

CHLOR - ALKALI 2

1994

REACTIVE CHEMICALS REVIEW

MAINTENANCE PROCEDURES

DO A 029593
CONFIDENTIAL

MAINTENANCE

METALS:

Dry Chlorine Service:

Service where materials will be in contact with chlorine where the moisture content is less than 5 PPM water by weight in chlorine.

Recommended Materials:

- Carbon Steel - Safe at temperatures less than 155 C (311 F)
- Iron - Safe at temperatures below 175 C (347 F)
- Filler Elements - wound fiberglass and sintered metal are recommended. Avoid polypropylene and organic materials as they react with chlorine.

Dry chlorine reacts *violently* with hot steel

No welding on chlorine lines that have not been isolated and depressured

Welding cables must not be clamped to chlorine lines

WARNING:

At ordinary temperatures, dry chlorine reacts with:

Aluminum
Arsenic
Gold
Mercury
Selenium
Tellurium
Tin
Titanium

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MAINTENANCE

METALS:

Wet Chlorine Service:

Recommended Materials:

- Titanium - High resistance to wet chlorine gas

The amount of water necessary to prevent a chlorine - titanium reaction will vary with temperature and pressure

Note: Titanium is highly reactive with dry chlorine gas and liquid chlorine

Storage:

Titanium equipment and materials are clearly identified (purple paint) and stored in a designated area in CA - 2 warehouse. This area is separated from other parts and locked. Material controller is responsible for this area.

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MAINTENANCE

METALS:

Caustic Service:

- Service where materials will be in contact with caustic varying in concentration from 8.5% to 50%.

Note: High corrosion rates will be caused by elevating temperatures and / or concentrations.

Recommended Materials:

- Carbon Steel pipe - 8.5 % caustic less than 150 F and strong r concentrations of caustic below 120 F
- Nickel pipe - Concentrations above 8.5 % with a temperature greater than 120 F
- Aluminum, Zinc, Tin and Copper are rapidly attacked by caustic and their use should be avoided.

Miscellaneous Applications:

- Heat Transfer Materials - Hot water and steam are recommended for heat transfer applications. Avoid organic materials that react with chlorine.

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MAINTENANCE

Cleaning / Purging Equipment and Lines:

Chlorine:

Hot water or steam is recommended over solvents

Preferred solvent for cleaning chlorine equipment is carbon tetrachloride

Purge chlorine systems with dry air or nitrogen - take necessary precautions to prevent contaminating an instrument air system when using dry air

Dry all chlorine equipment with nitrogen to a dew point of - 60 F

Caustic:

All materials to be thermal cut, heated or welded should be washed with 3% (1 N) HCl (This includes post weld heat treatment area).

Rinse with water after acidizing.

Sandblast inside and outside of pipe or material in the area where cutting, welding or postweld heat treatment will take place.

Re-acidize and rinse area as per above steps.

A Dow employee should test the material with litmus paper or phenolphthalein to assure that it has been cleaned and rinsed properly. The pheno. will turn from a clear liquid to a pink to purple color when caustic is present.

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MAINTENANCE

Lubricants:

Non - Saturated hydrocarbon based oils and greases react violently with chlorine under moderate to extreme operating conditions. Only APPROVED lubricants will be used for chlorine service.

Approved lubricants for chlorine service at CA - 2 include:

Greases:

Fluorolube GR 544 (Sealant for gaskets)
Climax FL - 5

Oil:

Fluorolube FS - 5

Approved Multi - Purpose usage lubricants for CA - 2 include (NOT to be used for Chlorine service):

CA II	Caustic I
REGAL 68	EP-2 REGAL
CAP32W	LUBRIPLATE
EMB	MARFAK #2
Multi Fax Grease	Mobil Lubri-Mist
Koppers Grease	Mobil SHC-634 (Synthetic Lub.)
MF EP2 Grease	FGL-2 (Food Grade)
MN EP2 Add Grease	Grease (Mobil - Exxon - Texaco)
MO Mist 2	REGAL 32
Merpa 220	REGAL 68
Perma 6 Cartridge	REGAL 100
R220 Seal	REGAL 150
Regal R & O 32	REGAL 220
Oil	
Slipkote Grease	
Sultube Oil	
M150 Meropa	
650 T Sample	
FMO-2400AW	
Super FGL-2	
EP-100	

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Chlor-Alkali II/Caustic Reactive Chemicals Review

Key Potential Reactive Concerns and Prevention Systems

1) Chlorine/Hydrogen Explosion Prevention

Scenario 1 - Low anolyte level

- >> Generator trips @ 2 inch level
- >> 2 level TX's and low level carbon probe - critical instruments
- >> Mod5 voting logic - 2/3, 2/2, 1

Scenario 2 - Excessive cell header vacuum

- >> Chlorine Compressor Trips if
 - 1) CHP reaches 9.5 in H2O vacuum (instantaneous)
 - 2) CHP reaches 8.0 in H2O vacuum for 10 seconds
 - 3) CHP less than 8.0 in H2O vacuum twice within 2 minutes
- >> Triple redundant pressure TX's - critical instruments
- >> Mod5 voting logic
- >> Vacuum Breaker mechanical relief at 6.0 in H2O vacuum

Scenario 3 - High Hydrogen in Tailgas

- >> Generator runback @ 4.75% (20 second delay) until conc. < 3.75%
- >> Generators will runback to 0 KA
- >> Triple redundant H2 analyzers - critical instruments
- >> Mod5 voting logic

Scenario 4 - Hydrogen Backflow from H2 train to Cells

- >> Discharge EBV closes upon H2 compressor trip
- >> T-206 will vent gas in train
- >> Individual stacks at cells backup T-206

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Chlor-Alkali II/Caustic Reactive Chemicals Review

Key Potential Reactive Concerns and Prevention Systems

2) Chlorine/Iron Fire Prevention

Scenario 1 - High 2nd/3rd stage compressor discharge temperature

- >> Compressor trips @ 325 F on either stage
- >> Triple redundant temperatures on each stage
- >> Mod5 voting logic

3) Hydrogen/Oxygen Explosion

Scenario 1 - Low H2 compressor suction pressure/ O2 intrusion

H2 compressor trips if.....

- >> Greater than 0.5% oxygen in H2 or.....
- >> Low suction pressure on 4 pressure TX's
 - * Less than 1.5 inches H2O vacuum (2 sec delay any TX)
 - * Greater than 0.3 inches H2O pressure (2 TX's furthest from suction)
 - * Greater than 0.125 inches H2O pressure (2 TX's closest to suction)

4) Titanium/Dry Chlorine Fire

Scenario 1 - Use of titanium parts in wrong service

- >> Titanium parts storage policy
- >> Limited titanium usage at CAII (E-201/202 tubes, wet Cl2 gas scrubber internals)
- >> Water and brine flow TX's to E-201/202, flow alarms, automatic backup
- >> Mod5 controls protect against dry Cl2 backflow

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**Chlor-Alkali II/Caustic
Reactive Chemicals Review**

Key Potential Reactive Concerns and Prevention Systems

4) Nitrogen Trichloride Decomposition

Scenario 1 - High N₂ compounds in brine

>> Monitor nitrogen compounds in brine - treat with HOCL

Scenario 2 - Excessive NCl₃ levels in taffy

>> Comprehensive Mod5 taffy pot/purification reboiler controls

Scenario 3 - Buildup of "heavies" in Cl₂ Evaporators

>> Automatic purging (popping) of all Cl₂ evaporator exchangers

DO A 029601
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☐ PRELIM ALREADY SUBMITTED☐ PRELIMINARY ☒ FINALDOW CHEMICAL U.S.A. - LOUISIANA DIVISION
SUPERVISOR'S INVESTIGATION OF ACCIDENT/INCIDENT

RECORD 9258

☐ CONTRACTOR	☐ DOW	ACCIDENT CLASSIFICATION	DATE OF ACCIDENT: 12/8/92
☐ ATC	☐ FIRST AID	INDUSTRIAL	TIME OF ACCIDENT: 3:00AM
☐ RWC #	☐ INJURY PREVENTE	MEDICAL NON INJURY ☒	DATE INVESTIGATED: 1/18/93
☐ DAW #	☐ PRECAUTIONARY	VISIT	DATE REP SUBMITTED: 1/18/93
☒ PSA	☐ ILLNESS	S & LP STANDARD VIOLATION	
☐ \$50000 PD		ENVIRON. RxCHEM.	

Block and Location of Accident Block 36 Chlor-Alkali II Cell Area

Name of Injured/Involved Employee None Class N/A

Time at Dow (Mos.) N/A Master No. N/A Time on Job (Mos.) N/A

Contractor Involved/Supervisor None

Chemical Released (Environ/RxChem only) None

Pounds, PPM (Environ/RxChem only) N/A

Accident/Incident Description (10 Words or Less) Chlorine cell hydrogen outlet plugged w/stopper

Accident / Incident Description (Full)

Approximately 10 hours after startup of the chlorine Circuit #1, an operator discovered hydrogen escaping from the caustic side of a chlorine cell on S-6. On this type of series, the hydrogen is intended to escape from the hydrogen (opposite side) side of the cell through a separate port. Hydrogen exiting the cell through the caustic side is an indication of plugging on the hydrogen side and is normally corrected by "rodding out" the hydrogen outlet pipe. While preparing to do this on this particular cell, the hydrogen outlet pipe was found to be broken and separated. A rubber stopper had been placed into the open end of the broken pipe on the cell side. This forces the hydrogen to exit the chlorine cell through the caustic side. This greatly increases the chances of hydrogen entering the chlorine compartment of a cell which can result in a hydrogen/chlorine explosion. The stopper was removed, the piping connected, and the operation of the cell was returned to normal. It is unknown as to who installed the stopper, if it was installed, or why.

RESULTS CLASSIFICATION (List all that apply with code number and description from back page)

ACCIDENT / INCIDENT	INJURY	BODY PART
999. OTHER- Reactive Chemicals Concern	None	N/A

JOB BEING PERFORMED (List one from Group I and all that apply from Group

100. OPERATION / ROUTINE

075. OPERATION / STARTUP

CAUSES (List all that apply with code number and description from back page)

AT TIME OF ACCIDENT

PRE-EXISTING

999. Other- Unauthorized Practice

981. Training

810. Equipment Failure

FOLLOW UP ACTION TO PREVENT RECURRENCE:

Action: Communicate incident to all CA II personnel.

