

LOSS PREVENTION AUDIT

Page 1

Prepared by: Leigh Hill Date: 4/10/96 Reviewed by: _____ Date: _____

A=Dow Rule or Regulation

B=Good Practice/Training

C=Hazard Analysis

VII. AUDIT QUESTIONS AND ANALYSIS

Operating Discipline

REFERENCE: Operating Discipline Standard for The Operating Units of Dow U.S.A.

- A 1. Yes ☒ No ☐ Have you filled out the plant self-evaluation forms to assess your plants progress on Operating Discipline?

Please provide these forms at the pre-audit meeting.

Section II Process Technology Documentation

Section V Process Risk Management

Section VI Operating Procedures

Section VII Process Control

Section VIII Operational Reliability

Section IX Dynamic Process Information

Section XII Industrial Hygiene

Plans: Complete the sections of the Operating Discipline Standard consistent with the LAD safety goals focusing primarily on areas of overlap with OSHA PSM.

- A/B 2. Who has primary responsibility for the plant's Operating Discipline?

Sidney Hood (Day Supervisor)

- A/B 3. How is the written portion of the Operating Discipline program maintained? (Have this available at the audit meeting.)

All training (IPT, resources, etc.) and procedural information is maintained electronically on a separate secure computer drive for Glycol-1. The self assessment information is kept in hard copy form only.

- A 4. Process Safety Information (OSHA 1910.119, Paragraph d)(Review the Operating Discipline Self-Evaluation on Process Technology Documentation, Process Risk Management, Industrial Hygiene.)

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2/5/97; LAD:bwb

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LOSS PREVENTION AUDIT

Page 2

- a. Is information included pertaining to the hazards of the chemicals used or produced by the process, and does the information include at least:

YES	NO	
x		• Toxicity Information
x		• PEL's
x		• Physical Data
x		• Reactivity Data
x		• Corrosivity Data
x		• Thermal and Chemical Stability Data
x		• Hazardous effects of inadvertent mixing of different materials that could foreseeably occur?

NOTE: MSDS's meeting the requirements of 29 CFR 1910.1200(g) may be used to the extent they contain the information required.

- b. Is information included concerning the technology of the process, and does it include at least:

YES	NO	
x		• A block flow diagram or simplified process flow diagram?
x		• Process Chemistry?
x		• Maximum intended inventory?
x		• Safe Upper and Lower Limits?
x		• An evaluation of the consequences of deviations?

(If the original technical information no longer exists, it may be developed in conjunction with the Process Hazard Analysis.)

- c. Is information included pertaining to equipment in the process, and does it include at least:

YES	NO	
x		• Materials of Construction?
x		• Piping and Instrument Diagrams (P&ID's)?
x		• Electrical Classification?
x		• Relief System Design and Design Basis?
	N/A	• Ventilation System Design?
x		• Design Codes and Standards Employed?
x		• Material & Energy Balances for Processes Built after 05/26/92?
x		• Safety Systems (e.g., interlocks, detection or suppression systems)

LOSS PREVENTION AUDIT

Page 3

- A 5. Operating Procedures (OSHA 1910.119, Paragraph f) (Refer to Operating Discipline Self-Evaluation on Operating Procedures)

Yes ☒ No ☐ Do written operating procedures exist for each process?

Yes ☒ No ☐ Do the procedures provide clear instructions for conducting activities safely?

Do the operating instructions address, as a minimum, steps for each operating phase, including?

YES	NO	
x		• Initial Start-up?
x		• Normal Operations?
x		• Temporary Operations?
x		• Emergency Shut Downs?
x		• Conditions Requiring Emergency Shut Down?
x		• Assignment of Shut Down Responsibility to Qualified Operators?
x		• Emergency Operations?
x		• Normal Shut Down?
x		• Start-ups following a turnaround or emergency shut down?

Yes ☒ No ☐ Are operating procedures readily accessible to employees who work in or maintain a process?

Yes ☒ No ☐ Are operating procedures reviewed as often as necessary to assure that they reflect current operating practice?

- A/B 6. Yes ☒ No ☐ Does the plant have a training process to keep people current on Operating Discipline?

Plans: OSHA requires refresher training every 3 years. In addition we perform technical evaluations for operations personnell semi-annually. These evaluations are based on IPT and current critical procedures.

LOSS PREVENTION AUDIT

Page 4

Process Hazard Analysis

Process Hazard Analysis (PHA) is required by the OSHA PSM Standard 1910.119, Paragraph e). This section of the Loss Prevention Audit along with the Reactive Chemicals Review, Chemical Exposure Index Review, Fire and Explosion Index, Hazardous Materials Transportation Review and others, constitutes Process Hazard Analysis for existing Dow facilities. This section of your PS&LP Audit will be retained for the life of the plant.

FLAMMABLE MIXTURES/COMBUSTIBLE DUSTS

C 1. Yes ☒ No ☐ Are flammable/combustible materials stored in your plant?

C 2. Yes ☒ No ☐ Are flammables loaded/unloaded in your plant?

A 3. Yes ☒ No ☐ Partly ☐ Are flammable materials processed in open, freely ventilated structures? (LPP 2.1.2.)

Plans: Finished PDC storage tanks, DV-851 A/B nitrogen purge vents to atmosphere_____

B 4. How do you prevent flammable mixtures in the vapor space of process tanks, storage tanks, rail cars, tank trucks, etc.? (LPP 10.2)
Flammable vents are purged with inert gases via vent systems to the THROX or in a few cases for tanks, to the atmosphere. In addition periodic checks of tanks for oxygen are made.

Plans: Where vents are purged to the atmosphere, capital projects have been defined to take these vents to the THROX. These projects will be prioritized by the business.

C 5. Yes ☒ No ☐ In process equipment operating under vacuum conditions, has the hazard of air introduction been evaluated?

(Example: Packing leaks on vacuum pumps, vacuum conditions resulting from temperature change associated with shutdowns, normal low pressure operations, etc.)

Plans: This hazard is identified and managed in procedures as part of operating discipline for glycol plant columns._____

LOSS PREVENTION AUDIT

Page 5

- B 6. Yes ☒ No ☐ Do you monitor system pressure and/or oxygen content in low positive pressure applications?

Plans: System pressure is monitored (i.e. hydrolyzer and degasser)_____

- C 7. Yes ☐ No ☒ a. Do you have a flare system?
Yes ☒ No ☐ b. Do you have a TOX, THROX?

If yes to either of the above, how do you prevent backflashes in the system? **Flame arrestors or piping diameter sized to prevent backflash (see attachment for design basis)**_____

Yes ☒ No ☐ Are temperature sensors utilized in conjunction with flame/detonation arrestors?

Plans: _____

How do you avoid flammable mixture within the header? (LPP14.2.7) _

Plans: _____The mixture is oxygen-free and chlorine content is controlled and trips are set on this composition. _____

Yes ☐ No ☐ NA ☒ Is your flare tip on a maintenance schedule?

