

OPENING REMARKS

James M. Morgan, Jr.
Virginia Military Institute

I am pleased to open the Eleventh AEC Air Cleaning Conference and call upon those who will make the official welcomes and outline the objectives of the Conference sponsored by the United States Atomic Energy Commission and the Harvard Air Cleaning Laboratory. As in the past we will attempt to prepare Proceedings of the formal papers and the discussions of those papers and other topics. A copy of the Proceedings will be mailed to you at the address you used in registering.

The official welcomes will be given by Mr. H. E. Parker who will represent Mr. D. G. Williams, Manager of the Richlands Operations Office, AEC, and by Dr. Dade Moeller of the Harvard Air Cleaning Laboratory. Mr. T. Nemzek, who was scheduled to make a note of welcome also, will give an overview of the LMFBR program tomorrow afternoon and will make appropriate remarks then. The objectives of the Conference will be presented by Mr. I. Craig Roberts representing the Division of Reactor Development and Technology, AEC, Washington, D. C., and the formal sessions will begin immediately thereafter.

WELCOME

H. E. Parker
Assistant Manager for Technical Operations
Richlands Operations Office

On behalf of the Richland Operations Office of the Atomic Energy Commission, I want to welcome you to this conference. We are delighted that you have chosen Richland for your conference.

The atmospheric sciences program supported by the AEC has long been interested in the removal of atmospheric particulates. The need to assure the reliability of our air cleaning systems has always had a top priority at Hanford, and our scientists here have contributed significantly to the technology.

Related studies dealing with the environment are: in-cloud scavenging, fallout phenomenology, and other scavenging studies supported by various government agencies.

I think you might be interested in a short summary on what's been happening at Hanford during the past few years. From a single-contractor, highly defense-production-oriented operation six years ago, Hanford has

become a multicontractor, highly diversified nuclear operation. Some of the more significant changes have been:

Seven production reactors have been shut down. We have only two operating, KE and N. N produces both plutonium and steam for generators operated by a public utility, which produces 800 MW for BPA system. As of now, 12,600,000,000 kilowatt hours have been produced, more than any other nuclear plant in the world. KE is strictly a production reactor.

Chemical processing plants -- only Purex is operating.

A full-fledged waste management program is under way, including the separation of long-lived strontium and cesium from other wastes, and special canning for long-term storage; in-tank solidification of all but current wastes by December 31, 1975 to saltcake in existing underground tanks. Waste Solidification Engineering Prototypes have been operated to develop and demonstrate methods for handling spent fuels from commercial nuclear power plants, by solidification in the form of glass, rock, or calcined form.

A five million dollar biology laboratory is under construction, with completion now scheduled for this fall.

The AEC has two extremely fine laboratory organizations here at Hanford to draw upon: The Pacific Northwest Laboratory operated by Battelle-Northwest; and the Hanford Engineering Development Laboratory operated by WADCO, a subsidiary of Westinghouse. Hanford's role in the LMFBR program will be extremely important. The \$100-million FFTF will be built here and will be the work horse for the LMFBR program for many years to come.

We now have ten contractors at Hanford: BNW, DUN, ARHCO, ITT/FSS, CSC, HEHF, HES, JAJ, UST, and WADCO.

Our contractors have brought into the area about \$35-million in private investment, generally in the form of permanent privately owned facilities; and their plans call for the total to be about \$51-million within a few years.

I should also mention this beautiful \$8.5-million Federal Building which was completed in 1965.

Our total AEC workforce as of 6/30/70 was 7,827. In addition, the employment of our contractors in their private endeavors is 953.

Our AEC operating dollars, FY 1971, are about \$139-million, plus approximately \$39-million in plant and capital equipment funds.

Again, it is indeed a pleasure to have you here at Richland. We hope you enjoy your stay in the Tri-Cities, and that your technical activities here prove thoroughly worthwhile.

WELCOME

Dade W. Moeller
Harvard Air Cleaning Laboratory

June, 1971, will mark the twentieth anniversary of the first AEC Air Cleaning Conference held at the Harvard School of Public Health in Boston, Massachusetts. The volumes which have resulted from the publication of the Proceedings of the nine subsequent Conferences held during the intervening years represent a veritable encyclopedia on air cleaning. In fact, a review of these publications reflects much of the history and development of the profession.

The record shows that educational activities played an important role in several of the earlier Conferences. For example, both the 2nd Conference in 1952 and the 5th in 1957 included two-day sessions devoted to a review of the air and gas cleaning fundamentals prior to proceeding with the formal program agenda. It is also interesting to note that the first four Conferences were limited to Commission and Commission-contractor personnel, and that the first three were sponsored by what was then called the AEC Division of Engineering.