Responsibility: Landry Expected Completion Date: 1/31/93 Actual Completion Date: 1/31/93

Action:

Responsibility: Expected Completion Date: Actual Completion Date:

Action:

Responsibility: Expected Completion Date: Actual Completion Date:

Landry, Prejean, Mabile, LeJeune,

N/A

Superintendent's Signature

Investigated by Maniotte

Signature of Injured

Original To: Safety Department

Copies To: Department Reporting; Major Manager; Safety Superintendent; Environmental Superintendent; Legal Department

DO A 029602
CONFIDENTIAL

9331

DO A 029603
CONFIDENTIAL

☒ DOW
☐ CONTRACTOR

Dow Chemical USA - Louisiana Division
Supervisor's Investigation of Accident/Incident
(Reference LAD S&LP S-305)

☒ Safety
☐ Environmental

9362

SAFETY CATEGORIES (Attachment 1)				ENVIRONMENTAL (Attachment 2)	GENERAL INFORMATION
Illness	Injury	Non-Injury			
☒ ITC ☐ JC ☐ DAW ☐ Fatality	☐ RMTC ☐ RWC ☐ DAW ☐ Fatality	☐ Inj. Prevented ☐ PreCautionary ☐ First Aid PSA ? ☐ Yes ☐ No	☒ PSA ☐ Bus. Loss ☐ Dept. Rept. ☐ Internal	☐ Internal Plant ☐ Dow ☐ Agency	Date of Incident: <u>10/25/93</u> Time of Incident: <u>8:00 PM</u> Date Investigated: <u>10/29/93</u> Date Report Submitted: _____

Block in Which Incident Occurred: Chlor-Alkali II, Block 36 Location within Block: Cell Area
Name of Involved Employee: None Master or Social Sec #: N/A
Employee Classification: N/A Time in Class (mos): N/A
Time at Dow (mos.): N/A Time on Job (mos): N/A
Contractor Firm: None Contract Supervisor: N/A

For Reactive Chemicals, Chemical Exposure, or Environmental Incidents:

Chemical Involved: Hydrogen Quantity Released (lb): _____
Spill Category: ☐ A ☐ B ☐ C (for Environmental Incidents only) C121993- 3
Short Incident Description (less than 10 words): Hydrogen explosion: chlorine series #5 & 8 hydrogen logs

Full Incident Description:
Approximately one hour after a plant trip due to a power failure, a small hydrogen explosion occurred inside hydrogen headers for chlorine series 5 & 8. When the plant tripped, the computer control failed to open the nitrogen valves for purging of the hydrogen logs. As a result air was drawn into the logs as the system cooled down forming an explosive mixture.

Accident / Incident Type (Attachment 3): 200 Fire / Explosion
500 Reactive Chemicals
Injury: None Body Part(s): N/A

Job Being Performed (Attachment 4):
Group I: _____ Group II: _____

Causes At the Time Of the Incident: 999 OTHER - Crash Shutdown Pre-Existing Causes: 999 OTHER - Inadequate Computer Program

(see Attachment 5 for Cause Definitions)
Root Cause (select one of above): 999 OTHER - Inadequate Computer Program

Follow-Up Actions:

Action: Modify Mod5 program to ensure opening of nitrogen upon trip to eliminate min-max problem
Responsible (Name / #): Bartholomew/Long Expected Date: 12/17/93 Actual Date: 12/20/93
Action: Add low flow alarm on nitrogen for rectifier no load condition (red alarm)
Responsible (Name / #): Bartholomew/Long Expected Date: 12/17/93 Actual Date: 12/20/93
Action: Consider low pressure alarm on hydrogen header
Responsible (Name / #): Mellieon Expected Date: 12/1/93 Actual Date: 12/20/93
Action: Consider elimination of manometers on hydrogen logs
Responsible (Name / #): Mellieon Expected Date: 12/01/93 Actual Date: 12/20/93
Action: Consider redundancy in nitrogen valves
Responsible (Name / #): Mellieon Expected Date: 12/01/93 Actual Date: 12/20/93

Superintendent's Signature: _____
Mellieon, Hudson, Sandow, Landry, Lively,
Moniotte, Armstrong, Breaux, Bartholomew,
Reactive Chemicals Committee Members
Investigated By: _____
Signature of Injured: _____
SHIFT: N/A

Form L-43 (Revised 1/93)

DO A 029604
CONFIDENTIAL

☒ DOW
☐ CONTRACTOR

Dow Chemical USA - Louisiana Division
Supervisor's Investigation of Accident/Incident
(Reference LAD S&LP S-305)

☒ Safety
☐ Environmental

9370

SAFETY CATEGORIES (Attachment 1)				ENVIRONMENTAL (Attachment 2)	GENERAL INFORMATION
Illness	Injury	Non-Injury			
☐ RMTC ☐ VC ☐ DAW ☐ Fatality	☐ RMTC ☐ RWC ☐ DAW ☐ Fatality	☐ Inj. Prevented ☐ PreCautionary ☐ First Aid PSA ? ☐ Yes ☐ No	☐ PSA ☐ Bus. Loss ☐ Dept. Repl. ☒ Internal	☐ Internal Plant ☐ Dow ☐ Agency	Date of Incident: 11/11/93 Time of Incident: 9:00 PM Date Investigated: 11/12/93 Date Report Submitted:

Block in Which Incident Occurred: Chlor-Alkali II, Block 36 Location within Block: Cell Area
Name of Involved Employee: None Master or Social Sec #: N/A
Employee Classification: N/A Time in Class (mos): N/A
Time at Dow(mos.) N/A Time on Job (mos): N/A
Contractor Firm: None Contract Supervisor: N/A

For Reactive Chemicals, Chemical Exposure, or Environmental Incidents:

Chemical Involved: _____ Quantity Released (lb): _____
Spill Category: ☐ A ☐ B ☐ C (for Environmental Incidents only) C121993- 5
Short Incident Description (less than 10 words): Hydrogen leak / fire on hydrogen log expansion boot

Full Incident Description:

A small fire developed at a hydrogen leak from an expansion boot on the west end of S-8 hydrogen log. The fire was extinguished and joint was tightened.

Accident / Incident Type (Attachment 3): 200 Fire / Explosion

None Body Part(s): N/A

Job Being Performed (Attachment 4):

Group I: 100 Operation Routine Group II: 035 No Task

Causes At the Time Of the Incident:

999 OTHER - Leak Pre-Existing Causes: 830 Procedures

(see Attachment 5 for Cause Definitions)
Root Cause (select one of above): 830 Procedures

Follow-Up Actions:

Action: Revise procedure for banding of boots to hydrogen logs

Responsible (Name / #): Armstrong Expected Date: 12/17/93 Actual Date: 8/31/94

Action: _____

Responsible (Name / #): _____ Expected Date: _____ Actual Date: _____

Action: _____

Responsible (Name / #): _____ Expected Date: _____ Actual Date: _____

Action: _____

Responsible (Name / #): _____ Expected Date: _____ Actual Date: _____

Action: _____

Responsible (Name / #): _____ Expected Date: _____ Actual Date: _____

Action: _____

Responsible (Name / #): _____ Expected Date: _____ Actual Date: _____

Action: _____

Superintendent's Signature _____ Investigated By Pittman, Dominique, Armstrong, Landry Signature of Injured N/A

Form L-63 (Revised 1/93)

DO A 029605
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Operation Requirements CI-1 and CA-2
Follow-up actions from CA-2 Cell Explosion Investigation

Communication: CI-1 and CA-2 Communications Notes

Effective: 12/21/94

The following actions are to be added to the minimum requirements for cell operators:

1. Visual round on all radial distributors once per shift.
2. Run 2 salt cells on each round. There are to be 2 salt rounds per shift unless approved by the shift supervisor or his designee.
3. Salt check cells will be separated by a minimum of 2 full covers. The location of the salt cells will be a cell crew responsibility.

Periodic salt profiles will be re-instituted on cell crew.

4. Plugged radial feeders should be unplugged per procedure promptly.
5. Salt should be taken off the series if the highest of the two salt cell is >300 but less than 305 for 2 consecutive rounds

-OR-

the salt is higher than 305 on any round.

Salt should be put back on when the maximum salt sample is <300 gpl and all other series parameters appear normal.
(hydrogen, voltage, pH etc.)

6. Series gas chromatographs are vital instruments. If they malfunction the operator should perform any known repair procedures or the analyzer technician should be called out.

Ed Pittman
Cell Operations Production Supervisor
12/21/94

Emergency
Drill
Reviews

②

LAD EMERGENCY DRILL REPORT

Plant: Chlor-Alkali Dept. (block 29)

Date: 5/31/95

Shift/Team: "B" shift and Day Personnel

Participants: Same

Drill Scenario: HCL line west of HE-201 has severe leak. Wind is out of WNW at 5 MPH.

Actions:

- 1) Spill was announced as a drill.
- 2) The spill horn was set by the control room operator.
- 3) Control room operator called Security.
- 4) Page was made to clear the block craftsmen to the warehouse.
- 5) HCL to outfall control was blocked.
- 6) Solvents was notified that Caustic block had no pH control.
- 7) Outside operator updated situation.
- 8) Made sure that the sump was routed to the outfall and not T-2.
- 9) Craft personnel were accounted for.
- 10) HCL line was isolated.
- 11) Called office personnel and accounted for.
- 12) Washed up leak and tagged.
- 13) All clear was given.

Comments: Operations personnel responded well to the drill. Some of the Day personnel were not aware of all responsibilities but were concerned enough to ask questions as to what happens next. Several persons with key responsibilities were out of the block at the time of the drill.

Changes Suggested: Yes

LAD EMERGENCY DRILL CRITIQUE

Most all of the personnel without emergency responsibilities knew what to do during the drill. Craftsmen sheltered immediately as well as day personnel in the office building. A few problems encountered were:

- 1) Group leaders did not report to the control room as to personnel safety status and if everyone was accounted for. This information needed to be requested by the control room.
- 2) Area sweeps were late.
- 3) The emergency plan found in the control room was an obsolete version. Emergency responsibilities had not been changed to reflect Department personnel changes.
- 4) One individual entered the block while the red lights were flashing. The individual said he knew what the flashing lights were for but just didn't see them.

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**LAD EMERGENCY DRILL
CHANGES/FOLLOW-UP ACTIONS**

Change/Follow-Up Action: Communicate drill findings to all personnel.

Responsible Person: Donnie Landry

Expected Completion Date: 11/28/95

Actual Completion Date: 11/28/95

Change/Follow-Up Action: Generate a quick and easily accessible list of emergency actions with both primary and backup responsibilities listed by names.

Responsible Person: Ike Sumly

Expected Completion Date: 4/30/96

Actual Completion Date:

Change/Follow-Up Action: Inform personnel of the requirements concerning communication of personnel status to the control room.

Responsible Person: Donnie Landry

Expected Completion Date: 11/28/95

Actual Completion Date: 11/28/95

DO A 029610
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Change/Follow-Up Action: Reveiw and update the block emergency plan as needed.

Responsible Person: Ike Sumly

Expected Completion Date: 12/31/95

Actual Completion Date: 12/31/95

Change/Follow-Up Action: Determine requirements, if any, for use of the "buddy system" when sweeping the plant for stragglers.

Responsible Person: Donnie Landry

Expected Completion Date: 11/30/95

Actual Completion Date: 11/30/95

DO A 029611
CONFIDENTIAL

LAD EMERGENCY DRILL REPORT

Plant: Chlor-Alkali Dept. (blocks 35,36)

Date: 6/1/95

Shift/Team: "B" shift and Day Personnel

Participants: Same

Drill Scenario: Liquid Cl₂ leak on line to Cl₂ Plant at PSV-515
(located N/W of T-35 in the piperack)

Actions:

- 1) The spill was announced as a drill.
- 2) The spill horn was set by the control room operator.
- 3) Security was called and a block page was made to clear areas.
- 4) Air handlers were turned off in B-3601.
- 5) Announcement to clear B-3601.
- 6) Control room operator simulates use of fresh air mask.
- 7) Control room operator communicates with outside operator on isolation of the leak. Cl₂ plant to block and sniff from their end.
- 8) Operator and permit writer don SCBA's and sweep the block for personnel.
- 9) Leak is isolated and spill condition cleared after 15 minutes from first page.

