MEMORANDUM

# PLANT ASBESTOS PROJECT

By

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Union Carbide Corporation

Texas City Plant

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FOREWARD

The Texas City Plant is concerned about the potential health hazards of asbestos. Accordingly, development of an action plan addressing this concern was authorized. The primary objectives of the action plan are:

1. To ascertain the magnitude of asbestos insulation requiring repair and which therefore presents a potential for release of asbestos fibers to the environment.
2. To recommend corrective action which will eliminate, in-so-far as possible, asbestos contamination of the environment.

## INTRODUCTION

An assessment of the amount of exposed "asbestos suspect" insulation was completed for the entire plant (exclusive of office buildings, control rooms, laboratories and shops). This assessment was accomplished through site surveys performed by inspection teams appointed by the department heads. Valuable assistance was given these teams by hourly insulator craftsmen and leadmen and Industrial Hygiene departmental personnel. Cost estimates in the ±30% range were made by the plant insulator group.

## SUMMARY

Due to the weathered condition and to some degree damage to the insulation weather barrier, and to the insulation itself, significant amounts of exposed "asbestos suspect" insulation exists in the plant.

Estimates of the quantity of asbestos suspect insulation requiring repair together with a cost estimate for correcting the exposed or damaged areas are tabulated below. The arrangement of the tabulation also prioritizes the problem areas in descending order.

| Priority | Location | Estimated Insulation Repair Required: Equipment($ft^2$) | Piping(Lin.ft) | Estimated Cost M$ |
|---|---|---|---|---|
| 1. | No. 2 Olefins | 12,500 | 11,100 | 325.0 |
| 2. | Phenolic Resins (B-176) and Solvent Resins Piperack | 240 | 2,210 | 56.4 |
| 3. | Bldg. 45 | 400 | 2,220 | 155.7 |
| 4. | Acids & Esters | | | |
| | Bldg. 17 | minor | | |
| | Bldg. 21 and 24 | 2,818 | 690 | 80.2 |
| | Bldg. 54 | none | 305 | |
| 5. | No. 3 Olefins | 2,280 | 12,764 | 465.2 |
| 6. | Plant Piperacks | none | 16,171 | 402.4 |
| 7. | OXO | | | |
| | OXO Syn Gas (B-139 etc.) | | 3,410 | |
| | Bldg. 79 | | 189 | 47.0 |
| | Bldg. 83 | | 530 | |
| 8. | E. O. D. | | | |
| | Bldg. 51 | minor | 720 | 20.6 |
| | Bldg. 219 | 700 | 3,300 | 65.7 |
| 9. | Ethanol & DES | minor | 1,420 | 47.2 |
| 10. | No.1 Steam Plant | | 719 | 68.2 |
| | No.3 Steam Plant | 140 | 295 | 18.2 |
| 11. | In-plant Distribution | none | 1,233 | 26.2 |
| 12. | Pump Houses | | | |
| | #4 | | 105 | |
| | #6 | | 35 | 13.1 |
| | #7 | | 27 | |
| | | | Grand Total | 1791.1 |

The critera used when prioritizing the potential asbestos problem areas are as follows:

1. Potential exposure of asbestos to plant personnel.
2. Potential for contaminating the community.
3. Exposed insulation which is highly visible and easily seen by the casual observer.

RECOMMENDATIONS

The overall action plan recommended is as follows:

1. As soon as possible (this year if possible) begin to correct the exposed asbestos containing insulation by, removing or covering the insulation using metal or mastic weather barriers at these "high priority" locations:

    a. No. 2 Olefins

        1) The Firebird, exhaust duct, and Waste Heat Boiler. Action: Remove.

        2) The three columns and associated equipment from the old butadiene (vinyl acetate and acetone recovery) unit. Action: Remove

        3) Flue gas breeching, cracking furnaces at building 105. Action: Remove.

        4) Dead 1 1/2" and 2" acetylene lines in 5th Street piperack. Action: Remove.

        5) Exhaust mufflers in building 103. Action: Mastic Coat.

        6) Pipelines where the insulation is intact but weather barrier has deteriorated. Action: Mastic Coat.

b. Phenolic Resin Unit - Building 176

1) Tanks and piping. Action: Remove.

2) No. 70 Column Flask Tank. Action: Remove.

