52nd
1958-2010

North Carolina Industrial Ventilation Conference

April 26-30, 2010

Clarion Hotel State Capital, Raleigh, NC

Industrial Ventilation Design or Operation & Maintenance Certificate Programs Available!

New Topics in Combustible Dusts Workshop
April 30

North Carolina Industrial Ventilation Conference in cooperation with

Division of Public Health
Department of Health and Human Services
State of North Carolina

North Carolina Occupational Safety & Health
Education and Research Center
School of Public Health
University of North Carolina at Chapel Hill

52nd Annual North Carolina Industrial Ventilation Conference

April 26-30, 2010 • Clarion Hotel State Capital • Raleigh, NC

INDUSTRIAL VENTILATION CONFERENCE

A new format, celebrating our 52nd year in the Southeast includes:

- An expanded review of the *Physics of Air* with a more in depth look at all of the properties that affect the problems facing today's designer and regulator.
- How to design systems where temperature and moisture may be present.
- How to use the *Perfect Gas Equation* to look at non-standard gas streams like products of combustion and *VOC's*.
- More detailed look at the fan and how it is specified and analyzed.
- New courses in *Industrial Hygiene* basics as well as an introduction to *Maintenance* and *Monitoring* of industrial ventilation systems.
- A basic primer on the skill set needed by today's designer, operator and regulator of air system design.

ELEMENTS OF THE PROGRAM

CLASSROOM SESSIONS — April 26-29

The instructors for each class are chosen for their knowledge of practical problems and applications and the ability to teach. Classes are conducted on an informal basis in what is sometimes called "guided design." The problems represent real world situations and are sequenced in a manner to take advantage of skills which the students acquire. Instructors are then free to circulate around the class assisting in various ways with individual questions and concerns. In this type of informal classroom environment, the student participates in the multifaceted thinking process which constitutes the design and evaluation of a ventilation system.

In order to facilitate computations in the problem sessions, students are required to bring a calculator.

NEW TOPICS IN COMBUSTIBLE DUSTS WORKSHOP — APRIL 30

The optional workshop on Explosive Dusts will bring together experts from all of the respective disciplines in order to give the student perspectives on areas as follows:

- Explosion and deflagration causes and preventative measures
- Techniques that utilize the latest technologies that will suppress explosions, extinguish and vent them to atmosphere
- A review of existing governmental and quasi –governmental regulatory impacts and enforcement
- Future perspective of the aforementioned as they integrate with industrial ventilation systems

Experts from explosion suppression companies, dust collector companies and regulators will all participate in the group presentation and discussion. A question and answer session will follow the seminar.

VENTILATION SYSTEM DEMONSTRATION

The conference has a ventilation system that is used for demonstration purposes. This system consists of ductwork, various hoods, variable speed centrifugal fan, stackcaps, and sound attenuator. This unit can be modified to employ various hood shapes (plain, flange, conical, bell mouth), as well as to illustrate so-called "fan system effects," and converted from single to multiple hood configuration. Measurement capability with each system includes: pitot tube traverse to determine flow rate, hood static pressure, duct pressure drop, and simulation of fan and system curves. The Monitoring & Maintenance Section also uses the demonstration lab to learn and apply basic troubleshooting skills.

FOUNDERS BANQUET

Is held Monday evening after classes and is an opportunity to meet people early in the week. Dinner will be served on the 20th floor of the Clarion, overlooking the city.

OPTIONAL INDUSTRIAL VENTILATION CERTIFICATE PROGRAM

The North Carolina Industrial Ventilation Conference in collaboration with the University of North Carolina, Occupational Safety and Health Research Center has established two Certificate programs in Industrial Ventilation. The Certificate programs are intended to recognize those individuals who have shown competence in industrial ventilation design or operation by successfully completing the program's requirements. Upon completion of the program an individual will be awarded a **Certificate in Industrial Ventilation Design** or **Certificate in Industrial Ventilation Operation & Maintenance,** and plaque from the University of North Carolina, Occupational Safety and Health Education and Research Center.

Program requirements:

- Successfully complete two levels of Industrial Ventilation Conference offered at the North Carolina Industrial Ventilation Conference. Each level will be four days in length. In order to successfully complete any level an individual must pass a quiz at the end of each of 7 modules (per year - total of fourteen modules). Questions for the quizes will come from lectures and classroom problem sessions during the Conference.
- The first (Basic) level is a four day detailed course in the basics of applied industrial ventilation including Hood & Duct Design, Fan Basics, Introduction to Air Control Devices (Baghouses, Scrubbers, ESP's, etc.) and Basic Industrial Hygiene Issues.