Comments: Operations personnel responded well to the drill. Some of the Day personnel were confused as to what to do and where to go without instruction. Day personnel in blocks 35 and 36 evacuated as instructed. There were no reports to the control room as to status of personnel at assembly points.

Changes Suggested: Yes

DO A 029612
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LAD EMERGENCY DRILL CRITIQUE

Building air handling units were shut off and intakes closed. Security was called, appropriate pages were made, and control room operator simulated use of fresh air system. All personnel responded well to instructions. Observations of problems were as follows:

- 1) Personnel response to the initial page was confused. Personnel with key responsibilities during emergencies were either absent or serving as observers. Backup for those personnel was not clear.
- 2) Not everyone had all required PPE available for use. Time was lost trying to find it.
- 3) Block 35 personnel responded to the evacuation instructions but did not contact the control room once reaching the assembly point to notify of status.
- 4) Day personnel responded to the evacuation but did not contact the control room.

**LAD EMERGENCY DRILL
CHANGES/FOLLOW-UP ACTIONS**

Change/Follow-Up Action: Communicate drill findings to all personnel.

Responsible Person: Donnie Landry

Expected Completion Date: 11/28/95

Actual Completion Date: 11/28/95

Change/Follow-Up Action: Generate a quick and easily accessible list of emergency actions with both primary and backup responsibilities listed by names.

Responsible Person: Donnie Landry

Expected Completion Date: 4/30/96

Actual Completion Date:

Change/Follow-Up Action: Inform personnel of the requirements concerning communication of personnel status to the control room.

Responsible Person: Donnie Landry

Expected Completion Date: 11/28/95

Actual Completion Date: 11/28/95

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Change/Follow-Up Action: Determine requirements (if any) for use of the "buddy system" when sweeping the plant site for stragglers.

Responsible Person: Donnie Landry

Expected Completion Date: 11/30/95

Actual Completion Date: 11/30/95

DO A 029615
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LAD EMERGENCY DRILL REPORT

Plant: Chlor-Alkali Dept. (block 36)

Date: 9/14/95

Shift/Team: "C" shift - Clayton Chavis, Pat Graham, Mike LeJeune, Henry Woods

Participants: Same

Drill Scenario: While operator was making a Cell Area round, he noticed the smell of something burning between S-1 and S-2. Upon further investigation, the source was identified as being a hydrogen wye on S-4.

Actions:

- 1) Area Operator notified Control Room Operator and searched for fire extinguisher.
- 2) Control Room Operator made block page and notified Plant Security.

Changes Suggested: Yes

LAD EMERGENCY DRILL CRITIQUE

- 1) First response to fire should have been to spray water and not spend time looking for a fire extinguisher.
- 2) Extra SOS investigated the fire instead of reporting to and backing up the Control Room Operator.

**LAD EMERGENCY DRILL
CHANGES/FOLLOW-UP ACTIONS**

Change/Follow-Up Action: Communicate drill findings to all personnel.

Responsible Person: Donnie Landry

Expected Completion Date: 12/14/95

Actual Completion Date: 12/14/95

Change/Follow-Up Action: Train Operations Personnel on types of Cell Area fires and appropriate response to each.

Responsible Person: Operations Supervisors

Expected Completion Date: 6/30/96

Actual Completion Date:

Change/Follow-Up Action: Communicate backup responsibilities of the Second S.O.S. on shift during emergency situations.

Responsible Person: Operations Supervisors

Expected Completion Date: 12/31/95

Actual Completion Date: 12/31/95

DO A 029617
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LAD EMERGENCY DRILL REPORT

Plant: CA-2

Date: 12-12-95

Shift/Team: "D" Team

Participants: Mike Prejean, Debbie Halbert, Clay McBunch, Dean Under

Drill Scenario: Motor on Fan E-214A is out of the hole, & E-214B motor Breaks shaft. (Outside Temp is 80°)

Actions: (Those actions taken by personnel participating in the drill)

Board Operator = Start cutting load quickly. Monitor Tempers closely. Bring down Circuits as quick & as safe as possible. Clear Area of Non-essential personnel. Notify management of prob
Extra S.O.S. = Assist Board operator as needed. Check on taking in 235# steam & shooting Caustic Plant.

West Side O.S. = Report to Cells while bringing down Circuits. When Circuits are De-energized, bottle them up. Report to Control Room for Further instructions.

East Side O.S. = Make Sure Area is clear of non-essential Personnel. Look into H₂O Sprayers on E-214 tubes to help slow the Temp. rise. Report to Control Room for further instructions.

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LAD EMERGENCY DRILL CRITIQUE

(How did the drill go? Any significant findings/problems - good and bad?)

Went good.
Talked to Keith the said the temp. should
rise as fast as we think, but he thinks this
is the right thing to do.

Changes Suggested: Yes/No No

**LAD EMERGENCY DRILL
CHANGES/FOLLOW-UP ACTIONS**

Change/Follow-Up Action:

Responsible Person: _____

Expected Completion Date: _____

Actual Completion Date: _____

Change/Follow-Up Action:

Responsible Person: _____

Expected Completion Date: _____

Actual Completion Date: _____

Change/Follow-Up Action:

Responsible Person: _____

Expected Completion Date: _____

Actual Completion Date: _____

LAD EMERGENCY DRILL REPORT

Plant: CAUSTIC

Date: 12/12/95

Shift/Team: C - shift

Participants: GARY Gilchrist, FRANCIS ALBARADO, RAY Brown

Drill Scenario T.C. Spill (Tank Car Overflowed)

Actions: (Those actions taken by personnel participating in the drill)

Operator notified Tank Car loader of spill

Operator helped loader to shut off flow to car.

Operator called control room and reported that (2) tank cars had overflowed. Approx 300 lbs

Board man notified security of spill type and amt.

Security notified environmental.

Env. called Board man (caustic) and ^{was} given details of the spill.

Plant security made an on site inspection.

Contaminated area was washed down.

(Had there been standing caustic Lo-vac would have been called to assist us.)

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LAD EMERGENCY DRILL CRITIQUE

(How did the drill go? Any significant findings/problems - good and bad?)

- ① Tank Car loader failed to log spill in log book
- ② Boardman comments were confusing as to the causes of spill per log book and green sheet.

Changes Suggested: Yes/No

Talked with loader about clearly communicating the log book. Also boardman to make sure notes in log book and green sheet are clear and precise

LAD EMERGENCY DRILL CHANGES/FOLLOW-UP ACTIONS

Change/Follow-Up Action:

Responsible Person: Boardman

Expected Completion Date: ASAP

Actual Completion Date: _____

Change/Follow-Up Action:

Responsible Person: _____

Expected Completion Date: _____

Actual Completion Date: _____

Change/Follow-Up Action:

Responsible Person: _____

Expected Completion Date: _____

Actual Completion Date: _____

DO A 029621
CONFIDENTIAL

LAD EMERGENCY DRILL REPORT

PLANT: CA-2

DATE: 3-27-95

SHIFT/TEAM: A Shift

PARTICIPANTS: Randy Hay
Benson Mable
Ron Everber
Dale Perkins

DRILL SCENARIO: Picked up 100 PPM Cl₂ at outfall
Probe #9 + #10 found it to be a ruptured
liquid Cl₂ line at the PSV Station.
(we are on the Mid Night Shift)

COMMENTS: ① Notified Security and the Cl₂ Plant
② Block Line on North of GT-2 and Head Cl₂ Plant
Block it on then end the Menemys Spill
③ Notify CA-2 Management of Situation
④ Prepare Line for Maltona as soon as possible

CHANGES SUGGESTED: YES (see page #2)

✓ NO

DRILL DOCUMENTATION MUST INCLUDE:

- A. COVER SHEET (Page #1)
- B. DRILL CRITIQUE (Page #2)
- C. CHANGES/FOLLOW-UP ACTIONS (Page #2)
- D. COMMUNICATION (Page #3)

DO A 029622
CONFIDENTIAL

LAD EMERGENCY DRILL CRITIQUE

CRITIQUE OF DRILL, WHAT WAS LEARNED FROM DRILL?

N/A

DO A 029623
CONFIDENTIAL

LAD EMERGENCY DRILL REPORT

Plant: Chlor-Alkali Dept. (block 29)

Date: 7/25/95

Shift/Team: "D" shift - Dale Duval, Joyce Geason, David Broussard, Herbert Duggan

Participants: Same

Drill Scenario: Power Failure - Lost all lights in the Control Room, outside in the Plant, and most all mechanical equipment.

Actions:

- 1) Activated Power Failure Procedure.
- 2) Kept User Plants up with C/E. Some of the user pumps were able to be restarted immediately.
- 3) Cl₂ Plant having problems getting river water. Cut back on water to CD-203 and CD-204 in order to help problem.
- 4) Tank car and truck loading was down and contacted loader to secure area, then report to the Control Room.

Changes Suggested: Yes

DO A 029624
CONFIDENTIAL

LAD EMERGENCY DRILL CRITIQUE

- 1) Lighting in the Control Room was inadequate.
- 2) Outside lighting was inadequate.
- 3) Most newer Operations Personnel not very familiar with Power Failure Procedure.
- 4) Need easily accessible storage area for flashlights.
- 5) Cl2 Plant had problems getting river water. Didn't have enough available operators to allow someone to leave to restart river water pumps.

DO A 029625
CONFIDENTIAL

**LAD EMERGENCY DRILL
CHANGES/FOLLOW-UP ACTIONS**

Change/Follow-Up Action: Communicate drill findings to all personnel.

Responsible Person: Donnie Landry

Expected Completion Date: 12/14/95

Actual Completion Date: 12/14/95

Change/Follow-Up Action: Audit emergency lighting in the Control Room

Responsible Person: Leonard Fair

Expected Completion Date: 3/15/96

Actual Completion Date:

Change/Follow-Up Action: Review Power Failure Procedure with Operations Personnel.

Responsible Person: Operations Supervisors

Expected Completion Date: 12/31/95

Actual Completion Date: 12/22/95

DO A 029626
CONFIDENTIAL

Change/Follow-Up Action: Discuss with Cl2 Plant Management th availability of Cl2 Plant Operations Personnel to restart river water pumps after such power failures.

Responsible Person: Allan Sandow

Expected Completion Date: 3/31/96

Actual Completion Date:

Change/Follow-Up Action: Evaluate methods to maintain uninterrupted C/E flow to Glycol I Plant.

Responsible Person: John Dizor

Expected Completion Date: 12/31/95

Actual Completion Date: 12/31/95

DO A 029627
CONFIDENTIAL

Annual
Lockout/Tagout

③

Special Tagging Considerations

Red Tags are standard cards used to identify all isolating devices used for energy control.