Having recently reviewed the published Proceedings of all previous Conferences, I would like to share with you some of the historical highlights associated with each.

2nd Conference (1952)--this Conference was particularly noteworthy in that the "Handbook on Air Cleaning" was issued concurrently with the Conference;

3rd Conference (1953)--held jointly with a meeting of the AEC Stack Gas Problem Working Group;

4th Conference (1955)--first Conference in which papers were presented dealing with meteorology and its implications in air waste management; this was also the first Conference sponsored by the AEC Division of Reactor Development, the forerunner of the present Division of Reactor Development and Technology;

5th Conference (1957)--first time representatives from private industry were invited to attend; first inclusion of papers related to air cleaning problems of liquid metal fast breeder reactors;

6th Conference (1959)--first Conference which provided detailed coverage of problems related to iodine and the rare gases; first Conference to which foreign guests were invited;

7th Conference (1961)--marked the initiation of James Morgan as co-editor of the Conference Proceedings, a task which he continues to perform to date; papers presented at this Conference included one on air cleaning problems within nuclear submarines;

8th Conference (1963)--first Conference to highlight recognition of the growing nuclear power industry and the relationship of air cleaning to reactor siting and engineered safeguards;

9th Conference (1966)--first Conference in which a significant number of papers were devoted to air cleaning problems associated with LMFBRs;

10th Conference (1968)--highlighted by being held in conjunction with the first international symposium on "Operating and Developmental Experience in the Treatment of Airborne Radioactive Wastes";

11th Conference (1970)--first Conference featuring air cleaning problems associated with LMFBRs; first Conference held at a site on the West Coast; previous Conferences have approached as far west as Los Alamos (3rd) and Idaho Falls (6th) but this is the first on the West Coast.

The published Proceedings of these Conferences range from a 159 page document covering the 5th Conference in 1957 to a two-volume 1202 page treatise covering the 9th Conference in 1966. In all, there have been ten volumes published (there were no Proceedings for the first Conference in 1951) which contain a total of 4454 pages. The Conferences today cover the entire field of air and gas cleaning and the published Proceedings represent the most up-to-date literature available in this field. This is well illustrated by the fact that the editors of the Journal, NUCLEAR SAFETY, now routinely publish a digest of each Conference shortly after it is held. Similar reviews have been published in other professional journals.

Looking over this lecture hall, the superb motel facilities, and the excellent support we have received from D. G. Williams, Marshall F. Mills, and the Richland Operations Office staff, and from Ronald L. Kathren and the members of the Columbia Chapter of the Health Physics Society, one can readily wonder why it took us twenty years to make it to Richland. The cooperation has been outstanding and to all the local people we owe a deep debt of gratitude.

Finally, we would like to recognize the contributions of Walter G. Belter and I. Craig Roberts of the AEC Division of

Reactor Development and Technology, and of Humphrey Gilbert of the AEC Division of Operational Safety, without whose support, encouragement, and assistance none of this would have been possible. In closing, I would also like to acknowledge the many contributions of my colleagues, Melvin W. First, and James M. Morgan, Jr., who have played key roles in planning the Conference program and handling the many headquarters details associated with its convening.

From all of them to all of you, let me extend a most cordial welcome to this, the 11th AEC Air Cleaning Conference. I am sure that all of you, in turn, join with me in expressing a warm welcome to our friends from overseas and to the north and south of our borders. Early registrants at the Conference include air cleaning experts from Canada, France, India, Korea, the United Kingdom, and West Germany. It is a pleasure to have you here.

OBJECTIVES OF THE ELEVENTH USAEC
AIR CLEANING CONFERENCE

I. Craig Roberts
Division of Reactor Development and Technology
USAEC

On behalf of the Reactor Development and Technology Division, I would like to join in welcoming you to this the eleventh in the series of AEC sponsored air cleaning conferences. I offer a particularly warm welcome to those attendees from outside the USA. The series began at Harvard in 1953 and the last conference was held in New York City in August 1968 in conjunction with a symposium of the International Atomic Energy Agency. It is pleasant to see the large attendance of this conference.

At each conference since 1957, this particular spot on the program has been filled by Walter Belter. It is with considerably regret that he had to miss this conference. He is representing the AEC at two waste management meetings in France this week and next. I just couldn't convince him to allow me to represent him at that meeting so that he could attend this one. I bring you his greetings and wishes for a successful conference.

