A. F. MEYER AND ASSOCIATES, INC.

ENVIRONMENTAL, NOISE, AND OCCUPATIONAL HEALTH CONSULTANTS

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Report on SARS Backfit Evaluation
Exxon Donor Solvent Plant
Baytown, Texas

by

Alvin F. Meyer, Jr. P.E.

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Prepared for

Office of Assistant Secretary for Fossil Energy

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DISCLAIMER

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Project Manager

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Report on SARS Backfit Evaluation

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THE PURPOSE OF THIS REPORT

This report provides information on observations, findings, and conclusions arising from a site visit to the Exxon Donor Solvent Plant, Baytown, Texas. That visit was to provide technical assistance and professional services to the DOE/ASFE/OPTA Project Officer regarding verification of his initial determination that this pilot plant is exempt from the SARS backfit requirement (DOE Order 5481.1). A secondary purpose was to obtain further information regarding the occupational safety and health plans and procedures at this new pilot plant facility.

SUMMARY OF OBSERVATIONS AND CONCLUSIONS

A well planned and implemented occupational safety and health program exists at the Exxon Donor Solvent Plant. Excellent manuals regarding general safety requirements and protection against carcinogens have been prepared and distributed. A Safe Operations Committee is in effect as is a Risk Management Committee. Adequate safety and industrial hygiene staff has been assigned and an excellent medical surveillance program has been established. Adequate compliance with environmental codes, standards, and regulations is being achieved. Although this plant is not subject to SARS because of the nature of the contract, adequate documentation exists in any case to exempt it from the SARS backfit requirement.

OBSERVATIONS AND FINDINGS

Organization for Environment and Safety

The safety and training coordinator reports to the Plant Manager through the Director of the Process Group. An Industrial Hygienist is assigned to the facility on loan from Exxon USA Medical Department. He is qualified in air and noise control as well as industrial hygiene. Environmental engineering is accomplished by the Exxon Research and Engineering Division, which provides a consultant for air and water quality.

A Safe Operating Committee (SARS type) has been established and is in operation. The Safe Operations Committee must approve any change or deviation from standards, codes or regulations or any new piece of equipment or process. There is also a Risk Management Committee, which is responsible for making risk assessments particularly for hazardous operations. It is noteworthy that on-site audits have been made by the Industrial Risk Assurance Company. OSHA compliance is overviewed by the OSHA Coordinating Officer at Exxon Headquarters.

Management Systems

In addition to detailed safety manuals, a very comprehensive policy statement has been issued by the company regarding occupational safety and health. A performance index is utilized to compare the safety record at this facility with other Exxon facilities and with OSHA standards. Of special interest is the fact that this performance index includes off-job injuries of more than two days. Exxon does not pay for an off-job injury or illness if it can be proved that it was due to negligence of the individual.

In the past year a monetary reward of $45 per employee was provided as a result of the facility's safety record.

Other Management Control Items

- o A Task Book System has been established for redundant jobs. This includes safety instructions.
- o Procedures have been established to ensure that subcontractors and others on-site who are not Exxon employees conform to the plant safety manual and procedures.
- o There is a prestartup safety and operational audit system in effect which takes into account occupational hazards and potential environmental incidents.

Fire Protection

Fire protection is provided from the Baytown Exxon Refinery. A backup 15 man in-house firefighting team is currently being trained. All firefighters have been trained in cardiopulmonary respiratory procedures and in heavy rescue methods. Simulated mock responses have been held. A fire protection evaluation has been made by the Fire Protection Service from the Exxon Refinery.

Air and Water Pollution Control

Necessary permits have been obtained from the Texas Air and Water Quality Commissions. Environmental surveillance equipment (wind direction, temperatures, speed, hydrocarbon sensors, etc.) has been installed. All liquid wastes from the plant are treated at the Baytown Exxon Refinery facility. It was noted that excellent curbing and protection measures have been provided throughout the plant to control spills.

Medical Surveillance

All Exxon employees are required to have preplacement and periodic evaluations at the Medical Department, Exxon Refinery. Contractor employees working on-site are required to have physical examinations by physicians selected by the contractor with advice from the Exxon Medical Department. Medical protocols have been prepared by the Exxon Medical Department and an epidemiological system for the Exxon Donor Solvent Plant is being instituted. A toxicology program is planned by the Exxon Research and Engineering Division.

Employee Training Programs

An excellent employee training program has been established. In addition to hazardous material manuals and information sheets, audio-visual programs on hazards within the facility and means of control have been prepared and are presented periodically.