  The student has a choice in the second year to continue with more detailed course in the system design (leading to a Certificate in Industrial Ventilation Design from the University of North Carolina-Chapel Hill) or to pursue a course of System Operation Maintenance (leading to a Certificate in Industrial Ventilation Operation and Maintenance from the University of North Carolina-Chapel Hill).

Each Level is presented in seven modules of 4 hours. The second year courses will also be presented in the seven-module format and the certificate is also provided to the student completing a total of fourteen modules. Attendance can be for any number of modules during any year (maximum seven at one Conference) and completion of the requirements for the **Certificate** can be accomplished within five years of beginning the program.

In order to enroll in the Industrial Ventilation Certificate Program an individual must complete and return an Industrial Ventilation Certificate Program Application. There is a one time $150 fee to enroll in the Certificate Program and should be sent with the completed application.

For more information about the Certificate Program or to receive an application, please contact Connie McElroy-Bacon at (919) 233-8400 or go to the North Carolina Industrial Ventilation Conference web site at **www.ncindustrialventilation.com.** The application can be downloaded from the web site.

PLAN OF INSTRUCTION

There will be 3 levels of instruction during the 2010 conference.

Basic Industrial Ventilation Skills (7 Modules)

Basics of Ventilation and Industrial Hygiene I (BA-1-1)

A look at the physical properties of air and other gases that may be present in industrial ventilation systems. Requires some basic

algebra and math skills to solve problems such as Q = VA, etc. This includes an introduction to flow and pressure in a duct system and how they can be measured. It also provides an introduction to the effects of density of the air stream and how it can affect duct sizes, hood design and selection of proper fans and motors. This course is a requirement for Certificate program and should be used as a basic introduction for all other courses at the Conference. It also includes a primer on Industrial Hygiene coordination with Industrial Ventilation Design.

Hoods & Duct I (DE-1-1)

The first in-depth course of its type looking at: hood classifications and types, nomenclature, capture velocities, air distribution over a large area (design of slots), hood "losses", air volume requirements for different hood designs, using hood Static Pressure to monitor the system, present regulations and hoods (USEPA Method 204); includes simple problem sets to calculate hood flow requirements and losses and how this impacts the horsepower and energy in a system. Also includes skills to size and design duct components.

System Design I (DE-1-2)

This topic continues the in-depth look at the primary components that define the system size including the effects of static, velocity and total pressure, hood static pressure, hood and duct losses and a lab demonstration.

System Design II (DE-1-3)

Building on the skills taught in the first three modules, this course introduces the attendee to the use of the ACGIH Calc Sheet to design and predict the operation of a system, how to size a fan and calculate horsepower.

System Design III (DE-1-4)

A third module of system calculations building on previous modules and looking at temperature and other density effects and the design of system duct and fans.

Basic Air Control Devices (DE-4-1)

Known as "Dust Collector 101", this module introduces the attendee to the fundamentals of dust, mist and gas emission controls. Besides nomenclature and principles of operation, key factors such as air/cloth ratio, can velocity, efficiency calculations, pressure drop and other issues are discussed.

Fan Operation Issues 101 (BA-5-1)

The fan is the heart of the system requiring its own detailed treatment. This module looks at all aspects of the different fan designs that are used in Industrial Ventilation systems. In addition there are problems sets to show how to select a fan at standard and non-standard conditions, evaluate fan and system curves, consider operation with VFD's (variable frequency drives) and how this can save energy. Also talks about nomenclature and how fans are specified (rotation, class, arrangement, accessories, etc.).

Industrial Ventilation Design Option Courses (Seven Modules required for Certificate)

Prerequisite: for certificate program in Industrial Ventilation Design: Completion of Basic Level taken at N.C. Industrial Ventilation Conference.

Participants should be able to:

- Utilize *Industrial Ventilation Manual*
- Understand the velocity pressure method of design
- Utilize the ACGIH calculation sheet

Operation and Maintenance Option Courses (Seven Modules required for Certificate)

Prerequisite: for the Certificate Program in Industrial Ventilation Operation and Maintenance: completion of Basic Level taken at N.C. Industrial Ventilation Conference

-Utilize Operation and Maintenance Manual

-More practical applications with less math

-Requires calculator and some problem solving

Basics of Ventilation II (BA-1-2)

An intense review of BA-1-1, this module does a quick revisit of basic formulae of system design (Q=VA, Hood Static Pressure, Effects of Density), sizing of duct, system pressure, and calculation sheet review. This module is intended for attendees who have completed basic modules or have over five years ventilation design experience.

Basics of Ventilation III (BA-1-3)

This course covers basic psychrometrics, the perfect gas equation and sample problems explaining both concepts. Subjects include dry bulb and wet bulb temperature, dew point, enthalpy, mass and heat balances in systems.

