SESSION I

WELCOME AND OBJECTIVES OF CONFERENCE

Monday, August 28, 1972
CHAIRMAN: D. W. Moeller

OBJECTIVES OF MEETING	D. W. Moeller
WELCOME	J. L. Liverman, M. B. Biles
PRESENTATION TO HUMPHREY GILBERT	

OPENING REMARKS OF SESSION CHAIRMAN:

On behalf of the Harvard Air Cleaning Laboratory, it is my pleasure to open and welcome you to this, the 12th AEC Air Cleaning Conference. Joining with Harvard University in the sponsorship of the Conference are the Oak Ridge National Laboratory and the U. S. Atomic Energy Commission.

In extending this welcome, I would like to take special note of our many foreign guests who are here with us. I believe the number of people from north and south of our borders and from overseas exceeds that of any previous such meeting. As of noon today, the records show that, in addition to over 200 registrants from the United States, we have representatives from six foreign countries including Canada, France, Switzerland, United Kingdom, West Germany, and Yugoslavia. To each and all of you, a most hearty welcome and best wishes for maximum benefit from this Conference.

As in all such endeavors, there are many people who must put in many hours of hard work to assure its success. One person I would like to recognize at this time is Clifford Burchsted of the Oak Ridge National Laboratory who has been in change of Local Arrangements for the meeting. We especially appreciate Cliff's efforts in securing this excellent lecture hall for our use. Let us hope that our presentations will be as good as those of the actors in the plays which have been performed here in the past!

At this time, I would like also to recognize Melvin First, my colleague at Harvard. Mel has handled all the contacts with those of you presenting papers and will be responsible in future weeks for editing and handling the publication of the Conference Proceedings.

Finally, I would like to cite the members of the Program Committee for their contributions. They are W. L. "Andy" Anderson, Clifford Burchsted, Melvin First, Gordon Burley, Humphrey Gilbert, and Craig Roberts.

OBJECTIVES OF THE MEETING

Dade W. Moeller

Harvard Air Cleaning Laboratory
Harvard School of Public Health
Boston, Massachusetts

Dating back to the 1st AEC Air Cleaning Conference in 1951, these meetings have served as a forum for the exchange of new developments in the field of air cleaning, and the published Proceedings represent the best source of up-to-date technical information on the subject. Such information, originally coming solely from AEC contractors, now includes the results of work by scientists and engineers in many industrial organizations as well as by our fellow-workers in foreign countries. A characteristic of all of the Conferences has been their informality and, indeed, the open debates which have occurred from time to time on key issues confronting us. This has always been done, however, in a spirit of seeking new knowledge and finding the truth, and I hope this Conference will follow in that pattern. Since 1963, the Nuclear Safety Information Center at ORNL has given additional stature to these meetings by publishing a summary of each one in the Journal, NUCLEAR SAFETY. I am pleased to say that this will be done again this year.

The 11th AEC Air Cleaning Conference was held only two short years ago and, yet, in that intervening time there have been several decisions which are having a major impact on air cleaning operations. At the time of the last Conference, plans were underway on the Fast Flux Test Facility in Richland, Washington, and ground had been broken for its construction. Now, that plant is well underway and plans have been announced, and bids solicited, for planning a full scale LMFBR demonstration plant which will be jointly operated by TVA and the Commonwealth Edison Project Management Corporation. This national commitment to fast breeder technology is having and will continue to have a significant effect on air cleaning research and development for some time to come. In particular, this commitment emphasizes the necessity for those performing air cleaning research to mold the results of their work into a form for practical application to ongoing systems.

Coupled with the commitment to the LMFBR has been the impact upon air cleaning of the National Environmental Policy Act of 1969 and the court's interpretation of that Act as indicated by the Calvert Cliffs decision of 1971. Not only must a full assessment now be made of the environmental impact of each nuclear facility, but there must also be a balancing of the environmental costs with the economic and technical benefits of the proposed plant. From the standpoint of air cleaning, this means both that the necessary air cleaning equipment must be developed and that those in charge of such

development must see to it that the required environmental protection can be accomplished at a price that we can afford to pay. This will necessitate continued attention to the requirements for uniform standards and quality control and to the need for designing and constructing systems that are both reliable and economic.

