

## **NASA LaRC HAZARDOUS MATERIAL PHARMACY**

**Student: Remy Esquenet**  
**Mentor: Robert D. Brown**  
**Office of Safety, Environment, and Mission Assurance**  
**Office of Environmental Engineering**

### **ABSTRACT**

This report outlines the steps taken in the research and design of a pilot hazardous material pharmacy at NASA LaRC. The purpose of the hazardous material pharmacy is to reduce hazardous material procurement costs and hazardous waste disposal costs through the collection and reissue of excess hazardous material. The results of this research show that a hazardous materials reuse facility is feasible and potentially beneficial to LaRC.

## **INTRODUCTION**

In 1993-1994 the Office of Environmental Engineering contracted SAIC to develop NASA Langley's Pollution Prevention (P2) Program. One of the priority projects identified in this contract was the development of a hazardous waste minimization (HAZMIN)/ hazardous materials reutilization (HAZMART) program in the form of a Hazardous Materials Pharmacy. As my LARSS project I was tasked with beginning the development of the Hazardous Materials Pharmacy.

A hazardous materials pharmacy is designed to reduce hazardous material procurement costs and hazardous waste disposal costs. This is accomplished through the collection and reissue of excess hazardous material. Currently, a rarely used hazardous material may be stored in a shop area, unused, until it passes its expiration date. The material is then usually disposed of as a hazardous waste, often at a greater expense than the original cost of the material. While this material was on the shelf expiring, other shop areas may have ordered new supplies of the same material.

The hazardous material pharmacy would act as a clearinghouse for such materials. Material that is not going to be used would be turned in to the pharmacy. Other users could then be issued this material free of charge, thereby reducing procurement costs. The use of this material by another shop prevents it from expiring, thereby reducing hazardous waste disposal costs.

## **APPROACH**

Research on the project began by doing a literature search and by visiting some operational Hazardous Materials Pharmacies in southeastern Virginia. The original contractor, SAIC, supplied two documents from The Air Force Center for Environmental Excellence. These documents are called "Hazardous Material Pharmacy: Commanders 'How-To Guide'" and "Facility Planning and Design Guide: Hazardous Material Pharmacy." The operational pharmacies that were visited were at Fort Eustis and at the Norfolk Naval Base.

The available literature and visits to operational pharmacies pointed out that hazardous material pharmacies are usually involved in the supply of new hazardous materials as well as the reuse of excess materials. NASA LaRC supply was contacted but they did not see the benefit of such a project. Because of lack of support from supply it was decided that the hazardous material pharmacy was only going to be a hazardous material reuse facility.

Putting a full scale reuse facility into affect immediately would be very difficult so a pilot program was chosen for development. This would allow for the collection, storage, and distribution mechanisms to be established while the pharmacy was still small and manageable. A pilot program dealing with Operations and Maintenance at LaRC was deemed the best option. Operations and Maintenance at LaRC is handled by a contractor called EG&G. EG&G was chosen for several reasons. EG&G has demonstrated exceptional awareness of environmental responsibilities and is an active participant in other pollution projects. EG&G has excellent accountability procedures for issuance, use and disposal of hazardous materials. EG&G is

divided into many trades covering the entire center. Each trade uses hazardous materials and could benefit from a hazardous material reuse facility.

EG&G's environmental coordinator was contacted and the project was discussed. The various trade shops were visited to evaluate their potential for participation in the reuse facility. A letter was sent to the contract specialist in charge of EG&G's contract, requesting EG&G's official involvement in the project. (See Appendix A) Copies of this letter were sent to key LaRC and EG&G personnel. OEE and EG&G representatives then met to discuss EG&G's participation in the pharmacy.

After an agreement was reached between OEE and EG&G a meeting was held to inform representatives of all of the EG&G trade groups that this pharmacy project would be moving forward. A list of excess hazardous materials was requested from each of the trades.

Research was also conducted to determine a location for the pharmacy. Property management personnel at the Logistics Management Division (LMD) were contacted to discuss the use of existing structures at LaRC. The use of prefabricated environmentally controlled hazardous material storage units was also considered.

