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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 AIR CLEANING AND TREATMENT CONFERENCE

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.

23rd DOE/NRC NUCLEAR AIR CLEANING AND TREATMENT CONFERENCE

TABLE OF CONTENTS

FOREWORD xvii

SESSION 1

OPENING OF THE CONFERENCE

Monday: July 25, 1994
Co-Chairmen: J. F. Leonard, *U. S. Department of Energy*
K. Duvall, *U. S. Department of Energy*

OPENING COMMENTS OF SESSION CO-CHAIRMAN LEONARD 2

A BRIEF HISTORY OF THE AIR CLEANING CONFERENCES

M. W. First, *Harvard Air Cleaning Laboratory* 3

THE INTEGRATED MELTER OFF-GAS TREATMENT SYSTEMS AT THE WEST VALLEY
DEMONSTRATION PROJECT

R. F. Vance, *West Valley Nuclear Services Co., Inc.* 16

SESSION 2

NUCLEAR AIR CLEANING CODES AND STANDARDS

Monday: July 25, 1994
Co-Chairmen: R. R. Weidler, *Duke Power Company*
J. J. Hayes, *U. S. Nuclear Regulatory Commission*

OPENING COMMENTS OF SESSION CO-CHAIRMAN HAYES 33

CHALLENGES OF EQUIPMENT QUALIFICATION USING TODAY'S STANDARDS WITH EMPHASIS
ON A CLASS 1E MOTOR PROGRAM

K. Deaton, *Ellis & Watts* 34

DISCUSSION 53

EVALUATION OF SELF-CONTAINED HEPA FILTER

T. E. Arndt, *Westinghouse Hanford Company* 54

DISCUSSION 63

23rd DOE/NRC NUCLEAR AIR CLEANING AND TREATMENT CONFERENCE

ASME N510 TEST RESULTS FOR SAVANNAH RIVER SITE AACCS FILTER COMPARTMENTS J. D. Paul, T. M. Punch, <i>Westinghouse Savannah River Company</i>	68
AN EVALUATION OF EFFORTS BY NUCLEAR POWER PLANTS TO USE ASTM D3803-89 W. P. Freeman, <i>Nuclear Consulting Services, Inc.</i>	78
DISCUSSION	83
CLOSING COMMENTS OF SESSION CO-CHAIRMAN WEIDLER	84

SESSION 3

PANEL SESSION: APPLICATION OF NUCLEAR AIR CLEANING AND TREATMENT CODES AND STANDARDS

Monday: July 25, 1994
Co-Chairmen: J. Jacox, *Jacox Associates*
C. Graves, *Nuclear Consulting Services, Inc.*

Panel Members: G. Sherwood, *U. S. Department of Energy*
B. Mokler, *Los Alamos National Laboratory*
T. Arndt, *Westinghouse Hanford Company*

OPENING COMMENTS OF SESSION CO-CHAIRMAN JACOX	86
HEPA FILTER TESTING - DEPARTMENT OF ENERGY OFFICE OF NUCLEAR ENERGY FACILITIES G. L. Sherwood, <i>U. S. Department of Energy</i>	87
AN EXAMPLE OF A COMPONENT REPLACEMENT WHEN APPLYING ASME N509 AND ASME N510 TO OLDER VENTILATION SYSTEMS T. E. Arndt, <i>Westinghouse Hanford Company</i>	93
A SINGLE STANDARD FOR IN-PLACE TESTING OF DOE HEPA FILTERS - NOT B. V. Mokler, <i>Environmental Health Services, Inc.</i>	96
INTEGRATING INDUSTRY NUCLEAR CODES AND STANDARDS INTO UNITED STATES DEPARTMENT OF ENERGY FACILITIES J. Jacox, <i>Jacox Associates</i>	98
PANEL DISCUSSION	102

23rd DOE/NRC NUCLEAR AIR CLEANING AND TREATMENT CONFERENCE

SESSION 4

NUCLEAR WASTE

Monday: July 25, 1994
Co-Chairmen: R. Porco, *Ellis & Watts*
W. Bergman, *Lawrence Livermore National Laboratory*

