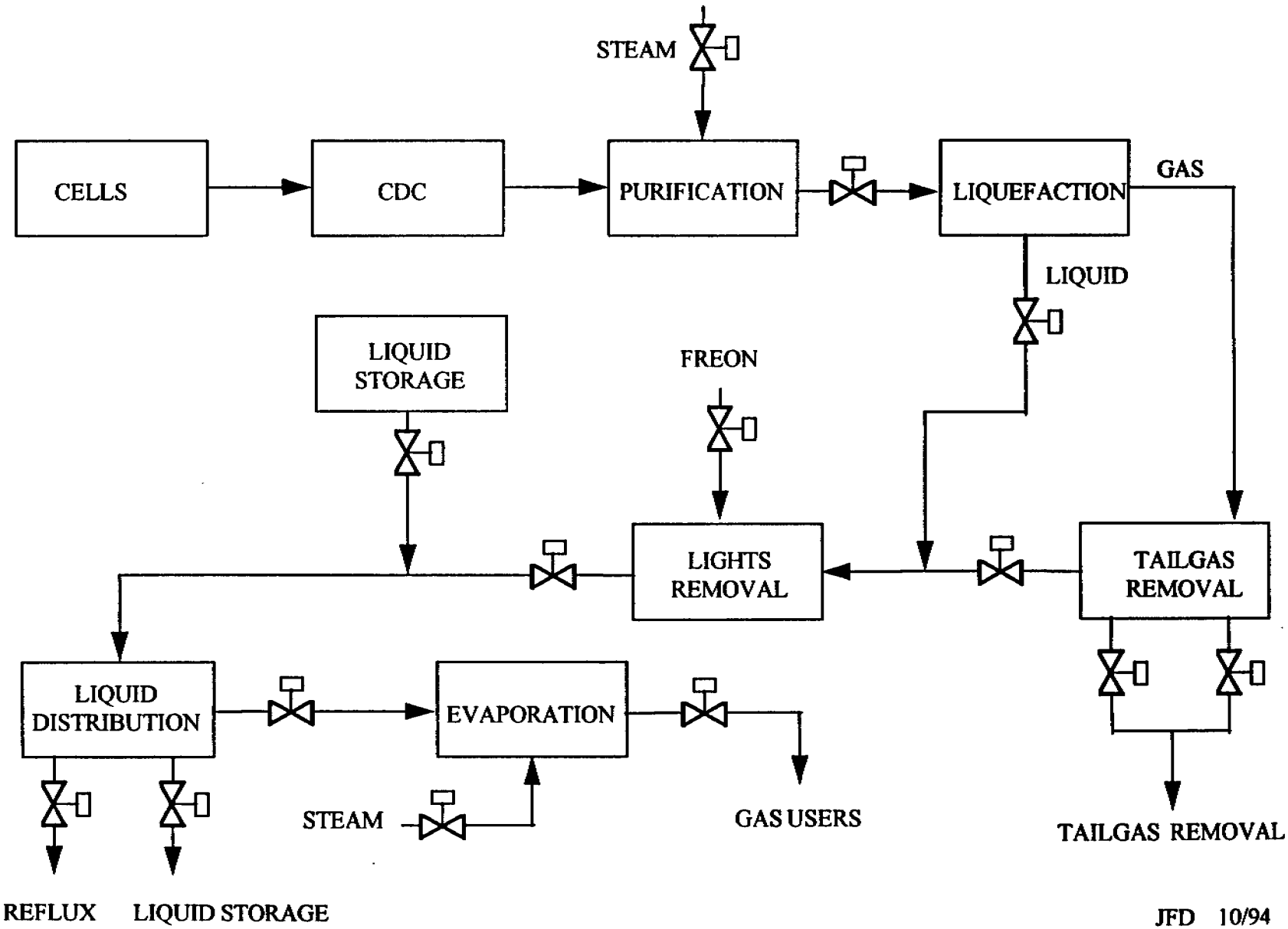
Fire Fighting water is supplied by the division system which includes nine diesel pumps, each capable of supplying 5000 GPM at 100 PSIG. These pumps start automaticaly on low pressure in the water header. Normal water supply is by electric pumps at the water treating plant that deliver a capacity of 3500 GPM.

