Interoffice Memo

Hoechst Celanese

Date January 15, 1990

To R.J.H. Voorhoeve

Dept/Location Corpus Christi

From J.W. Dunn
JWD-010-90

Dept/Location DEHSA/Bed. 1

Subject: **FINAL REPORT: COMPREHENSIVE ENVIRONMENTAL HEALTH AND SAFETY (EH&S) AUDIT - CORPUS CHRISTI, TECHNICAL CENTER, OCTOBER 31 - NOVEMBER 4 1988**

A Comprehensive Environmental Health & Safety (EH&S) Audit was conducted between October 31 - November 4, 1988 at the Corpus Christi (TX) Technical Center. Due to organizational and program changes since the original audit, the issuance of the final report was delayed.

In the attached Executive Summary, overall evaluations of the site's EH&S management systems and program components are presented followed by a brief description of key observations identified during the audit process.

The program evaluations and key observations are described in more detail in the full report along with other comments and observations. The items requiring an action plan response represent opportunities for program improvements. The audit follow-up procedure is described in Section IV of the full report.

The items noted in this report should be incorporated in the formulation of business and resource plans. Further, the program evaluations and subsequent corrective actions and improvements implemented by the plant should be used in communicating key aspects of the site's EH&S performance to Hoechst Celanese management during normal business reviews and reporting cycles.

On behalf of the Corporate EH&S Audit Programs staff and the audit team, we extend our thanks and appreciation to you, the Corpus Christi and Advanced Technology Group employees who contributed to the success of this endeavor. If you have any questions or require further information, please call me.

J.W. Dunn
Director, Corporate EH&S
Audit Programs

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EXHIBIT
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FINAL REPORT: COMPREHENSIVE ENVIRONMENTAL, HEALTH AND SAFETY (EH&S) AUDIT, CORPUS CHRISTI TECHNICAL CENTER, OCTOBER 31 - NOVEMBER 4, 1988

I. EXECUTIVE SUMMARY

OVERALL EH&S SYSTEMS EVALUATION

General EH&S Management - Site Management and employees demonstrate visible commitment to EH&S Programs. A capable site EH&S staff is in place and programs are generally well conceived and implemented except as noted in this report.

> Key Observation - Documentation of activities pertaining to several written EH&S programs and procedures should be reviewed and updated; the specific observations are described in the full report.

Industrial Hygiene Program - The facility has a well developed Industrial Hygiene program. The program contains the core elements of an effective program.

> Key Observation - There are issues that deal with potential exposure to formaldehyde and ethylene oxide in the facility that are being addressed through both engineering controls and industrial hygiene monitoring. These assessments and mitigation programs should receive a high priority to ensure continuing compliance with the specific substance standards for these chemicals.

Occupational Safety and Loss Prevention Program - Although the Occupational Safety programs at the facility are generally well developed and implemented, there are several important areas where improvements are needed to meet requirements.

> Key Observation: There are issues concerned with the definition of the role of the facility emergency brigade, training of the members and the identification of the equipment that they are expected to use. Although training is conducted and the general requirements of the program are being met, it is of critical importance that these reviews and program refinements be made quickly to ensure that we continue to have a well prepared emergency response capability.
>
> The program to inspect and maintain the stationary fire protection systems at the facility needs to be reviewed to ensure that all of the recommended tests and maintenance items are being completed as required.
>
> There are a number of issues in the area of preventive maintenance that need to be addressed to ensure that critical equipment is maintained and operational to perform its intended function.
>
> Hazardous Work Permitting Procedures need to be reviewed and expanded to ensure that the employees performing the work are adequately protected.

Product Safety Program - The facility programs in the area of product safety are generally well designed and implemented.

Key Observation: There are a number of issues under the Toxic Substances Control Act that were previously covered under the Chemicals Group procedures. These must be reviewed and updated to reflect Advanced Technology Group programs and, to ensure continued compliance with TSCA.

Environmental Program - Significant work has been completed since the 1986 audit; the environmental control programs at the facility are effective and contain the required elements. No major program deficiencies were found.

II. EH&S Audit Process

Scope - This was a comprehensive environmental, health and safety (EH&S) audit to assure, to the extent practicable the facility's compliance with applicable laws and regulations and Hoechst Celanese policies and procedures. The audit included a review of environmental control measures, safety and industrial hygiene programs, employee health, emergency response preparedness plans and community related issues. The program evaluations reflect those observations where procedures or practices may be out of compliance with standards or Hoechst Celanese policies and could present an unacceptable risk to employees, property or the community.