How do you insure that you have a flame? _____

- C 8. Yes ☐ No ☒ Does the plant/process have potential combustible dust flammability concerns? (LPP 11.1)

If yes, answer the following questions:

Deleted as N/A

Does the plant have static electricity guidelines and programs (LPP 3.6)? **Yes**
Grounding procedures and trips are in place at the loading rack. Loaders hook up grounds on the TC and TT. The grounds are connected to the Modicon, so it can see if the TT/TC are grounded. If the Modicon senses a lost ground, the EBV closes.

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2/5/97; LAD:bwb

DO A 045536
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LOSS PREVENTION AUDIT

Page 6

Process Hazard Analysis

FACILITY SITING - DRAINAGE

REFERENCES: LPP 2.4, LPP 7.6.3.

- B 1. Yes ☐ No ☒ NA ☐ If one or more fire protection systems are activated, will flooding occur in the process area?

If so, where? _____

Plans: _____

- B 2. Yes ☐ No ☒ Can trenches, ditches, sewers, etc., back-up into the plant?

If so, where? _____

Plans: _____

- B 3. Yes ☐ No ☒ Would a fire in trenches, ditches, sewers, etc. expose the plant?

If so, refer to LPP 2.4.4. for cover recommendations.

Plans: _____

- A 4. Yes ☒ No ☐ Are all sewers trapped to prevent vapor backup?

Plans: _____

- A 5. Yes ☒ No ☐ NA ☐ Are tanks containing liquid with flash points less than 140°F diked or impounded? (LPP 7.6)

Plans: Drain valves stay closed; rain water is analyzed and drained with someone at the site, then the valve is closed. _____

LOSS PREVENTION AUDIT

Page 7

B 6. Yes ☐ No ☒ Don't Know ☐ Are diked walls liquid-tight? (LPP 7.6)

Yes ☐ No ☒ Are they tested?

Plans: _____

A 7. Yes ☐ No ☒ Are tanks located far enough from dike walls so that a leak will not spray over the wall. (LPP 7.6.2.)

Plans: _____

A 8. Yes ☒ No ☐ Is area drainage generally directed away from the process equipment?

Rate your drainage system:

Excellent ☒ Fair ☐ Adequate but Needs Improvement ☐

Plans: _____

B 9. Yes ☒ No ☐ Are drainage areas including ditches clean and free of obstruction/debris? (LPP 7.6)

B 10. Yes ☒ No ☐ Does your plant have secondary containment?

Yes ☒ No ☐ If so, are there written procedures covering operation, especially during emergencies?

Plans: Procedures are attached, but basically, when the level gets to 25% the pump comes on and pumps the pond down. The TOD is run two times a day. Do not know the design basis for the pond. _____

A 11. Yes ☒ No ☐ Do you have a written plan for handling spilled materials?

Plans: These procedures are part of the blocks operating discipline and SPC / SPCC requirements. Procedures attached. _____

LOSS PREVENTION AUDIT

Page 8

Process Hazard Analysis

WAREHOUSE STORAGE

Warehouse - An attached or detached building for storage of raw materials, finished products or maintenance items or equipment.

REFERENCES: Minimum Requirement, LPP 12.4.

- C 1. Yes ☐ No ☒ Not Required ☐ Are warehouse areas protected with fire protection or detection systems?
Plans: Only portable fire extinguishers _____

What is the warehouse inspection practice?
_____ Daily walk-through inspections.

- C 2. Yes ☐ No ☒ Are pallets stored within the warehouse? (LPP 12.4.3)
Plans: _____

- B 3. Yes ☐ No ☐ Are empty pallet stacks less than eight (8) feet in height? (LPP 12.4.3.)
Plans: Not applicable _____

- B 4. Yes ☒ No ☐ NA ☐ Where does sprinkler and fire fighting water drain? (LPP 12.4.4)
Plans: Plant surface drainage _____

LOSS PREVENTION AUDIT

Page 9

- C 5. What type fork truck is utilized in the warehouse?
Diesel Powered ☐ Gasoline Powered ☒ LPG Powered ☐
List types of fork trucks. Nissan 4000 _____

- C 6. Where is fuel storage for the fork truck located? (LPP 12.4.5) _____
Plans: Fuel is not stored in the block; a fuel truck comes by _____

- C 7. Yes ☐ No ☒ Are flammable or combustible liquids dispensed or
drummed in the warehouse area? (LPP 12.4.5)
Plans: _____

Process Hazard Analysis

EQUIPMENT/BUILDING LOCATIONS AND FIRE RISK

REFERENCES: Minimum Requirements, LPP 2.2. and 12.2.

- A 1. Yes ☐ No ☒ Do buildings and process structures meet the minimum separation distances as calculated by the F&EI (LPP 2.2?)

Yes ☒ No ☐ If minimum distance is not met, is the area protected?
Plans for areas of concern: Yes; explosion proof buildings, orientation of explosion panels on the THROX away from the buildings, redundant instrumentation to detect process upsets (vibration monitors, fire-eyes, etc.), combustible gas detectors and extensive fire protection equipment.

- A 2. Yes ☒ No ☐ Has the construction for occupied buildings in high hazard plants been evaluated per LPP 12.2.?

Yes ☐ No ☒ Are there significant areas of concern?

Plans: _____

- B 3. Yes ☒ No ☐ Are buildings of non-combustible construction?
Yes ☒ No ☐ Are temporary buildings (trailers) located to avoid exposing other critical facilities? (i.e.: under power line, pipelines, flammable storage)

Plans: _____

- B 4. Describe your buildings' air supply system. Review monitoring and emergency procedures regarding flammable and/or toxic releases. (LPP 12.1) _____

The air conditioner is a closed-circulation system. In the event of toxic releases, the AC is shut off as defined in the emergency plan. As much as possible buildings are located away from hazards (all loading operations at the tank farm), extensive monitoring is done for chlorine and combustible gases. This instrumentation is identified as critical and maintained as a high priority. Extensive fire protection (monitors and sprinkler systems) is utilized. Smoke detectors are located in all

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2/5/97; LAD:bwb

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LOSS PREVENTION AUDIT

Page 11

buildings and all employees receive annual fire protection training and emergency procedure drills are utilized annually as a minimum.

LOSS PREVENTION AUDIT

Page 12

Yes ☒ No ☐ Can the air supply be shut down in an emergency?

Yes ☒ No ☐ Do you monitor the air intake for flammable/toxic material?

Plans: chlorine monitors and combustible gas detectors are utilized in the process areas. _____

A 5. Yes ☒ No ☐ Are penetrations of fire walls properly protected?
(LPP 3.5.6)

Plans: Places where cables enter buildings is sealed. _____

A 6. Yes ☐ No ☐ Are fire doors inspected periodically and fusible link systems tested for closing (LPP 10.13)?

Plans: N/A _____

LOSS PREVENTION AUDIT

Page 13

Process Hazard Analysis

HUMAN FACTORS

(Technical systems and equipment designed so they can be used safely and efficiently by humans.)

- A 1. Yes ☒ No ☐ During a Process Hazard Analysis (i.e.; Project Review, Management of Change Review), are human factors considered? (For Example: "What if the operator adds material B instead of material A?")