F. Replacement Cost

$99 MM 1996



PLANT EBV SYSTEM



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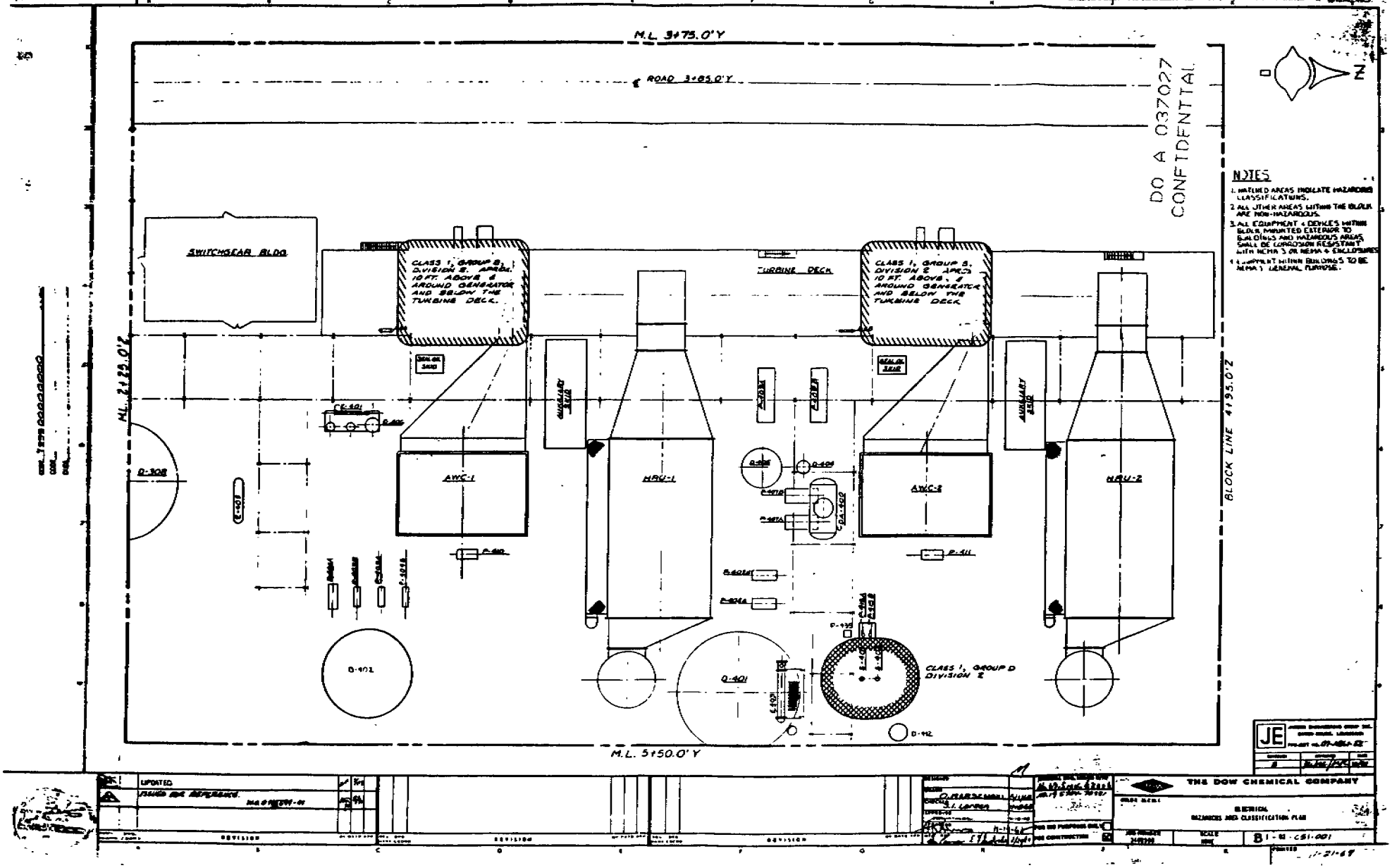