AUDIT PROCEDURES

The audit was based on advance information supplied by the facility and information determined through inspections, discussions with plant management, staff, operators and environmental, health and safety personnel and inspection of the areas surrounding the plant.

This audit report was prepared from the work papers collected by the following audit team. The information was then collated and recommendations for action planning developed through discussions between members of the facility staff and myself.

The audit team was composed of the following individuals:

G.A. Vos - Corporate EH&S audit team leader (Manager, Environmental, Health and Safety Audit Programs Group, Somerville, NJ)

J. Gordon - Industrial Hygiene Auditor (Coordinator, Industrial Hygiene, Hoechst Celanese Chemical Group, Dallas, TX)

W. Powell - Safety Auditor (Manager, Safety and Loss Prevention, Specialty Chemicals Group, Bucks, AL)

H. Trebitz - Product Safety Auditor (Director, Product Safety International Liaison, Specialty Chemicals Group, Somerville, NJ)

P. Morris - Environmental auditor (Manager, Environmental Health, & Safety Department, Specialty Products Group, Bayport Works, Pasadena, TX)

ASSISTING FROM THE TECHNICAL CENTER

R. Graham - Director of Research
J. W. Dunn - Manager of Administration
A. Savage - Environmental, Health, and Safety Superintendent
J.K. Stafford - Environmental Coordinator
R. Pasquino - Industrial Hygienist
P. Lieck - Safety Supervisor
C. Shafer - Industrial Health Coordinator
L.W. Hartman - Engineer and Maintenance Manager
R. Mather - Manager Piloting and Engineering Services
C. Hilton - Research Section Leader

III. Facility EH&S Program Evaluations

The EH&S program evaluations and observations appearing on the following pages were developed using the information gathered during the Corpus Christi facility audit. The EH&S areas addressed by the audit are:

A. General EH&S Management
B. Environmental
C. Industrial Hygiene
D. Product Safety
E. Occupational Safety & Loss Prevention

Areas requiring priority attention are highlighted in the Executive summary as Key Observations and in the full report by a double asterisk (**). Additional comments and observations requiring an action plan response are identified in the Program Evaluation sections by a single asterisk (*).

If corrective action will be implemented over a significant period of time (generally, greater that six months), interim control measures should be considered and described in the action plan and quarterly status reports. The complete audit follow-up procedure is described in Section IV of this report.

As in the past, plant management will want to incorporate the issues and observations described herein during discussions and activities pertaining to business planning, performance assessment and reporting cycles, e.g.,

- strategic planning
- resource planning
- capital planning
- operating expense budgets
- individual and unit performance objectives
- annual compliance assurance letter

A. GENERAL EH&S MANAGEMENT EVALUATIONS

1. Documentation Issues - There were several programs which appeared effective as determined through the audit process but a lack of full documentation made the evaluation difficult. Site procedures should ensure adequate documentation is maintained in the following areas:

* a) Hazardous materials training, provided for the Facility Emergency Response Team, should be documented and a compilation made of the training for the employees on the team and the total amount of training provided to each team member.

* b) The system for tracking incident investigation corrective actions; the facility should ensure that these programs are conducted and documented in the future.

2. Housekeeping - The facility has an excellent housekeeping program which results in a professional and organized impression of the site. In particular, the laboratories and the maintenance area should be singled out as exceptional. There is one area where attention should be focused to bring it up to the facility standards. This is:

* The previous drum cleaning facility must be improved to ensure that:

  - Improperly labeled or unlabeled drums, large plastic bottles and other small containers have been removed or properly addressed.

  - All facilities, used for this purpose in the future, are properly designated as temporary waste storage areas.

  - Congestion in the area is improved and that containers do not block access to the drum cleaning equipment or the safety shower and eye wash station and, that there is sufficient work space for any operations still performed there.

3. Plant Safety Programs - The facility has various safety committees to ensure that all employees have an opportunity to participate in the safety programs.

* A system should be implemented to ensure that action items developed from site safety committee activities and inspections are addressed and that items referred from one committee to another are documented properly and addressed.

4. Plant Inspection Programs - The facility inspection programs should be revised to address the following areas:

* a) The safety shower inspection program should be reviewed to ensure that:

  - Showers are tested on a regular basis consistent with the hazards presented.

  - Problems identified during inspections have appropriate corrective actions completed and properly documented.

* b) Reporting forms and/or checklists should be developed for use in plant inspections that list all of the items that must be checked during the inspection and provide a method to document corrective action.

B. ENVIRONMENTAL EVALUATION

1. Spill Control - The facility has an effective program for spill control and a thorough Spill Control and Countermeasures Plan. The plan should be reviewed in the following areas:

* a) Although all major vessels are properly contained, there are several small storage tanks that should be evaluated for possible addition of containment.