GENERAL OVERVIEW OF OCCUPATIONAL HEALTH PROGRAM

Appendix I is a summary of the presentation by Exxon Coal Liquefaction Pilot Plant personnel provided during the March 17, 1980 meeting.

CONCLUSIONS

Although not subject to the backfit requirement, because this facility is not a typical cost share pilot plant, the Exxon Donor Solvent Plant would meet the requirements for adequate documentation of compliance with codes, standards, and regulations. It would fit into the low risk category in this independent observer's judgement.

Appendix I

PRESENTATION TO
MR. JACK ABRAHAMS
U. S. DEPARTMENT OF ENERGY

MARCH 17, 1980

EXXON COAL LIQUEFACTION PILOT PLANT

OCCUPATIONAL HEALTH PROGRAM

BY

S. J. COHEN

EXXON COAL LIQUEFACTION PILOT PLANT

OCCUPATIONAL HEALTH PROGRAM

- Seven-part program.
  - Engineering controls.
  - Industrial hygiene.
  - Medical surveillance.
  - Personal hygiene.
  - Operations work practices.
  - Laboratory work practices.
  - Health education.

- Broad program objectives/structure developed by Exxon Technical, Medical, Industrial Hygiene, Operations, and Laboratory personnel.

- Program based upon Exxon petroleum refining and chemicals plant experience, Exxon research laboratory and small pilot plant experience, and outside experience in coal liquefaction pilot plants.

- Details of each program currently under development by appropriate groups.

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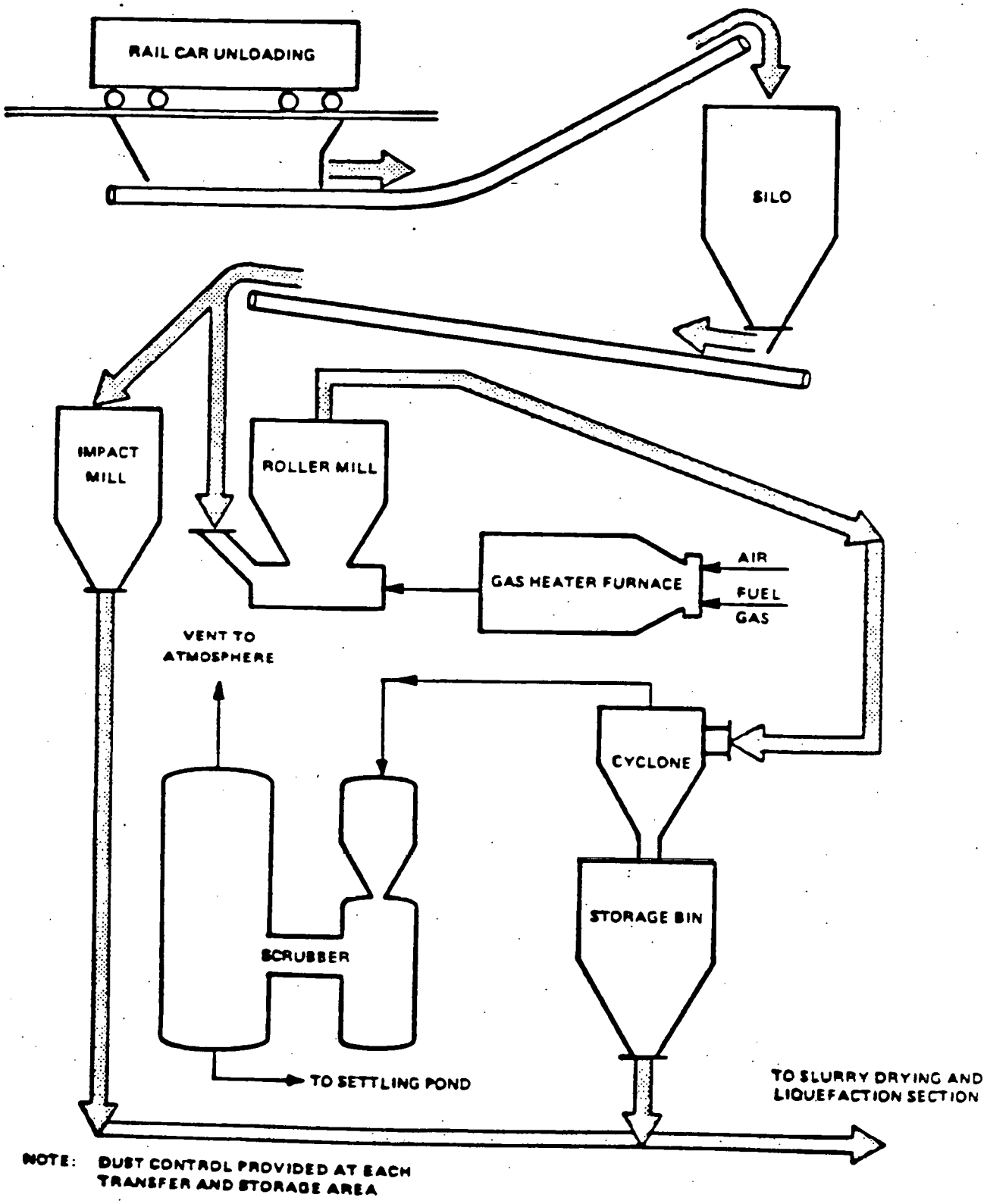