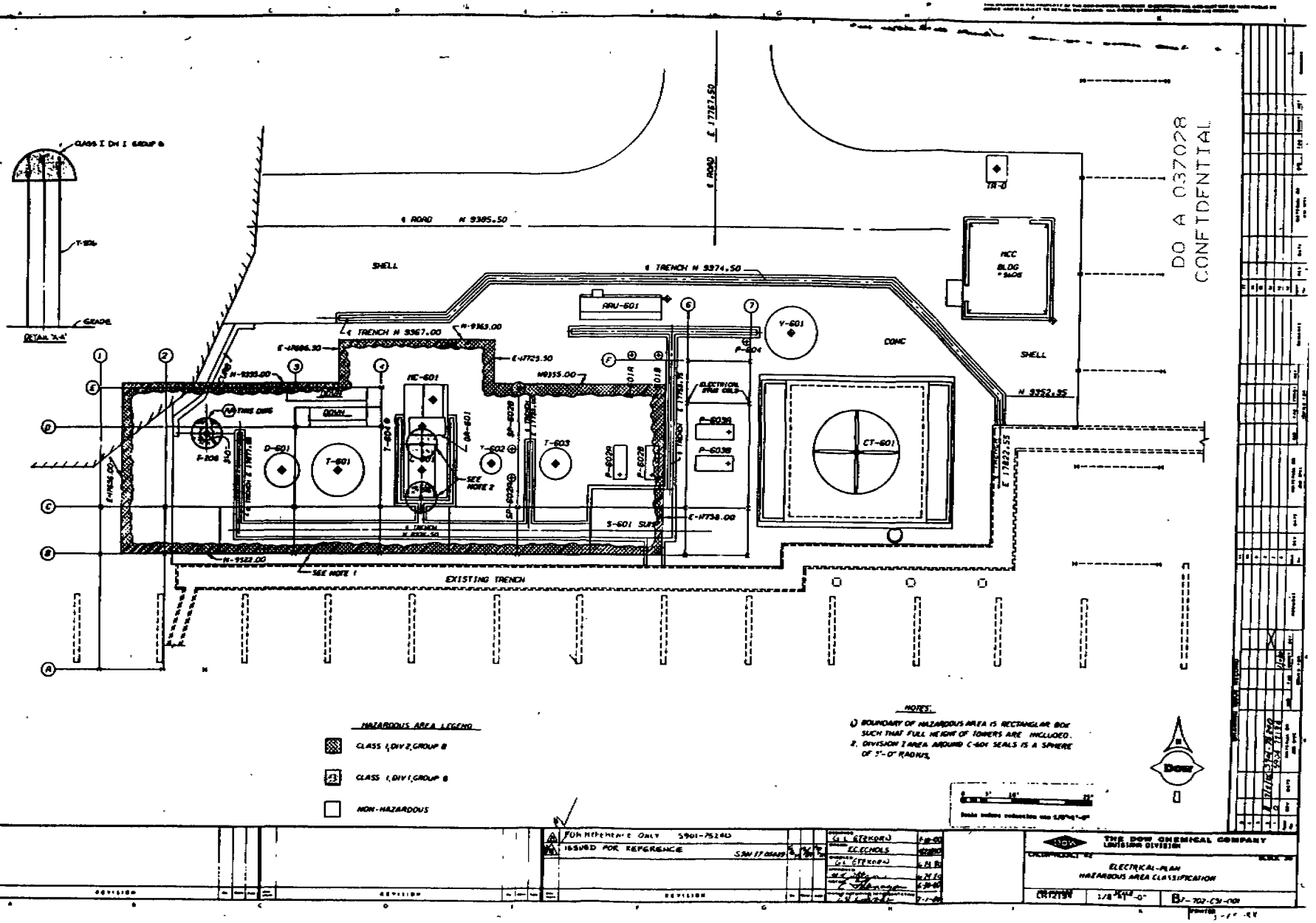
UPDATED

THE DOW CHEMICAL COMPANY

SERIOL

HAZARDOUS AREA CLASSIFICATION PLAN

B1-B-CS1-001


DO A 037028
CONFIDENTIAL
CLASS I DIV 1 GROUP B
DETAIL 'A-A'
GRADE
℄ ROAD N 9395.50
℄ ROAD E 17283.50
SHELL
℄ TRENCH N 9374.50
℄ TRENCH N 9367.00
N-9363.00
E-17086.50
E-17129.50
N-9355.00
W9355.00
N-9335.00
HC-601
ARU-601
Y-601
CONC
SHELL
N 9352.95
ELECTRICAL DRUM CELL
P-6038
P-6038
CT-601
D-601
T-601
T-602
T-603
SP-6028
P-6028
P-6028
S-601 SUP
E-17758.00
E 17822.55
N-9323.00
SEE NOTE 1
EXISTING TRENCH
SEE NOTE 2
HAZARDOUS AREA LEGEND
CLASS 1,DIV 2,GROUP B
CLASS 1,DIV 1,GROUP B
NON-HAZARDOUS
NOTES:
1) BOUNDARY OF HAZARDOUS AREA IS RECTANGULAR BOX SUCH THAT FULL HEIGHT OF TOWERS ARE INCLUDED.
2. DIVISION 1 AREA AROUND C-601 SEALS IS A SPHERE OF 5'-0" RADIUS.
N
THE DOW CHEMICAL COMPANY
LOUISIANA DIVISION
ELECTRICAL-PLAN
HAZARDOUS AREA CLASSIFICATION
1/8"=1'-0"
B-702-C31-001

CAUSTIC PLANT

PROCESS DESCRIPTION

The Caustic 1 plant is made up of an evaporation train, a salt removal area and a finishing area. The evaporators are used to concentrate the caustic to 50%. The salt removal area consists of salt columns, centrifuges, and salt settlers which are used to process. The finishing end of the plant cools the caustic with heat exchangers and removes salt to production specifications in the sparkler filters.

A caustic evaporator train is made up of four bodies configured as a triple-double evaporator system with a primary salt removal and a condensate collection system. The evaporator bodied are referred to as the fourth effect, third effect, second effect, and first effect.

After the evaporators, salt, and sulfate are removed at the centrifuges. Additional processes are 1)cooling and 2)final filtration in the Sparkler filters.

The boiler grade condensate is returned to the Power plant for use in steam generation.

As the cell effluent is increased in concentration, solid salt drops out of solution in the evaporators because of reduced solubility. This salt is collected in a settling tank by use of cyclones. From here it is fed to a salt column. Caustic concentration in the salt slurry from the bottoms of the salt column is monitored and controlled by the addition of condensate. Salt slurry is sent to the Chlorine plant where it is fed back to the chlorine cells.