Plans: _____

- B 2. Yes ☒ No ☐ Is adequate information about process conditions (normal and upset) displayed in the control room?

Plans: _____

- B 3. Yes ☒ No ☐ Are the displays visible from all normal areas in the control room?

Plans: _____

- B 4. Yes ☒ No ☐ Are automatic safety features provided to cope with a process upset when either a rapid response or complex information process is required?

Plans: _____

- B 5. Yes ☐ No ☒ Must any instrument, display, or control be disabled or bypassed manually as a normal part of the operation?

Plans: _____

LOSS PREVENTION AUDIT

Page 14

- B 6. Yes ☐ No ☐ Are alarm set points and process computer software protected from unauthorized change?

How: All are except points which are on the TDC _____

- B 7. Yes ☒ No ☐ Are critical inputs to the process control computer protected from incorrect entries?

Plans: _____

- B 8. Yes ☐ No ☒ Are there unnecessary alarms?

Plans: _____

- B 9. Yes ☒ No ☐ Is equipment labeling adequate for trained personnel to determine content and flow direction?

Plans: _____

- B 10. Yes ☒ No ☐ Do shifts communicate the process status (batch conditions, process abnormalities, equipment out of service, active work permits, etc.) to each other?

How: Operations log book (written) and permit board. _____

If not, plans: _____

- B 11. Yes ☒ No ☐ Are checklists used for critical procedures?

Plans: _____

LOSS PREVENTION AUDIT

Page 15

- B 12. Yes ☒ No ☐ Do the people developing and reviewing procedures analyze the job for hazards and identify the hazards in the procedure?

Plans: _____

- B 13. Yes ☒ No ☐ Are operating personnel able to read and understand process control programs?

Plans: _____

- B 14. Yes ☒ No ☐ Are operating personnel trained in using the process information computer?

Plans: _____

LOSS PREVENTION AUDIT

Page 16

Process Hazard Analysis

Chemical Exposure Index (C.E.I.) Summary for Consolidated Audit

When was the last C.E.I. Review? (Month/Year) 12/93

- A 1. What chemicals were discussed and what were their respective C.E.I. values?

CHEMICAL	C.E.I.	CHEMICAL	C.E.I.
Chlorine	576	Propylene Oxide	192
Propylene Dichloride	72		

- B 2. Please list ALL chemicals in your plant that will be reviewed during this audit.

1. Chlorine	4.
	5.
	6.

- B 3. Please list all chemicals that have potential spill/release scenarios with an ERPG/EEPG-2 hazard distance that exceeds the distance from your plant to the public.

1. Chlorine	4.
	5.
	6.

LOSS PREVENTION AUDIT

Page 17

CHEMICAL EXPOSURE INDEX

- B 1. Yes ☒ No ☐ Does the plant have procedures for determining the level of release for emergency communication?

Plans: _____

- B 2. Yes ☒ No ☐ Does the plant use an area monitoring system for the chemicals of CEI concern?

If the answer is YES, list:

Chemical	Detector Type	Detection Level
Chlorine	Rosemount	0.5 ppm

How often are these monitors checked and calibrated? Monthly

- Yes ☒ No ☐ Are plant personnel trained to respond to the alarms from area monitors?

Plans: _____

- A 3. Have the scenarios for potential chemical spills and gas releases included in this audit been reviewed with:

YES	NO		DATE REVIEWED
x		Plant Operators/Technicians?	12/93
x		Supervision?	12/93
	x	Other Affected Employees?	
	x	Process Engineering?	
x		Safety and Loss Prevention?	
	x	Adjacent Plant Supervision?	

LOSS PREVENTION AUDIT

Page 18

Have you reviewed scenarios from neighboring plants that may affect your area with:

YES	NO		DATE REVIEWED
	x	Plant Operators/Technicians?	
	x	Supervision?	
	x	Other Affected Employees?	

Plans: _____

- B 4. Yes [x] No [] Does the plant conduct routine, periodic "what if" emergency drills on the release of toxic chemicals?

When was the last drill? Month/Year: 9/96 _____

Plans: _____

- B 5. Yes [x] No [] Does the plant have written procedures detailing how to mitigate releases of chemicals in the plant?
(Examples: pump to another vessel, apply foam, temporarily plug hole, etc.) IPT modules are attached.

Yes [x] No [] Does the plant periodically train operating personnel on these procedures?

Plans: The IPT modules are used to train all new hires and our operators are recertified on this material every 3 years. _____

- B 6. Yes [x] No [] Are there checklists employed for the periodic inspection, maintenance, and testing of equipment used to mitigate spills or releases?

If yes, list: See Security Documentation & CGD testing history

Equipment	Last Inspection	Last Test

LOSS PREVENTION AUDIT

Page 19

- B 7. Yes ☒ No ☐ Does the plant monitor corrosion/erosion in the piping systems of the facility?

How is monitoring done? Visual inspection via PSM Program _____

- B 8. Yes ☐ No ☒ Does the plant have areas in the piping system that require constant or repetitive repairs?

- B 9. Yes ☒ No ☐ Does the plant have a preventative maintenance program in place to monitor the integrity of the piping system?

Consider all elements: i.e., paint, insulation, supports, shoes, etc.

Plans: PSM inspection program; see attached. _____

- B 10. Yes ☒ No ☐ Does the plant have procedures that define exactly who has the responsibility for the operation, inspection, and maintenance of adjacent and intra/interplant pipelines and associated equipment? C-9 files

Plans: _____

LOSS PREVENTION AUDIT

Page 20

Process Hazard Analysis

HAZOP

- C 1. Do any of your unit operations have:
- Yes [x] No [] an F&EI of 128 higher?
- Yes [x] No [] a C.E.I. of 200 or higher or?
- Yes [x] No [] meet the criteria for conducting a HAZOP as outlined in the Process Risk Management Guidelines for Facilities and Distribution?

Plans: The PO tank truck loading area has had a HAZOP study performed (see PHA file) due to F&EI. A HAZOP was also done on the titanium degasser area due to reactive chem incident (in PHA file). Our S&LP representative reviewed the chlorine C&EI and determined that a HAZOP review would not add value in this particular case since it is a pipeline scenario. _____

- B 2. Where a HAZOP Review has been performed (please list areas studied), what is the status of the recommendations from the HAZOP study?

Process	Process Unit
PCH Recovery	Titanium Degasser
PO Tank Truck Loading	Loading Rack

All Follow-ups are complete.

ADDITIONAL RISK EVALUATION

- C 1. Yes [x] No [] Has any additional risk evaluation or quantitative risk assessment been done in your facilities?

Plans: F&EI, CEI, DRI _____

- B 2. Yes [x] No [] Do you have a system for tracking risk evaluation recommendations until closed out?