OPENING COMMENTS OF SESSION CO-CHAIRMAN PORCO	114
GENERATION AND RELEASE OF RADIOACTIVE GASES IN LLW DISPOSAL FACILITIES	
M. S. Yim, <i>Harvard School of Public Health</i> , S. A. Simonson, <i>Massachusetts Institute of Technology</i>	115
DISCUSSION	127
NUMERICAL ANALYSIS OF A NATURAL CONVECTION COOLING SYSTEM FOR RADIOACTIVE CANISTERS STORAGE	
R. J. Tsal, S. Anwar, M. G. Mercado, <i>Fluor Daniel Inc.</i>	128
DISCUSSION	137
DISPOSAL OF SLIGHTLY CONTAMINATED RADIOACTIVE WASTES FROM NUCLEAR POWER PLANTS	
J. L. Minns, <i>U. S. Nuclear Regulatory Commission</i>	138
CLOSING COMMENTS OF SESSION CO-CHAIRMAN BERGMAN	148

SESSION 5

FILTERS AND FILTRATION

Monday: July 25, 1994
Co-Chairmen: H. Gilbert, *Consultant*
R. G. Dorman, *Consultant*

HEPA FILTER CONCERNS - AN OVERVIEW	
J. F. Leonard, <i>U. S. Department of Energy</i>	150
DISCUSSION	156
A NOVEL PERMANENTLY MAGNETIZED HIGH GRADIENT MAGNETIC FILTER USING ASSISTED CAPTURE FOR FINE PARTICLES	
J. H. P. Watson, <i>Institute of Cryogenics, England</i>	158
DISCUSSION	175

23rd DOE/NRC NUCLEAR AIR CLEANING AND TREATMENT CONFERENCE

THE DEVELOPMENT OF A HEPA FILTER WITH IMPROVED DUST HOLDING CHARACTERISTICS J. Dymont, <i>AWE Aldermaston</i> , C. Hamblin, <i>UKAEA Harwell, England</i>	176
EFFECT OF HUMIDITY ON THE FILTER PRESSURE DROP J. Vendel, P. Letourneau, <i>Institut de Protection et de Sûreté Nucléaire, France</i>	187
DISCUSSION	194
PRELIMINARY FIELD EVALUATION OF HIGH EFFICIENCY STEEL FILTERS W. Bergman, G. Larsen, R. Lopez, K. Wilson, <i>Lawrence Livermore National Laboratory</i> , K. Simon, L. Frye, <i>Martin Marietta Energy Systems, Inc.</i>	195
DISCUSSION	213
CLOSING COMMENTS OF SESSION CO-CHAIRMAN DORMAN	214

SESSION 6

PANEL SESSION: AEROSOL SAMPLING IN EFFLUENT AIR STREAMS

Tuesday: July 26, 1994
Chairman: A. R. McFarland, *Texas A&M University*

Panel Members: K. Duvall, *U. S. Department of Energy*
J. A. Glissmeyer, *Pacific Northwest Laboratories*
J. M. Karhnak, *U. S. Environmental Protection Agency*
G. J. Newton, *Inhalation Toxicology Research Institute*

OPENING COMMENTS OF SESSION CHAIRMAN MCFARLAND	216
SINGLE POINT AEROSOL SAMPLING: EVALUATION OF MIXING AND PROBE PERFORMANCE IN A NUCLEAR STACK J. C. Rodgers, C. I. Fairchild, G. O. Wood, <i>Los Alamos National Laboratory</i> , C. A. Ortiz, A. Muyschondt, A. R. McFarland, <i>Texas A&M University</i>	217
DISCUSSION	232
RADIONUCLIDE AIR EMISSIONS AT DEPARTMENT OF ENERGY FACILITIES K. Duvall, <i>U. S. Department of Energy</i>	233
DISCUSSION	240
EPA PERSPECTIVE ON RADIONUCLIDE AEROSOL SAMPLING J. M. Karhnak, <i>U. S. Environmental Protection Agency</i>	241
DISCUSSION	248

23rd DOE/NRC NUCLEAR AIR CLEANING AND TREATMENT CONFERENCE

GUIDE TO SAMPLING AIRBORNE RADIOACTIVE MATERIALS IN NUCLEAR FACILITIES J. A. Glissmeyer, <i>Pacific Northwest Laboratory</i>	250
PANEL DISCUSSION	255
CLOSING COMMENTS OF SESSION CHAIRMAN MCFARLAND	257

