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TRIP REPORT #2 NEFTOCHIM

BOURGAS, BULGARIA

WASTE MINIMIZATION PROJECT

NOVEMBER 15 - 18, 1993

**WORLD ENVIRONMENT CENTER
419 PARK AVENUE SOUTH, SUITE 1800
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I. ITINERARY

- November 14, 1993 - Arrive in Sofia.
- November 15, 1993 - Depart Sofia for Bourgas. Meeting with various Neftochim managers. Presentation of Organic Vapor Analyzer and training on its use.
- November 16 - 17 - Field work and training.
- November 18 - Meeting with management and conclusion of visit.
- November 19 - Depart Bourgas for Sofia. Debriefing with Mr. Gerald Zarr, U.S. AID Representative, Sofia.

II. EXECUTIVE SUMMARY

A WEC waste minimization team consisting of Mr. Glenn B. DeWolf, Project Director, Radian Corporation, Mr. Samuel Weiss, WEC Staff Consultant, and Mr. Thomas J. McGrath, WEC Vice President, visited Neftochim Refinery in Bourgas, Bulgaria for the start-up phase of the Waste Minimization Demonstration Project (WMDP). The first visit to Neftochim Refinery was a reconnaissance visit in July 1993.

At the time of this visit, the original recommendation of the WEC team was put into practice by providing the plant staff with a sophisticated instrument for detecting and measuring hydrocarbon leakage at valves, pumps, pipe joints, etc. The leakages represent not only serious economic losses but sources of air pollution as well. Instructions were also provided so that plant employees were soon able to operate the equipment and demonstrate their proficiency in finding and correcting leaks.

WEC also offered to provide correlation between leakage measurements and actual weight losses so that economics could be calculated. At this point, plant staff has taken over the Waste Minimization project, although additional support may be extended by WEC if requested.

The project can be considered a success in view of the fact that the objective was accomplished in a timely manner, at minimum cost, and with no disruption in plant operations.

Please refer to Mr. Glenn DeWolf's report, Section Three (3), for further information.

III. GLENN B. DEWOLF, RADIAN CORPORATION REPORT



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SUBJECT: Neftochim Petroleum Refinery and Chemical Combine,
Bourgas, Bulgaria

We visited the Neftochim Petroleum Refinery and Chemical Combine in Bourgas, Bulgaria from November 15 through 18, 1993 to begin implementing the World Environment Center, Waste Minimization Program defined in our earlier visit of July, 1993. For more details refer to the previous report under the WEC cover, "Trip Report #1, Bourgas, Bulgaria, Waste Minimization Project, July 19 - 23, 1993. During the present visit we accompanied delivery of a Foxboro Company, Century Organic Vapor Analyzer (OVA), Model 108, with accessories and calibration gases. We began a fugitive emissions screening and measurement study for waste minimization through reduction of hydrocarbon losses from equipment leaks.

On the first day, we met with Neftochim staff to explain the overall principles for the technical implementation of the program and to train them on using the instrument. Mr. Drusc of ANSYCO, Karlsruhe, Germany, the local distributor for Foxboro, provided hands on training for the instrument. We provided training in the overall execution of a fugitive emissions program and use of the instrument in the field.

We also delivered several documents to Neftochim about fugitive emissions and several other documents related to other aspects of waste minimization. These were specific to issues identified in our July visit as being important to them.

The documents on fugitive emissions included the following:

- Improving Air Quality: Guidance for Estimating Fugitive Emissions from Equipment, Chemical Manufacturers' Association, Washington, D.C., 1989.
- Protocols for Generating Unit Specific Emission Estimates for Equipment Leaks of VOC and VHAP, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research triangle park, N.C., EPA - 450/3-88-010, October, 1988.

We also left a copy of overhead transparencies ("acetates") that we used during our presentation, which outlined the overall approach for the fugitive emissions program as a

means of waste minimization.

Other documents included the following:

- Evaluation of Treatment Technologies for Listed Petroleum Refinery Wastes, American Petroleum Institute, API Publication No. 4465, Health and Environmental Sciences Department, May 1988.
- Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC, EPA-450/4-88-010, August, 1988.

We also provided a computer diskette copy of the US EPA public domain screening model, SCREEN-2 for air pollutant dispersion modeling. This might be used by Neftochim to preliminarily examine environmental benefits of the program in terms of air emissions' impacts in the areas surrounding Neftochim.

The field work consisted of taking measurements on several components in different parts of the complex to demonstrate the techniques and allow Neftochim personnel to experience the field operation of the instrument. They were the ones who actually took the measurements under our guidance. Bad weather and some problems with charging the batteries for the instrument limited the number of measurements taken during our stay. Neftochim decided that measurements during this start-up week were for demonstration purposes only and no attempt was made to actually begin the formal documentation work on any specific process unit. They planned to develop a formal plan and schedule for the various units after we left and to begin work as appropriate according to the weather and other circumstances.

Initially Neftochim has assigned two engineers to use the instrument and to begin taking the measurements. These personnel are to become Neftochim's in-house trainers for other personnel. In essence we trained the trainers.

The instrument was calibrated for methane using standard gases at 100 and 1000 ppm. Of the components tested in the styrene unit and in the hydrodesulfurization unit, two valves were found leak at values at or above the 10,000 ppm screening value. One of these, a fuel gas line into the unit, re-tested with a dilution probe, showed a gas concentration of 80,000 ppm. In both cases, tightening the valve stem packing gland nuts reduce the measured value to 1000 ppm or less. This dramatic demonstration convinced our hosts of the significant leak reduction achievable through a systematic and disciplined screening, measurement, and maintenance program for leak detection and repair.

We agreed that Neftochim would plan an appropriate schedule for the complex and carry out the program. We offered, and they accepted that after they had completed a significant part of or all of one process unit, we would review the results and recommend any changes in methodology or accounting methods for the savings. We need to follow-up soon on the status of the program since our most recent visit.

Other items discussed dealing with the sludge problem in the large holding basins in the

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wastewater treatment system area, and Mr. Sam Weiss's approach for pump-out. Various options for recovery of hydrocarbon values from the sludge after pump-out were also discussed.

Future work on this program includes:

- maintaining contact with Neftochim to answer questions;
- arranging a follow-up advisory visit; and
- planning and preparing a broader waste minimization presentation to advise Neftochim on how to proceed further with waste minimization on their own. This presentation will be made during a final and concluding project visit.

At this time, therefore, two more visits are expected prior to conclusion of the project.

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