The product from the evaporator train is fed to a salt settling tank. The overflow is fed to a forwarding tank and the bottoms is fed to the centrifuges. The function of the centrifuge is to remove the salt and the sulfate. The product from the centrifuge goes to the forwarding tank and the slurry is sent to the sulfate salt column. This column removes the caustic from the salt with condensate spargers. Salt is sent to the Chlorine plant and caustic is sent to the user feed tank.

Caustic leaving the centrifuges goes through two precoolers before entering the caustic cooling tank. The precoolers are used to cool the 50% caustic and preheat the cell effluent feed to the evaporators. Caustic is pumped through a set of heat exchangers with chilled water as the cooling media and into the sparkler feed tank. The sparkler filter operation is made up of six filters. After the sparkler filter operation the finished caustic is stored in the finished 50% storage tanks.

BLOCK 29—CAUSTIC

This is a production block.

RAW MATERIALS

Cell Effluent from Chlorine (Block 26) and from Chlor-Alkali II (Block 36) is received here via pipeline, and by typical evaporation processes, concentrated.

FINISHED PRODUCT

288.75 MM lbs/quarter of 50% regular grade caustic are produced here.

LOADING & SHIPPING

50% caustic and cell effluent are distributed to division users via pipeline. 50% regular grade caustic is shipped to customers by tank truck, tank car, barge, and ship.

UTILITIES

Steam is supplied by the division Power Plant. Electrical power is supplied by two independent power feeder lines, also from the division Power Plants. Process water is supplied from the division Water Treating Plant. River water and compressed air are supplied from Caustic owned equipment. Caustic supplies compressed air to the division air network. This network serves as Caustic's source of backup air when needed. Caustic also supplies river water to Chlorine(Block 26). Hydrochloric acid for pH control is supplied via pipeline from the Solvents Plant(Block 16).