System Design IV (DE-2-1)

This module focuses on using the calculation sheet and techniques to solve problems involving non-standard air and mixing of hot and cold or dry and wet air streams.

Fans 201 (BA-5-3)

This segment is a continuation of the Basic Fan module and focuses on system effects and issues that may impede operation. The module includes demonstration and practical problems to solve on system effects.

Fans 202 (DE-3-3)

The fan is the heart of the system and rates a third module covering noise, vibrations, fan selection at non-standard (high temperatures) conditions and VFD's and other methods to control volume and pressure.

Energy and Cost (DE-5-1)

Systems use large amounts of horsepower to convey dust and gases. This module provides the attendee with tools to calculate both the initial system costs as well as operating costs (power, maintenance, replacement air, etc.) and includes sample problems. Dilution vs. close capture ventilation will also be discussed.

System Design V (DE-2-2)

This module will encompass stack design issues and system design with non-standard air and dilution ventilation.

Monitoring & Maintenance of Ventilation Systems I (MM-1-1)

After systems are in operation they must be maintained and monitored to ensure reliability. This module provides the basic insight into these requirements including documentation, use of pan performance curves and system measurements to monitor operations. Minimal math required.

Sustainability in System Operation (MM-1-2)

This module concentrates on baghouse maintenance and monitoring techniques. This includes "How They Work", pulse-jet and reverse air, air/cloth ratio, can velocity, bag cleaning and dust removal. Minimal math required. Focus is on keeping the system operating reliably.

Troubleshooting Laboratory (MM-1-3)

Practical problems (ducts plugged, fan speed selection, etc.) are created for solution by students. Problems use skills developed in the Basic Level and remainder of modules.

Format

Monday, April 26, 7:30-8:00 AM Registration, Clarion Hotel State Capital, Raleigh, NC.
You may pick up course materials in the lobby anytime between 7:30 and 8:00 AM.

	Monday	Tuesday	Wednesday	Thursday
7:30 Registration				
Basic Ventilation Skills				
8:00-12 noon	BA-1-1 Basics of Ventilation & IH	DE-1-2 System Design I	DE-1-4 System Design III	BA-5-1 Fans 101
12:00-1:00 PM Lunch				
1:00-5:00 PM	DE-1-1 Hoods & Duct I	DE-1-3 System Design II	DE-4-1 Basic Air Control Devices	Ask the Experts-Open Forum (Optional)
Advanced Design				
	Monday	Tuesday	Wednesday	Thursday
7:30 Registration				
8:00-12 noon	BA-1-2 Basics of Ventilation II	DE-2-1 System Design IV	DE-5-1 Energy & Cost	DE-2-3 System Design VI
12:00-1:00 PM Lunch				
1:00-5:00 PM	BA-1-3 Basics of Ventilation III	DE-3-2 Fans 201	DE-3-3 System Design V	Ask the Experts-Open Forum (Optional)
Monitoring and Maintenance				
	Monday	Tuesday	Wednesday	Thursday
7:30 Registration				
8:00-12 noon	BA-1-2 Basics of Ventilation II	DE-3-3 Fans 201	DE-2-2 Fans 202	MM-1-3 Practical System Troubleshooting
12:00 - 1:00 PM Lunch				
1:00-5:00 PM	MM-1-1 Monitor. & Maint. of Vent. I	MM-1-2 Sustainability in System Operation	DE-5-1 Energy & Cost	Ask the Experts-Open Forum (Optional)

NEW TOPICS IN COMBUSTIBLE DUSTS

Friday
8:00 am-12:00 noon

After one year of new NFPA regulation, there have been new developments in the implementation and enforcement.

The optional workshop on Explosive Dusts will bring together experts from all of the respective disciplines in order to give the student perspectives on areas as follows:

- *Explosion and deflagration causes and preventative measures*
- *Techniques that utilize the latest technologies that will suppress explosions, extinguish and vent them to atmosphere*
- *A review of existing governmental and quasi –governmental regulatory impacts and enforcement*

Experts from explosion suppression companies, dust collector companies and regulators will all participate in the group presentation and discussion. A question and answer session will follow the seminar.

PROGRAM STAFF

ACKERSON, ROSS, Air Solutions, Inc., St. Louis. MO

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SULLIVAN, PAUL, NC-OSHA, Charlotte, NC*

TRAMM, LEO, RMT, Inc., Milwaukee, WI

*PLANNING COMMITTEE MEMBER

GENERAL INFORMATION

This conference was established to promote good ventilation practices and design techniques throughout industry and will help you learn to evaluate and/or design a ventilation system. Time and money are regularly spent for ventilation systems that do not perform satisfactorily. Information available in this course helps attendees to "get the job done" properly the first time and eliminate problems caused by improper design, installation, or maintenance.