* b) Definition of the person or function responsible for inspection, frequency of inspections, types of inspections should be defined in the plan, and a recordkeeping system for inspections conducted should be detailed in the procedures.

2. Storm Water Runoff -

* The storm water run-off system should be evaluated to determine the potential impact of a spill in the central area of the plant entering the off-site ditch at the east boundary of the facility.

C. INDUSTRIAL HYGIENE EVALUATION

1. Occupational Health Monitoring - The plant has Industrial Hygiene and Medical programs, however:

* A system should be developed to track work history and integrate the data with the Industrial Hygiene and Medical program data to assess the potential of long term or delayed health effects.

2. Specific Substance Standards - Although the facility has taken action to protect their employees against possible exposure to several chemicals for which OSHA has developed comprehensive health standards the following should be addressed:

** a) Formaldehyde - The facility should develop a written program for formaldehyde based upon the results of industrial hygiene monitoring to establish the effectiveness of the engineering controls installed in the operating unit.

** b) Ethylene Oxide - Based upon a complete set of industrial hygiene sampling data, now available, the facility should develop a written program for ethylene oxide.

** c) Asbestos - The facility has established a system utilizing asbestos removal contractors to perform removal and demolition work of asbestos on site. The facility's written program should define the site's administrative and supervisory responsibilities for this type of work.

3. Respiratory Protection - The facility has a respiratory protection program, however the following items should be addressed:

* a) The written program should include: a section on the use of respiratory protection in dangerous atmospheres, a definition of oxygen deficient atmosphere, a description of respirator selection based on potential exposures and risks, a provision for periodic evaluation to determine the program's continued effectiveness and, the respirator fit test form actually in use.

* b) The inspection and documentation activities for emergency use respirators should be reviewed to ensure that they are being conducted thoroughly and consistently. Examples of exceptions noted during the audit are:

- Inspection records for two Scott Air-Paks were missing.
- All of the 5-minute escape respirators were not identified by number and included in the inspection program.
- Inspection records did not contain information on corrective actions for problems identified during the inspection.

- Inspection records are not being sent to the Safety group as required by the facility procedure.

* c) The qualitative fit testing program must be reviewed to ensure that the required protocols are being followed. For example, the following needs to be addressed:

- Respirators are not identified by model number.
- Respirator facepieces issued are not always the size approved during fit testing.
- Employees covered by the respiratory protection program but not currently fit tested are not advised of their ineligibility.
- Some employees were issued respirators for which there are no fit test records.

4. Occupational Noise Exposure - The facility conducted a noise survey in 1988 and based upon the survey, "noise areas requiring hearing protection" were established. Consistent with this survey, training was conducted in 1988.

* Since engineering controls to reduce noise exposure to below 90dBA - (8-hr. TWA) have not been applied, annual training and continued personnel hearing protection programs should be conducted and implemented until a resurvey confirms that the noise levels have been reduced.

5. Hazard Communication Standard - The plant hazard communication program contains all of the required elements, however:

There are a number of elements that should be addressed to enhance the overall effectiveness of the program. These are:

* a) The written hazard communication program should be revised to provide for:

- Training of new employees before assignment to their work areas, for example: there was no documentation available to verify that the last six new employees were trained in the hazards of the workplace before assignment to their work area.
- Training of employees transferred from one work area to another.
- Precautions to be taken by employees when performing non-routine tasks.
- A program to inform contractors of the hazards they may encounter.
- Procedures for the retraining of employees if new hazards are introduced.

* b) The facility has a procedure to ensure that all chemicals are reviewed and approved before purchase, including the acquisition of MSDSs. This procedure was found to be working well except the maintenance area. For example: four of six purchased chemical substances reviewed in the maintenance areas were not approved for purchase through the system nor were Material Safety Data Sheets (MSDSs) on file. The facility should review their system to ensure all hazardous chemicals are included in the program.

* c) The facility should review the chemical lists throughout the Technical Center to ensure that they are consistent. The facility policy on maintaining chemical lists should be reviewed to ensure that it is working properly.

* d) The facility has an excellent system for establishing hazard ratings for chemicals, however, a written procedure should be developed specifying the sources for determination of CELMIS (hazard) ratings that provides the source of hazard information or the decision logic used in establishing the ratings.

6. Personal Protective Equipment - While the facility has adopted an effective program to supply and control the use of Personal Protective Equipment. The facility should review the following to ensure effectiveness:

* a) Procedures established by IBAP unit personnel to prevent chemical exposure from contaminated protective clothing in their area.