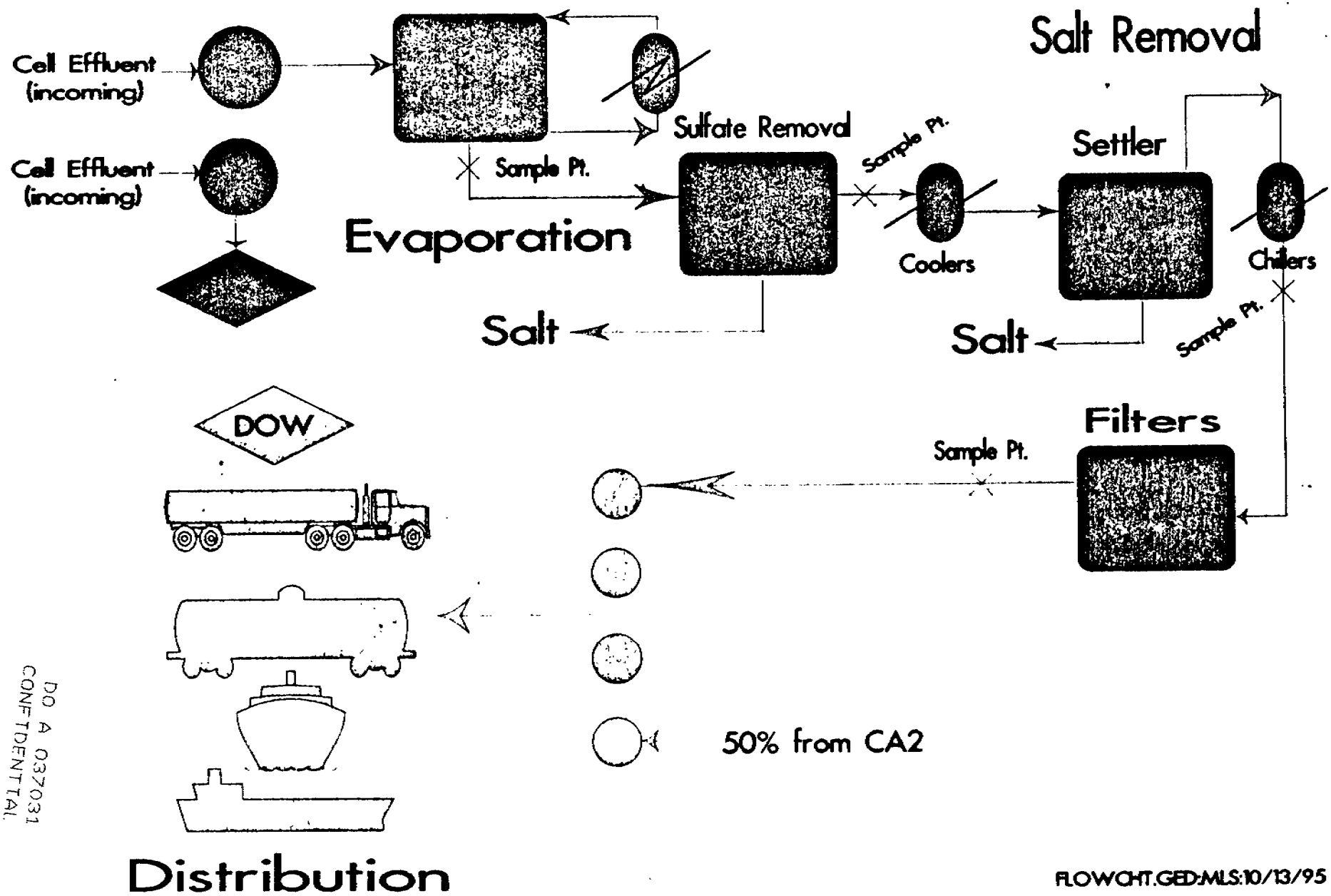
CRITICAL EQUIPMENT

Non-spared critical equipment includes the first, second, and fourth effect evaporator recirculation pumps.

LOSS CONTROL SYSTEMS

The probability of fire in this block is very low. Besides fire extinguishers, the only fire prevention/control system in the block is smoke detectors in the control room, motor control centers, and computer room. The computer room has a Halon fire protection system. The block is completely contained. All spills and runoff drain to a trench system with sump pumps that transfer the liquid to a holding tank.