Plans: A PC based system is used in the plant for tracking the follow-ups to completion _____

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2/5/97; LAD:bwb

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LOSS PREVENTION AUDIT

Page 21

(Revised 02/18/94; cmk)
2/5/97; LAD:bwb

DO A 045552
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C. Mechanical Integrity

Mechanical Integrity is a new term used in the OSHA Process Safety Management Regulation (1910.119, Paragraph J). At Dow, Mechanical Integrity includes the items in this section:

Electrical Systems

Fire Protection Systems

Fired Equipment

Critical Instrument Systems

Emergency Block Valves

Storage Tanks

Pressure Vessels/Relief Devices/Glass Devices/Expansion Joints

Critical and Rotating Equipment
(Including Compressors and Pumps)

Management Systems

Piping, Compressors and Pumps

LOSS PREVENTION AUDIT

Page 23

Mechanical Integrity

ELECTRICAL SYSTEMS

REFERENCES: Minimum Requirements, National Electric Code, LPP 3. Included as part of the Loss Prevention Audit, is an Electrical 5-point inspection by the Electrical Maintenance Department. Contact your area electrical supervision to verify and coordinate this activity.

Following is a list of some Loss Prevention items that will be included in that plant inspection:

1. The Electrical Area Plot Plan drawing should be reviewed and current. Contact Loss Prevention if revisions are required. (L.P.P.) Identify any installations that are in conflict with electrical plot plan.
2. The Safety Electrical One Line Diagram (SEOLD) should be reviewed and current per LAD S&LP S-214.
3. The electrical field audit will include an inspection of existing installations to observe mechanical integrity, maintenance needs, and conformance with L.P.P.-3., the National Electrical Code, and Area Classification practices.
4. The results of this Electrical Department 5-Point inspection audit will be included in the follow-up portions of this audit.

- B 1. Does your plant have:
- Yes ☒ No ☐ *Redundant Electrical Power Supply?
- Yes ☒ No ☐ *Redundant Feeds?
- Yes ☐ No ☒ Diesel Generated Power Backup?
- Plans: _____

- B 2. Yes ☒ No ☐ Is switch over automatic? (LPP 3.4)
- Last Date Exercised: March 28, 1996 _____
- Plans: _____

LOSS PREVENTION AUDIT

Page 24

- A 3. Yes ☐ No ☒ Are there major cable trays routed through flammable liquid areas where pooling resulting from spills can occur? (LPP 3.2.5)

Plans: _____

- B 4. Yes ☐ No ☒ Do you have fire protection on any of your major cable trays, (i.e., water spray, drainage, routing, fire retardant materials)? (LPP 3.2.7)

Explain: _____

- B 5. Yes ☒ No ☐ Considering possible unit fire exposures, are all cable wall penetrations appropriately sealed with approved fire stops? (Urethane is not an approved fire stop.) (LPP 3.2.6)

Plans: _____

Mechanical Integrity

FIRE PROTECTION SYSTEMS

REFERENCES: Minimum Requirements

- C 1. Yes ☒ No ☐ Do you have fire monitors and/or fixed sprinkler systems to protect flammable areas?

Plans: _____

- A 2. Yes ☒ No ☐ NA ☐ Do you have a plant program to routinely exercise/test fire monitors and fixed sprinkler systems?

Plans: _____

- A 3. Yes ☒ No ☐ Is your extinguisher inspection and testing up-to-date?

Plans: _____

- B 4. Yes ☒ No ☐ Are the size and type of extinguishers appropriate to the anticipated fire -- for example, a "C" rated extinguisher where electrical fires could be expected?
Yes ☒ No ☐ Are they properly located (i.e., office, MCC, switchgear rooms)?

Plans: _____

LOSS PREVENTION AUDIT

Page 26

- A 5. Yes ☒ No ☐ NA ☐ Have your employees participated in annual fire extinguisher training?

Last Training Date: _____

Plans: _____

- B 6. Yes ☐ No ☒ Do you have hose cabinets?
Yes ☐ No ☐ If yes, are employees trained on their use?
Yes ☐ No ☐ Is there a Preventative Maintenance Program on the hoses?
Yes ☐ No ☐ Are the hose cabinets necessary?

Date of last hose test: _____

- C 7. Yes ☒ No ☐ Do office areas, MCC's, switchgear, computer rooms and unoccupied buildings have smoke detectors alarming in a 24-hour/day occupied area? (LPP 9.1 and 9.2)

Plans: _____

- A 8. Yes ☒ No ☐ Are checks of smoke detectors made routinely and documented? (LPP 10.13)

Plans: _____

- C 9. How is your structural steel protected from a spill fire? (LPP 10.10)

Plans: EBV's Low Inventory, deluge and sprinkler systems, fireproofing in certain areas. _____

LOSS PREVENTION AUDIT

Page 27

B 10. Yes ☐ No ☒ NA ☐ Is fire proofing well maintained? (LPP 10.10.7)

Yes ☒ No ☐ Is there an inspection program?

Date of Last Inspection? 1996

Plans: Converting fireproofing at T-300 area to sprinkler system; project will be completed this year.

B 11. Yes ☒ No ☐ NA ☐ Is pipe insulation on hot lines (i.e.: 150# steam or DOWTHERM*) in good condition to prevent a chemical leak from entering the insulation and auto-igniting? (LPP 10.12.4)

Plans:

A 12. Yes ☒ No ☐ NA ☐ Are gas AND spill detectors adequately maintained (LPP 9.9.6) and tested routinely? (LPP 10.13) Provide Documentation.

Plans:

B 13. Yes ☐ No ☒ Do you maintain foam within your area to fight fires? (LPP 5.8)

If yes, what kind of foam is used and when was the material last tested?

Contact the Fire Department for the above information.

Plans:

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LOSS PREVENTION AUDIT

Page 28

B -- DELUGE & SPRINKLER SYSTEMS

REFERENCE: Fire Protection Manual -- The intent of this page is to assure that fire protection systems are properly maintained. Your Loss Prevention contact can assist with filling this out.

	1-1	1-2	2
Adequate access to valves during an emergency?			
Explosion or traffic exposure to valve?			
Explosion or traffic exposure to piping?			
Is the valve freeze protected?			
Is the system adequately drained of water?			
Is the pilot system adequately drained of condensate?			
Is remote dump switch labeled on deluge system?			
Date of most recent 2" drain test?			
Static pressure in recent drain test (psig)?			
Flowing pressure in recent drain test (psig)?			
Design flow (gpm)?			
Design pressure at deluge valve inlet (psig)?			
Date of last flow test?			
Were there plugged heads/corrected?			
Are any pilot heads painted?			
Is there any missing or damaged pipe?			

Use another page if you have more than three systems.

LOSS PREVENTION AUDIT

Page 29

	3	4	5
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Design pressure at deluge valve inlet (psig)?			
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Are any pilot heads painted?			
Is there any missing or damaged pipe?			

LOSS PREVENTION AUDIT

Page 30

	6	7	8
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Were there plugged heads/corrected?			
Are any pilot heads painted?			
Is there any missing or damaged pipe?			