## **EQUIPMENT AND FACILITIES**

NASA LaRC vehicles were used for travel to the Hazardous Materials Pharmacies at Norfolk Naval Base and Fort Eustis. LaRC bicycles were used to visit various EG&G trade shops and potential locations for the pharmacy. Training was received at the NASA LaRC Computer Lab in Microsoft Excel. Microsoft Word was used extensively to generate reports and letters.

## **RESULTS**

A temporary site for the pharmacy has been established. While in its preliminary stage it will be operated out of the EG&G warehouse. Buildings 1270 B,C,D had been considered as a permanent location for the pharmacy because they are currently being used for chemical storage and are scheduled to be closed in October. After reviewing the structures they were determined to be unacceptable because they do not meet safety requirements for hazardous material storage. The best option for a permanent location was determined to be a prefabricated structure designed for hazardous material storage. A suitable unit has been priced and funds have been allotted in next year's budget. (See Appendix B) The final location of this structure has not been definitively established. One possible location is adjacent to the EG&G warehouse, building 1187. Another possible location is behind the new pollution prevention building that is currently under construction.

Lists of excess materials have been received from each of the EG&G trade offices. (See Appendix C) These materials will be collected when suitable storage lockers have been placed into the EG&G warehouse.

OEE and EG&G personnel have agreed that EG&G personnel will run the daily operations of the hazardous materials pharmacy while it is in its preliminary stage. During this preliminary stage no additional manpower will be needed and no amendments will be made to the EG&G contract. A list of available materials will be distributed to all of the trades on a bi-weekly basis. Any trade will be able to take any material that is listed on the pharmacy inventory if they can show that the material is needed for a specific work order. The material can then be issued free of charge.

The success of the program will be determined by tracking the material that passes through the pharmacy. The value of the materials that are distributed can be totaled to estimate the reduction in procurement costs for EG&G. The potential disposal costs of these materials can also be totaled to estimate the reduction in hazardous waste disposal costs. The sum of these two figures will provide an estimate of the total savings benefit resulting from pharmacy operations.

If this pilot project proves successful it can be expanded to incorporate other areas at NASA LaRC. Other areas that have been identified, through analysis of hazardous waste disposal records, are the Operations Support Division, the Fabrication Division and Flight Dynamics.

National Aeronautics and  
Space Administration  
**Langley Research Center**  
Hampton, VA 23681-0001

**APPENDIX A**



429

June 30, 1995

Reply to Attn of:

**TO:** 126/David Jones, Contract Specialist, EG&G Contract NAS1-20243, Supply,  
Construction, and ADP Contracts Branch, AD  
**FROM:** 429/Head, Office of Environmental Engineering, OSEMA  
**SUBJECT:** Establishment of Hazardous Materials Pharmacy

The Office of Environmental Engineering (OEE) is in the preliminary stage of developing a hazardous materials pharmacy program. OEE proposes EG&G participate in establishing a Center pilot project.

A hazardous materials pharmacy is designed to reduce both hazardous material procurement costs and hazardous waste disposal costs. This is accomplished through hazardous material collection and reissue. Currently, a rarely used hazardous material may be stored in a shop area, unused, until it has passed its expiration date. The material is then usually disposed of as hazardous waste, often at a greater expense than the material originally cost. While this material was on a shelf expiring, other shop areas ordered new supplies of the same material.

The hazardous materials pharmacy would act as a clearinghouse for such materials. Material that is not going to be used would be turned in to the pharmacy. Other users could then be issued this material free of charge, thereby reducing procurement costs. The use of this material by another shop prevents it from expiring, thereby reducing hazardous waste disposal costs.

If successful, the pharmacy concept could be expanded to include the entire Center. EG&G is uniquely qualified to participate for several reasons. EG&G has demonstrated exceptional awareness of environmental responsibilities and is an active participant in pollution prevention projects. EG&G has excellent accountability procedures for issuance, use, and disposal of hazardous materials. The Centerwide operations and maintenance activities conducted by EG&G are eminently suitable for hazardous materials pharmacy operations. Successful pharmacies based on similar operations have been established at the Norfolk Naval Base and at Fort Eustis, VA. OEE would not expect any modifications or additional tasking to the EG&G contract for its participation.