CAUSTIC 1 PLANT



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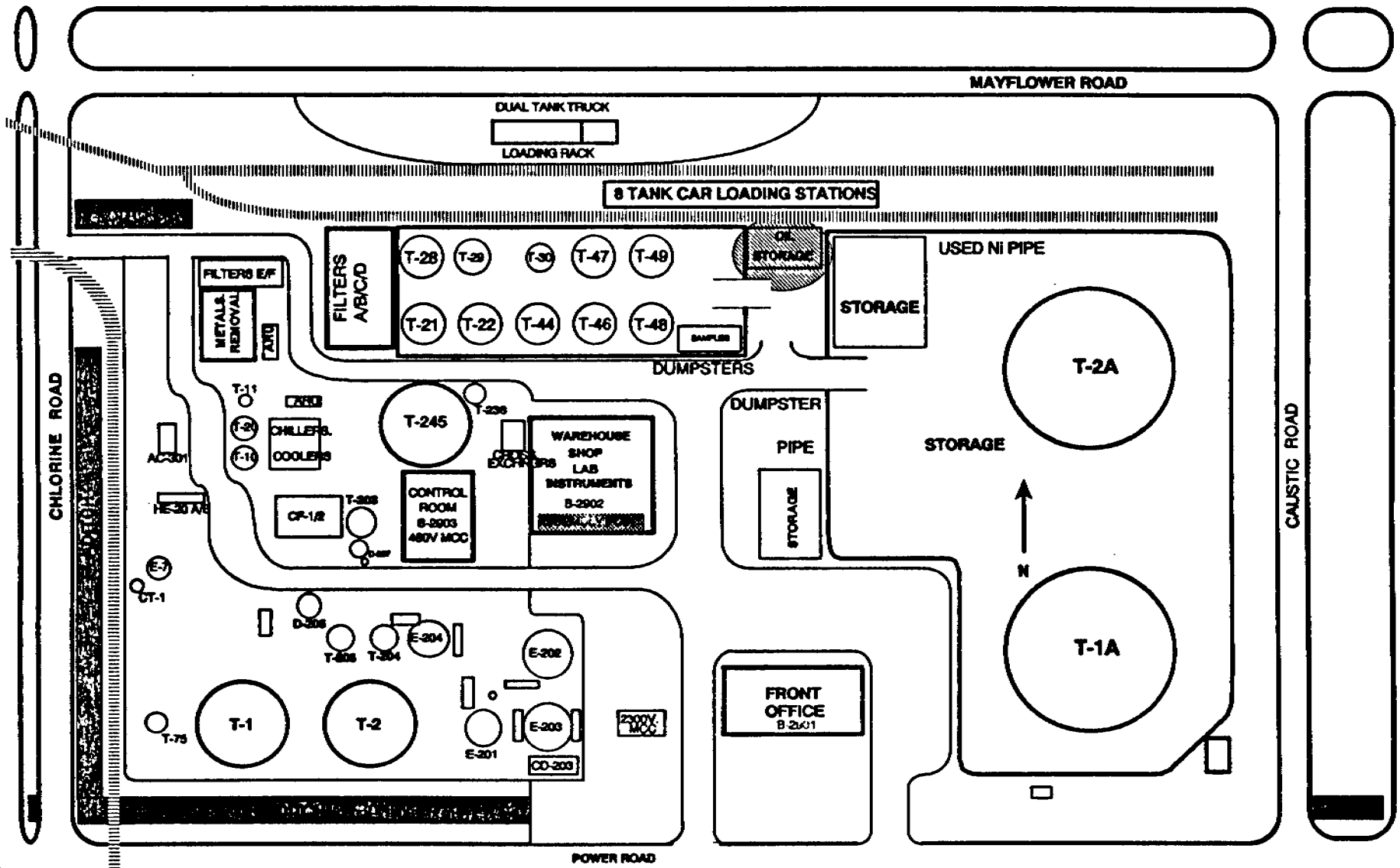

BLOCK 29: CAUSTIC 1 LAD

DO A 037032
CONFIDENTIAL

CAUSTIC 1 LAD TANK FARM STORAGE AREA