Classroom problems will be solved using the so-called "velocity pressure method" of calculation. All participants will receive a copy of the appropriate current edition of the Industrial Ventilation Manual by the American Conference of Governmental Industrial Hygienists.

Classroom sessions and morning registration on April 26, 2010, will be held at the Clarion Hotel, 320 Hillsborough St., Raleigh, NC. Registration on Monday, April 26, will take place between 7:30 and 8:00 AM, with the first session beginning at 8:00 am. The optional "New Topics in Combustible Dusts" workshop will begin on Friday, April 30, 8:00 am.

TUITION

The cost for Level I Basics of Ventilation, Level II Industrial Ventilation Design OR Level II Operation and Maintenance is $1,145 per person. The three levels are taught concurrently April 26-29.

Tuition for the optional "New Topics in Combustible Dusts" workshop, April 30, is $150 per person. Please call about company discounts for 3 or more conference registrants.

Registration fees include the most current copy of the appropriate ACGIH Industrial Ventilation Manual, all course materials (problems, calculations sheets), breaks, three lunches, and the Founders Dinner on Monday, April 26.

Should you wish to enroll in a 2-year Certificate Program, there is an additional one time fee of $150.

MAINTENANCE POINTS — The American Board of Industrial Hygiene will award 4.0 certification maintenance points to Certified Industrial Hygienists (C.I.H.) who satisfactorily complete any level of the conference.

PROFESSIONAL DEVELOPMENT HOURS (PDHs) — The Industrial Ventilation Conference (S-0213P) is an approved sponsor of continuing competency activities for North Carolina Professional Engineers and Registered Land Surveyors. Upon course completion, each qualified participant may receive Professional Development Hours (PDHs).

ACCOMMODATIONS — Rooms have been set aside at Clarion for participants of this conference, but their availability cannot be guaranteed past March 25. Lodging is NOT included in your registration fee. Please make your own reservation directly with the Clarion. To receive your special rate of $79/night (plus tax), please state that you will be attending the **Industrial Ventilation Conference**. Guaranteed late arrival reservations are advisable.

CLARION HOTEL STATE CAPITAL
320 Hillsborough St.,
Raleigh, NC 27603 919-832-0501

PARKING — On-site parking is available for Clarion guests and conference attendees at no charge.

CANCELLATION — The full registration fee or an organization purchase order is due at the time of registration. If the Conference is canceled, full reimbursement of paid registration fees will be made. In the event the participant cancels, a written notice is required. A twenty-five dollar ($25.00) fee will be charged for cancellation 4 or more days from the start date of the program. No reimbursement can be made if cancellation occurs within 3 business days of the program, or if the participant fails to attend. Substitutions will be accepted.

OTHER CONFERENCES — The **Birmingham Industrial Ventilation Conference** will be held in Alabama October 11-13, 2010. For information please call (520) 621-4007. The **59th Annual Industrial Ventilation Conference** will be held in Michigan February 2010. For information please call (517) 322-1133.

Registration Form

52nd N.C. Industrial Ventilation Conference **Clarion Hotel State Capital, Raleigh, NC** **April 26-30, 2010**

(Please print or type)

Name _____

Phone ( ) _____

Fax ( ) _____

E-Mail _____

Job Title _____

Firm/Org. _____

Address _____

City _____

State _____ Zip _____

PLEASE CHECK LEVEL YOU PLAN TO ATTEND:

☐ **Level I**
Tuition: $1,145

☐ **Level II**
Tuition: $1,145

If registering for Level II, please check the track you plan to attend

☐ Level II (Design Program)
☐ Level II (Operation & Maintenance Program)

☐ Enroll me in the Optional "New Topics in Combustible Dusts" workshop - April 30 - $150
☐ Enroll me in a certificate program-$150

Total: $ _____

PAYMENT MUST ACCOMPANY REGISTRATION

Payment Method ☐ Visa ☐ MasterCard ☐ AmEx ☐ Check ☐ PO

Card Account Number _____

Exp. Date _____

Card Holder Signature _____

Card Holder Name (Please Print) _____

Billing Address for Credit Card: _____

Street/PO Box _____

City/State/Zip _____

☐ Purchase Order PO# _____

Make Checks Payable to: Industrial Ventilation Conference

Mail to: Industrial Ventilation Conference
Attn: Connie McElroy-Bacon
P.O. Box 37129
Raleigh, NC 27627-7129

For Information: Phone (919) 233-8400
Fax (919) 852-4594
E-mail: cbacon@mindspring.com
www.ncindustrialventilation.com

Call about group conference registration discounts—3 or more participants from the same company.

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Raleigh, NC 27627-7129

Visit our Website:
www.ncindustrialventilation.com

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