3) Pipelines in piperack between buildings 122 and 176. Action: "Metal out" and/or Mastic Coat.

c. Building 45 Hydrogen Converters.

1) No. 3, 4, and 5 Hydrogenators. Action: Remove asbestos and re-insulate with non-asbestos.

2) No. 1 and 2 Hydrogenators. Action: Install metal weather barrier.

3) Piping. Action: Use metal or mastic weather barrier where insulation in intact.

d. Building 24.

1) Acid Still Fore column. Action: Remove.

2) Acid Still. Action: Remove.

3) Acid Refining Column. Action: Remove.

4) No. 2 Esters Refining Still. Action: Remove asbestos insulation and replace with non-asbestos.

5) Condensate Tank. Action: Remove asbestos insulation and replace with non-asbestos.

6) 4: Dead Oxide Line. Action: Remove.

2. Each department including those not listed above will work out an action plan to correct the problem areas in their respective departments using the asbestos suspect survey data obtained by the inspection teams. The magnitude of the corrective work required for the entire plant precludes completion in one year. However department action plans should target for completion within a 2 to 4 year period.
3. Each department will include in their 1986 budget preparations funds for correcting their most obvious and/or greatest exposure potential areas.
4. Subsequent years budgets to include funds until resolution of the problem areas is completed.

DISCUSSION

Included in the appendix of this report is a tabulation of cost estimates for the various departments. These cost estimates were developed by the plant insulator group and have a ±30% accuracy.

When planning repairs to the exposed asbestos insulation, the following guidelines are suggested.

1. Determine whether or not the insulation contains asbestos. If the insulation does not contain asbestos fibers, a decision to defer repair should be made. Economic considerations (energy conservation, production restraints, etc.) or safety considerations may result in a decision to go ahead with the repair anyway.
2. If the asbestos containing insulation is in poor condition (hanging loose, broken up, sagging, etc.), remove the old insulation and replace with asbestos free material.
3. If the weather barrier is in poor condition (or essentially gone), but the insulation itself is in fairly good condition:
   a) Fill up the voids or breaks with non-asbestos filler if necessary.
   b) Cover straight runs of piping with metal and/or mastic weather barrier.
   c) "Mastic in" valves, 90° elbows, and other non-uniform sections.
   d) Use a combination of metal or mastic weather barrier or columns and other equipment.
4. If the weather barrier has breaks, is damaged, or missing over short reactions repair using a generous coating of mastic.

5. If the insulation has "end or "edge" exposure, generously coat these exposed areas with an approved mastic. This treatment should be considered where "dead" or out-of-service piping or equipment has insulation which needs to be repaired.
6. If the asbestos containing insulation is in poor condition and is installed on "dead lines" or out-of-service equipment, remove and dispose this insulation.
7. Reference to the "Remarks" column of the inspection data sheets (Main Piperack Survey, Unit Equipment Survey, or Unit Piping Survey data sheets) will generally include comments on suggested repair.
8. Seek advice from the plant insulator group as required.

## HOUSEKEEPING

The entire plant places itself in a position of being open for censure from regulatory agencies when loose insulation is allowed to lie on the ground or has been left where it has fallen from equipment, piping, etc. Picking up and removing this insulation for disposal should be done on a continuing basis.

## ASBESTOS IDENTIFICATION

Distinctive warning identification such as yellow adhesive backed film with black lettering is recommended for identifying asbestos containing insulation on equipment and pipe lines.

Pipelines in piperacks should be thusly identified approximately every 100 - 150 feet.

ACKNOWLEDGEMENT

The response by the plant to the request for "walk through inspections" of the operating areas and the plant piperacks was outstanding. Suitable recognition of everyone who participated may be impossible. However, recognition of the following for their commendable support and effort is in order because without their help this project could not have gotten off the ground.

