

NACC 2018 June 3-5, 2018, Charleston, SC

35th INTERNATIONAL NUCLEAR

AIR CLEANING

CONFERENCE

June 3-5, 2018

CHARLESTON MARRIOTT

CHARLESTON, SC

CONFERENCE WELCOME

DR. RONALD R. BELLAMY

CONFERENCE CHAIR

Good morning and welcome to the 35th International Nuclear Air Cleaning Conference, sponsored by the International Society of Air Treatment Technologies. My name is Ronald Bellamy, and as the President of ISNATT, I am pleased and honored to chair this conference, and I formally declare this conference to be in session. The Air Cleaning Conferences were started 70 years ago to review research activities at the national laboratories by the Atomic Energy Commission. The first meetings were open to AEC and contractor laboratory staff only. Once it was obvious how important these meetings were, the large amount of interest, and the need to disseminate air cleaning information to the public, it was decided to formally transition to biennial conferences. These meetings/conferences have been held regularly since 1948.

Every conference has been an extremely useful and beneficial forum for air cleaning experts from around the world to establish contacts, to network, and to exchange ideas, information, and technology. I am able to make this statement from personal knowledge and experience, dating back to the first Conference that I attended in 1974 in San Francisco. I am confident that this meeting will continue that outstanding tradition. The officers and the Board of ISNATT are thrilled by the response to this conference, in terms of the quality and quantity of technical presentations, the interest in exhibits by companies, the number in attendance, and the support for the other activities associated with the conference, such as sponsors for the breaks and receptions. To each of you we say thank you for your interest and participation, especially those of you from outside the United States for making that extra effort to travel here and contribute to our conference. Let's make sure that these international visitors are welcomed and are part of all of the week's activities. We have representatives here from Australia, Canada, China, Germany, Japan, Korea, Spain, and the UK. Discussion topics this year will include new and old issues, and we hope that issues resolution continues to be a common theme of our conferences.

ISNATT has a group of volunteer officers, which at present also include Dr. Charles Waggoner as Vice-President, Curt Graves as Treasurer, and Art Soma as Secretary. We have a Board of Directors that includes Eric Banks, Nicholas Zaremba, and Chris Chadwick. A special thank you to Dr. Waggoner who has stepped up as a co-chair of this and future conferences, and deserves the credit for the outstanding technical program for the conference. I ask that these individuals stand and that they be recognized with a round of applause. At our ISNATT business meeting today, we will entertain a slate of officers for the next two years. This will be an important meeting as we ensure that our course forward will satisfy your interests and needs in terms of technical topics, location and structure of future meetings, and how else we can use the ISNATT resources to move forward on a path to improve the safe operation of nuclear facilities of all kinds.

Please be sure that your electronic devices are silenced. You received a copy of a flash drive with the papers and presentations, for your reference both here at the conference, and in the future. This flash drive also contains previous conferences and attendees. You will note that there are some presentations not included on the flash drive since they were not submitted in time. Once received, we will provide them on the ISNATT website.

You are all well aware of the importance of self-reflection, critical thinking and continuous improvement. This philosophy is a cornerstone of nuclear safety worldwide. We want your feedback on these conferences, so please be sure to fill out a questionnaire feedback sheet to give us your thoughts, comments and suggestions for future conferences, particularly in terms of locations and technical topics to emphasize. Each and every comment will be reviewed and factored into future planning. The feedback form will also be on the website if

you would like to use that avenue to provide feedback.

This conference is so much more than the formal presentations. Please take advantage of the many opportunities outside the formal sessions to interface with your colleagues. The breaks and meals for these conferences provide an excellent opportunity for this interface. Our breaks this year are sponsored by Jacobi Carbons, today's breakfast was sponsored by AAF International, and the sponsor for tomorrow's breakfast is Veolia. Several companies are supporting the conference with exhibits, located in the Opal Two Room. These companies include AAF International, Camfil USA, Jacobi Carbons, MCAir, NUCON International, and Porvair Filtration Group. Please visit these exhibits during our conference breaks and express your appreciation.

All of you have interfaced with our administrative staff. They are an exceptionally hard-working, dedicated, and efficient group of volunteers and I urge you to acknowledge their excellent performance. A special note of thanks to Paula Waggoner and Karen Bellamy, who handled all of the preparatory work prior to the conference. Without these volunteers we could not keep our administrative costs low, and these conferences could not achieve the success we continue to experience.

