

I. AROCLOR DEPARTMENT BIENNIAL SAFETY AUDIT

November 11, 1970

Division - Organic
Location - Anniston, Alabama
Department Reviewed - Aroclor
Status of Reviewed Facilities -

The Aroclor Department came on stream in 1928 producing only Liquid Aroclors. Since that time several major expansions have been completed to increase Liquid Aroclor capacity and to produce Solid Aroclors. The Aroclor Department also encompasses facilities to prepare blends of the aforementioned products.

Products Produced

Aroclor 1221	Aroclor 1268	Aroclor Blends
1232	5432	HCl
1242	5442	
1248	5460	
1254	5060	
1260	Montars	

Audit Committee

Hal Brazelton - Maintenance Supervisor - Aroclor Area
Tom Lawrence - Plant Safety Supervisor
Tom Lackey - Aroclor Department Foreman
Gerald Miller - Aroclor Department Supervisor

Distribution

G. L. Jessee
H. E. Schulte
J. C. Landwehr
J. L. Corder
T. W. Lawrence
V. R. Haupt
Director Safety & Property Protection
Audit Team Members

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II. LOSS EXPOSURE

Aroclor, Department (Liquid) 826.08 PL \$ 603,500
 Loss Exposure = Fire and explosion in chlorinators
 Property Value = \$ 1,900,000
 Daily Business Interruption Value = 143 M #/day @ \$.114 = \$ 16,300

Assumptions:

1. Days to repair = 60
2. Salvage Value = 50%
3. Explosion/Fire Factor = E2/F4 = .33

Loss Estimate:

	Possible	x .33	Probable
Property Damage = (1-0.3)(1,900,000) =	850,000		280,000
Business Interruption = (60)(16,300) =	978,000		323,000
	1,828,000		603,500

Comments:

Equipment Protection: Relief Valves Temperature Alarms & Controls
 Rupture Discs Pressure Alarms & Controls
 Shutdown Systems

Fire Protection: Yard Hydrants - Hand and cart extinguishers - Plant Engines

Aroclor, Department (Solid) 826.17 PL \$ 514,000
 Loss Exposure = Fire and explosion chlorinator area
 Property Value = \$ 2,000,000
 Daily Business Interruption Value = 86,500 #/day @ \$.1075 = \$ 9,300

Assumptions:

1. Days to repair = 60
2. Salvage value = 50%
3. Explosion/Fire Factor = E2/F4 = .33

Loss Estimate:

	Possible	x .33	Probable
Property Damage = (1-0.5)(2,000,000) =	1,000,000		330,000
Business Interruption = (60)(\$9,300) =	558,000		184,000
	1,558,000		514,000

Comments:

Equipment Protection: Relief Valves Temperature Alarms and Controls
 Rupture Discs Pressure Alarms and Controls
 Shutdown Systems

Fire Protection: Yard Hydrants - Hand and cart extinguishers - Plant Engines

III. STATUS OF UNRESOLVED HAZARDS

1. Description: Complete upgrading of low voltage control panel in Motor Control Center

Responsibility: Maintenance

Status: Work underway 95% complete

Target Date: 4/15/71

Check Date: 4/15/71
2. Description: Safe technique to remove Montar 5 from Aroclor Stills No. 4 and No. 5

Responsibility: TSD - Maintenance

Status: In TSD backlog. Design package to be transmitted 4th Quarter 1971. Engineering Cost \$3.6 M - Cost of System \$10 M - \$150 M

Target Date: 12/1/71

Check Date: 10/1/71
3. Description: Process Control to assure circulation of Solid Aroclor through coil in external direct fired furnace, No. 4 Still

Responsibility: TSD - Maintenance

Status: TSD currently recommends Ramapo Flow Meter as installed on CEA 2080 construction of No. 5 Still. Total cost estimated at \$5 M. Experience with Ramapo Meter System is unsatisfactory. TSD to continue investigation and repair.

Target Date: 9/1/71

Check Date: 5/1/71
4. Description: Capture hot sprays from relief vents on Liquid chlorinators- potential personnel burn hazard

Responsibility: TSD - Maintenance

Status: In TSD backlog. Concepts presented in 1970 to eliminate this hazard were rejected based on operational difficulties, added safety problems and cost. This item has been placed on permanent hold by Production effective 10/1/70.