They are warning devices and DO NOT provide physical restraint to prevent operation of the device, such as that which would be provided by a lock.

Individuals must not get a false sense of security from the presence of the tag.

When a Red Tag is attached to a device, that device is NOT to be operated under any circumstances.

The tag must NOT be removed, ignored, or otherwise defeated.

Red Tags must be legible and understandable.

The tag is to be securely fastened to the device so it cannot be accidentally detached.

Any Red Tags found unattached must be reported to department supervision immediately.

Violation of the Lockout/Tagout standard will result in appropriate disciplinary action.

Lockout/Tagout Responsibilities

Owner:

1. **Establish isolation procedures**
2. **Specify and purchase lockable equipment when available**

Operations Representative:

1. **Attach locks or tags on equipment being isolated**
2. **Physically verify isolation (ensure equipment rendered safe)**
3. **Review conditions with job representative and workers**
4. **Address worker concerns**
5. **Review and communicate addendums**
6. **Verify release after work complete**
7. **Notify personnel when equipment placed back in service**

Job Representative:

1. **Review job scope with operations representative**
2. **Review, verify, and confirm isolation**
3. **Resolve differences with operations representative**

Workers:

1. **Review prior to signing job acceptance**
2. **Communicate concerns**
3. **Notify operations representative when complete, scope changes, or other hazards identified**
4. **Return equipment to safe status**
5. **Sign released when job complete**

DO A 029630
CONFIDENTIAL

O₂/Combustible
meter
Re-certification

④

S-208, EXPLOSIMETERS (COMBUSTIBLE & OXYGEN METERS)

I. General Information

- A. Scope** To specify the limitations, testing, and maintenance of explosimeters and oxygen meters.
- B. Statement of Standard** Explosimeters and Oxygen Meters are to be tested prior to use. Any meter which fails to function properly shall not be used.
- C. Definitions** **Explosimeter** - meter used to measure the level of oxygen and combustible gases in an area to ensure a safe work atmosphere
- D. Responsibilities**
- 1. Department Supervision:**
 - a. Administer this standard
 - b. Designate the individual department meter contact
 - c. Ensure meters are returned to the Instrument Shop for the quarterly inspection and calibration and whenever found defective
 - d. Establish a process to maintain documentation of persons trained to use meters
 - 2. Instrument Department:**
 - a. Train and certify Department Meter Contacts annually as instructors. Appropriately document.
 - b. Purchase meters for use in the Division, maintaining appropriate records
 - c. Maintain list of meters approved for division use
 - d. Recommend meters for Department use
 - e. Perform in-depth inspection and calibration of department meters quarterly in central Instrument Shop and repair defective meters
 - f. Maintain records of meter inspection and repair for a period of three years plus current
 - 3. Department Meter Contact:**
 - a. Ensure proper care of these meters
 - b. Ensure the proper use of the meters
 - c. Be certified by the Instrument Department as a meter instructor
 - d. Certify others in their area in the safe use of these meters

II. Training Requirements

- A. Users** Only persons who have successfully completed the Oxygen and Explosimeter Training Class, and who have valid certificates, may use meters.

Users must demonstrate competency as a part of training.

Recertification is required annually.

- B. Trainers** The Department Meter Contact will certify others in their area. This person must be experienced in the use of the meters, a certified user, prior to be trained as an instructor.

III. Selection and Purchase of Meters

- A. Miscellaneous** Meters used will be evaluated for accuracy, reliability, and maintenance repair cost prior to division use.

For selection of the meters most suitable for departmental needs, consult the Instrument Department. They will in turn order the appropriate meters.

IV. Calibration and Testing of Meters

- A. Designated Areas** Each department using meters will have a designated place for storage, charging, and testing/calibration of the meters.

All meters not being used should be in this area.

- B. Calibration Station Setup** The calibration station must conform to the "Explosion Meter Calibration Station" diagram in Attachment 1.

NOTE: Only rechargeable batteries are to be used in meters due to the explosion potential of alkaline batteries when attempting to recharge.

- C. Calibration Gases** A cylinder of 2.5% Methane in air mixture will be used for testing combustible gas meters. Use of any other mixture must be approved by the Instrument and Safety Departments.

Calibration gases should be purchased in 220 cu. ft. cylinders. Small test cylinders should be used for field calibration only when meters are used for prolonged periods.

- D. Calibration and Testing Schedule** Meters are to be tested and calibrated prior to each use. In addition, in-depth inspection and calibration must be performed by the Instrument Department at least quarterly.

E. Calibration Procedure

The steps below can be applied to most meters. For a more specific check, follow the instructions for meter being used.

Units must be tested in a clean, combustible-free atmosphere.

Step	Action
1	Remove the sample probe and tube. Check cotton filter housed in meter end of probe. If dirty or wet, replace filter.
2	Clean and dry the moisture trap (if applicable).
3	Turn unit on and check battery voltage. NOTE: Never calibrate a unit plugged into charger.
4	Check pump flow and alarm (if applicable).
5	Zero oxygen meter using Nitrogen. If not zero, adjust zero potentiometer until zero is obtained.
6	Check oxygen reading in air. Should be 21%. If not, adjust oxygen calibrate potentiometer until 21% reading is obtained.
7	Check combustible meter for zero in clean air. If not reading zero, adjust combustible gas zero potentiometer until zero reading is obtained.
8	Introduce calibration gas (2.5% Methane in air). Combustible gas meter should go upscale to 55% for Gastech GX-3, 1214, GP204 2.5% for BioMarine 902A. If reading is incorrect, adjust combustible gas span potentiometer until correct reading is obtained. NOTE: An explosion meter with a bad combustible gas detector will appear to be working. The ONLY way to tell if the sensor is good is by putting a calibration gas on it and checking the span.

F. Confined Space Entry Post Use Testing

Meters must be tested after use but prior to entry in confined space entry situations (See USA-5). Only steps 4 and 6 listed above are required for this post use function check. Do not issue the permit until this post use test is completed. If the meter requires any adjustments, do not permit the entry.

G. Procedure for Defective Meters

If the unit fails any of the steps above, doesn't hold calibration or function properly, or if the user is not satisfied that the unit is working properly, **DO NOT USE IT**. Tag the unit and send it to the Instrument Department for repair.

DO A 029634
CONFIDENTIAL

II. Additional Procedures

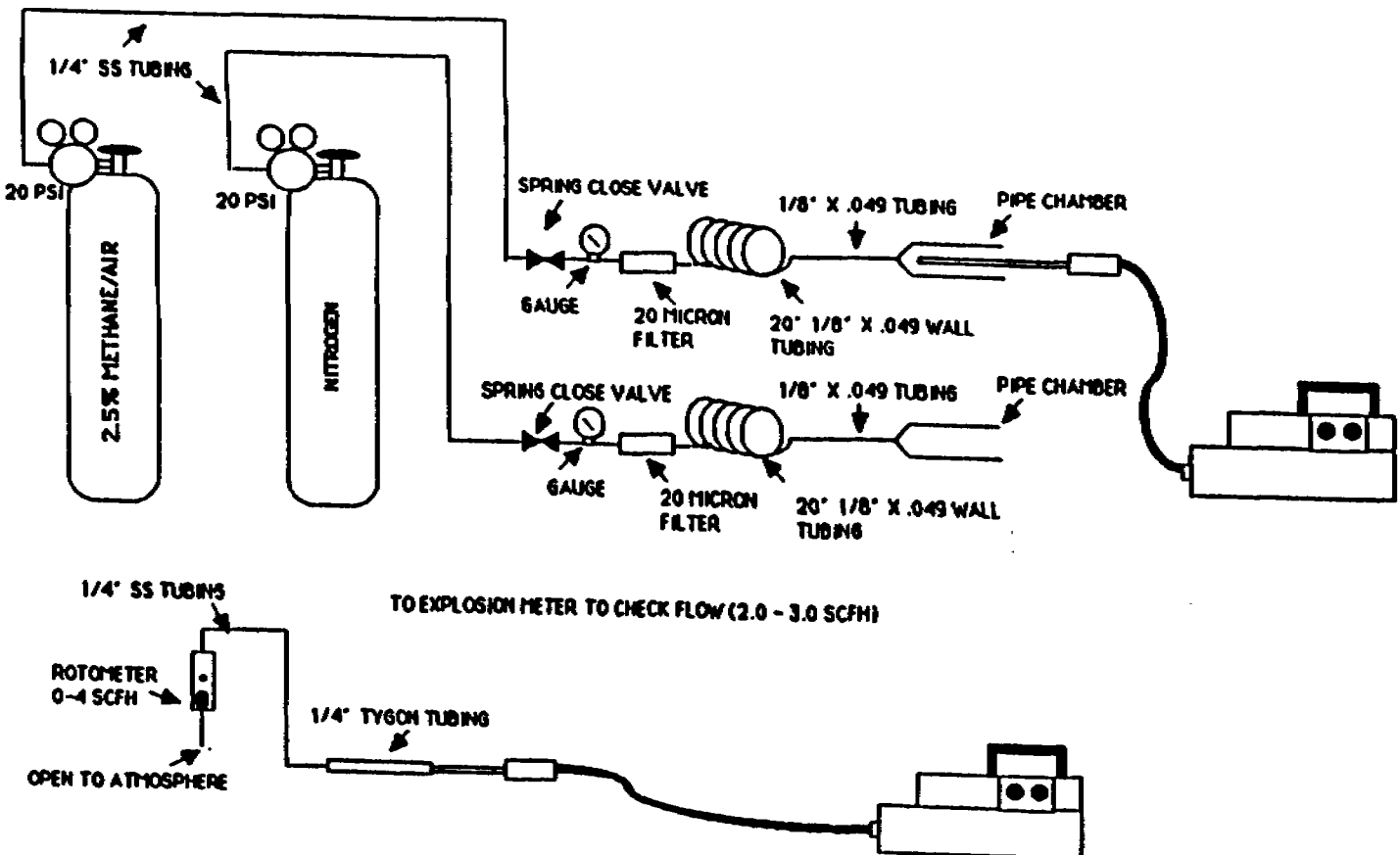
- A. Isolation** If one of the accepted methods for isolating equipment listed in Section IV.A.2.a. of USA-5 cannot be performed then the alternate method to be used must be approved by the Superintendent/Department Head.
- If blinds or pancakes are used to provide isolation, then the blind thickness shall meet Dow Engineering Details L4G-6420-01 for RF and FF flanges and L4G-6420-02 for RTJ flanges (See Attachments 2 and 3).
- B. Air Quality Testing** Air quality tests will be performed at all expected entry points into the confined space.
- Consider also the possibility of stratification of the atmosphere within the confined space. If it is possible, testing must be done at a variety of points within the space.
- The post use functional check required by USA-5, Section IV.C.3, need not include recalibration of the instrument. Checking it against a known reference sample is sufficient.
- C. Ventilation** If forced or induced ventilation is used, it
- should provide a minimum of ten volume changes per hour,
 - must have a valve or switch readily accessible to allow fast shutoff of the air should a spill occur
- D. Testing for Concentration of Last Contained Compound** Confined spaces should be cleaned below the Threshold Limit Value (TLV) of the last contained compound (see Attachment 1). If not, entry procedures must be reviewed and approved by Industrial Hygiene.
- If there is no simple method to determine the TLV or the chemical does not have a published exposure guideline and/or it is known that the chemical does not cause acute inhalation toxicity (i.e., death or serious illness), then a procedure which includes cleaning or decontamination, the use of ventilation or PPE, and which has been approved by Industrial Hygiene, can be used in lieu of obtaining a TLV.
- E. Lighting** Low voltage, explosion proof, lighting is preferred. If the situation however requires more lighting than this can provide, the lighting used must be 115VAC industrial grade with a caged protector and protected by a Ground Fault Circuit Interrupter (GFCI) located outside of the space.