FIGURE 2-1
FLOW DIAGRAM OF COAL PREPARATION AND STORAGE AREA
ECLP PLANT

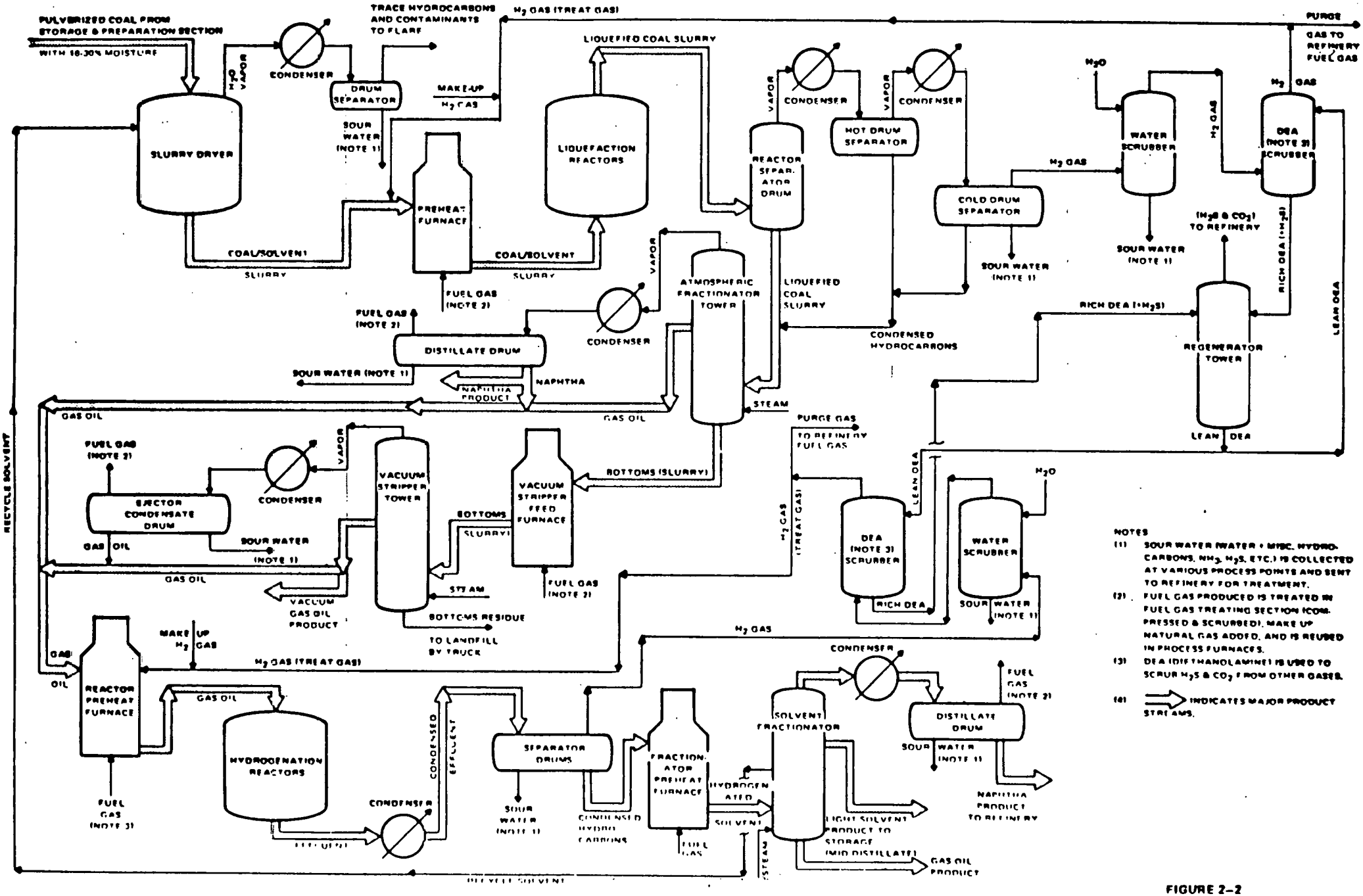

FIGURE 2-2
PROCESS FLOW DIAGRAM - ECLP PLANT

EXXON COAL LIQUEFACTION PILOT PLANT

OCCUPATIONAL HEALTH PROGRAM

ENGINEERING CONTROLS

Equipment	Location/Identification	Description of Operation
DUST SUPPRESSION		
• Venturi Scrubber/Separator	Coal Preparation Unit	Removes Coal Fines From Roller Mill Drying Gas
• Bag Filters	Coal Preparation Unit	Filters Coal Dust From Gas Streams
• Bag Filters	Vacuum Bottoms Conveyor	Filters and Dust Due To Vacuum Bottoms Breakage
• Water Spray System	Rail Car Track Hopper	Track Hopper Dust Suppression
• Rail Car Covers	Rail Cars	Prevents Dust From Blowing Out of Cars
• Conveyor Covers	Track Hopper Conveyor Raw Coal Conveyors Silo Reclaim Conveyors Crushed Coal Conveyors Prepared Coal Conveyors	Prevents Coal Dust From Escaping Conveyor Belt Into Atmosphere
• Fire Monitors	Coal Preparation Unit	Washes Down Any Dust Accumulation
NOISE SUPPRESSION		
• Acoustical Wrapping	Fans Blowers Slurry Letdown Valves	Limits Equipment Noise
• Steam Turbine Silencers	Turbines	Limits Noise Caused By Exhaust Steam
• Burner Mufflers	Process Furnaces	Limits Noise Caused By High Air Intake Volume

EXXON COAL LIQUEFACTION PILOT PLANT

OCCUPATIONAL HEALTH PROGRAM

ENGINEERING CONTROLS (CONTINUED)

Equipment	Location/Identification	Description of Operation
GAS/LIQUIDS EMISSIONS		
• Venturi Scrubber	Vacuum Bottoms Sandvic Belt	Removes Fumes From Vacuum Bottoms Cooling
• Flare System	-	Burns Safety Valve and Other Emergency Releases
• Smokeless Flare Tip	-	Improves Combustion, Minimizes Smoke
• Fuel Gas DEA Scrubber	Solvent Hydro Unit	Prevents H_2S and CO From Atmosphere Through Furnace Firing
• Non-Oily Water Retention Pond	Offsites	Collects Solids For Landfill
• Oily Water Retention Pond	Offsites	Collects Oil Washed From Unit Surfaces and Other Cleaning Activities