* b) Procedures for the selection, purchase, distribution and training relative to Personal Protection Equipment (PPE) to ensure that those items that have been selected by hazard and approved for purchase and use by the EH&S group are the only items actually purchased and used.

D. PRODUCT SAFETY EVALUATION

1. Toxic Substances Control Act - Procedures for compliance with the Toxic Substances Control Act had been covered by Chemicals Group procedures, however, since the transfer of the Technical Center to the Advanced Technology Group not all of the procedures have been revised to identify the new responsibilities.

   The facility should develop new procedures to ensure that the following areas are properly defined:

** a) TSCA Reporting, Recording and Notification Procedures -

- The requirements of Section 8(d) (Health & Safety Studies Reporting)
- The requirements under Section 13 (import certification)
- The requirements under Section 12 (export notification)
- The facility's draft procedures addressing substantial risk information, Section 8(e) reporting should be revised to include a correct summary of regulatory requirements.
- Provisions to ensure that samples sent under the R&D exemption are accompanied by a letter providing notification of their exemption status and are uniformly labeled to reflect the respective R&D exemption requirements. Labels should contain standardized wording similar to that used on MSDSs.

* b) TSCA Training -

- A description of training program content, the materials used, indication of participation rate and the frequency at which training will be conducted should be included for TSCA Sections 5, 8(c) and 8(e).

E. Occupational Safety and Loss Prevention Program

1. Emergency Brigade - The facility does not have a fire brigade, however, an emergency response team for incipient stage fire fighting and spill response is present.

** The facility should review the emergency response team procedures to ensure that they are current and provide for the following:

- Periodic training sufficient to ensure that all of the members are prepared to perform the required tasks in an emergency.
- Medical certification for all members of the team.
- Clear definition of the command responsibilities for types of emergencies that the emergency team will respond to including the types of equipment available and the people designated to use this equipment.

2. Fire Protection Systems - The facility has a program to monitor site fire protection equipment, however:

The facility should review their procedures and practices in relation to the maintenance and inspection of stationary fire protection equipment to ensure that recommendations and proper operating practices are observed. For example:

** a) Inspection programs and equipment maintenance

- Some equipment is not included in the facility's fire equipment inspection program that should be and some specific requirements are not addressed; e.g., fire monitors, the fusible links in the lab hallway and the fire blankets and stretchers throughout the facility should be included in the inspection program and, the dry pipe system has not been set up on a trip test schedule.
- Weekly fire pump checks must be done consistently and documented.
- There should be a system in place to ensure that corrective action items noted on fire equipment inspections are corrected.
- American Risk Management (A.R.M.) fire protection/loss control recommendations which are not to be implemented or for which implementation will be delayed significantly should be documented to ensure that the rationale and interim measures are specified.
- The frequency of the facility's sprinkler and 2 inch drain test/inspection program should be evaluated and possibly increased (e.g., quarterly).
- The weekly sprinkler inspection should include water and air pressure checks.
- The fire pump fuel system is sealed but should also be locked in the

open position.

* b) A written procedure should be developed for communicating fire equipment impairments to the personnel in the areas affected by the loss of the fire protection equipment and to an American Risk Management representative.

3. Preventive Maintenance (PM) Programs - The facility has a preventive maintenance program, however:

** A review of facility equipment equipment should be conducted to determine what equipment should be added to the PM program. The following should be addressed:

- The testing of safety interlocks
- DHS All pressure relief devices not currently included
- The inspection and testing of several types of critical equipment, (e.g., the water spray system in the HF lab electrical lighting).
- The inspection and repair or replacement of electrical extension cords.
- The testing of electrical grounds.
- The inspection and replacement of defective portable ladders.
- Maintenance checks and routine servicing of the emergency generators used for backup power supply of critical equipment.
- DHS Expanding the list and tests already in place for the routine testing of the integrity of atmospheric tanks containing hazardous materials or petroleum products. The results of any such testing (i.e., pressure testing, visual and/or dye checks, and wall thickness measurements) should be documented.
- LWH BSS The program that provides for the testing of laboratory type hoods on a two month cycle should be expanded to include other industrial hygiene ventilation systems. For example: the drum cleaning, steam cleaning and corrosion laboratory systems.

COMPLETE- PROGRAM HAS BEEN EXPANDED.

4. Process Safety - The plant Process Safety program should be extended to include the following:

* a) The program for conducting Process Safety Reviews on new process and pilot plant units should be extended to include Utility and Service equipment, e.g., Carbon monoxide, Hydrogen and boiler equipment.

