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TO MEMORANDUM FOR RECORD

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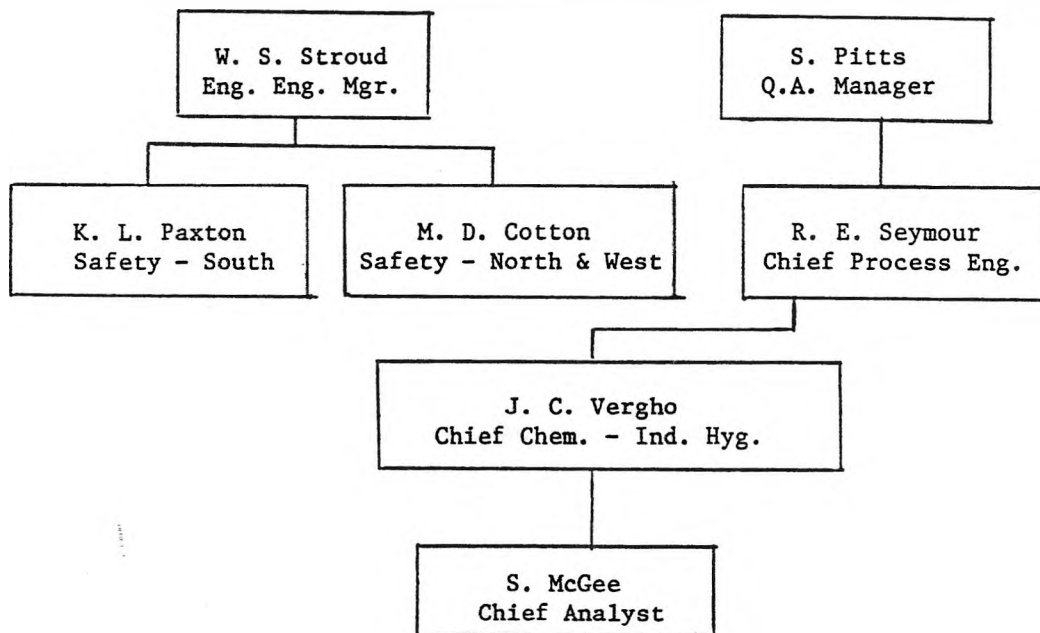
RE: TENNESSEE OPERATIONS - INDUSTRIAL HYGIENE AUDIT

I. Introduction

Tennessee Operations consists of three distinct plant facilities designated North, South and West. Operations include smelting, fabrication, and powder production. Supporting these activities are prebake reduction, carbon plant, anode assembly, carbon bakes, ingot casting, heat treatment, scalping, hot and cold rolling mills, paint line, can reclamation, craft and maintenance shops.

II. Present Hygiene Capabilities

Industrial hygiene activities at Tennessee Operations are conducted under the supervision of Mr. Joseph Vergho, Chief Chemist - Industrial Hygienist. He is assisted by Mr. Steve McGee - Chief Analyst, who has received on-the-job industrial hygiene training from Mr. Vergho in addition to the intensive two-week NIOSH Industrial Hygiene Measurements course and a NIOSH Sponsored Asbestos course. A schematic representation of reporting relationships is as follows:



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The size and scope of the Quality Assurance laboratory with gas chromatographic, precision gravimetric, atomic absorption and infrared spectrophotometric capabilities make it sufficiently equipped to accommodate nearly all industrial hygiene analytical needs.

III. Present Hygiene Activities

Industrial hygiene sampling efforts are directed by recognized problem potential. The effort to establish a periodic sampling program is commendable. On an annual basis, three reports are prepared, one per plant, summarizing sensory and quantitative hygiene measurements taken.

For example, during 1978, the following personal monitoring results were reported.

South Plant

Dust, F⁻, SO₂
Asbestos, NH₃
CTPV, CO
HCL, Cl₂, Noise

North Plant

CO
Cl₂
Noise
Dust, Oil Mist, Asbestos, H₂SO₄, Organic Solvents

West Plant

CO
Oil Mist
Noise

Industrial hygiene sampling reports are directed to management accountable for the operation or plant in question, and to the Operations Industrial Hygiene Committee and other ad hoc groups, such as the South Plant Noise Control Committee, where appropriate. A cursory look at data accumulated over the years indicates that problem areas have been defined and documented, but periodic sampling has demonstrated that either little or nothing has been done to control exposures. For example, in the South Plant repeated measurements of total dust at ore unloading and entrained asbestos at the Bldg. 52 marine sawing operations indicate continuing over exposure conditions.

Given the present lack of full-time in house industrial hygiene expertise, Mr. Vergho has done a commendable job in trying to

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maintain a minimal program for an operation as diverse and complex as Tennessee.

IV. Audiometry

Audiometric testing is extended to all employees at the time of their initial employment and generally whenever periodic physical examinations are conducted. Facilities for such testing are located at both the North and South plants.