We would like to meet with you and an EG&G representative to discuss this project. The OEE point of contact for this activity is Leslie Holland at extension 48690. Please contact her to set up a meeting or if you need additional information. Thank you for your time and consideration.

John W. Lee  
43342

cc:  
134/AD  
481/OSD  
485/J. R. Carbonneau  
485/J. L. Kirby  
421/OSEMA  
429/OEE  
429/L. H. Holland

429/RMEsquet:edd UFI:8800 (48690)

## APPENDIX B

The following unit is suitable for use as an exterior containment unit for hazardous materials. It measures 16' long, 9'9" deep and 8'8" high. It has a storage capacity of 28 - 55 gallon drums. Two entrances are located on the 16' side of the unit. The interior of the unit is divided into two halves by a fire rated separation wall. One side is suitable for the storage of hazardous materials, and the other side is suitable for storage of corrosives. Separate secondary containment and sumps are built into each side of the unit in the event of a leak or spill. The unit is fitted with explosion relief and dry chemical fire suppression systems. The unit is also air conditioned and insulated.

### Safety Storage Model 30

Feature	Cost
Base Unit - Model 30	\$13,000
Air Conditioning 2,800 BTU	\$ 2,800
Explosion Relief	\$ 750
Fire Rated Separation Wall	\$ 750
Dry Chemical Fire Suppression	\$ 1,775
Separate Sumps	\$ 155
Insulation	\$ 1,330
Explosion-proof Lighting	\$ 1,055
Corrosive Materials Liner	\$ 600
<b>TOTAL</b>	<b>\$22,215.00</b>

### Manufacturer Information

Safety Storage, Inc. Northeast  
341 Willowbrook Lane  
West Chester, PA 19382  
Representative: Art Fad  
Telephone: (610) 692-9151  
Fax: (610) 692-9156

## APPENDIX C

August 01, 1995

EG&G's inventory of materials to be placed into NASA's Hazardous Materials Pharmacy Reuse facility.

### PIPE / WELDING SECTION

Selig's Super Freee-All  
Drain cleaner, contains sodium hydroxide.  
poison / corrosive  
1 ea. 5 gal. can

### ELECTRICAL SECTION

Glyptal Inc.  
74010 hardener  
flammable liquid  
5 ea. 1 gal. cans

Paint, aluminum, heat resisting, 1200 deg. F  
flammable liquid  
1 ea. 1 gal. can

Glyptal Inc.  
74004 buff epoxy enamel  
flammable liquid  
2 ea. 1 gal. can

### A/C, SHEETMETAL SECTION

Ethylene Glycol  
6 ea. 1 gal. cans

Selig's spray & wipe, Clean Up II  
aerosol detergent, disinfectant  
11 ea. 19 oz. aerosol cans

Paint aluminum, heat resisting, 1200 deg. F  
NSN 8010-00-815-2692  
1 ea. 1 gal. can

Selig's Formula 0-88  
organic cleaner and degreaser  
combustible liquid  
1 ea. 5 gal. can

## **MECHANICAL SECTION**

Dupont Axarel 6100  
cleaning agent  
combustible liquid  
1 ea. 5 gal. can

Dupont Axarel 2200  
cleaning agent  
combustible liquid  
1 ea. 5 gal. can

## **BUILDING TRADES SECTION**

Paint Enamel, interior, semi-gloss  
4 ea. 1 gal. cans

Glidden Latex paint  
6 ea. 1 gal. cans

Pittsburgh Paints  
DTM enamel / 100% acrylic  
2 ea. 1 gal. cans

Bix spray-on stripper  
paint remover  
poison  
1 ea 1 gal. can

Pittsburgh off white  
block filler / latex  
1 ea. 5 gal. can

Pittsburgh pitt-guard  
polyamide-epoxy coating  
part A, 3 ea. 1 gal. cans  
part B, 3 ea. 1 gal. cans

Plasite (white)  
cold-set coating  
flammable  
3 ea. 1 gal. kits

Devcon "Z"  
cold galvanizing compound  
3 ea. 24 lb. cans