LOSS PREVENTION AUDIT

Page 31

	EXAMPLE	9	10
Adequate access to valves during an emergency?	Yes		
Explosion or traffic exposure to valve?	No		
Explosion or traffic exposure to piping?	No		
Is the valve freeze protected?	Yes		
Is the system adequately drained of water?	Yes		
Is the pilot system adequately drained of condensate?	Yes		
Is remote dump switch labeled on deluge system?	Yes		
Date of most recent 2" drain test?	1/18/85		
Static pressure in recent drain test (psig)?	92		
Flowing pressure in recent drain test (psig)?	90		
Design flow (gpm)?	2123		
Design pressure at deluge valve inlet (psig)?	11		
Date of last flow test?	10/12/86		
Were there plugged heads/corrected?	Yes/Yes		
Are any pilot heads painted?	No		
Is there any missing or damaged pipe?	No		

LOSS PREVENTION AUDIT

Page 32

Mechanical Integrity

FIRED EQUIPMENT

C Yes ☒ No ☐ NA ☐ Do you have fired equipment (furnaces, TOX, THROX, kilns, boilers)?

REFERENCES: Minimum Requirements, LPP 13, Technology Center, Burner Management Guidelines

List the type (THROX, TOX, boiler, fired heater, furnace, etc.) and number of each. (LPP 13.1, Appendix B)

Throx (R-4) _____

B 1. Yes ☐ No ☒ Has your unit had any Burner Management System (BMS) safety incidents in the last three (3) years?

If Yes, how many? _____

Be prepared to discuss the incidents and corrective actions taken at the time of the audit.

A 2. Yes ☐ No ☒ Is the separation of fired equipment from the process in compliance with LPP 2.2?

If not, what protective features are used to address less than recommended distances? MOD V, Burner Management Control, Orientation of explosion panels, redundant instrumentation to detect process upsets (vibration monitors, fire-eyes, etc.), combustible gas detectors, and fire protection equipment. _____

Plans: _____

A 3. Complete the audit checklist in LPP 13.1, Appendix C and be prepared to discuss exceptions at the time of the audit. (Please attach a checklist for each fired heater.)

Plans: Attached. _____

LOSS PREVENTION AUDIT

Page 33

- B 4. Provide a copy of your start-up and relight procedures for your fired equipment. MOD V English Language
- B 5. List the conditions that will result in the auto shutdown of the fired unit. Refer to MOD programming / English Language_____
- _____

- A 6. Yes ☒ No ☐ Have you had a Burner Management System Audit?

Last Audit Date? 1994 TTU Tech Center Audit_____

Plans: See attached audit and follow-ups_____

What is your plant policy for a Burner Management System Audit

Frequency?_____3 yrs_____

Frequency of Audit?:_Next Audit in 1997

Mechanical Integrity

CRITICAL INSTRUMENT SYSTEMS

REFERENCES: Minimum Requirements, LPP 15.4.

- A 1. Yes ☒ No ☐ Have your critical and important instrument systems been identified? See definition LPP 15.4.3.

If yes, how many are critical? 3 systems are considered "critical" by current definition; over 200 items are on a well documented PPM program.

Plans: _____

- A 2. Yes ☒ No ☐ Have test procedures been written?
Yes ☒ No ☐ Is your testing up-to-date?
Yes ☒ No ☐ Is testing documented?

Have records available for inspection. (LPP 15.4.4)

Plans: Records are on the GEMPTS database; they include instrument, set point, responsibility and frequency for testing, due date, function, description, past inspection dates and comments, and test procedure. _____

- B 3. Yes ☒ No ☐ Do you test from the initiating device through the final control element?

Discuss: _____

Plans: Evaluate and modify as needed

- B 4. Yes ☒ No ☐ Do you have a process control computer?
What kind do you have? MOD V, TDC/PICSVAX

- B 5. What would happen if you lost power to your computer?

Battery Backup _____

What is the amount of operating time available after power failure?

30 min _____

LOSS PREVENTION AUDIT

Page 35

Yes ☒ No ☐ Is it adequate?

When was your battery back-up last "load checked?"

Date Last Checked: MOD on September 5, 1996 and every six months before and after this date. TDC batteries are never load tested, but replaced when bad. Control VAX UPS batteries were installed July 1995. They are scheduled to be load tested this year and will be tested every five years thereafter.

Yes ☒ No ☐ Have there been any computer failures since the last audit?

If Yes, Discuss What Happened: TDC lost two controller boxes due to a lightening strike in August of 1996.

Plans: _____

- A 6. What controls do you have in place to prevent bypassing critical instruments?
Must have management approval as documented by Block Policy

- B 7. Yes ☒ No ☐ Is the fail safe position of automatic valves documented?
Yes ☐ No ☒ Is the rationale for selecting the fail safe position documented?

- B 8. Yes ☒ No ☐ Do you have documentation of how control systems are supposed to operate, including set point limits?
Process Control Strategy exists via English Language for MOD and online documentation for PICSVAX

- B 9. When was your last in-depth review of the English language program?
Date Last Reviewed: These programs are reviewed on installation only; so the date was July 1991.

Plans: _____

LOSS PREVENTION AUDIT

Page 36

- B 10. When was your last in-depth computer hardware and instrument reliability review?

Date Last Checked: The computer hardware is only reviewed in-depth on installation, so the dates would match the capital projects which were 1992 for the THROX, 1993 for the Glycol Plant, 1994 for PICSVAX, and 1995 for the Reactor trips. No in-depth reliability review is done on instrumentation other than critical instrument checks. The TDC had an in-depth review in July of 1995.

Plans: _____

- A 11. What is department procedure for programming changes involving critical and important instruments?

Discuss: _____ MOC procedure requires level 2 review

Plans: _____

Mechanical Integrity

EMERGENCY BLOCK VALVES

REFERENCES: LPP 17.1.6.

- A 1. Yes ☒ No ☐ Are incoming and outgoing headers handling flammable or toxic materials fitted with EBV's at the battery limits? EBV's are located on systems within the block limits (reactor inlet, PO tanks, etc.)

Yes ☐ No ☒ Are the EBV's remotely operated? Some, but not all

Yes ☒ No ☐ Are the EBV's on a P.M. program and exercised at least annually?

What is the testing frequency? These valves are on the instrument PM program; testing frequency is typically 6 months. All documentation is on GEMPTS. _____

Have documents available at the pre-audit.

Plans: _____

- A 2. Yes ☐ No ☒ Are all vessels or processing equipment with greater than 5,000 gallons (2,000 gallons, if expansion joints, hoses or swivel joints are involved) of flammable liquids, flammable/toxic gasses or the equivalent amount of vapor fitted with remotely operated EBV's?

Plans: A capital project has been defined and approved to install EBV's where required by OSHA PSM. This is scheduled for 1997-1998. _____

- A 3. Yes ☐ No ☐ Are vessels or processing equipment with greater than 20,000 gallons (8,000 gallons, if expansion joints, hoses, or swivel joints are involved) of liquid at or above its flashpoint fitted with remotely operated EBV's?

Plans: A capital project has been defined and approved to install EBV's where required by OSHA PSM. This is scheduled for 1997-1998. _____

LOSS PREVENTION AUDIT

Page 38

- B 4. Yes ☒ No ☐ Are EBV's installed around critical equipment such as reactors, furnaces, etc., in case of emergency shutdown?