SESSION 7

EFFLUENT STACK MONITORING

Tuesday: July 26, 1994
Co-Chairmen: J. J. Hayes, *U. S. Nuclear Regulatory Commission*
T. M. Punch, *Westinghouse Savannah River Company*

A REAL-TIME STACK RADIOACTIVITY MONITORING SYSTEM AND DOSE PROJECTION PROGRAM A. P. Hull, P. A. Michael, <i>Brookhaven National Laboratory</i> , H. J. Bernstein, <i>Bernstein & Sons</i>	259
DISCUSSION	267
POTENTIAL RADIONUCLIDE EMISSIONS FROM STACKS ON THE HANFORD SITE, PART 2: DOSE ASSESSMENT METHODOLOGY USING PORTABLE LOW-RESOLUTION GAMMA SPECTROSCOPY J. M. Barnett, <i>Westinghouse Hanford Company</i>	269
DISCUSSION	277
THE RETENTION OF IODINE IN STAINLESS STEEL SAMPLE LINES G. J. Evans, C. Deir, <i>University of Toronto</i> , J. M. Ball, <i>Whiteshell Laboratories, Canada</i>	279
DISCUSSION	290

SESSION 8

PANEL SESSION: GAS PROCESSING

Tuesday: July 26, 1994
Co-Chairmen: J. L. Kovach, *NUCON International*
J. Jacox, *Jacox Associates*

Panel Members: J. R. Kriskovich, *Westinghouse Hanford Company*
T. M. Punch, *Westinghouse Savannah River Company*
R. F. Vance, *West Valley Nuclear Services*

OPENING COMMENTS OF SESSION CO-CHAIRMAN KOVACH	293
--	-----

23rd DOE/NRC NUCLEAR AIR CLEANING AND TREATMENT CONFERENCE

GAS PROCESSING IN THE NUCLEAR INDUSTRY J. L. Kovach, <i>NUCON International Inc.</i>	294
APPLICATION OF NUCLEAR AIR CLEANING AND TREATMENT CODES J. R. Kriskovich, <i>Westinghouse Hanford Company</i>	297
GAS PROCESSING AT DOE NUCLEAR FACILITIES J. Jacox, <i>Jacox Associates</i>	301
PANEL DISCUSSION	304

SESSION 9

ADSORPTION

Tuesday: July 26, 1994
Co-Chairmen: P. Sigli, *Camfil*
J. L. Kovach, *NUCON International*

RESIDENCE TIME DETERMINATION FOR ADSORBENT BEDS OF DIFFERENT CONFIGURATIONS J. E. Otermat, W. O. Wikoff, J. L. Kovach, <i>NUCON International Inc.</i>	308
DISCUSSION	310

HALIDE TEST AGENT REPLACEMENT STUDY E. M. Banks, W. P. Freeman, B. J. Kovach, J. L. Kovach, R. R. Sommer, <i>NUCON International</i>	313
---	-----

SESSION 10/11

PROCESSING AND FUEL REPROCESSING

Tuesday: July 26, 1994
Co-Chairmen: J. G. Wilhelm, *Bundesministerium für Umwelt, Germany*
M. Kikuchi, *Hitachi Energy Research Laboratory, Ltd., Japan*

A STUDY ON THE EXPULSION OF IODINE FROM SPENT-FUEL SOLUTIONS T. Sakurai, A. Takahashi, N. Ishikawa, Y. Komaki, M. Ohnuki, K. Kato, <i>Japan Atomic Energy Research Institute, Japan</i>	321
DISCUSSION	332

THE DEVELOPMENT AND DESIGN OF THE OFF-GAS TREATMENT SYSTEM FOR THE THERMAL OXIDE REPROCESSING PLANT (THORP) AT SELLAFIELD P. I. Hudson, C. P. Buckley, W. W. Miller, <i>British Nuclear Fuels plc, England</i>	333
---	-----