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IV. HAZARDS UNCOVERED BY THIS REVIEW

1. Description: Biphenyl charge tank was protected with Protect-o-seal closures as part of an earlier accident investigation. The top of this tank is subject to severe corrosion and Vapors escape through holes where the tank has failed.

Responsibility: Production - Maintenance

Status: TSD report in March 1970, "recommending carbon steel top and insulation and/or tracing to maintain temperature above dew point", will be done. Maintenance to replace tank top in 2nd Quarter 1971 at cost of \$3 M.

Target Date: 6/1/71

Check Date: 5/1/71

2. Description: Protect operator from nozzle on 1st stage No. 5 still jet. Still jet start-up places operator in hazardous position if 1st stage nozzle is cracked or broken.

Responsibility: (1) TSD, (2) Maintenance

Status: TSD to provide design by 7/1/71
Maintenance to construct and install by 8/1/71
Cost \$1 M.

Target Date: 8/1/71

Check Date: 5/1/71

3. Description: Main 2300 V feeder to Aroclor motor control center now enters department in a fire hazard area and is not protected from accidental personnel contact.

Responsibility: (1) TSD, (2) Maintenance

Status: TSD recommended on 2/5/71 that the feeder be encased in a non-conducting material such as Corroclux or Transite. Maintenance will fabricate and install in 3rd Quarter 1971. Estimated cost \$1 M to \$7 M.

Target Date: 9/15/71

Check Date: 8/1/71

IV. HAZARDS UNCOVERED BY THIS REVIEW (Contd.)

4. Description: HCl off-gas lines from Solids chlorinators are routinely operated near the chlorine-steel reaction temperature. High temperature alarms on chlorinators No. 9, 10, 11 would prevent loss of off-gas lines and off-gas coolers.
- Responsibility: (1) TSD, (2) Maintenance
- Status: TSD will provide design by 3rd Quarter 1971.
Maintenance will install in 4th Quarter.
Cost estimated \$1.5 M.
- Target Date: 12/15/71
- Check Date: 11/1/71
5. Description: The Aroclor Motor Control Center is not fused on the low voltage side of the 2300 - 440 V transformer. Major shorts in the area must be relieved at the main sub-station. This system requires a long time factor to stop power to the control center. Equipment loss can be significantly reduced by fusing on the 440 V busses of the center.
- Responsibility: (1) TSD, (2) Maintenance
- Status: The TSD recommendation that bolt-in fuses be installed will be completed in April 1971. Estimated Cost \$1.4 M.
- Target Date: 5/1/71
- Check Date: 4/15/71
6. Description: Several locations were observed where safety equipment would most likely be inaccessible in the event of emergencies.
- Responsibility: Production
- Status: All safety equipment locations will be reviewed and re-located to achieve maximum accessibility in case of emergencies. Complete by 5/1/71 - Cost \$300.
- Target Date: 5/1/71
- Check Date: 4/15/71
7. Description: Concrete curtain wall on West side Bldg. 27, 3rd level, is cracked and could easily fall into work area below.
- Responsibility: Maintenance
- Status: The curtain wall serves no purpose and the concrete portion can be taken down leaving the steel roof supports. This work can be completed by 10/1/71, Cost \$4 M.
- Target Date: 10/1/71
- Check Date: 7/1/71

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IV. HAZARDS UNCOVERED BY THIS REVIEW (Contd.)

8. Description: Grating on catwalk around top level of No. 5 still furnace was not secured to foundation. Presents tripping hazard.

Responsibility: (1) Maintenance, (2) Production

Status: MRO No. 25401 issued on 3/28/71 to complete work by 4/15/71
Cost \$300.

Target Date: 4/15/71

Check Date: 4/15/71

9. Description: Design change on #9 Chlorinator cooler has left a hole in the floor on 3rd level Aroclor Department. This hole is barracaded but should be filled permanently.

Responsibility: (1) Maintenance, (2) Production

Status: MRO No. 25402 issued 3/28/71 to install grating.

Target Date: 4/15/71

Check Date: 4/15/71

10. Description: The South Plant storm sewer runs from the Benzene unloading area under Aroclor and the organic warehouse. A Benzene spill into the unloading area sewer would pose an explosion hazard down stream.

Responsibility: (1) TSD, (2) Production, (3) Maintenance

Status: No concrete recommendations for action can be obtained at present. Several ideas have been brought forward, however, all potential solutions to date are not acceptable. Therefore, in April 1971, a review meeting to discuss this problem will be held. Pending this review meeting, action to resolve the hazard will be published.

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