Reflected in the National Environmental Policy Act is the public's increasing clamor for a better quality environment. In essence, we have moved from an era of asking what we can do to decrease pollution and environmental damage, to an era of asking what we can do to prevent pollution and to preserve environmental quality. This attitude, and other considerations, have led to the promulgation by the AEC of more stringent regulations on releases from nuclear facilities. As a result, a large part of the work in air cleaning during the last two years has been in upgrading the reliability of air cleaning systems to meet these newer standards. This has been particularly true with respect to the control of the noble gases.

Another development which may have an impact on air cleaning operations (and which, in fact, might serve as the theme of one of our future Conferences) is the current trend toward planning for the construction of nuclear facilities on natural or man-made offshore islands. To say the least, the meteorological interpretation of the behavior of airborne effluents from such plants is a science unto itself. Whether this will mean a relaxing of some of our current air cleaning requirements is something we will have to wait and see. It will definitely mean that assessments will have to be made of the performance of air cleaning systems in new environments, such as those characteristic of the atmospheres above the oceans.

Accompanying these developments, we see a continued interest in light water reactors for meeting present electric power needs. The latest data released by the AEC shows that, during the first half of 1972, electric utilities announced plans for 18 nuclear power generating units with a total capacity of almost 20 million kilowatts. As of June 30, 1972, there were 26 nuclear power units in operation, 51 units being built, and 66 additional units on order. Within all such plants, air cleaning systems have required a considerable amount of planning and thought. Because this dependence on light water reactors will continue for several more decades, we will have to continue to allocate a large share of our R & D effort to air cleaning problems associated with such units. As all of you know, such problems are certainly not the exclusive property of the LMFBR.

A review of the program being presented at this meeting shows that the titles of the papers are, in many ways, a reflection of the previously cited developments. The opening technical session focuses attention on the noble gases and the requirements for newer and better data for predicting the performance of removal systems under both normal and accident conditions. As at the 11th Conference in 1970, we see a continuation and, in fact, an increase in efforts to refine air cleaning systems for BWR's and PWR's as well as LMFBR's. In addition to the plants themselves, we see attention being directed to air cleaning problems associated with the

acquisition, fabrication, and reprocessing of nuclear fuels and to the requirements for monitoring and evaluating the performance of the associated air cleaning systems.

As in the past, the objectives of this Conference are several fold. First of all, to bring into focus those areas of greatest research need and those where controversy exists or clarification is required. Almost of equal importance is the reporting of progress on efforts to make the results of this research applicable to on-going systems. It is a pleasure to join with you in this effort, and I look forward to the results of your deliberations over the next four days.

As I mentioned in my opening remarks, joining with the Harvard Air Cleaning Laboratory in the sponsorship of this Conference are the Oak Ridge National Laboratory (ORNL) and the U.S. Atomic Energy Commission (AEC). Here to extend an official welcome on behalf of ORNL is Dr. James L. Liverman, Associate Director, Biomedical and Environmental Sciences.

WELCOME

James L. Liverman

Associate Director
Biomedical and Environmental Sciences
Oak Ridge National Laboratory
Oak Ridge, Tennessee

On behalf of the Oak Ridge National Laboratory and the two other Union Carbide managed AEC facilities here, I want to welcome you to Oak Ridge for this the 12th AEC Air Cleaning Conference. The last Oak Ridge meeting of this group was nine years ago in 1963 and I need not remind you that since that time there have been a number of revolutionary changes in the way we do things and in particular of how what we do is closely scrutinized. The public has become aware and concerned over environmental and health effects of a wide diversity of human activities, especially those associated with a developing nuclear energy. With this awareness has come a demand on the part of a constantly increasing minority that the public itself be allowed to participate in the decision making process of Federal Agencies on matters affecting the public.