23rd DOE/NRC NUCLEAR AIR CLEANING AND TREATMENT CONFERENCE

DISCUSSION	351
DEVELOPMENT OF SILVER IMPREGNATED ALUMINA FOR IODINE SEPARATION FROM OFF-GAS STREAMS K. Funabashi, T. Fukasawa, M. Kikuchi, F. Kawamura, <i>Hitachi Energy Research Laboratory</i> , Y. Kondo, <i>Hitachi Works, Japan</i>	352
DISCUSSION	363
TREATMENT OF TRITIATED EXHAUST GASES AT THE TRITIUM LABORATORY KARLSRUHE E. Hutter, U. Besserer, <i>Kernforschungszentrum Karlsruhe GmbH</i> , G. Jacqmin, <i>NUKEM GmbH, Germany</i>	365
DISCUSSION	377
CLOSING COMMENTS OF SESSION CO-CHAIRMAN WILHELM	378
CLOSING COMMENTS OF SESSION CO-CHAIRMAN KIKUCHI	378

SESSION 12

AIR TREATMENT SYSTEMS AND ACCIDENT CONTROL

Tuesday: July 26, 1994
Co-Chairmen: R. D. Porco, *Ellis & Watts*
W. R. A. Goossens, *PEGO bvba, Belgium*
X. Chen, *Shanghai Nuclear Engineering Research & Design Institute, People's Republic of China*

VALUE-IMPACT ASSESSMENT FOR RESOLUTION OF GENERIC SAFETY ISSUE 143 - AVAILABILITY OF HVAC AND CHILLED WATER SYSTEMS P. M. Daling, J. E. Marler, T. V. Vo, H. K. Phan, J. R. Friley, <i>Pacific Northwest Laboratory</i> , V. T. Leung, <i>U. S. Nuclear Regulatory Commission</i>	380
DISCUSSION	390
LEAK TESTING OF BUBBLE-TIGHT DAMPERS USING TRACER GAS TECHNIQUES P. L. Lagus, J. H. Brown, <i>Lagus Applied Technology, Inc.</i> , L. J. DuBois, <i>Commonwealth Edison</i> , K. M. Fleming, <i>NCS Corporation</i>	391
DISCUSSION	403
CONSTANT DEPRESSION FAN SYSTEM: A NOVEL GLOVEBOX VENTILATION SYSTEM W. V. Milliner, <i>Atomic Weapons Establishment plc, England</i>	404

23rd DOE/NRC NUCLEAR AIR CLEANING AND TREATMENT CONFERENCE

CALCULATION CODE EVALUATING THE CONFINEMENT OF A NUCLEAR FACILITY IN CASE OF FIRES J. C. Laborde, C. Prevost, J. Vendel, <i>Institut de Protection et de Sûreté Nucléaire</i> , G. Perrin, <i>Services Techniques COGEMA</i> , J. L. Peirano, S. Raboin, <i>Services Calculs Scientifiques SGN, France</i>	412
PERFORMANCE OF HEPA FILTERS AT LLNL FOLLOWING THE 1980 AND 1989 EARTHQUAKES W. Bergman, J. Elliott, K. Wilson, <i>Lawrence Livermore National Laboratory</i>	425
DISCUSSION	431
THE ACTUAL PRACTICE OF AIR CLEANING IN BELGIAN NUCLEAR FACILITIES W. R. A. Goossens, <i>PEGO bvba, Belgium</i>	432
AN INTRODUCTION TO THE DESIGN, COMMISSIONING, AND OPERATION OF NUCLEAR AIR CLEANING SYSTEMS FOR QINSHAN NUCLEAR POWER PLANT X. Chen, J. Qu, M. Shi, <i>Shanghai Nuclear Engineering Research and Design Institute</i> , L. Yang, <i>Qinshan Nuclear Power Plant, People's Republic of China</i>	439
DISCUSSION	453
AP600 CONTAINMENT PURGE RADIOLOGICAL ANALYSIS M. O'Connor, J. Schulz, C. Tan, M. Kasjaka, <i>Bechtel Power Corporation</i> , N. Alper, <i>Westinghouse Electric Corporation</i>	454
DISCUSSION	477
A LOW PRESSURE FILTER SYSTEM FOR NEW CONTAINMENT CONCEPTS H. G. Dillmann, H. Pasler, <i>Kernforschungszentrum Karlsruhe GmbH, Germany</i>	478
DISCUSSION	485
CLOSING COMMENTS OF SESSION CO-CHAIRMAN PORCO	485

SESSION 13

SOURCE TERMS AND ACCIDENT ANALYSIS

Wednesday: July 27, 1994
Co-Chairmen: R. R. Bellamy, *U. S. Nuclear Regulatory Commission*
R. Zavadoski, *Defense Nuclear Facilities Safety Board*

