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TRIP REPORT #2 CHEMKO

STRAZSKE, SLOVAK REPUBLIC

WASTE MINIMIZATION PROJECT

AUGUST 16 - AUGUST 20, 1993

**WORLD ENVIRONMENT CENTER
419 PARK AVENUE SOUTH, SUITE 1800
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JANUARY 1994

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I. INTRODUCTION

Pursuant to the technical assistance program for Central and Eastern European countries funded by the U.S. Agency for International Development, the World Environment Center (WEC) team conducted a follow-up visit to Chemko Strazske in the Slovak Republic on August 16 - 20, 1993. The WEC team consisted of:

Thomas J. McGrath, Vice President

B. Bhushan Lodh, Project Manager

Tomas Andrezal, In-country Coordinator

Sharad Gandbhir, Advanced Engineering Associates, Inc., Engineering Consultant

The purpose of this visit was to implement the waste minimization program, formation of a Waste Minimization Committee (WMC), conducting a demonstration session on Organic Vapor Analyzer (OVA) and collection of sampling data at the manufacturing facility.

II. EXECUTIVE SUMMARY

Pursuant to the technical assistance program for Central and East European countries funded by the U.S. Agency for International Development, the World Environment Center (WEC) had organized a reconnaissance trip to Chemko Strazske, a manufacturer of inorganic and organic chemicals, located in the eastern most part of the Slovak Republic during March 1 - 5, 1993.

The WEC team and Chemko management selected the cyclohexanone plant for the waste minimization demonstration project (WMDP). The consulting engineer and the volunteer expert estimated that the WMDP may result in a reduction of raw material between 50% and 70%, resulting in cost savings of \$78,500 to \$314,000 per year, depending on the factory's operating capacity.

A project implementation trip to Chemko Strazske was made during August 16, 1993 to August 20, 1993. The project team consisted of WEC staff, Dr. Bhushan Lodh and the consultant, Mr. Sharad Gandbhir from Advanced Engineering Associates, Inc.

The following tasks were completed:

- Selection of the members for the Waste Minimization Committee (WMC) from various departments at Chemko.
- Presentation of seminars on Waste Minimization Programs.
- Training of the selected personnel from the WMC for the use of OVA, collection and presentation of the volatile organic compound monitoring data.

Please refer to Mr. Sharad Gandbhir's report, section IV.

III. ITINERARY

- August 15, 1993 - Arrive in Kosice, Slovak Republic.
- August 16 - 20, 1993 - Visit to Chemko Strazske; presentation of waste minimization program and benefits; form waste minimization committee; conduct demonstration session on organic vapor analyzer and collection of data.
- August 20, 1993 - Return to U.S.A.

IV. SHARAD GANDBHIR'S REPORT

WASTE MINIMIZATION PROJECT
CHEMKO STRAZSKE
SLOVAK REPUBLIC

REPORT NO. 2

by
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EXECUTIVE SUMMARY

During the first visit to Chemko Strazske from March 1, 1993 to March 5, 1993, a Waste Minimization Project in Cyclohexanone Facility was selected. In the interim period, until the second visit from August 16, 1993 to August 20, 1993, bids for Organic Vapor Analyzer were evaluated. Foxboro Model OVA 128-A1FAZ was purchased and carried to the Chemko facilities during the August 1993 visit.

The following tasks were completed:

- o Selection of the members for the Waste Minimization Committee (WMC) from various departments at Chemko.
- o Presentation of seminars on Waste Minimization Programs.
- o Training of the selected personnel from the WMC for the use of OVA, collection and presentation of the plant data.

BACKGROUND

A team of WEC staff, Mr. Thomas J. McGrath, Dr. Bhushan Lodh and consultant Mr. Sharad S. Gandbhir of Advanced Engineering Associates, Inc. visited Chemko Strazske from March 1, 1993 to March 5, 1993 and identified a waste minimization project that satisfied the established guidelines. The identified project was cyclohexanone manufacturing facility.

The consultant sent out enquiries for a portable Organic Vapor Analyzer(OVA)and received the bids form various manufacturers. After careful comparison of safety features, versatility, and cost, the consultant recommended a purchase of Foxboro Model OVA 128-A1FAZ.

The second visit was originally scheduled to take place in early June 1993. It was delayed at Chemko's request till August 16, 1993 because some modifications to the facility had to be completed.

OBJECTIVE

Objectives of the visit to Chemko Strazske from August 16, 1993 to August 20, 1993 were

- o To establish a Waste Minimization Committee
- o To make a presentation on a Waste Minimization Program
- o To start the Waste Minimization Program by
 - Conducting a demonstration session on OVA
 - Conducting a demonstration session on collection of data in a selected section of the manufacturing facility
 - Explaining the goals of the present program and setting up a program for transmission of weekly data

DETAILS OF ACHIEVEMENTS

During the first visit to Chemko Strazske in Slovak Republic, Cyclohexanone facility was jointly selected for the present waste minimization project. The reasoning for selection of this facility was as follows:

Basic raw materials used for this process are benzene and hydrogen. Benzene consumption per ton of product is significantly higher at Chemko Strazske than that in similar facilities elsewhere in the Western Countries. Chemko attributed about 10 per cent of this higher consumption to fugitive losses. As stated in the last report, these fugitive emissions amount to revenue loss of about \$314,000 per year. It was agreed that a waste minimization program in this facility would show a quick payout.