V. Matters of Industrial Hygiene Concern

1. Noise

Because of the size, diversity, and physical separation of plants, the periodic assessment of noise exposure involves a considerable expenditure of manpower. Tennessee has done a satisfactory job in delineating those areas that require remedial measures. In many cases, engineering controls have been effective in reducing or eliminating exposures. However, where such controls are infeasible and it has been determined that overexposure conditions are present, it is imperative that employees are cognizant of hearing protector areas via proper sign posting and that protection is worn when and where required.

Anticipating the need for exposure determinations for those individuals involved in highly variable noise exposures either through the ambulatory nature of their duties or the intermittency of exposure, Tennessee has purchased personal dosimeters. Measurements taken with this equipment when coupled with sound level measurements will be needed in order to evaluate worker exposure per job classification.

The subsequent exposure classifications obtained per job classification should be matched with employees within a classification so that a record can be maintained of an employee's exposure history.

The annual plant-wide noise level survey presently being conducted should be expanded in order to obtain the exposure histories mentioned above. This survey is a critical element in an effective hearing conservation program in order to determine the efficiency and continued effectiveness of noise abatement activities, to document employee exposure, and for future correlation with audiometric test results.

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2. Urinary Fluoride Survey

Since the inception of the program, the general trend of employee participation has been on the increase. It is hoped that this trend, a function of time invested in the program and the employee education efforts expended, will continue. The relatively high baseline fluoride level for the Tennessee control group warrants investigation as to probable cause. Every effort should be expended to insure that the control group is represented by non-exposed employees. If, however, the control value is truly indicative of non-occupational fluoride exposure, efforts to control occupational exposure are critical because of the reduced margin between control and criteria values. RMJ

3. Employee Health Hazard and Exposure Measurement Notification

When an employee participates in a personal monitoring effort, because of legal requirements and to elicit the employees cooperation in future testing, he should be informed of the test results and of the nature of the hazard and its remedy. This responsibility will substantially increase the present industrial hygiene workload. Two paradigms for such training and exposure notification include practices of the Urinary Fluoride Program and the soon to be released Coal Tar Pitch Volatile Health Hazard Evaluation Presentation. Any presentation prepared for employee use will need to be a combined effort with input provided from safety, engineering, medical, personnel/labor relations, and local management.

4. Asbestos

Past asbestos sampling has indicated that at times the current OSHA standard has been exceeded. Where respiratory protection is required, such as in Bldg. 52, it is imperative that proper employee use of such protection is guaranteed. Periodically, work practices should be reviewed and the ventilation systems should be evaluated to determine if they operate at design efficiencies. As required by CFR 1910.1001, semi-annual monitoring and annual medical surveillance activities should be continued concurrently with an effort to reduce exposures below the permissible exposure limit.

The documentation of potential exposures in areas outside of marinite processing such as in pot digging and during the removal of thermocouple wires in Bldg. 810, preheats is appropriate & commendable.

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5. CTPV

The assessment of occupational exposure to coal tar pitch volatiles in smelting should be continued on a periodic basis. Sampling strategy should be so designed to accumulate data to construct exposure profiles per job classification for all employees potentially exposed.

The sampling results for CTPV in electrode production have indicated that some areas or processes have the potential of creating excessive exposure. As an interim measure, respiratory protection programs as defined by Alcoa Engineering Standard 18.1.1 and CFR 1910.134, should be implemented after sufficient personal sampling has indicated exposures in excess of 0.2 mg/m³ TWA of benzene soluble particulate polycyclic organic matter.

6. CO

The plant-wide detector tube monitoring system for carbon monoxide should be continued at the present testing frequency. Efforts such as this one, although exposures have been well within specified limits, are necessary to insure that no process or general ventilation patterns have changed or degraded to the extent that any increased likelihood of exposure occurs.

7. Perchloroethylene

Given the present controversy over the carcinogenic potential of chlorinated hydrocarbons, exposure determinations for perchlor should be continued on an annual basis.

8. Oil Mist

In light of exposures in the tenths of milligrams per cubic meter, the current frequency of personal monitoring is satisfactory. Future sampling strategy should be directed towards obtaining data for worst case situations and toward developing an exposure profile based on job classification.

9. Bldg. 832 - Paint Line

Because of the varied types of coatings applied and solvent systems used in this operation, it is necessary to obtain a data base that is product dependent. For this reason, the periodicity of personal sampling cannot be predetermined. The present approach to obtained exposure data on new products such as vinyl cladding, or upon receipt of new toxicity data such as with the PPG Duracron coating should be continued.

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Since multiple contaminant exposures can arise from multiple component coating systems, exposure evaluations must consider the cumulative toxicity of the various constituents.

10. Personnel

The diversity, size, and physical separation of plant facilities along with the attendant hygiene concerns described above warrant the services of a full-time industrial hygienist. In order to perform the necessary sampling requirements of an industrial hygiene surveillance program, such a staff member will require the services of a hygiene technician. Without such an investment in personnel, the adequacy of Tennessee's present program will fall short in complying with regulatory requirements that are becoming increasingly complex and time demanding. The creation of a full-time industrial hygiene position will also provide the needed manpower to conduct frequent plant walk-through surveys to insure that process and work practice changes do not lead to the deterioration of the work environment.

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