OPENING COMMENTS OF SESSION CO-CHAIRMAN BELLAMY	487
REVISED ACCIDENT SOURCE TERMS FOR LIGHT-WATER REACTORS L. Soffer, <i>U. S. Nuclear Regulatory Commission</i>	488

23rd DOE/NRC NUCLEAR AIR CLEANING AND TREATMENT CONFERENCE

DISCUSSION	496
POTENTIAL RADIONUCLIDE EMISSIONS FROM STACKS ON THE HANFORD SITE, PART 1: DOSE ASSESSMENT	
W. E. Davis, J. M. Barnett, <i>Westinghouse Hanford Company</i>	498
DISCUSSION	508
THE LINK BETWEEN OFF-SITE-EMERGENCY PLANNING AND PLANT-INTERNAL ACCIDENT MANAGEMENT	
H. Braun, <i>Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit</i> , R. Görtz, <i>Bundesamt für Strahlenschutz, Germany</i>	509
DISCUSSION	519
NAUAHYGROS - A CODE FOR CALCULATING AEROSOL BEHAVIOR IN NUCLEAR POWER PLANT CONTAINMENTS FOLLOWING A SEVERE ACCIDENT	
R. Sher, <i>Rudolph Sher Associates</i> , J. Li, <i>Polestar Applied Technology, Inc.</i>	520
DISCUSSION	538
EXPERIMENTAL STUDY ON THE PARTICLES DEPOSITION IN THE SAMPLING DUCT	
J. Vendel, J. Charuau, <i>Institut de Protection et de Sûreté Nucléaire, France</i>	539
DISCUSSION	549
CLOSING COMMENTS OF SESSION CO-CHAIRMAN BELLAMY	550

SESSION 14

AGING EFFECTS ON AIR CLEANING COMPONENTS

Wednesday: July 27, 1994
Co-Chairmen: R. R. Weidler, *Duke Power Company*
W. Bergman, *Lawrence Livermore National Laboratory*

OPENING COMMENTS OF SESSION CO-CHAIRMAN WEIDLER	552
FILTER-ADSORBER AGING ASSESSMENT	
W. K. Winegardner, <i>Pacific Northwest Laboratory</i>	553
CRITERIA FOR CALCULATING THE EFFICIENCY OF HEPA FILTERS DURING AND AFTER DESIGN BASIS ACCIDENTS	
W. Bergman, <i>Lawrence Livermore National Laboratory</i> , M. W. First, <i>Harvard School of Public Health</i> , W. L. Anderson, H. Gilbert, J. W. Jacox, <i>Consultants</i>	563

23rd DOE/NRC NUCLEAR AIR CLEANING AND TREATMENT CONFERENCE

DISCUSSION	598
PERFORMANCE OF HEPA FILTERS UNDER HOT DYNAMIC CONDITIONS D. P. Frankum, G. Costigan, <i>AEA Technology, England</i>	601
DISCUSSION	612
PRELIMINARY STUDIES TO DETERMINE THE SHELF LIFE OF HEPA FILTERS H. Gilbert, <i>Consultant</i> , J. K. Fretthold, F. Rainer, <i>EG&G Rocky Flats Plant</i> , W. Bergman, D. Beason, <i>Lawrence Livermore National Laboratory</i>	613
DISCUSSION	637
EFFECTS ON THE EFFICIENCY OF ACTIVATED CARBON ON EXPOSURE TO WELDING FUMES D. Ghosh, <i>Southern Company Services, Inc.</i>	639
DISCUSSION	654
CLOSING COMMENTS OF SESSION CO-CHAIRMAN BERGMAN	656

SESSION 15

WORKING LUNCHEON

Wednesday: July 27, 1994
Co-Chairmen: L. Soffer, *U. S. Nuclear Regulatory Commission*
R. R. Bellamy, *U. S. Nuclear Regulatory Commission*

Invited Speaker: The Honorable Kenneth C. Rogers, Commissioner
U. S. Nuclear Regulatory Commission

CLEAN AIR AND CLEAR RESPONSIBILITY Commissioner Kenneth C. Rogers, <i>U. S. Nuclear Regulatory Commission</i>	658
DISCUSSION	664

SESSION 16

OPEN END

Wednesday: July 27, 1994
Co-Chairmen: M. W. First, *Harvard Air Cleaning Laboratory*
K. Duvall, *U. S. Department of Energy*