• Tail Gas Compressor	Vacuum Tower Top	Compresses Tail Gas Into Fuel Gas System
• Closed Drum System	Entire Plant	Allows Displacing Residual Liquids From Equipment Into a Closed System Rather Than Sewer

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EXXON COAL LIQUEFACTION PILOT PLANT

OCCUPATIONAL HEALTH PROGRAM

INDUSTRIAL HYGIENE

Recognition, evaluation, and control of hazardous substances in the employee's environment are the objectives of industrial hygiene. Extensive air monitoring of the employee's personal exposure and work area will be conducted.

The data collected will be used in direct operational support to assure a healthy environment at ECLP and to provide an expanded data base for future production facilities. The data base will also provide an exposure history in support of the medical surveillance portion of the program.

OBJECTIVES

- Provide industrial hygiene monitoring of all operations to determine the degree of employee exposure to toxic substances and physical agents.
- Recommend control measures when employee exposures are deemed excessive.
- Expand present industrial hygiene data base on health aspects applicable to commercialization of the Exxon Donor Solvent Process.
- Provide in-depth baseline studies during initial operation of plant.
- Provide continuing monitoring of plant operations.
- Respond to employee health concerns.

INDUSTRIAL HYGIENE (CONTINUED)

CONTAMINANTS

- Coal dust.
- Organic vapors.
- Particulates/BSF.
- Hydrogen sulfide.
- Noise.

MONITORING PROGRAM

- Personal and area sampling.
- Baseline comprehensive study.
- Routine process monitoring.
- Routine mechanical monitoring.
- Special mechanical operations.
- Special operational support.
- Routine laboratory monitoring.

EXXON COAL LIQUEFACTION PILOT PLANT

OCCUPATIONAL HEALTH PROGRAM

MEDICAL SURVEILLANCE

OBJECTIVE

Detect changes in worker's health during exposure to ECLP and determine if any changes are related to that exposure.