V. Limitations and Other Considerations

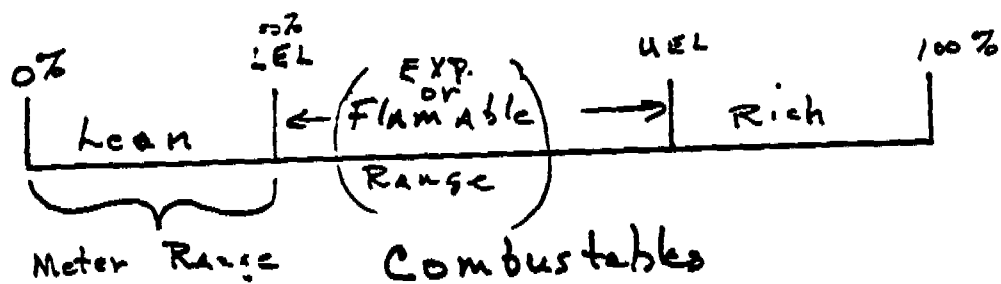
- A. Temperature Exposure** The approved explosimeters are not good for temperatures below 5 °F or above 140 °F.
- When used at 100 to 140 °F, the meter must be recalibrated in the field at a temperature which approximates the one at which it will be used.
- B. Extended Usage** Meters used continuously for extended periods, such as to monitor welding or hot work for a whole shift, should be tested and calibrated periodically (as conditions warrant but at least every 4 hours) to correct any drift due to temperature changes, sample changes, degradation of sensor, etc.
- C. Different Explosive Limits than Checked** The meter is calibrated with 2.5% Methane in air. The compounds to be checked may have a different explosive limit. In addition, permanently mounted meters may be calibrated for a different explosive limit other than the meter.
- Consult the Instrument Department in these situations.
- D. Oxygen Deficient or Oxygen Rich Atmospheres** An explosion meter cannot be used to measure combustible gas in atmospheres that are oxygen deficient, below 10%, or oxygen rich, more than 25%, oxygen by volume. These conditions will cause erroneous readings.
- Special fittings are available for these instances, such as sampling in nitrogen or other inert atmospheres. These meters and fittings must be clearly labeled for their special use and stored separately from the normal meters. It is recommended that they be placed under lock and key.
- These meters require special training not included in the regular explosion meter training classes. Improper use of this fitting could result in a false sense of safety. For the correct training in the use of this type of fitting, contact your Department Meter Contact or the Analyzer Department.
- E. Silicone Compounds** Tetraethyl lead or compounds containing silicon may poison combustible gas sensors, and give inaccurate readings.
- F. Concentrations > 100 % LEL** In combustible gas concentrations above 100% L.E.L., the explosion meter will give erroneous readings.
- G. Liquids** These units are not made to take liquid samples. If liquid is drawn into the unit, it is no longer safe for use and should be tagged and sent to the Central Instrument Shop immediately.

Attachment I

Explosion Meter Calibration Station Diagram



As a National Brand



DO A 029638
CONFIDENTIAL

NAME: _____

MASTER # _____

DEPARTMENT: _____

DATE: _____

1. Why do we use the portable combustible gas/oxygen meters in the Division?

2. What does the scale on the combustible gas meter indicate?

3. If a person is not certified in the use of the explosimeter, is it O.K. for him/her to use it? _____

4. At what oxygen meter reading would you start to get concerned about your safety? _____

5. At what elevated temperature is re-calibration required? _____

6. What is meant by lower explosive limit (LEL) and upper explosive limit (UEL)?

LEL _____

UEL _____

Why is this important for you to know? _____

7. Describe the meter reactions to these mixtures.

A. Lean mixture _____

B. Explosive mixture _____

C. Rich mixture _____

8. What is the correct meter setting when calibrating the oxygen meter in normal atmospheric air? _____

9. What is meant by the vapor density of a gas?

Why is this important for you to know? _____

10. When checking for combustible gas, the oxygen meter should read with in what range? _____

DO A 029639
CONFIDENTIAL

11. If you have purged a line with inert gas, such as nitrogen, what should you check first? _____
Why? _____
12. What is the only way for you to know that a combustible gas sensor is working properly? _____
13. When a liquid is drawn into the explosimeter, is it safe to reuse the meter after you have thoroughly dried it? _____
14. Are the Divisions combustible gas/oxygen meters accurate between the LEL and the UEL? _____
15. If you are using the explosimeter and the combustible gas meter pegs up scale, what action should you take? _____
16. If you zero the combustible gas meter and put 2.5% methane/air calibration gas on the unit and the meter reads 35% LEL, what should you do? _____
17. What should the combustible gas meter read with 2.5% methane/air calibration gas applied? _____
18. Is it acceptable to check calibration of the explosimeter while they are plugged into the charge unit? _____
19. List three conditions that would cause an explosimeter to require re-calibration.
- A. _____
- B. _____
- C. _____
20. Where should you test and calibrate the explosimeter? _____

NAME: _____

MASTER # _____

DEPARTMENT: _____

DATE: _____

1. Why do we use the portable combustible gas/oxygen meters in the Division?

2. What does the scale on the combustible gas meter indicate?

3. If a person is not certified in the use of the explosimeter, is it O.K. for him/her to use it? _____

4. At what oxygen meter reading would you start to get concerned about your safety? _____

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LEL _____

UEL _____

Why is this important for you to know? _____

7. Describe the meter reactions to these mixtures.

A. Lean mixture _____

B. Explosive mixture _____

C. Rich mixture _____

8. What is the correct meter setting when calibrating the oxygen meter in normal atmospheric air? _____

9. What is meant by the vapor density of a gas?

Why is this important for you to know? _____

10. When checking for combustible gas, the oxygen meter should read within what range? _____

DO A 029641
CONFIDENTIAL

11. If you have purged a line with inert gas , such as nitrogen, what should you check first? _____
Why? _____

12. What is the only way for you to know that a combustible gas sensor is working properly? _____

13. When a liquid is drawn into the explosimeter, is it safe to reuse the meter after you have thoroughly dried it?

14. Are the Divisions combustible gas/oxygen meters accurate between the LEL and the UEL? _____
15. If you are using the explosimeter and the combustible gas meter pegs up scale, what action should you take? _____

16. If you zero the combustible gas meter and put 2.5% methane/air calibration gas on the unit and the meter reads 35% LEL, what should you do?

17. What should the combustible gas meter read with 2.5% methane/air calibration gas applied? _____
18. Is it acceptable to check calibration of the explosimeter while they are plugged into the charge unit? _____
19. List three conditions that would cause an explosimeter to require re-calibration.
- A. _____
- B. _____
- C. _____
20. Where should you test and calibrate the explosimeter?

NAME: _____

MASTER # _____

DEPARTMENT: _____

DATE: _____

1. Why do we use the portable combustible gas/oxygen meters in the Division?

2. What does the scale on the combustible gas meter indicate?

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5. At what elevated temperature is re-calibration required? _____

6. What is meant by lower explosive limit (LEL) and upper explosive limit (UEL)?

LEL _____

UEL _____

Why is this important for you to know? _____

7. Describe the meter reactions to these mixtures.

A. Lean mixture _____

B. Explosive mixture _____

C. Rich mixture _____

8. What is the correct meter setting when calibrating the oxygen meter in normal atmospheric air? _____

9. What is meant by the vapor density of a gas?

Why is this important for you to know? _____

10. When checking for *combustible gas*, the *oxygen meter* should read with in what range? _____

11. If you have purged a line with inert gas, such as nitrogen, what should you check first? _____
Why? _____

12. What is the only way for you to know that a combustible gas sensor is working properly? _____

13. When a liquid is drawn into the explosimeter, is it safe to reuse the meter after you have thoroughly dried it?

14. Are the Divisions combustible gas/oxygen meters accurate between the LEL and the UEL? _____
15. If you are using the explosimeter and the combustible gas meter pegs up scale, what action should you take? _____

16. If you zero the combustible gas meter and put 2.5% methane/air calibration gas on the unit and the meter reads 35% LEL, what should you do?

17. What should the combustible gas meter read with 2.5% methane/air calibration gas applied? _____
18. Is it acceptable to check calibration of the explosimeter while they are plugged into the charge unit? _____
19. List three conditions that would cause an explosimeter to require re-calibration.
- A. _____
- B. _____
- C. _____
20. Where should you test and calibrate the explosimeter?

Review of
1995
Safety
Performance

5

CHLOR-ALKALI DEPARTMENT EMPLOYEE SURVEY
SAFETY INCENTIVE PROGRAMS FOR 1996

SURVEY RESULTS AND COMMENTS

Safety Question of the Week:

Weekly	___ 15 ___
<u>Monthly</u>	___ 18 ___
Other	___ 1 ___
Discontinue	___ 10 ___

Comments:

Have it every two wks.
Increase monthly award \$. (3)

Environmental Question of the Week:

Weekly	___ 15 ___
<u>Monthly</u>	___ 17 ___
Other	___ 2 ___
Discontinue	___ 10 ___

Comments:

Have it every two wks.
Increase monthly award \$. (3)

Unsafe/Environmental Condition Reports:

Award for best:	<u>Monthly</u>	___ 20 ___
	Other	___ 8 ___
	Discontinue	___ 16 ___

Comments:

Award the best one for the year.
Award the best USCR monthly. (2)
Award the best quarterly. (7)

Other Comments/Ideas:

Send a copy of the questions to the lab.
Discontinue BBS Program. (4)
Have on the spot awards for doing/knowing the correct thing.
Use some award money to buy biscuits for shift folks monthly.
Stop giving individual awards and promote team atmosphere by giving food, jackets, etc.
Include outstanding items from BBSO's in selection pool.
Have monthly drawings for # of BBSO's over the minimum.

DO A 029646
CONFIDENTIAL

Miscellaneous Safety Concerns:

Elevated Work - Fall Protection - Use of:

Employees must be continuously protected from injury due to falls, including movement to and from the actual work area, whenever exposed to an unprotected side or edge with a fall hazard of 6 ft. or more or that is above a recognized hazard such as an open vat, rotating equipment, etc.

Safety Harnesses and Lanyards are to be inspected by the user prior to use.

Each lanyard must have a current metal inspection tag that has not expired. Tags on lanyards are good for only 6 months.

Each harness must have a current metal inspection tag that has not expired. Tags on harnesses are good for only 1 year.

These are 2 (two) separate inspection tags.

If a harness or a lanyard does not have a tag, or if the tag has expired, that piece of equipment may not be used. This is a Dow Policy, which OSHA will consider as Law for Dow.