Prior to 1970 there was only limited opportunity for the public to participate since only a few agencies had mandates to consider environmental issues--the radiological ones in the case of AEC--but even in these the issues were largely restricted to a case-by-case consideration which provided only limited overview of broad environmental impact and possible alternatives to reduce the impact. With the signing of the National Environmental Policy Act on January 1, 1970, however, the whole picture began to change, for Section 102 of the Act required specifically that agencies consider environmental factors of the proposed action at the earliest possible stage and to mold their actions to improve the environmental status. By December 1970, most agencies, including the AEC, had issued guidelines for compliance with the provisions of NEPA and the public had begun to participate. It was not until the Calvert Cliffs decision in August of 1971, however, that a court action of sweeping proportions launched the nation on a broad program of full compliance with the full intent of NEPA. This decision did much to clarify the Act and provided that:

a. the lead agency responsible for an action must make an independent assessment of all environmental impacts and consider less damaging alternatives and furthermore,

b. that a retrospective review be made of all actions taken since the passage of NEPA to bring them in line with the renewed emphasis of "independent" assessment of all factors.

With the enormous pressures for energy production, this decision placed on the AEC regulatory function an almost insurmountable burden of paperwork. ORNL along with Argonne and Battelle Northwest were called upon to assist with these independent assessments. For more than a year now we have had approximately 150 people of the ORNL involved in preparation, review, and administrative board appearances on some of the most controversial siting actions. It has been a tough year for many of our people to be pulled away from the research bench into the swirl of activity associated with "independent assessment" but I think if we survive we will in fact be far ahead, because these activities have caused us to view the problems of radiological, thermal, chemical, esthetic, and related effects of energy

production in a much more comprehensive and interrelated way than was demanded previously. We are forced to view the problems of the real world as they truly are, not as we would like them to be, and to revise our R&D programs to get at the answers needed.

Your efforts in developing adequate control measures have been in a major way responsible for making our job in preparing the air release portion of impact statements relatively easy. I only wish that all aspects of control of possible environmental insults were as far advanced as the areas in which you work. Certainly, there are still problems, but I suspect they are less than those in non-atomic energy areas.

As you are aware from the provisions of NEPA many of the insults deriving from fossil fueled plants do not quite fall under the close scrutiny of the Act. I am led to wonder at what stage this action will come and to wonder what this implies in terms of the AEC's recently broadened authority to look at aspects of energy in general. Will that broadened authority and the consequent involvement in research and development force a broadening of the considerations of those of us here to include the cleaning of air from coal fired plants or gas fired plants. In what ways will we change our views, our considerations and our actions. Are the things which we have evolved in preventing radiological releases relevant and applicable to the air cleansing needed in the non-fission plants? Do we require more total effort or can we handle the situation with our current level of effort?

In closing, I would invite your active consideration as you proceed through this conference to constantly ask the question, "Is what we are discussing here relevant to the broadened AEC mission," and, if so, "In what ways."

Thank you for your time and I wish you success in this meeting. You are always welcome in Oak Ridge--do come back.

MOELLER: Thank you, Dr. Liverman. We appreciate not only your words of welcome, but also we are indebted to you for setting the stage for many of the topics we will be discussing here.

Also serving as a sponsor (and I might say, financier) of this Conference is the Division of Operational Safety of the U.S. Atomic Energy Commission. Here to welcome us on behalf of the AEC is Dr. Martin Biles, Director of that Division.

AEC WELCOME

Martin B. Biles
U. S. Atomic Energy Commission
Washington, D. C.

Thank you, Dr. Moeller. You have been welcomed by Mr. Hart and Dr. Liverman. Now I wish to welcome you on behalf of the Atomic Energy Commission. We in Washington have been intimately acquainted with the planning for this conference. We know that the agenda is interesting and full; therefore, my remarks will be brief.