Before "getting down to business," I would like to recognize the efforts of the many people who have contributed to the preparation of this meeting. As usual Mel First, Dade Moeller, and Jimmy Morgan have carried the lion's share of the burden. I would like to thank them and Marshal Mills of the Richland Office who has handled local arrangements, members of the local Chapter of the Health Physics Society who have assisted in local arrangements, Humphrey Gilbert for his work on the paper selection committee and to all others who have had a hand in assuring the success of the meeting.

Because of the considerable effort that has gone into the preparation of this meeting -- not to mention the inconvenience many of you have experienced just to be here -- it seems both fitting and proper that we examine -- at the outset -- what we hope to accomplish.

I would like to begin by offering a theme for the Conference. It is a statement about the need for engineering standards made recently by the Director of the Reactor Development and Technology Division. He recently stated that the nuclear community is beset by a number of difficult and complex problems: rising costs, construction delays, shortage of trained personnel and other resources, labor and management difficulties, and mounting concerns about the environment. Solution of these problems requires an industry-wide

effort on the development, acceptance and disciplined application of engineering standards and related quality assurance practices. It is very important that we are able to characterize a test or experiment -- or a system or a test facility -- with precision sufficient to permit the results to be meaningfully interpreted. Further, a means must be available for making the knowledge and experience acquired in research and development efforts widely available for further and broader application. Engineering standards provide a basic and important means of helping to fulfill both the requirements. They embody statements of the technology, the engineering procedures and practices, and ultimately the specifications which have proven successful in the areas of design, construction, inspection, testing, operation and maintenance in service. Thus the development and use of acceptable standards offer a means available to all of reproducing on a uniform basis the successes that have been achieved in many different segments of the nuclear research and development programs as well as in the industrial production.

Mr. Shaw's statement very strongly points up the importance of engineering standards. The preliminary program devoted an entire session to the discussion of standards development. That had to be changed in the final program. However we must give increased attention to the application of the work being described and I intend to have something to say in that regard in the open session.

There is no question that in the field of air cleaning we can and must do better in keeping our work amenable to application. But we can take pride in our record and I think these air cleaning conferences have been a great help in this direction.

These conferences offer a unique opportunity for the critical review of on-going research and development. The researchers, designers, manufacturers and program administrators gathered here represent a variety of points of view and a wealth of experience that are not duplicated at any other meeting. When brought to bear on a topic -- as happens in the discussion periods -- these many points of view and experience bring great clarity to an issue or topic. In that regard, this Conference performs the same function that professional society meetings are supposed to perform -- that is "they keep us honest." In addition this conference keeps us practical. I think it important to note that this critical review depends entirely on each of you sharing your experience with the rest of us. The large attendance and highly organized program at this conference strongly inhibit that sharing. I urge you to overcome such inhibitions -- to join in the discussion -- or we might as well have all stayed at home and read the papers.

When preparing these remarks, I became interested in how useful the information discussed at these meetings had been to the atomic energy industry. I skimmed through the proceedings of previous conferences and found that at the first few meetings attention centered on aerosol sampling

methods and the adoption of the chemical industry's wet gas cleaning methods to the atomic energy program. In those days the conferences were small and more in the nature of working meetings and so the information was of a highly applied nature. Representatives from each operating site described their air cleaning problems and practices and received rigorous, informal discussion. The discussion frequently had an impact on operating practices as soon as the representatives returned to their facilities.

Starting in the middle 1950's, the development and growth of the civilian nuclear power reactor program required methods for estimating fission product release rates and for collecting the fission products -- particularly radio-iodine. Attention was directed toward the characterization and application of activated charcoal. I think it is interesting to note that as a result of that earlier work there are now 44 power reactors in operation or under construction that employ or will employ beds of activated carbon. Also approximately one half million pounds of carbon are now in use at AEC operating facilities.

The growth of the nuclear power industry made it advisable to expand the program and attendance at these conferences. It was necessary to make available the results of AEC sponsored air cleaning R&D to vendors, A-E's, suppliers and others outside of the AEC "family." That expansion has been both a blessing and a curse. As noted previously the many points of view constitute an extremely effective review body. On the other hand, the large attendance severely limits individual discussion.

We are now entering the Fast Breeder Reactor era. The development of fast breeders is the Commission's highest priority civilian nuclear reactor program. The success of this program will depend heavily on the performance of development laboratories and operating facilities. They must not only develop the necessary technology efficiently, but also assist in the effective transfer of these technological developments to industry. I am confident that this and succeeding conferences will greatly assist in this endeavor even more effectively than past conferences have contributed to our present state of development.

With that I will conclude my remarks.