| DEPARTMENT | INDIVIDUALS |
|---|---|
| Energy Systems | W. D. (Bill) Wilkins<br>W. N. Parker<br>R. A. Rivera<br>C. R. Malveaux<br>O. B. Hayden |
| Ethylene Oxide Derivatives | T. F. Hanrahan |
| No. 2 Olefins | T. W. Cates<br>Henry G. Parker |
| Ethanol and DES | F. G. McWhorter<br>J. A. McKenzie |
| Solvents and Acids | Frank L. Campbell<br>J. L. Lamb<br>J. B. Richards |
| In-Plant Distribution | J. L. Pedraza<br>B. C. Wedhorn |

| DEPARTMENT | INDIVIDUALS |
|---|---|
| Solvent Vinyls | D. B. Rygaard<br>W. E. Benskin<br>R. F. Garza<br>R. J. Hadley<br>R. Hernandez<br>H. Martinez<br>B. L. Nall<br>J. Nunez<br>E. K. Sumrall |
| Vinyl Acetate | Donald R. Kirkland |
| No. 3 Olefins | N. Dean Sharp<br>Roy M Hughes<br>O. T. Mallett<br>Angel Echevarria |
| OXO and OXO Syn Gas | Marcie Laundrie<br>Dan O'Neil<br>J. D. Duston<br>L. M Gonzalez |
| Industrial Hygiene | Kirk E. Martin<br>C. W. Perry<br>D. W. Harkreader |

Also, the support and assistance received from the Insulator Craft group was outstanding. Special thanks and appreciation is due these people:

