Proceedings of the 23rd DOE/NRC Nuclear Air Cleaning Conference

Held in Buffalo, New York
July 25–28, 1994

Edited by M. W. First

Sponsored by
U.S. Department of Energy
U.S. Nuclear Regulatory Commission
International Society of Nuclear Air Treatment Technologies, Inc.
The Harvard Air Cleaning Laboratory

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23rd DOE/NRC Nuclear
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Date Published: February 1995

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M. W. First

Sponsored by
Office of Environmental Guidance
U.S. Department of Energy
Washington, DC 20585

Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission
Washington, DC 20555

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Treatment Technologies, Inc.
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ABSTRACT

This report contains the papers presented at the 23rd DOE/NRC Nuclear Air Cleaning Conference and the associated discussions. Major topics are: (1) nuclear air cleaning codes, (2) nuclear waste, (3) filters and filtration, (4) effluent stack monitoring, (5) gas processing, (6) adsorption, (7) air treatment systems, (8) source terms and accident analysis, and (9) fuel reprocessing.
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U. S. Nuclear Regulatory Commission  

CLEAN AIR AND CLEAR RESPONSIBILITY  
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We have learned a great deal at this and prior Conferences about the source term for power reactors being revised and refined, but we have not heard that a similar effort is under way to define a source term for decontamination, decommissioning, remediation, or for waste management in general, even though planning for these operations is well under way. The idea persists that all air cleaning and gas treatment requirements can be solved by some number of HEPA filters placed in series at the end of a pipe in spite of the knowledge that remediation, decontamination, and decommissioning requirements will be different from power reactor accident mitigation. Therefore, I was keenly interested in the panel session on gas processing as I believe that, here is where the future of nuclear air cleaning technology will reside for the next decade as we confront new problems and arrive at different solutions than we have been accustomed to accepting. We face a formidable task to make waste management operations safe, not only for the environment, but also for the people who are going to be doing the work. The West Valley operation is in the nature of a pilot study for the much larger task that must be tackled at other sites. From that standpoint, the presentations on the work at West Valley were very important.

Although HEPA filters continue to be the workhorse nuclear air cleaning device, we learned at this Conference about the vulnerability of HEPA filters to elevated temperature, humidity, dust loading, and aging, both in storage and in service. This brings up the question of how many years these filters should be kept in operation, even though they continue to pass the in-place filter test that is mandated as a periodic event. When we learn that some filters have been in service for thirty years, we can't help but wonder what their performance will be for an entire year following an in-place filter test, or how they will respond to emergencies. Do we really have confidence that this is the barrier we should be depending on? I have come to the conclusion that five years ought to be about as long as we should keep filters in service, even if they do not get loaded up. You might ask, where did the five year number come from; the answer is that, currently, we have no evidence that they will serve more than five years safely. Realistically, we do have to confront this issue with more than guesses; we need some specific goals that will make it mandatory to discard air cleaning equipment long before it becomes a questionable safety device. The many presentations and discussions at this Conference on the subjects of aging effects and residual safety factors promises that this topic will continue to receive serious research support that will help lead to resolution.

Another topic that engaged the interests of the conference was the many conflicts that exist among the many regulations, codes, standards, directives, etc., that are invoked simultaneously at various sites. It will be obvious from the presentations and commentary that full compliance with all becomes impossible, and that additional complications arise from differences in the codes and standards adopted by the several nations insofar as they impact the free movement of equipment internationally. It is probable that everyone would be better off with internationally-agreed-upon standards, but it is unlikely to happen in a short time.

All of the papers in the reprocessing session came from nations other than the United States. This, of course, is the legacy of Jimmy Carter, the self-styled nuclear engineer, who also canceled the Clinch River LMFBR. I do not see any change in the public attitude regarding these matters; at least not in the immediate years ahead, unless all of us take it as a personal duty to propagandize for the safe operation of nuclear power in the United States, in Germany, and in other places where nuclear power is under severe attack. I think it is significant that in Japan and in France, nuclear power is doing very well. It simply means that we, in the United States, may have to wait until we...
burn up all the natural gas and all of the oil in the ground before we again become serious about alternative energy sources. I hope we do so before we get into a terrible energy crunch.

For the future, it will be important for the Program Committee to encourage operating people to come forward with reports that can assist others who are likely to confront similar problems. Should the Air Cleaning Conferences become a forum only for research papers, people who conduct operations and those who do the engineering of the systems will lose interest in the Conferences. It is unfortunate that operating people do not write a lot of papers. Unlike research people, for whom a paper is the product, operating people have a different standard; they must keep the plant operating and make prompt repairs. The point is, those of us who are able to write with great facility should not only urge our operating people to come forward with their important information, particularly the "lessons learned" sort of thing, but also help them put it together so they can make presentations at future Air Cleaning Conferences. That way, we can get the benefit of the knowledge we need to learn about but that is currently locked away in the minds of individual operating people. Please keep this plea in mind, and when you find somebody who has learned something very interesting about operations, I hope you will help them prepare a paper for presentation at this forum. We should always be on the alert for reports of new air cleaning methods.

I would like to extend my sincere thanks to all of the members of the Program Committee who worked diligently over the past couple of years to put together the program of the 23rd Conference and who helped conduct it in an orderly manner. I am very grateful to each of them for their devotion to the Air Cleaning Conferences and for their willing assistance to the Chairman.

Richard Porco, chairman of ISNATT and a member of the Conference's Program Committee, deserves special mention for his diligence and skill in organizing the Conference exhibits. Fees from exhibitors help support the Conferences.

Thanks from all attendees, as well as the Chairman, are due Mary Kovach for her able assistance at the registration desk and to Julia First for her kind management of each morning's hospitality gathering of family members.

The Chairman extends his special thanks to Suzanne Reine for her able handling of all the business affairs of the Conference and for her careful and timely assembly of the camera-ready master copy of the Proceedings.