OPENING COMMENTS OF SESSION CO-CHAIRMAN FIRST	669
---	-----

23rd DOE/NRC NUCLEAR AIR CLEANING AND TREATMENT CONFERENCE

BAR CODED AIR SAMPLE TRACKING: HOW IT CAN ASSIST IN COMPLIANCE WITH THE DOE'S NEW 10 CFR 835 AND THE NRC'S 10 CFR 20 REGULATION W. H. Bailey, <i>NFS Radiation Protection Systems, Inc.</i>	670
DISCUSSION	681
EXPERIMENTAL STUDY OF ELEMENTARY COLLECTION EFFICIENCY OF AEROSOLS BY SPRAY: DESIGN OF THE EXPERIMENTAL DEVICE D. Ducret, J. Vendel, <i>Institut de Protection et de Sûreté Nucléaire, S. LeGarrec, Société des Techniques en Milieu Ionisant, France</i>	682
DISCUSSION	694
DEGRADATION OF HEPA FILTERS EXPOSED TO DMSO W. Bergman, K. Wilson, G. Larsen, R. Lopez, J. LeMay, <i>Lawrence Livermore National Laboratory</i>	695
DISCUSSION	720
PROPOSED RETROFIT OF HEPA FILTER PLENUMS WITH INJECTION AND SAMPLING MANIFOLDS FOR IN-PLACE FILTER TESTING J. K. Fretthold, <i>EG&G Rocky Flats</i>	721
DISCUSSION	741

SESSION 17

FILTER TESTING

Thursday: July 28, 1994
Co-Chairmen: W. L. Anderson, *Consultant*
J. F. Leonard, *U. S. Department of Energy*

NEW PERFORMANCE DATA FOR "EMERY 3002" AND "EMERY 3004," TWO ARMY-APPROVED SAFE MATERIALS TO REPLACE DOP IN MASK AND FILTER TESTING H. R. Carlon, M. A. Guelta, <i>U. S. Army Edgewood Research, Development and Engineering Center</i>	743
DISCUSSION	757
COMPARISON OF EMERY 3004 AND 3006 CHARACTERISTICS WITH DOP FOR POSSIBLE USE IN HEPA FILTER LEAK TESTS B. J. Kovach, E. M. Banks, G. Kovács, <i>Nuclear Consulting Services Inc.</i>	758
DISCUSSION	765
REVIEW OF IN-PLACE HEPA FILTER TESTING AT SEVERAL DOE FACILITIES B. V. Mokler, <i>Environmental Health Sciences, Inc.</i> , R. C. Scripsick, <i>Los Alamos National Laboratory</i>	766

23rd DOE/NRC NUCLEAR AIR CLEANING AND TREATMENT CONFERENCE

DISCUSSION	780
CLOSING COMMENTS OF SESSION CO-CHAIRMAN ANDERSON	781

SESSION 18

PANEL SESSION: VENTILATION AND AIR CLEANING DESIGN AND APPLICATION FOR CONTROL OF RADIOACTIVE CONTAMINANTS DURING DECONTAMINATION AND DISMANTLEMENT OPERATIONS

Thursday: July 28, 1994
Co-Chairmen: J. E. Williams III, *Parsons Environmental Services, Inc.*
R. Palmer, *FERMCO*

Panel Members: D. Edwards, *FERMCO*
R. D. McCullough, *FERMCO*
K. Tschaenn, *FERMCO*

OPENING COMMENTS OF SESSION CO-CHAIRMAN WILLIAMS	783
--	-----

VENTILATION SYSTEM DESIGN FOR CONTROL OF RADIOACTIVE AIRBORNE PARTICULATES DURING THE DECONTAMINATION AND DISMANTLEMENT (D&D) OF THE PLANT ONE ORE SILOS

J. E. Williams, <i>Parsons Environmental Services</i>	784
---	-----

PANEL DISCUSSION	797
------------------------	-----

INDEX OF AUTHORS AND SPEAKERS	808
-------------------------------------	-----

LIST OF ATTENDEES	810
-------------------------	-----

FOREWORD

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

23rd DOE/NRC NUCLEAR AIR CLEANING AND TREATMENT CONFERENCE

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.

Melvin W. First
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