It is a severe violation of Dow Policy and OSHA Standards to remove a good tag from one piece of safety equipment and place it on another.

THE LOUISIANA DIVISION IMPLEMENTATION PLAN

VISION ELEMENT

SAFETY & HEALTH ENHANCEMENT

Sponsor: Chris Messelt

KEY OBJECTIVE

We will strive to achieve a workplace where *no one is injured*.

MEASURES & TARGETS

Our site OSHA injury rate will be <1.0 by December 1996.

Compliance process deficiencies will be zero by April 1996, including C-9 checklists, red tags, and safe work permits.

Process Safety improvement will include 100% on MOC, 100% on focused training, 100% on leak-free commissioning and 100% on PSM compliance by December 1996.

No incidents with community impact by December 1996.

Dow caused distribution incidents will be reduced 55% by December 1996 and 90% by December 1998 with 1994 as the base year.

DO A 029648
CONFIDENTIAL

1995 Permit and Red Tag Audits - Division Required:

(Ike and Wilbert check 5 of each per week per Division Guidelines)

Permits Audited: 470

Red Tags Audited: 455

% Correct: 97.2%

% Correct: 96.5%

DO A 029649
CONFIDENTIAL

BBS Observations Data:

(Department Data through regular Observations)

Permits Audited: 1085

Red Tags Audited: 644

% Correct: 96%

% Correct: 97%

DO A 029650
CONFIDENTIAL

BBS Observations Data From CA II Shutdown:

Permits Audited: 460

Red Tags Audited: 224

% Correct: 97%

% Correct: 97%

DO A 029651
CONFIDENTIAL

Fourth Quarter - Dow only:

Permits Audited: 39

Red Tags Audited: 45

% Correct: 91%

% Correct: 90%

DO A 029652
CONFIDENTIAL

Chlor-Alkali Department Safety Checklist Compliance: (Formerly C-9)

Total Items Required: 370

Discrepancies: 8

% Compliance: 97.8%

Discrepancies: 5 weekly checks on emergency horns and lights were missed.

2 annual training requirements were not completed (O2/Combustible meter and Scott air pack)

1 annual audit was not completed (Flow check on sandblast unit)

Emergency Plan Review

DO A 029654
CONFIDENTIAL

6

CHLOR-ALKALI II EMERGENCY PLAN

AUTHOR: Lot's Of Folks
DEVELOPED: Unknown
REVIEWED: N/A
REVISED: 12/15/95
BY: D.L.Landry

EMRPL440.DOC
REVISION #: 3
APPROVED BY: Gretchen Leblanc
EFFECTIVE DATE: 12/22/95

AREA:	SAFETY	TYPE:	EMERGENCY PLANS
--------------	---------------	--------------	------------------------

I. OBJECTIVE:

To ensure that the Public, Chlor-Alkali II Personnel, and all other Division Personnel are properly protected and informed in the event of an Emergency situation. This includes the safe and orderly Shutdown of CA II.

II. REVISIONS:

- | | |
|----------|--|
| 12/15/95 | Added Level I and II Freeze Plans to Section III. Added 4. Severe Freeze to Section V, B. Reworded Section XIV., B, 2 to include requirement for personnel searching plantsite alone to carry radios. Added new Section XXI on Severe Freeze and re-numbered remaining sections. |
| 12/28/94 | Miscellaneous corrections throughout the entire plan and the addition of new sections: IV-C-5, VIII-T, VIII-U, XI-D-E-F-G-H, XVII-G. MAJOR REWRITE. |
| 07/30/93 | Changed Control Room Breathing Air Description |

III. REFERENCES:

Louisiana Division Emergency Plan Manual
Chlor-Alkali II Hurricane Preparation Procedure
Chlorine Leak Response Procedure
Computer Room Fire Procedure
Level I and II Freeze Plans for CA II

IV. POSSIBLE INTERNAL EMERGENCIES:

- | | |
|----|--|
| A | Power Failures |
| B. | Chemical release to Air, Ground, or Water (Chlorine, Caustic, HCL, H ₂ SO ₄ , Oil, Carbon-Tet, Fuel Gas, Hydrogen, Sodium Hypochlorite, Sodium Bisulfite). |
| C. | Fires |
| 1. | Hydrogen Fires |
| 2. | Building Fires |
| 3. | Oil Fires |

4. Fuel Gas Fires
 5. Cl_2 - Fe Fires
- D. Hydrogen Air Explosion
 - E. Hydrogen Chlorine Explosion
 - F. Nitrogen Trichloride Exothermic Reaction
 - G. Injuries: Chemical, Falls, Etc.

V. POSSIBLE EXTERNAL EMERGENCIES:

- A. Chemical Release
- B. Weather
 1. Hurricane
 2. Floods
 3. Tornadoes
 4. Severe Freeze
- C. Bomb Threats
- D. National Emergencies

VI. PERSONNEL:

SHIFT MAKE UP 5 People (1 - Operations Supervisor, 2 - S.O.S.'S, 2 - O.S.)

DAY PERSONNEL 19 Dow People (Approx.) 15 Craft People (Approx.)

VII. HAZARDOUS CHEMICALS AND QUANTITIES:

Chemical	Quantities Stored
Carbon Dioxide	100,000 Lbs.
Carbon-Tetrachloride	1,000 Gal.
Caustic - 50% (100% Basis, Non-Flammable)	18,300,000 Lbs.
Cell Effluent (9% Caustic, 100% Basis, Non-Flammable)	2,600,000 Lbs.
Chlorine Liquid And Gas	300,000 Lbs.
Fuel Gas	1,000,000 CFH
Hydrochloric Acid	60,700 Gal.
Hydrogen Gas Production	9,000 SCF/Min
Hydrogen Gas (Tube Trailer)	0 To 30,000 SCF
Oil	53,000 Gal.
Sodium Hypochlorite	851 Lbs.
Sulfuric Acid	32,000 Gal.
Sodium Bisulfite	8,000 Gal.

Liquid Chlorine Capacities of Plant Equipment under normal operating conditions:

LIQUID CHLORINE PIPING:

LINE SIZE	CAPACITY PER 100' OF PIPE (LBS.)
1/2"	20
3/4"	35
1"	56
1 1/2"	132
2"	218
2 1/2"	480
3"	827
6"	1876

LIQUID CHLORINE EQUIPMENT:

TAFFY POT	4,000
T-205	12,400
T-204	700
D-501	8,500
D-526	2,600
T-503	2,400
T-35	150,000
E-531 SHELL	18,000
D-511	2,000
E-511 HEAD	2,000
E-512 HEAD	800
D-529	2,600

VIII. EMERGENCY ALARMS AND EQUIPMENT:

- A. Emergency Horn - Used to communicate Immediate Emergency Condition and Block Evacuation of Craft Personnel.
- B. Battery Powered Lighting in the Control Room and Motor Control Center.
- C. Sprinkler System (located over C-201 A) manually activated from the Control Room.
- D. Twelve Deluge Guns, strategically located.
- E. One Portable 150# Dry Chemical Fire Extinguisher and one Portable 75# CO₂ Fire Extinguisher.
- F. Three 2 Bottle and One 6 Bottle Fresh Air Breathing Apparatus on carts.
- G. One Control Room Breathing Air System connected to 12 Fresh Air Bottles with enough air to supply three Operators with air for greater than 90 minutes.
- H. Thirteen Scott Air Paks located in the Control Room Building.
- I. 5-Minute Escape Packs located throughout the Plant

- J. Spare Canisters for Full Face Masks, located in the Control Room Building.
- K. Hand-Held Fire Extinguishers Located Throughout The Plant.
- L. Electrical Flashsuits located in the Motor Control Centers.
- M. Steam Snuffing Systems for Gas Turbine Tunnel Oil Fires.
- N. Safety Showers with Alarm System in the Control Room identifying location.
- O. Bumpless Transfer System (U.P.S.) for Supplying Power to the TDC and MOD 5 Process Control Computers.
- P. Two Battery Banks for supplying power to the U.P.S. System and Critical Equipment.
- Q. Building Housing Absorbent Pads, Booms, Oil Sorb.
- R. Two Sandbag Storage Boxes for emergency use.
- S. Votrax Audible Alarm -Synthesized Voice for early warning of CL₂ Cells Spill Potential.
- T. O₂ Analyzers in the Field Instrument Houses Alarm in the Control Room.

IX. ELECTRICAL FEEDERS:

- A. Two 14KV Electrical Motor Power Sources which can be automatically transferred.
 - 1. Division Power Feeder H-10
 - 2. Division Power Feeder H-28
- B. 14KV Alternate Cell Power Source H-10 and H-28.
- C. 2.4KV Motor Power Feeders are:
 - 1. L-21/Backup L-11, L-22
 - 2. L-34
 - 3. L-23
- D. Two D.C. Battery Banks
 - 1. Process Control Computer Backup MOD 5
 - 2. Equipment D.C. Oil Pumps (Backup)
 - 3. Control Room Instrumentation
 - 4. Plant Intercom System Fed from an Inverter (Backup)

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X. SAFETY EQUIPMENT REQUIREMENTS:

Each Person is required to have:

- A. Hard Hat
- B. Respirator
- C. Monogoggles
- D. Hearing Protection
- E. Rubber Boots - For all Operating Personnel and Visitors entering the Caustic, Cell, and Acid Areas. Electrically Tested Boots are Required in the Cell Area.

All Plant Visitors are required to use the Sign-In Book for visitors, located in the Office Professional's Office Area.

All Dow In-Block Non-Operations Personnel must use the Sign-Out Board for Emergency Accountability.

XI. EMERGENCY RESPONSE INITIATION:

- A. The Control Room (EXT.-8527) is the Central Point for all information and instructions during any Emergency. It is the responsibility of the Operations Supervisor or his/her substitute to see that the proper Emergency Procedure is activated and that evacuation, if necessary, is carried out in a safe manner

B Reporting Emergencies:

Any person discovering an Emergency Situation will immediately contact the Control Room and give the following information:

- 1. Location of the Emergency
- 2. Type of Emergency
- 3. Any other Pertinent Information

The Control Room Operator will immediately sound the Emergency Horn, if necessary, and report it to Plant Security by dialing (EXT. 333.) He/She must report to Security the following:

- 1. His/Her Name
- 2. His/Her Department
- 3. The Type of Emergency (Fire, Spill, Injury, Etc.)
- 4. The Chemical Involved (Gas or Liquid, and Size, if Applicable).
- 5. The Location in the Block, if Applicable.
- 6. Any Specific help needed, if known (Fire, Truck, Ambulance, Etc.)

If A Fire Truck or Ambulance is being dispatched, the Control Room Operator will direct someone to meet it at the appropriate Block Entrance.