We are continuing the tradition for student attendance and participation. You may recall that we initiated scholarships to fund these students for attendance and other expenses. Each scholarship is in honor of one of the founding fathers of nuclear air cleaning, who has made a significant contribution to past conferences. Student scholarships this year are awarded to (1) Gentry Berry, who is a second year Ph.D candidate in Mechanical Engineering studying under Dr. Heejin Cho at Mississippi State University, and his scholarship is in honor of Dr. Melvin W. First, who chaired this conference for many years and directed the Harvard Air Cleaning Laboratory, (2) Brandon Bogle, also from Mississippi State University, and his scholarship is in honor of Mr. Mark Saucier, a significant contributor to this conference and the ASME Committee work for many years, (3) Kevin Liu from Cal Poly, and his scholarship is in honor of Humphrey Gilbert, who was a filtration expert and supporter of this conference for many years, (4) Joseph Lee from UC-Berkeley, and his scholarship is in honor of Wendell Andy Anderson, also a filtration expert and regular attendee at these conferences, and (5) Kishore Makewaran from UT-El Paso, and his scholarship is in honor of Dr. Dade Moeller, Harvard Professor, ACRS member at the US Nuclear Regulatory Commission, and strong supporter of air cleaning research as well as a renowned writer of air cleaning texts. Gentry Berry is here, and I would like to invite him to join me here at the podium and receive a certificate. The other students could not attend, but you will see some of their work during the conference with the presentations as well as during this evening's poster session. Please join me in recognizing all of the students as well as those technical giants who we honor with the scholarships in their names.

I mention Mark Saucier, who was a significant contributor to these conferences as well as the work of ASME for over 30 years. Mark passed away unexpectedly in February 2017 and his contributions, his personality and his notebook on the best beer gardens in every city we ever visited, will be missed.

We have a very ambitious agenda, filled with exceptionally interesting and timely papers and discussions. Our keynote speaker this morning will be Bernard Swinnerton, who has joined us from the UK to discuss Nuclear Ventilation Regulations and Standards in the UK. Additional papers this morning will focus on new and improved HEPA filters and media

Lunch is provided for all attendees in the Courtyard. This afternoon's session will begin with a panel session on a very controversial topic, and that is the use of actual cubic feet per minute versus standard cubic feet per minute, which unit to use for qualification and which unit to use for in place testing, and what difference does it make. Audience comments and input will be welcome. We will also have additional papers on filtration theory and components. Our formal agenda today ends with an ISNATT business meeting, followed by a student poster session and reception sponsored by Mississippi State University in the Yellow Topaz conference room. Please show your support for this function.

Tomorrow there will be a breakfast for all attendees, followed by a keynote address on the Status of the Decommissioning and Decontamination Progress at Fukushima. This is especially timely as we will also hear about Fukushima and the accident response from Dr. Steven Biegalski at Tuesday's luncheon. Dr. Biegalski is a recognized expert on Fukushima, travels worldwide to discuss the accident and its impact and also teaches on this important subject. Dr. Biegalski is the head of the Mechanical Engineering Department at Georgia Tech. Lunch will be in the Emerald Three conference room, and all attendees as well as their guests are invited to attend.

Additional papers tomorrow will cover recent results of HEPA testing at the Filter Test Facility, recent activities at the Defense Nuclear Facilities Safety Board, test results on axial flow filters, papers on fire detection/smoke effects for both activated carbon and HEPA filter media, and inleakage analysis.

On Tuesday evening in the Topaz Room, Camfil USA will be sponsoring a reception and time for social interaction.

ASME CONAGT activities are a large part of our overall program this week. Wednesday and Thursday will be consumed with subcommittee and other working level meetings, and the Main Standards Committee meets Friday morning. You are most welcome to attend any of these meetings, and if not already involved, consider becoming involved in committee work. Please talk to any committee member, the ASME staff here, Daniel Miro-Quesada, our staff secretary, myself, or Helen Mearns or Andy Stillo as co-vice chairs of CONAGT,

for further details.

Please plan on a full day Tuesday, concluding with time for any followup discussions, presentations of emergent issues, and any rebuttals. We will review the accomplishments of this conference, receive any last-minute thoughts you may have, and discuss plans for future conferences.

There are two collateral upcoming functions that fit nicely with the goals of this conference, and I want to mention them. First, the Harvard University TH Chan School of Public Health will offer its In-Place Filter Testing Workshop August 6-10, 2018, in Boston, MA. Many of the lecturers are here and look forward to your attendance at this course. More information is available at <https://ecpe.sph.harvard.edu>. Second, the Nuclear Heating, Ventilating, and Air Conditioning Utilities Group, NHUG, will hold its annual meeting July 18-20, in Atlanta. You can get more information and register at their website, NHUG.org.

Questions and answers, and discussions, are a key part of the information exchange we hope to achieve. Time will be allowed after each presentation for questions, and we can arrange for followup discussions if necessary. You are the key to a successful conference and we look forward to your active participation. Please note I mentioned our foreign attendees. Some of the talks will be translated real time so take this into consideration, speak slowly, and give the translator the time he needs.

Before I introduce our keynote speaker, I will give you the opportunity for comments or issues from the floor that we can address at this time. Thank you for your attendance.