Air cleaning problems have always been extremely important to the Atomic Energy Commission. In fact, the Commission was concerned about ecology long before ecology was a household word. Our sponsorship of these twelve conferences, spanning more than two decades, documents that concern. Now, with the increasing public interest in ecology and protection of the environment, air cleaning problems are even more important--not only in the nuclear industry but throughout all industries. We now have a national commitment to protect and to improve the environment, and a very important way to improve and to protect the environment is effective and reliable air cleaning. The large attendance at this meeting, well above the 229 who attended the last conference at Richland two years ago, is solid evidence of the increasing interest in this subject. The wide representation here, involving industry, universities, and our colleagues from overseas, is further evidence of the ubiquity of that interest.

The success of new Commission programs and the health and safety of the public both depend heavily on developing new, improved, and most important, reliable air cleaning systems and methods. Industry too, has programs dependent on effective air cleaning. And, of course, all of us appreciate a cleaner environment. The needed new technology is being developed both by government and industry. In disseminating this new technology, this meeting will be extremely productive. You will have an opportunity for critical review of on-going research and development in air cleaning, and for the sort of exchange of ideas that is necessary for progress.

In closing, I would like to express our appreciation of the efforts put forth by Dr. First and by those who have helped him to organize this meeting. I would like, particularly, to mention Humphrey Gilbert's effort. He has sparked not only these conferences, but also a substantial portion of the research and quality control efforts that have transformed the air cleaning field in the past years. Gil is now retiring, and I can think of no more fitting retirement celebration for him than the biggest and best air cleaning conference we have yet had. May I then wish you--and Gil--every success.

MOELLER: Thank you Dr. Biles.

Following those remarks I think this is an appropriate time for those of us at the Harvard School of Public Health to join with Dr. Biles in bringing additional honor to Mr. Gilbert. Humphrey, please come forward and join us on the stage.

As Dr. Biles has just pointed out, these Conferences have become almost an institution within the AEC. The man who has been responsible for this recognition of the importance of air cleaning problems and has almost single-handedly seen that these Conferences were financially supported has been your friend and mine, Humphrey Gilbert. In recognition of his many contributions, we would like to present him at this time with this letter of commendation from the Harvard School of Public Health and request that a photocopy be printed with the Proceedings of the Conference.

HARVARD SCHOOL OF PUBLIC HEALTH

Office of the Dean

55 Shattuck St.
Boston, Massachusetts 02115

Mr. Humphrey Gilbert
AEC Headquarters
Washington, D. C. 20545

Dear Humphrey:

The Harvard School of Public Health, through long and close association with you during the past quarter century, is in a special position to assess your contributions to the field of air cleaning and, most especially, your beneficial influence on the development of improved filter effectiveness and safety. Therefore, on this occasion, when you have just retired from your post, we wish to add our commendations to those you have received from the Atomic Energy Commission.

It is fitting that we present this open letter to you at an AEC Air Cleaning Conference because this meeting is taking place as a direct result of your interest and personal sponsorship of it within the AEC. Further, we think a scientific meeting devoted to air and gas cleaning technology is the proper place to express our appreciation for your many contributions to this field.

Although your objective has always been the practical one of producing and applying better equipment and methods to the air cleaning task, you have recognized the value of and vigorously sponsored the use of basic and applied research to solve the multitude of knotty problems you found when the AEC first began to use absolute filters to protect its workers and the public. The combination of theory and practice is the hallmark of a good engineer and your applications of these attributes has resulted in significant improvements in the safety of nuclear reactors.

We understand that your retirement from the AEC is for the purpose of entering into a new career as a consultant on matters of nuclear safety. We take this occasion to acknowledge your past achievements and to wish you continued success in your new endeavor.

Sincerely yours,

James L. Whittenberger

James L. Whittenberger, M.D.
Associate Dean