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C. Upon Sounding of the Emergency Horn:

1. All uninvolved Dow Operations Personnel must report to the Control Room for instructions.
2. An announcement should be made at once regarding the Emergency.
3. If manpower is available, an Operations person should be assigned to monitor the Plant Ecology System.
4. The Safety Contact, Environmental Contact, MOD 5 Specialist, and the Instrument Supervisor, if present, should report to the Control Room for possible assistance.
5. All Burning, Welding, and other Potential Ignition Sources must be extinguished.
6. Block Craft Personnel will evacuate the Block and assemble at Block 35 Warehouse unless otherwise directed. I & E Personnel will shelter in the I & E Shop in B-3601.
7. All Non-Essential Dow Personnel (Personnel without Defined Emergency Responsibilities) and Visitors will report to the Conference Room in Building 3601, unless otherwise directed, for further instructions. Sheltering at that location is normal procedure.

D. Response to Votrax Audible Alarm: The Votrax Alarm will clear area 1 due to the potential of backpressure of the Cells, as indicated by Pressure Transmitters on each Series. Unless a routine test of the Spill Alarm is being conducted, it must be assumed that a Hazardous Condition exists and the following actions taken:

1. All Craft Personnel are required to use Mouthbit Respirators and Leave Area 1. Normal assembly is at the Block 35 Warehouse.
2. The Control Room Operator will check Instrumentation to determine necessary actions to correct the situation. Assistance from the Outside Area Operator may be required and that person will use appropriate Respiratory Protection depending on present conditions and instructions from the Control Room Operator. See CL₂ Leak Response Procedure.
3. Once the situation is corrected, or determined that it was a false alarm, an all-clear will be announced and the craftsmen may return to work. Unless otherwise instructed, work permits must be re-initialed or approved prior to returning to work.

E. Response to CL₂ Detection on Area Monitors:

1. The Control Room Operator will announce that CL₂ is being detected in an area and that all personnel in that area are to use their respirators and leave the area. Those persons should evacuate to a crosswind location or the Block 35 Warehouse, depending on wind directions or instructions from Dow Operations.
2. The Control Room Operator will notify the Area Operator of the location and amount of CL₂ being detected so that the Operator can safely investigate the source with appropriate Respiratory Protection. See CL₂ Leak Response Procedure.
3. Once the source has been determined and the problem has been corrected, an all-clear will be given and personnel may return to work. Unless otherwise instructed, work permits will need to be re-initialed or approved prior to returning to work.

F. Response to Instrument House O₂ Alarms: These houses are equipped with O₂ Analyzers with a green light for indication of adequate O₂ content and a red light with Audible Alarm to indicate that the O₂ content is at an unacceptable level. Personnel may not enter an Instrument House unless the O₂ level is adequate. If an O₂ Analyzer in one of these houses alarms, it will also alarm in the Control Room. Response is as follows:

1. The Control Room Operator will notify the Area Operator to check the house to verify that it is not occupied by personnel. The Instrument Analyzer Technician will be notified immediately to determine validity of the alarm.
2. Persons may not enter the house without first checking the O₂ content with a portable meter.
3. In the event of an emergency, the Control Room Operator will notify Security at (EXT.#333) for assistance.

G. Response to Safety Shower Alarms:

1. The Control Room Operator will immediately announce that there is a Safety Shower Alarm and the location of it.
2. Operations Personnel in the block must respond to the page immediately. Personnel responding to the page must be wearing all Area Required PPE.
3. Immediate assessment of injury and/or potential must be made upon arrival at the Safety Shower. Response to this assessment should be as follows:

If the Shower Alarm was an accidental activation, the Control Room Operator must be notified and an all-clear given immediately.

If the Shower Alarm was used to attract attention to an accident/injury other than a Chemical Exposure, such as a fire, unconsciousness, or a fall, the Control Room Operator must be notified immediately so that appropriate help can be called. If Chemical Injury and/or potential is evident, or even questionable, the very first and most important thing to do is to get the injured under the shower, clothes removed, if contaminated, and using the eyewash, if affected. If the injury's eyes are not affected by the Chemical Exposure, the Monogoggles should not be removed. If a Chemical Leak affects the safe use of the shower, the injured must be moved to a Safer Shower location. Precautions must be taken to prevent further injuries/exposures to all personnel. The second most important thing to do is to notify the Control Room Operator of the situation so that medical help can be called for. After help is called on (EXT. #333), the Control Room Operator will assign someone to meet the Ambulance at the nearest drive access to the shower. The injured must remain washing under the shower, or eyewash for a minimum of 15 minutes, or until told to stop by a member of the Dow Medical Team.

4. An all-clear will be given on the Shower Alarm when it has been determined that all necessary help has arrived on the accident scene and that the situation is under control.

H. Response to Division Pages:

1. When division pages are made pertaining to Spills, Fires, etc. Originating from Blocks other than CA II, an assessment will be made as to the impact on CA II. Once this has been done, an announcement by the Operations Supervisor, or designee, will be made as soon as possible on the effects of the condition on CA II. More detailed responses are contained in Section XV., Part E, of this procedure.

I. General Operator Responsibilities:

1. The Control Room Operator is the primary focal point for all communications in emergencies. He/she will direct the actions of Operations Personnel, as needed, during an emergency.
2. The extra S.O.S. on shift will report to the Control Room and assist the Control Room Operator as needed.
3. Outside Operators will address the emergency situation as is required and directed by Control Room Operators.
4. The Operations Supervisor will give direction, instruction, and assistance as needed.

XIV. EVACUATION:

A. The Plant will be Evacuated on Instructions from any of the following:

1. The Emergency Coordinator or Plant Security in a Division-Wide Emergency or release from an adjacent area.
2. The Chlor-Alkali Manager
3. The Chlor-Alkali II Plant Superintendent or His/Her Substitute, The Operations Supervisor, or Substitute. Unless specified otherwise, all Personnel will be Evacuated except the Shift on Duty, The Plant Superintendent, and those people specifically designated at the time of the Emergency to assist in Emergency Procedures.

B. Personnel Evacuation Responsibilities:

Block Supervision will be responsible for carrying out Evacuation of Personnel.

During Day Working Hours:

1. The Craft Supervisor, with the assistance of the Block Foreman, will account for and direct the movement of Maintenance Personnel on the roadways. Industrial Craft Foremen should report their workers accounted for to the Contract Supervisor or Foreman.
2. The Operations Supervisor and Permit Coordinator will inspect the Plant Site for Personnel injury and evacuation problems. Personnel searching the plantsite alone must have radio contact with the Control Room at all times.
3. The highest level of Supervision of the Non-essential Engineering Staff will account for and direct the assembly and evacuation, if necessary, of all Non-essential Day Personnel and Visitors.

4. The Electrical Supervisor, with the Senior Dow Instrument person as backup, will account for and direct the Instrument Group and the Electrical Group.
- C. Emergency Radios will be carried by:
1. Operations Supervisor on Duty
 2. Highest Level of Supervision in charge of Evacuation
 3. Craft Supervisor
- D. In-Block Communications Radios will be carried by:
1. Permit Coordinator
 2. Same Person as #2. in "C" above
 3. Personnel searching plantsite
- E. All Radios should be used for Monitoring Purposes with the exception of Requested Updates and/or Reporting Emergencies.
- F. If an Emergency should occur at Night or on Weekends, the Operations Supervisor or Shift Leader will evacuate Personnel as they see necessary and assign a leader to carry a radio.
- G. Evacuees will remain together until the Emergency is cleared.
- H. Evacuation Routes:
- Emergency Conditions and Wind Direction will dictate Evacuation Routes. However, Normal Evacuations will be to Union Road at the South side of the Block, then East to Chlorine Road and Gate #1 or West on Union Road toward Gate #4.
- I. Assembly Areas:
1. Craft Personnel will assemble at Block 35 Warehouse unless directed to another assembly point. I & E Personnel will shelter in B-3601 Shop unless otherwise directed.
 2. All Dow Non-essential Personnel will assemble at the Conference Room. The Office Professional, with the Safety Contact as backup will check the Visitors Sign-In Book and the Sign-Out Board and bring a Personnel Roster for a head count. The highest level of Supervision present will account for all personnel. If the Conference Room is not a safe place to meet, assembly should be at a Roadway Assembly Point. If these Assembly Areas are not accessible due to the emergency, the parking lot or North-South Road at the West Block limits should be used. An area located crosswind to a Spill will normally be the best location. If the decision is made to remain in the building (Cocooning or Sheltering), all building air intakes must be shut off.

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XIII. PLANT SHUTDOWN:

A. Plant Shutdown will be executed on instructions from the following:

1. Chlor-Alkali Manager
2. Chlor-Alkali II Plant Superintendant Or Substitute.
3. The Operations Supervisor or Substitute.
4. The Emergency Coordinator or Plant Security in a Division-Wide Emergency.

B. Upon completion of the Shutdown, the remaining Personnel may be Evacuated, depending on the nature of the Emergency. The Operations Supervisor and two S.O.S.'s will remain except when severe danger exists.

Note: If an Immediate, Total Evacuation is announced, the Crash Shutdown Procedure will be initiated and "all" personnel must leave as instructed.

C Crash Shutdown Procedure:

1. De-Energize Generators.
2. Trip Gas Turbines
3. Ensure Adequate Instrument Air Pressure
4. Energize J-250 Dump Scrubber
5. Trip Chlorine Compressor
6. Activate EBV's
7. Trip C-520
8. Block In 235# Steam

If Time and Conditions Permit, Proceed with an Orderly Plant Shutdown.

XIV. POWER FAILURES:

A. Chlor-Alkali II has seven (7) Electrical Feeders entering the Plant. A failure of any of the Feeders will result in a Plant upset. However, the most Critical Failure would be a loss of H-28 and the loss of H-10. In such an event:

1. Evacuate Craft Personnel.
2. Account for, and/or Evacuate, Non-Essential Dow Personnel.
3. Report any Chemical Releases to Plant Security on (EXT.-333).
4. Assure the Operation of the Chlorine Dump Scrubber.
5. Confirm the Operation of the Effluent Recovery System.
6. Stabilize Plant Condition.
7. Communicate with the Division Power Plant on failure.
8. Notify Supervision.

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XV. CHEMICAL RELEASE (GAS) - CHLORINE/ACID/CAUSTIC/CARBON-TET FROM CHLOR-ALKALI II:

- A. If a Toxic Gas release occurs in this plant or from some other source which effects Personnel at CA II, we will normally continue to operate. Depending on the situation, that decision will be made by the Operations Supervisor or Control Room Operator in the Plant at the time of the incident.

The Control Room Operator:

1. Sound the Emergency Alarm.
2. Notify Security using (EXT. 333) (If the Release is in CA II)
3. Issue Immediate Standby and/or Evacuation Communication, as applicable.
4. Notify Supervision.

Remaining Operations Personnel:

1. Account for Block and Craft Personnel
2. Secure Plant

- B. Chemical Release (Liquid) Acid/Caustic/Oil/Carbon Tet/Sodium Hypochlorite from Chlor-Alkali to Outfall:

A major Safety and Ecology problem could develop if any one of several 50% Caustic or Cell Effluent tanks developed a major leak. The Plant Area is not diked sufficiently to prevent a major Caustic Spill from entering the return canal. The best course of action would be to evacuate any people who might be exposed to the liquid and notify the Solvents Plant to dump HCL in the return canal to help neutralize the Caustic. (See Tank Spill Procedure following).

