LOS ALAMOS AIR CLEANING ACTIVITIES

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Because of the brief time allotted for these remarks, I feel that it would be unrealistic to go into detail on some one arbitrarily selected piece of work here at Los Alamos. Instead, I will give you a brief explanation of the organization here, the type of work being done by the various parts of the organization and the names of people involved in each type of work. In this way it is hoped that from this information, you will follow up your own special interests. Only the host installation finds itself in this fortunate position so we hope you take this opportunity to meet our people and inspect our facilities.

There are three major organizations at Los Alamos. The Atomic Energy Commission staff is, of course, responsible for overall operation of the Los Alamos project. The University of California is responsible for the operation of the Los Alamos Scientific Laboratory, and the Zia Company is the maintenance contractor for both townsite and laboratory.

Of interest to this seminar, the Atomic Energy Commission operates the Waste Disposal Laboratory at Los Alamos. This Industrial Waste Section of the Health and Safety Branch is under the direction of Mr. C. W. Christenson, who is inactive at present due to illness, and his work is being carried on by Everett Matthews. This section, with a staff of 16 people, operates three waste treatment laboratories on a combination routine and pilot plant basis. These plants handle all industrial and radioactive waste from the main technical areas at Los Alamos on a routine basis but at the same time are carrying out a research and development program on the coprecipitation of Pu by ferric hydroxide and aluminum hydroxide.

In addition to the above this Section carries out a research and development program which may be best explained by listing some of their recent work.

1. Radiation tolerance of activated sludge. This was done on a laboratory scale using cobalt sources on activated sludge. The work is complete and will be published.

2. Removal of P^{32} and I^{131} by use of trickling filters. Work is complete.

3. Removal of mixed fission products by a trickling filter.

4. Removal of TNT, RDX and Ba salts by a precipitation of the Ba as $BaSO_4$ and adsorption of the TNT and RDX on activated carbon.

5. Movement of Pu thru soil and rock surrounding waste seepage pits. This work is in progress.

6. Treatment of radioactive laundry wastes by activated sludge process.

7. Concentration of Pu in industrial waste effluent by various algae.

Within the framework of the University of California organization at Los Alamos, there are several groups doing work of interest to this seminar.

In the Health Division, Group H-5, under the direction of Harry Schulte, is responsible for the Industrial Hygiene activities in the Laboratory. Mr. Schulte's group of 19 people concerns itself with all health problems involving non-radioactive materials but the work of this group is of interest here because of their experience in air sampling techniques and their experience in the evaluation of various hazards. This group is involved in one way or another with most stack gas problems at Los Alamos. This group acts in an advisory capacity on air sampling techniques to the Monitoring Group, H-1, which is under the direction of Mr. Dean Meyer.

Some recent work of Mr. Schulte's Group has been:

1. Development of certain phases of the Los Alamos incinerator. Mr. Schulte will have more to say about this in a few minutes.

2. Industrial hygiene in the Be shop. This included protection of the workers, adequate cleaning of the exhaust air and a particle size study from the particular machine operations involved.

3. Development and modification of air sampling equipment for special jobs.

4. Surveys for radioactive and non-radioactive hazards outside the Technical Areas to protect the community and the surrounding areas. As a result of this work, this Group has done a great deal of the air sampling and evaluation work in connection with the Nevada tests.

In the University of California Engineering Department, Mr. Charles Wherritt heads the Mechanical Design activities of Group ENG-2. As a part of their work, this group designs ventilation and filtration systems throughout the project. Since the main function of the Los Alamos Scientific Laboratory is research, the work of this Group must follow the research program and, as a result, is very wide in scope and is ever changing.

Recent work of Mr. Wherritt's Section includes:

1. Improvement of the air filtration system at the Graphite Shop. This was done by using a cyclone filter followed by a Hersey filter.

2. A 25 ton air conditioning system for the 701 calculator.

3. Equipment to maintain a flow of -70° F dew point air thru a process unit.

A Division of the Los Alamos Scientific Laboratory, the Chemistry and Metallurgy Research Division concerns itself almost exclusively to research and production work involving radioactive materials. Because of the special

problems in this work, the Chemistry and Metallurgy Division has people on its staff doing work of interest to this seminar.

In the CMR-10 Group of this Division, work done on the capillary air washer by Hammond and Leary is being carried on by Mr. Robert Clark of that Group. Mr. C. S. Leopold, a consulting engineer of Philadelphia, is also taking an active part in this work. This work which has extended over a period of several years has been centered around the research and development of the so-called "capillary air washer." This air cleaning device consists of a conventional capillary washer section followed by a dry pad section. The capillary washer sections are made up of 8" thick pads of 250 μ glass fibers. The first stage of the washer section is countercurrent flow while the second stage is concurrent flow. The dry pad following this washer section is made up of $1\frac{1}{2}$" of 100 μ glass fibers followed by $\frac{1}{2}$" of 10 μ glass fibers.

The above arrangement is followed by a second section consisting of one concurrent capillary cell stage followed by a dry pad.

Work has been done involving the variables, velocity, particle density and size, filter media density, water rates, etc. Also as a part of this work, a rather extensive program was carried out on sampling techniques and aerosol generation.

Work has been going on at other installations along similar lines and Mr. Clark will be happy to discuss the work and facilities here with any interested persons.

Also in the Chemistry and Metallurgy Division, CMR Engineering under my direction is responsible for the design of ventilation and filtration systems for this Division. Since CMR Engineering includes a mechanical equipment design section the work is usually a combination of equipment design, ventilation and filtration. This section develops special hoods and dry boxes for the Division as well as special ventilation and filtration systems. The ventilation systems worked on by this Group range from complete building systems of 600,000 cfm to single enclosures of 30 cfm.

I believe it is evident in work of this kind at a research laboratory that there is no one type of filter that answers all problems and it is the responsibility of this group to apply the proper filter for the particular job in CMR Division.

This section has developed an interchangeable dry box system that is now available commercially.

They have recently been concerned with the ventilation of laboratories handling very light gases.

In general, you will find that the approach to the filtration problem has been as follows:

1. Production areas. The supply air is filtered thru commercial filters and in addition, that portion of the supply air entering dry box trains is again filtered thru CWS type filters or the variable density type edge filters. The exhaust from these areas is filtered as close to the box as possible then passed thru back up filters before discharge to atmosphere.

2. Research areas. Due to changing conditions, it is usually not feasible to filter locally so all air from these areas is passed thru a main filter system. In two of our largest installations, capillary washer systems as described previously are used.

This is a brief explanation of the work at Los Alamos which may be of interest to you and an introduction to the people involved in that work. We hope you take advantage of your visit here to investigate matters of special interest to you.