Plans: _____

- A 5. Yes ☒ No ☐ NA ☐ Are there remotely operated EBV's on the lines to and from loading and unloading stations when hazardous materials are being handled?

Plans: Control system has EBV's close when a grounding fault is detected. _____

- B 6. Yes ☐ No ☒ Are flexible unloading joints or swivel joints for tank car and truck loading and unloading for flammable or toxic materials protected on both ends by EBV's ?

Plans: _____

- A 7. Yes ☒ No ☐ NA ☐ Are EBV's "fail safe" for all utility interruptions?

Plans: _____

- B 8. Yes ☐ No ☒ NA ☐ If the valve is in a fire exposure area, is it "fire tested?"*

Plans: _____

- A/B 9. Yes ☐ No ☒ Are your EBV's identified as per L.P.P. 1.5.5. (painted yellow)?

Plans: _____

* Fire tested means approved by a testing agency for fire service.

LOSS PREVENTION AUDIT

Page 39

Mechanical Integrity

STORAGE TANKS

REFERENCES: LPP 6.11

A 1. Yes ☒ No ☐ Have all tanks been visually inspected within the last year? (LPP 6.11.8) Check Criteria

A 2. Yes ☒ No ☐ Are tanks in a maintenance testing program?

B 3. Yes ☒ No ☐ Are storage tank non-destructive tests (NDT's) up-to-date?

B 4. Yes ☒ No ☐ Is drainage around all tanks adequate to prevent water from getting between the tank foundation and the bottom of the tank?

Plans: _____

B 5. Yes ☐ No ☒ Has soil built up around tanks such that the exterior of the tank is in contact with the soil?

Plans: _____

A 6. Yes ☒ No ☐ Are all storage vessels electrically grounded?

Plans: _____

B 7. Yes ☒ No ☐ NA ☐ Do tanks have a system to protect against overpressure?

Plans: _____

LOSS PREVENTION AUDIT

Page 40

- A 8. Yes ☒ No ☐ NA ☐ Do tanks have a system to protect against vacuum?

Plans: _____

- A 9. Yes ☒ No ☐ Do you have tanks that have pad/depad systems to maintain inert atmospheres or to maintain positive pressures? (LPP 10.2)

Yes ☒ No ☐ If yes, do you prevent the pressure from the pad system from exceeding the design pressure rating of the tank?

How? PSVs _____

- B 10. What type of material is used for inerting? Nitrogen _____

What % oxygen is maintained? We do not measure the % oxygen in our tanks that we purge with nitrogen. _____

- B 11. Yes ☒ No ☐ Are your storage tanks in the original service for which they were intended?

Yes ☐ No ☐ If no, do they meet the requirements for the present service?

Plans: _____

- B 12. Yes ☒ No ☐ Have your vessels been checked to determine if their protective devices are adequate for the service (i.e., fill/empty rates, fire exposure, etc.)?

Plans: All of these devices were checked as part of OSHA PSM compliance preparation and capital projects are in progress to correct deficiencies; one is scheduled to RTO in 1997 and one (which requires a total plant shutdown) is scheduled for 1998. _____

- B 13. Yes ☒ No ☐ Are your tanks protected with redundant level indicating devices to prevent spills?

Plans: _____

LOSS PREVENTION AUDIT

Page 41

- B 14. Yes ☐ No ☒ Are automatic shut off systems operated from these devices?

Plans: _____

- C 15. Yes ☐ No ☐ NA ☒ For unstable chemicals, is temperature monitored and alarmed?

How would you respond to a temperature rise? _____

Plans: _____

If not, what parameters of storage are monitored?

List: _____

Plans: _____

- B 16. What preventive maintenance exists for tank protective systems (i.e., levels, temperatures, pad/depads, PVRV's, ERV, and flame arrestors)?
Devices registered on the PSV program are inspected via program schedule.

Plans: _____

- B 17. Yes ☐ No ☒ Does your drain line or any other appendage off the tank extend below the elevation of the bottoms of the tank?

If yes, how do you keep water, soil, etc., from coming in contact with this piping? _____

Mechanical Integrity

PRESSURE VESSELS/RELIEF DEVICES/GLASS DEVICES/ EXPANSION JOINTS

REFERENCES: Minimum Requirements, LPP 6.5., 6.9,
LAD Vessel Program, S-314

- A 1. Yes ☒ No ☐ Are all pressure vessels (Pressure Containing Equipment) registered?

If no, how many are not? _____

Plans: _____

Yes ☒ No ☐ Do you have any vendor-supplied tanks in your plant?
(i.e., the vendor fills)

How do you assure mechanical integrity for these vessels?

If a vendor vessel remains in our possession for over a year, it is
registered in the PV program and is inspected annually. _____

Plans: _____

- B 2. Yes ☒ 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? (LPP 6.5.4.C)

Plans: _Some of this paperwork is in Glycol-1 equipment files and the
other (visual inspections, etc.) is kept in the PV program files. _____

- B 3. Who is responsible for managing the pressure vessel testing inspection
program in your plant? _Vic Glaviano _____

LOSS PREVENTION AUDIT

Page 43

- C 4. List any vessels with suspected mechanical integrity problems.
_DV-2 (70 side degasser)_____

Plans: _____

Have current inspection printout on pressure vessel and relief valve status available at the pre-audit.

- B 5. Who is responsible for managing the pressure relief devices (i.e., valves and rupture discs, vacuum relief's) program? (LPP 14.3.4)
Name? _Vic Glaviano_____

- A 6. Yes [x] No [] Are all pressure relief devices registered? (LPP 14.3.4)
Plans: _____

- A 7. Yes [x] No [] Are design calculations on all pressure relief devices done?(*Corporate Relief Design Manual*)

If no, number incomplete? _____

Schedule for completion? _____

- B 8. Yes [x] No [] Is there a file folder for each pressure relief device with registration form, design calculations, specifications and piping isometric sketch?

Plans: _____

LOSS PREVENTION AUDIT

Page 44

- A 9. Yes ☐ No ☐ Have all glass devices in hazardous service been registered? (Texas Safety Standard O-40)

Plans: n/a _____

- B 10. Yes ☐ No ☐ Are glass devices in hazardous service adequately guarded?

Plans: n/a _____

- B 11. Yes ☐ No ☐ Are required inspections, maintenance, evaluation and recordkeeping done for glass devices in hazardous service? (Texas Safety Standard O-40)

Plans: n/a _____

- C 12. Yes ☐ No ☒ Does the plant utilize expansion joints in hazardous applications? (Texas Safety Standard O-43)

- A 13. Yes ☐ No ☐ Are all expansion joints registered?

Plans: n/a _____

- B 13 a. Yes ☐ No ☐ Are required inspections, maintenance, evaluation and recordkeeping done?

Plans: n/a _____

- B 14. Yes ☒ No ☐ Does your plant have a test/replacement program for flexible hoses?