Control Room Operator:

1. Notify Security using (EXT. 333).
2. Contact Solvents Plant of approach of material.
3. Notify Supervision.

Remaining Operations Personnel:

1. Take Immediate Steps To Prevent Further Spillage.
2. Secure Plant

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C. Internal Chemical Release:

Control Room Operator:

1. Evacuate necessary people from affected area.
2. Sound Emergency Horn if Total Block Evacuation is necessary.
3. See Division Guidelines on Internal Reporting of Releases.

Remaining Operations Personnel:

1. Secure Problem Area.
2. Account for all affected Personnel.

D. Waste Storage Spill Cleanup: To be added later

E. Chemical Releases originating from Neighborhood Plants:

1. The Operations Supervisor or the Control Room Operator will assess the situation and make a judgement as to the duration and Concentration Exposure to CA II. A Block announcement, concerning the status and impact on CA II Block, should be made as soon as possible after the assessment has been made.
 - A. Non-Essential Personnel may be evacuated and Plant Operation continued with Safety Precautions and Equipment.
 - B. If Gas Turbine intakes are affected, Turbines may be shut down. Partial Plant Operations will continue.
 - C. A decision may be made to initiate a Total Plant Shutdown and Evacuation.

Chlorinated Methanes could release flammable materials which might carry into the CA II Block. The most likely material would be a Methylchloride Spill since they inventory a large quantity. If a large vapor cloud of Methylchloride entered CA II, all ignition sources should be shut off. The Methanes Plant is more likely to have an HCL or CL_2 Spill which could enter CA II. Neither of these materials is flammable. That situation should be handled as an internal release as normally handled. The Chlorine I Plant is likely to have Chlorine Gas Releases which, at some time, will enter the CA II Plant. These can be handled as Plant Personnel normally handle our own releases. The Cellulose Plant is very unlikely to have an incident which would produce an emergency situation in the CA II Plant. Cellulose does inventory Propylene Oxide. If, for some reason, a Propylene Oxide Vapor Cloud occurred and did move into the CA II plant, it would be imperative to shut off all ignition sources immediately. Propylene Oxide is extremely flammable and explosive.

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XVII. FIRES:

Fires should be reported to the Control Room, giving location and severity.

At this time, without delay, action should be taken. If fire can be handled with Block Personnel, it should be. However, (EXT. 333) should be dialed, giving all necessary information.

A. Hydrogen Fires

1. Stack Fire - Can be extinguished by switching stacks. Procedure should be followed carefully.
2. Hydrogen Headers - CA II Fire Protection for assistance. If fire cannot be extinguished with a water hose or fire extinguisher, cut load to 20KA and add Nitrogen to Hydrogen Log.

B. Electrical Fires

In most cases, Electrical Fires may be extinguished by opening necessary switches to isolate, then use Fire Extinguishers. Use CO₂ extinguishers first and dry chemical if CO₂ is not available. CO₂ is preferred over dry chemical, since the dry chemical leaves a powder residue that will require extensive cleaning.

C. Oil Fires

Oil fires are more likely to get started around the Gas Turbine Areas. The Turbines run at very high temperatures and small leaks can occur. Temperature Monitoring Devices are installed in the Exhaust end of both G.T.'s and are indicated in the Control Room. In addition, fixed dry Chemical Extinguishers are located in this area for quick and effective fire fighting capabilities. 15# steam is piped into Gas Turbine Tunnels for extinguishing Oil Fires. If fires are of a small, contained nature, dry chemical will extinguish them easily. However, if the fire is large, Fire Fighting Equipment or Foam Application may be necessary.

D. Building Fires:

1. Evacuate the Building of Staff Personnel.
2. Notify Plant Security on (EXT. 333).
3. Control Room Operators are to prepare to operate with Breathing Air.
4. Air Conditioning Unit should be shut down.
5. Electrical supply to affected areas should be de-energized.
6. Activate Halgon* System if Computer Banks are threatened.
*Halgon will not support life. Breathing Air is necessary for entry following activation of the System. Refer to Computer Room Fire Procedure.
7. Standby for Operations Upset and possible shutdown.
8. Assist Plant Security, as possible.
9. Notify Supervision.

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E. Fuel Gas Fires:

1. Notify Plant Security on (EXT. 333).
2. Direct Water Monitors to area to cool Equipment.
3. Hook up N₂, start a purge, and block in the fuel source. Allow the N₂ to purge the fuel to the fire source.
4. Stabilize Plant Operation.
5. Notify Supervision.

F. Hydrogen Chlorine/Air Explosions:

1. Notify Plant Security on (EXT. 333).
2. Account for Craft and Block Personnel. Inspect Plant Site for possible injuries.
3. Issue Immediate Evacuation Communications.
4. Secure Plant.
5. Notify Supervision.

G. Hydrogen Tube Trailer:

The Hydrogen Tube Trailer becomes CA II responsibility when it enters the division destined for CA II. Air Products, the supplier of the trailer, has an Emergency Response Team available to counter or assist with emergencies. Contact is by way of 1-800-523-9374. (Painted on the Tube Trailer).

H₂ is very light and rises into the atmosphere rapidly. The immediate leak area has the most potential to ignite. During daylight, a H₂ flame is nearly invisible. Evidence of a fire will likely be from impacted surrounding materials, or from feeling the heat of the fire.

In The Event Of A Leak Or Fire:

1. Notify Plant Security On (EXT. 333).
2. In the event of a leak, extinguish all ignition sources in the area.
3. Clear appropriate area of Personnel.
4. Direct Water Deluge Guns on the Tube Trailer for cooling as soon as a problem is detected.
5. Notify Air Products @ 1-800-523-9374 for possible assistance.
6. Evaluate the circumstances and determine if isolation is possible. The Division Fire Team will assist in this evaluation.

To isolate, Protective Clothing must be worn and approach slowly (feeling for heat). If unable to approach for isolation, allow Hydrogen to burn until source is depleted.

7. Stabilize Impacted Plant Operations.
8. Notify Appropriate Supervision.

XVIII. HURRICANES:

Refer to Chlor-Alkali II Hurricane Procedure in addition to Section "B" of the Division Emergency Plan Manual.

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XIX. FLOODS:

Refer to Division Emergency Plant Manual, Section "C".

XX. TORNADOES:

The purpose of this Procedure is to keep people from working where quick escapes are not possible while conditions are favorable for Tornadoes.

A. Tornado Watch

A Tornado Watch means conditions are favorable for Tornadoes. When under these conditions, all jobs need to be evaluated to make sure no one is in a position to be trapped somewhere in the Plant without a chance to escape. Some examples are as follows:

- A. No work is allowed on piperacks.
- B. No work is allowed on Scaffolds over 10 feet tall
- C. All Vessel Entries will be canceled until watch is over. Also, an announcement should be made on the P.A. of the condition. Everyone should be familiar with the Safety Locations located throughout the Plant.

B. Tornado Warning

A Tornado Warning means Tornadoes have been spotted in the area. When under these conditions, all work is to stop and everyone is to report inside immediately. No one is to go outside unless it is absolutely necessary.

XXI. SEVERE FREEZE:

Refer to CA II Level I and Level II Freeze Plans and the Division Plan.

XXII. BOMB THREATS:

Refer to Division Emergency Plan Manual, Appendix II

XXIII. LOCATION OF CRITICAL BLOCK VALVES:

All Critical Block Valves for Chemicals entering and leaving the CA II Block via pipelines are painted international orange and labeled as to the contents. Most of these valves are located in Block Limit Pipeways. These valves are all shown on one of the attached plot plans. Following the occurrence of any emergency, Plant Supervision will inspect and report any damage prior to start-up.

XXIV. EMERGENCY RESPONSE FOR A TANK SPILL IN THE CAUSTIC AREA AND/OR STORAGE TANK AREA

A. Problems/Hazards

1. Environmental Contamination

- A. No existing dikes to contain spill
- B. Outer perimeter ditches bypass Permitted Outfall

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2. Property Damage
3. Safety - Chemical Exposure - Personnel Exposure since areas are well traveled.

B. Definitions:

1. Massive Spill - A tank failure in which the contents are able to flow out without being restricted. This type of spill could dump contents of a Vessel in a short period of time.
2. Minor Spill - Small damage where contents can spill out at a low rate. Contents can be restricted or contained where the effects are not as critical.

C. Spill In S-301 Area

1. Indication Of Spill Condition
 - A. Visual Inspection of Tank
 - B. Sump V Overflow Alarm
 - C. Weir Level in S-301 Dropping for no apparent reason
 - D. CA II Outfall pH rises suddenly (Only if contents of tank leaks into Power Trench)
 - E. High pH in Ecology Area indicated by D-803's Filling Alarm and HCL Flow Deviation Alarm.
2. Response To Spill
 - A. Notify Security of Caustic Spill (EXT.-333)
 - B. Non-Essential Personnel Evacuation
 - C. Isolate outer perimeter ditch by blocking culvert at Northeast corner of Block and Southwest corner of block. Pallets with sand bags and a drum lid are located by both locations. Place the drum lid in front of the culvert and pile the sand bags behind the lid.
 - D. Stop any product from entering the tank and transfer as much out of the tank as possible to minimize spill loss.

D. Spill In Caustic Storage Areas

1. Indication Of Spill Condition
 - A. Visual Sighting
 - B. Erratic Level change in Tank
 - C. Unexplained high pH in Ecology Area as indicated by D-803's Filling Alarm and/or HCL Flow Deviation Alarm.
2. Response
 - A. Notify Plant Security of Spill Condition (EXT.-333)
 - B. Evacuate Non-Essential Personnel from area
 - C. Isolate outer perimeter ditch by blocking the culvert at the Northeast corner of the Block and the Southwest corner of the

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Block. Pallets with sand bags and a drum lid are located by both locations. Place the drum lid in front of the culvert and pile the sand bags behind the lid.

- D. Stop any product from entering the tank and transfer as much out of the tank as possible to minimize the spill loss.
- E. If the spill is flowing across the road on the Western perimeter of CA II, keep an eye on the River Water Canal which supplies Cellulose and Methanes to make sure none of the spill is flowing into that canal. If it appears that any material may get into the canal, notify Cellulose and Methanes.

XXV. SHUTDOWN OF BUILDING 3601 AIR HANDLING UNITS IN THE EVENT OF A SPILL OR FIRE (IF ACCESSIBLE):

The Safety Contact, with the Environmental Contact, and the MOD 5 Specialist, as backups, will shutdown the following Units:

Laboratory A/C Unit
Lunchroom A/C Unit
Air Handling Units for B-3601 - Three Breakers in the NE corner of the Control Room on panels behind Caustic MOD 5 cans:
DP-1-Bkr-1 (Labeled with Red Tape)
DP-1-Bkr-2 (Labeled with Red Tape)
Breaker next to DP-1 (South Side, Labeled with Red Tape)
MCC 103 #7/2 (Control Room A/H Unit on Roof)

After consideration, it was felt that the Computer A/H Unit could be left running.

Important Note: Although Designated Personnel are responsible for shut down of the A/C and A/H Units, all CA II Personnel should be familiar with these locations for shutdown in the event that the above-mentioned Personnel are absent at the time of a Spill

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