The medical surveillance will involve both Exxon and contract employees. It will consist of four parts:

- Preplacement examinations and documentation.
- Periodic examinations, including a matched control group.
- Record keeping -- medical and work exposure.
- Evaluation of findings.

The medical surveillance will include:

- Routine
- Epidemiological
- Cytology

All loaned wage hour personnel, Carter's Operations Supervisors, a few selected Technical personnel, and contractors' personnel with accumulated 90 days of service at ECLP will participate in the medical surveillance program.

EXXON COAL LIQUEFACTION PILOT PLANT

OCCUPATIONAL HEALTH PROGRAM

PERSONAL HYGIENE

OBJECTIVES

- Prevent/minimize skin contact from coal-derived materials.
- Prevent ingestion of any coal-derived materials.
- Prevent breathing of respirable particles, coal-oil mists/vapors, and toxic materials.
- Prevent any contaminated person, clothing, equipment, etc., from leaving the plant.

Coveralls, gloves, and other necessary protective gear will be furnished to any person working in the process areas. Dry-cleaning and laundering of clothing will be provided.

- Cotton coverall is outer garment.
- Slicker suits, rubber gloves, and rubber boots are provided.

Personnel working in the process areas must wear oil-resistant shoes. Selected work shoes cannot leave the plant. Up to two pairs per year will be subsidized.

Personnel working in the plant will be expected to take a daily shower. We shall provide the time, good facilities, and education about the health benefits of a daily shower. We shall employ the dirty-clean locker rooms concept with interconnecting showers.

Educational signs will be provided in rest rooms, lunch rooms, locker rooms, and smoking and refreshment areas. Reminder signs will be distributed around the plant.

EXXON COAL LIQUEFACTION PILOT PLANT

OCCUPATIONAL HEALTH PROGRAM

OPERATIONS WORK PRACTICES

OBJECTIVES

- Prevent personnel exposure to contaminants during equipment repairs or removal.
- Prevent personnel exposure to contaminants while catching and handling samples.
- Prevent the transmission of contaminants while transporting materials to areas outside ECLP.

Process and Laboratory procedures (work practices) and Mechanical job plans (work practices) have been prepared. Work practices attempt to force planning about all aspects of the work, including occupational health and safety considerations. The work practices procedures will have a built-in system to involve the industrial hygienist and to further improve the procedure before subsequent use.

EQUIPMENT REMOVAL/REPAIRS

Work Permits -- The Operations Department will establish work practices which will define the type of permit required for work to be performed. The occupational health considerations and the criteria for the issuance of the work permit will be reviewed before the job begins. Job examples are as follows:

- Line opening.
- Exchanger cleaning.
- Pump removal.
- Strainer cleaning.
- Enclosed vessel work (including consideration of radioactivity).
- Catalyst handling.
- Furnace work.

Safety Equipment -- Guidelines will be established for the type of safety equipment needed for each job.

Process personnel will establish work practices for preparing equipment for removal with emphasis on safety and occupational health considerations. Before turning the work over to Mechanical, Process will see that the equipment is blocked and bypassed. They will further ensure that it is flushed, purged, and drained and that necessary gas analyses have been made.

EXXON COAL LIQUEFACTION PILOT PLANT

OCCUPATIONAL HEALTH PROGRAM

LABORATORY WORK PRACTICES

OBJECTIVES

- Minimize exposure of laboratory personnel to coal-derived materials.
- Eliminate/control hazardous vapor or dusty conditions.
- Avoid skin contact from organic solvents and coal-derived materials.

The laboratory will be organized to aim for only one person per shift becoming involved in sample handling and preparations.

Standard laboratory engineering control systems for handling volatile materials, removing dust, etc., will be installed and monitored for good operations.

Protective gear will be available for any unusual conditions.

EXXON COAL LIQUEFACTION PILOT PLANT

OCCUPATIONAL HEALTH PROGRAM

HEALTH EDUCATION

OBJECTIVES

- Educate ECLP operational and contractor supervisor personnel about pertinent aspects of OHP.
- Furnish an information booklet about OHP to all personnel entering the process area.
- Present undated OHP to all ECLP operational and contractor's supervisor personnel on an as-needed basis, but at least once per year.

Plans are to use the slide/tape media, workbooks, and written test as the tools to educate the concerned personnel about OHP. Different languages will be used in the slide/tape media.

Booklets will be shirt pocket size. The contents will emphasize the personal hygiene part of OHP. It will be prepared in several languages.

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