Plans: _____

Mechanical Integrity

CRITICAL AND ROTATING EQUIPMENT

These questions pertain primarily to large rotating equipment but also apply to equipment critical to the operation of the plant (hard to replace, costly).

REFERENCES: LPP 16.1.

A/C 1. Yes ☒ No ☐ Have you identified your critical equipment?
(LPP 16.1.2)

Plans: See attached list. _____

B 2. Yes ☒ No ☐ Does the critical equipment list include items such as large and/or unusual motors, transformers, foreign and/or domestic equipment requiring long deliveries? (Centrifuges and Blowers)

Plans: _____

B 3. Yes ☒ No ☐ Do you have adequate spare parts to minimize downtime (business interruption)?

Plans: _____

B 4. Yes ☒ No ☐ Are spares/spare parts stored in a controlled environment?

Plans: _____

B 5. Yes ☒ No ☐ Do you have adequate monitoring/protection devices for your identified critical equipment? (LPP 16.1.4)

Plans: _____

LOSS PREVENTION AUDIT

Page 46

- B 6. Yes ☒ No ☐ Do you have vibration monitors?
Plans: Vibration monitors are on critical motors; P-156's, MRU-5, and BL-101 _____

- B 7. Yes ☒ No ☐ Do you have an on-going preventative maintenance program? (LPP 16.1.5)
Please describe: _____
Plans: _____

- A 8. Yes ☐ No ☒ Do you have dead-head protection on all pumps? (LPP 16.4.)
Describe: Only can motor pumps and mag drive pumps have dead-head protection.
Plans: _____

- B 9. Yes ☐ No ☒ Are stainless steel bolts a problem because of potential process or atmospheric corrosion?
If so, how do you control their use?

Mechanical Integrity

MANAGEMENT SYSTEMS

REFERENCES: OSHA Process Safety Management
(1910.119, Paragraph J)

- A 1. Yes ☒ No ☐ Do you have written procedures to assure on-going integrity of process equipment? (i.e., pressure vessels, EBV's, fire protection systems, etc.)

Plans: _____

- A 2. Yes ☒ No ☐ Are the employees involved in maintaining the on-going integrity of process equipment given an overview of the process and its hazards, and trained in the procedures applicable to their job.

Plans: _____

- A 3. Yes ☒ No ☐ Do inspection and testing procedures follow Dow site or Division guidelines?

Plans: _____

- A 4. Yes ☒ No ☐ Do the frequency of inspections and tests of process equipment meet accepted Dow site or Division guidelines?

Plans: _____

- A 5. Yes ☒ No ☐ Are all inspections and tests documented as per Dow guidelines?

Plans: _____

LOSS PREVENTION AUDIT

Page 48

- A 6. Yes ☒ No ☐ Are suspected deficiencies corrected in a safe and timely manner after necessary means are taken to assure safe operations.

Plans: _____

- A 7. Yes ☒ No ☐ In the construction of new plants and equipment, is equipment fabricated according to Dow site or Division standards and suitable for the process application for which they will be used?

Plans: _____

- A 8. Yes ☒ No ☐ Are appropriate checks and inspections performed to assure that equipment is installed properly and consistently with design specifications?

Plans: _____

- B 9. How do you assure that maintenance materials, spare parts and equipment are suitable for the process application for which they are being used?

Piping and equipment specifications _____

Plans: _____

- B 10. How do you assure the proper materials of construction are used in maintenance and new projects?

Plans: ___Piping and equipment specifications _____

LOSS PREVENTION AUDIT

Page 49

B 11. Yes ☒ No ☐ Do you have a list of the proper gaskets for each part of your process? (LPP 6.6)

Plans: _____

Yes ☒ No ☐ Is gasketing covered in your piping specification?

Mechanical Integrity

PIPING, PUMPS, COMPRESSORS

REFERENCES: Pipeline Technology Center (Angleton, TX), Dow
Pipeline-Texas Operations only (Freeport, TX)
Texas Safety Standard M-72

- B 1. Yes ☐ No ☒ Do you have accurate drawings showing the routing of your pipelines?
- B 2. How often are your pipelines inspected? Per C-9 and PSM requirements; typically semi-annually _____
- B 3. Yes ☒ No ☐ Are all your pipelines well identified and maintained?
- A 4. Yes ☒ No ☐ Has definite ownership, including predictive, preventative maintenance (PPM) responsibilities, been clearly defined between the origin and termination of your pipelines?
- B 5. Yes ☐ No ☐ If more than one owner is involved for outside-block-limits pipelines, does each concur in writing with your interpretation of the extent of ownership? N/A
- B 6. Yes ☒ No ☐ Do you have records showing the design criteria for each of your pipelines (material of construction, MAWP, operating pressure, coatings, etc.)?
Where is the information kept? P&IDs _____

DO A 045581
CONFIDENTIAL

LOSS PREVENTION AUDIT

Page 51

B 7. Do you have a scheduled and documented periodic program for maintaining your pipelines for:

Yes ☒ No ☐ N/A ☐ Painting?

Yes ☐ No ☒ N/A ☐ Cathodic Protection?

Yes ☒ No ☐ N/A ☐ Ground Interface Deterioration?

Yes ☒ No ☐ N/A ☐ Surveillance?

Reference PSM inspection form.

B 8. Yes ☒ No ☐ Are your pipelines in the original service for which they were designed?

B 9. Yes ☐ No ☒ Do you maintain a record of pipeline repairs?

B 10. Where are the repair records kept? _____

B 11. If another owner is responsible for working on/repairing one of your outside-block-limits pipelines, how do they know the hazards (if any) associated with your materials? N/A _____

B 12. Yes ☐ No ☐ N/A ☒ When work is performed by others on lines adjacent to yours, do you inspect the repair scene to assure the integrity of your piping has not been compromised?

B 13. Yes ☒ No ☐ N/A ☐ Within the last 5 years, has your coated buried piping been free of leaks or other problems?

If "NO", what type (material) of coating was involved? _____

B 14. Yes ☐ No ☒ Other than visually, can you determine if your pipeline is leaking?

LOSS PREVENTION AUDIT

Page 52

- B 15. Yes ☒ No ☐ Do you have written contingency plans for handling leaks from your outside-block-limits pipelines?
- B 16. Yes ☐ No ☐ N/A ☒ If more than one owner is involved, do they concur with your emergency contingency plans?
- B 17. Yes ☒ No ☐ In a pipeline emergency, will you, as the owner, normally respond?
- B 18. Yes ☐ No ☐ N/A ☒ If others are expected to respond, have they been included in training/planning necessary to handle a pipeline leak with your materials?
- B 19. Yes ☒ No ☐ Is there a list of owner contacts available to those responding to the emergency?
- B 20. Yes ☒ No ☐ Is the list of contacts dated and periodically updated?
- B 21. Yes ☐ No ☒ Is Distribution E/R included on the "pipeline emergency" call list? N/A this is covered by materials flow.
- B 22. Yes ☒ No ☐ N/A ☐ If you handle flammable or combustible materials, are there provisions for grounding containers at the take-off point stations?
- B 23. What concerns do you have about your pipeline systems?
No current LRCs installed _____

Management of Process Change/Project Reviews

MANAGEMENT OF CHANGE

REFERENCES: U.S. Area Standard No. 2, OSHA 1910.119 (I)

A 1. Yes ☒ No ☐ Does your plant's program for Management of Change include a written procedure which complies with Dow's U.S. Area Standard No. 2?