The consultant completed several tasks as follows after the return from the first trip:

- o Wrote specifications for a suitable as well as portable Organic Vapor Analyzer (OVA) using three main criteria
 - Safety
 - Reliability
 - Cost
- o Received, compared and made a recommendation to purchase Foxboro Century Portable Organic Vapor Analyzer Model OVA128-A1FAZ

The consultant then visited the local Foxboro distributor for a demonstration and training session for the purchased OVA.

The consultant carried the OVA to Chemko Strazske during the second visit in August 1993. The agenda for the meetings is shown in Figure 1.

The following tasks were completed during the August 1993 visit Chemko Strazske:

1. Formalization of Waste Minimization Committee

Participated in formalization of the Waste Minimization Committee(WMC). Names of the committee members are shown in Figure 2.
2. Waste Minimization Program Seminars

Using Ford Motor Company's report as a model, conducted seminars

on waste minimization programs

3. OVA Demonstration
Conducted demonstration session for the OVA. Explained the hydrogen flame ionization theory, and demonstrated calibration of the equipment.
4. Pilot Sample Monitoring Program
Conducted a pilot program on the sample monitoring data collections with active participation from the WMC members. The corrective actions to be taken were then discussed.
5. Data Transmittal Program
Set up a program to have the data transmitted on a weekly basis.

Additional details for the above mentioned Tasks 1 and 2 listed below were discussed during the meetings

1. Waste Minimization Committee

The consultant emphasized the importance of participation of members from the various disciplines of the facility. The consultant then explained the following benefits of the Waste Minimization Program:

- o Reduced Operating Costs,
- o Improved Environment,
- o Improved Quality,
- o Safer Workplace,
- and o Regulatory Compliance

2. Waste Minimization Program

The consultant gave an overview of the Waste Minimization Project. He then explained the definition of waste, why waste is important, what should everyone do about waste, and guidelines for identifying and reducing waste.

The consultant then further explained the above mentioned benefits of Waste Minimization Program and discussed the Waste Minimization Hierarchy of Prevention, Minimization, Treatment, and Disposal.

The following principles for the success of a Waste Minimization Program were then discussed:

- o Waste Minimization Start-up - formation of Waste Minimization Team and setting up realistic objectives.
 - o Knowing Waste Streams - Identification, quantifying, and costing of waste streams.
 - o Focussing on Waste Sources - Location, measurement and verification of waste quantities, and identification of waste reduction opportunities.
 - o Development of Effective Solutions - development and screening of options, establishment of and implementation of action plan.
- and o Verification of Results.

FIGURE 1

AGENDA FOR AUGUST 16 TO AUGUST 20, 1993 VISIT TO CHEMKO STRAZSKE

MONDAY, AUGUST 16, 1993

9:00 TO 9:30 INTRODUCTION

9:30 TO 12:00 REVIEW OF GOALS FROM PREVIOUS MEETING AND SCHEDULE OF ACTIVITIES DURING THIS VISIT

13:00 TO 16:00 PRESENTATION ON WASTE MINIMIZATION PROGRAM

TUESDAY, AUGUST 17, 1993

9:00 TO 12:00 FAMILIARIZATION WITH ORGANIC VAPOR ANALYZER, REVIEW OF P&I DIAGRAMS, SELECTION OF PLANT SECTION AND MARKUP OF LOCATIONS FOR SAMPLING

13:00 TO 16:00 HISTORIC DATA GATHERING

WEDNESDAY, AUGUST 18, 1993

1. QUALITATIVE MEASUREMENTS AND IDENTIFICATION OF MAJOR FUGITIVE EMISSION LOCATION
2. PRIORITIZATION OF LEAKS
3. CORRECTIVE ACTIONS

THURSDAY, AUGUST 19, 1993

1. CORRECTIVE ACTIONS CONTINUED
2. QUALITATIVE MEASUREMENTS
3. CONTINUATION OF ACTIVITIES IN OTHER AREAS

FRIDAY, AUGUST 20, 1993

1. SUMMARY OF ACHIEVEMENTS
2. PLAN FOR FUTURE ACTIVITIES

FIGURE 2

MEMBERS OF WASTE MINIMIZATION COMMITTEE AT CHEMKO STRAZSKE

1. Mr. Karel Hyska, Chem. Eng., Manager, Technical Division
2. Ing. Stefan Barnak, Head Technologist of Plant, Plant of Benzene Chemistry
3. Ing. Anton Babik
4. Ing. Peter Laca, Environmental Department
5. Ing. Jan Hrabcak
6. Ing. Eva Zemanova, Research Fellow
7. Ing. Andre Tall
8. Ing. Zeliznay
9. Ing. Peter Mihocko
10. Ing. Petrik
11. Ing. Milos Marko
12. Ing. Joseph Hlayac
12. Ing. Ivan Gavula
13. Ing. Valdimir Mikitka

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