* b) DHS A facility-wide assessment should be conducted to ensure that the electrical classification codes previously established remain valid for current operations.

5. Plant Engineering and Maintenance - The facility maintenance and engineering program should be revised to include the following:

DHS * a) The facility should conduct a review of the location of plant piping that is adjacent to roadways to ensure that critical pipes are protected from road traffic, for example: some piping on the hydrogen and carbon monoxide storage tanks.

BSS * b) A program should be initiated to ensure that construction or modification work requiring the removal of permanent fall protection devices is provided with suitable temporary protection, for example: the two 20 ft sections of guard rail, temporarily removed from the third and forth floors of the TFE unit.

ESS * c) The plant should review the policy for the construction and use of temporary scaffolding to ensure that they are used safely, for example: employees were using a scaffold in the TFE unit that did not have required midrails and toeboards.

6. Hazardous Work Permitting - The facility should review their hazardous work permitting system to ensure that the following items are covered:

** a) The electrical lock out procedure should be reviewed to ensure that all electrical equipment in the facility has been locked out by the person performing the work prior to beginning work on the equipment. This procedure should contain provisions for those pieces of equipment that cannot currently be locked out and provisions for the use of owner locks in addition to the worker locks.

* b) The confined space entry procedure should ensure that proper consideration has been given to the possible need for routine monitoring for contamination and heat exposure.

* c) The Hot Work procedure should be reviewed to ensure that provisions for repeated atmospheric checks are considered and that work areas and fire watches are properly identified for jobs being performed in elevated areas.

* d) Equipment used for combustible gas/oxygen checks should be routinely calibrated and documentation maintained.

7. Standard Operating Procedures - Facility Standard Operating Procedures (SOPs) should be reviewed and improved in several areas of the operations. For example:

* a) Utility Department SOPs should be updated to reflect actual current practice. Unofficial changes in pencil should be reviewed and incorporated or eliminated.

* b) SOPs for unloading raw materials should be reviewed and updated to reflect current acceptable practices.

* c) SOPs should be developed for the drum cleaning operations.

* d) Emergency shut down procedures should be developed for the Pilot Plant (IBAP).

* e) The facility should develop written "line breaking" procedures for process, pilot plant or utility equipment lines and pipes.

8. Injury and Illness Recordkeeping - The facility appears to be properly evaluating and recording instances of Occupational Injuries and Illnesses, however:

* a) Plant documentation of "extent of injury" contained on accident and injury reports should be reviewed to ensure that there is enough information on accident reports to determine if injuries should be recorded on the OSHA 200 log.

* b) The facility should begin keeping a dispensary log.

BSS 9. Fork Truck Programs - The facility has a program to control the operation of Powered Industrial Vehicles, however:

* The program should be reviewed and improved in the following areas:

  - The maintenance department should develop a specific program to routinely inspect fork trucks.

  - The current operator program to routinely inspect fork trucks before each working shift must be reviewed and enforced consistently throughout the operation.

  - The facility should develop a program to ensure that defects noted on forklift inspections are corrected in a timely manner.

LWH 10. Emergency Response - The facility emergency response plans and procedures should be reviewed in the following areas to ensure:

* a) There is a provision for periodic testing of the emergency response training capability and that problems are detected and corrected in a timely fashion.

* b) Documentation of training and drills should be kept as a record of the facility's preparation activities.

IV. FOLLOW-UP

All of the above items were discussed with your staff during the closing conference. Within 45 days of receipt of the final audit report, the Corpus Christi Plant is requested to submit its action plan to the Director, Environmental, Health and Safety Audit Programs with copies to the Vice President, Environmental, Health & Safety Affairs (EHSA), and other Hoechst Celanese management staff you deem appropriate.

The Action Plan must address each comment and observation requiring a response (i.e., those marked with single and double asterisks [*,**]). The action plan must contain a satisfactory description of the corrective action taken or planned, identification of the person(s) primarily responsible for the corrective action and a timeframe for completion (by month or calendar quarter). Where there are recommendations noted, the facility is free to substitute alternative methods to effectively address the comment or observation described. Where an alternate course of action is selected, the facility must document this decision in the action plan and explain the rationale.

An action plan status report is due each quarter (i.e., every 3 months) following the date of the action plan until all issues and observations identified in the audit have been satisfactorily resolved. The action plan status report is addressed to the Director, Environmental, Health & Safety Audit Programs with copies to Hoechst Celanese management staff you deem appropriate and me.

A letter confirming receipt, review and acceptance of the action plan and any subsequent status reports will be addressed to facility management.