J. E. Barnes
H. P. Smith
H. G. Kelly Jr.
Keye Harding
D. R. Labry
P. J. Bartlett

COST ESTIMATES

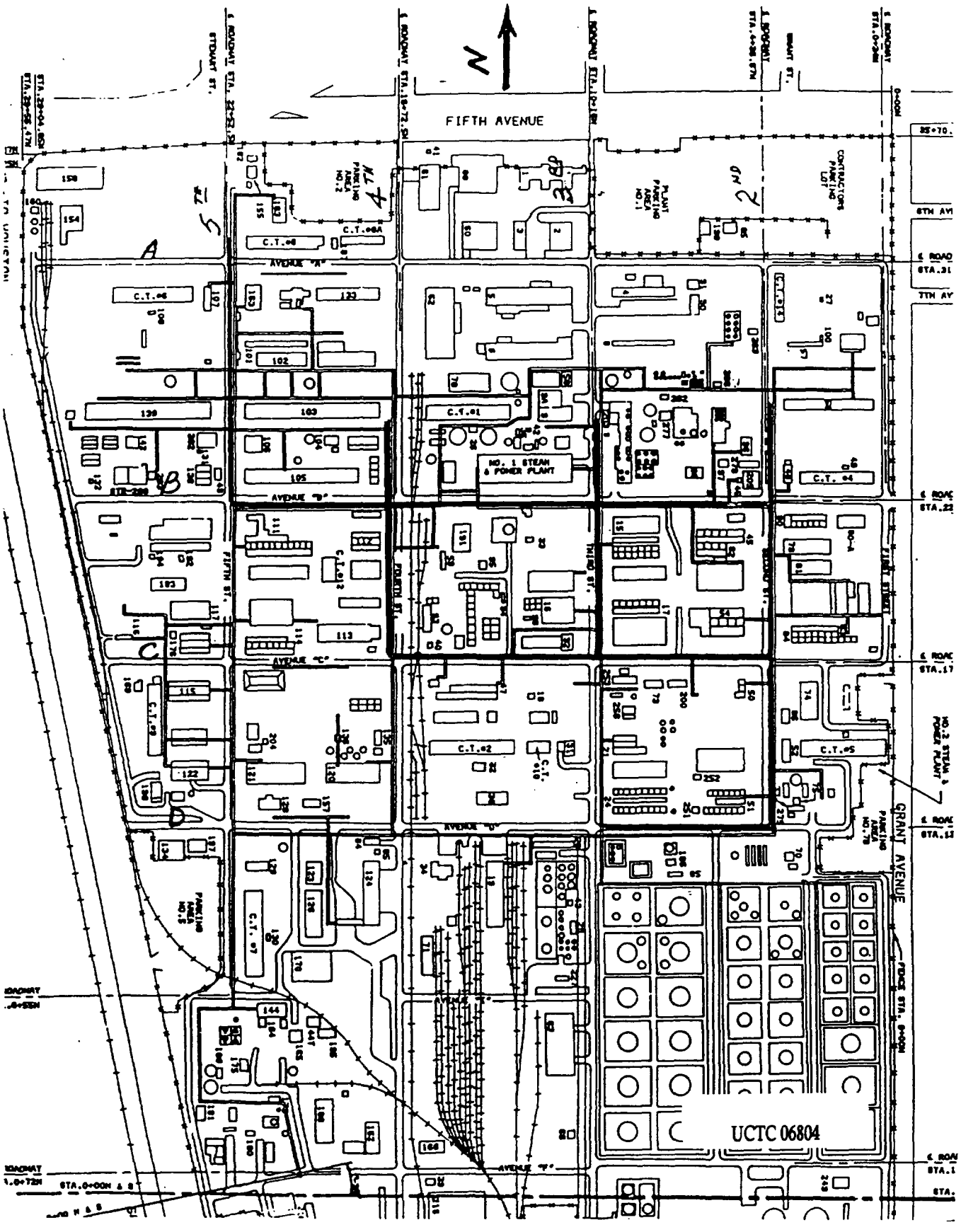
July 19. 1985

PLANT ASBESTOS PROJECT

| DEPARTMENT | AREAS INVOLVED | MATERIAL M$ | INSULATOR LABOR M$ | SUBTOTAL M$ | MISC AND ESCALATION M$ | TOTAL M$ |
|---|---|---|---|---|---|---|
| Energy Systems | Main Piperack | 23.9 | 285.7 | 309.6 | 92.8 | 402.4 |
| | No.1 Steam Plant | 8.0 | 46.3 | 54.3 | 13.9 | 68.2 |
| | No.3 Steam Plant | 1.3 | 13.0 | 14.3 | 3.9 | 18.2 |
| | Pump Houses | 1.5 | 8.6 | 10.1 | 3.0 | 13.1 |
| E. O. D. | Bldg. 51 | 1.0 | 15.1 | 16.1 | 4.5 | 20.6 |
| | Bldg. 219 | 2.0 | 49.0 | 51.0 | 14.7 | 65.7 |
| No.2 Olefins | | 18.0 | 236.2 | 254.2 | 70.8 | 325.0 |
| Ethanol-D.E.S. | Bldg. 15 | 1.8 | 15.4 | 17.2 | 4.6 | 21.8 |
| | Bldg. 94 | 2.2 | 17.9 | 20.1 | 5.3 | 25.4 |
| Solvents and Acids | Bldg. 17 | 1.9 | 26.7 | 28.6 | 8.0 | 36.6 |
| | Bldg. 21 | -- | 1.5 | 1.5 | 0.5 | 2.0 |
| | Bldg. 24 | 0.4 | 20.9 | 21.3 | 6.3 | 27.6 |
| | Bldg. 54 | 0.4 | 10.4 | 10.8 | 3.2 | 14.0 |
| In-Plant Distribution | Bldg. 19 | 9.7 | 12.5 | 22.2 | 4.0 | 26.2 |
| Solvent Vinyls | Bldg.176 & P/R | 2.4 | 41.5 | 43.9 | 12.5 | 56.4 |
| Vinyl Acetate | Bldg.110 & 111 | none | none | none | none | none |
| No. 3 Olefins | | 24.7 | 338.5 | 363.2 | 102.0 | 465.2 |
| OXO-Syn Gas | Bldg. 45 | 3.0 | 66.7 | 69.7 | 20.0 | 89.7 |
| | Bldg.45 Converters | 9.3 | 43.6 | 52.9 | 13.1 | 66.0 |
| | Bldg. 79 | 0.5 | 6.9 | 7.4 | 2.1 | 9.5 |
| | Bldg. 83 | 0.5 | 14.9 | 15.4 | 4.5 | 19.9 |
| | Bldg.282 (Syn Gas) | 0.5 | 13.1 | 13.6 | 4.0 | 17.6 |
| | GRAND TOTALS | 113.0 | 1,284.4 | 1,397.4 | 393.7 | 1,791.1 |

(1) Escalated labor cost by 30% for scaffolding, asbestos disposal and contingancies.

Identification of Piperack Priorities



UNION CARBIDE INTERNAL CORRESPONDENCE

P. O. BOX 471, TEXAS CITY, TEXAS 77590

July 19, 1985

TO: P. D. Balmert
L. E. Calvert
S. J. Footer
R. W. Klein
R. A. Mendez
F. S. Provenzano
D. R. Reem

Gentlemen:

Attached is a copy of my memorandum "Plant Asbestos Project" for your comment and approval.

Very truly yours,

J. F. Schultz