A 2. When was your last audit for compliance with the Management of Change Standard? (Date) 11-96

Yes ☐ No ☒ Have all recommendations from your last audit been closed? Still in progress.

Please furnish documentation of your last audit findings. See attached.

B 3. What is the involvement of your operation and maintenance personnel in the Management of Change process? Originator, reviewer, and approver. Also receive training on all as required.

A 4. Please provide documentation of several completed checklists used for process changes during the pre-audit.

A 5. Yes ☒ No ☐ Are all employees, Dow as well as contractor, informed of and trained for process changes that affect them prior to the initiation of the change?

How? Written or oral (tail gates or formal training classes) depending on the level and complexity of the change.

Management of Process Change/Project Reviews

PROJECT REVIEWS

REFERENCES: Minimum Requirements, U.S. Area Standard No. 2

- A 1. Yes ☒ No ☐ Does your department have Engineering Project Reviews or other Project Review Processes?

Who is involved? All functions identified as necessary per MOC

- B 2. Describe your process for handling recommendations from the project reviews. Follow-ups are documented and the completion list must be attached to the MOC for the project change.

Please furnish documentation for the follow-up from these recommendations.

- B 3. Describe how new projects are integrated into the plant's operating discipline. per MOC requirements

LOSS PREVENTION AUDIT

Page 55

E. Pre-Startup Safety Review

REFERENCES: Site Specific Standards, Dow Minimum Requirements, June 1989, OSHA 1910.119 (i)

- A 1. Yes ☒ No ☐ Do you have a Pre-startup Safety Review for all new facilities or changes to existing facilities?

Plans: _____

- A 2. Do the pre-startup reviews address the following:

- a. Yes ☒ No ☐ Construction and equipment in accordance with design specifications?

Plans: _____

- b. Yes ☒ No ☐ Safety, operating, maintenance and emergency procedures are in place and are adequate?

Plans: _____

- c. Yes ☒ No ☐ Have the recommendations from the project review process been completed or considered?

Plans: _____

- d. Yes ☒ No ☐ Recommendations from the plant Process Hazard Analysis have been resolved and implemented prior to startup?

Plans: _____

Please provide documentation for 2.a.b.c.d.

LOSS PREVENTION AUDIT

Page 56

- A 3. Yes ☒ No ☐ Do you verify that training for all employees involved in operating the process has been completed prior to start up?

Plans: _____

Please provide documentation.

F. Emergency Planning and Response

REFERENCES: Minimum Requirements, OSHA 1910.119 (n),
 OSHA 1910.38
 Texas Operations Emergency Plan and Rough Weather Plan

A 1. Yes ☒ No ☐ Are copies of your Unit Emergency Plan available to all personnel?

Plans: Copies are located on the PC electronically and in our emergency plan book in the control room and at Security. _____

A 2. Yes ☒ No ☐ Are all copies up-to-date?

Last update: 4-96 _____

Plans: _____

B 3. Who updates the plan? Operating Discipline Manager (Day Supervisor) _____

Plans: _____

A 4. Does the plan include: (If not, be prepared to discuss why.)

-- Yes ☒ No ☐ NA ☐ Emergency Call List?

-- Yes ☒ No ☐ Procedure for switching to alternate for each utility?

-- Yes ☒ No ☐ Procedure for total loss for each utility?

-- Yes ☒ No ☐ Crash shutdown procedures?

Time Required: _____

-- Yes ☒ No ☐ Orderly shutdown procedure?

Time Required: _____

-- Yes ☒ No ☐ NA ☐ Procedures in case of neighbor plant problems?

-- Yes ☒ No ☐ NA ☐ Procedure for loss of raw materials?

-- Yes ☒ No ☐ NA ☐ Gas release procedures?

-- Yes ☐ No ☒ NA ☐ Scenarios in CAER/MIDAS Program

-- Yes ☒ No ☐ NA ☐ Spill procedure?

LOSS PREVENTION AUDIT

Page 58

- Yes ☐ No ☒ NA ☐ Reactive Chemical Incident Procedures?
- Yes ☒ No ☐ NA ☐ Fire fighting plans for each type of fire?
- Yes ☒ No ☐ NA ☐ Emergency communications plan?
- Yes ☒ No ☐ NA ☐ Chain of command defined?
- Yes ☒ No ☐ NA ☐ Escape procedures and routes?
- Yes ☒ No ☐ NA ☐ Procedures for post-evacuation employee accounting?
- Yes ☒ No ☐ Preferred means to report emergencies?

- Duties and procedures of employees who:
 - Yes ☒ No ☐ NA ☐ Remain to operate critical equipment?
 - Yes ☒ No ☐ NA ☐ Perform rescue and medical duties?
- Yes ☒ No ☐ NA ☐ The names for persons or locations to contact for more action plan information?

Field Note Reference(s): Reactive Chem Incidents are covered in the IPT modules and in the procedures on the VAX. _____

- B 5. Yes ☒ No ☐ Is there a documented emergency plan training and retraining program?

If yes, please describe: _____

Plans: _____

- A 6. Yes ☒ No ☐ Is training up-to-date and documented for all employees?

Plans: _____

- B 7. Yes ☒ No ☐ Does each employee participate in at least one hypothetical drill or table top each year? (Suggest a toxic scenario and flammable scenario.)

List the hypothetical emergencies for the past year: _____

Plans: _____

DO A 045589
CONFIDENTIAL

LOSS PREVENTION AUDIT

Page 59

- B 8. Yes ☒ No ☐ NA ☐ Do you meet with Fire Department (Emergency Services) and discuss fire fighting plans and hazards for your plant periodically?

Plans: _____

- B 9. Where are vital records kept and how are they protected?
Most vital records are kept electronically and backed up on different drives. Engineering has copies of our P&Ids, I&E drawings and equipment files.

- B 10. Yes ☒ No ☐ Do you have emergency drills involving neighboring plants?

Plans: _____

- A 11. Yes ☒ No ☐ Are contractors adequately trained in emergency procedures?

Plans: _____

- A 12. Are emergency horns:

- Yes ☒ No ☐ Distinctive for each purpose of the alarm?
- Yes ☒ No ☐ Capable of being perceived above ambient noise and light levels by all employees in the affects portions of the workplace?
- Yes ☒ No ☐ Distinctive and recognizable as a signal to evacuate the work area or perform actions designated under the plant?
- Yes ☒ No ☐ Maintained in operating condition?
- Yes ☒ No ☐ Tested appropriately and restored to normal operating condition as soon as possible after test?
- Yes ☒ No ☐ Unobstructed, conspicuous and readily accessible, if they are manual alarm systems?