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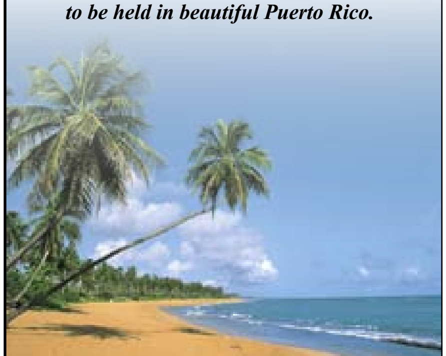
American Association for Wind Engineering

THE WIND ENGINEER

NEWSLETTER OF AMERICAN ASSOCIATION FOR WIND ENGINEERING

In This Issue

Americas Conference on Wind Engineering to be held in beautiful Puerto Rico.



Kareem elected to National Academy of Engineering

The following media release came from the University of Notre Dame. Ahsan Kareem, Robert Moran Professor of Civil Engineering and Geological Sciences at the University of Notre Dame, has been elected a member of the National Academy of Engineering (NAE).

Election to NAE is among the highest professional distinctions accorded to an engineer. Academy membership honors those who have made outstanding contributions to engineering research, practice or education, including significant contributions to engineering literature, the pioneering of new and developing fields of technology, making major advancements in traditional fields of engineering, or developing and implementing innovative approaches to engineering education.

Kareem, who also is director of Notre Dame's NatHaz Modeling Laboratory, was cited for contributions to "analyses and designs to account for wind effects on tall buildings, long-span bridges, and other structures."

Kareem specializes in probabilistic structural dynamics, fluid-structure interactions, structural safety and the mitigation of natural hazards. To better understand and predict the impact of natural hazards on the constructed environment, he uses computer models and laboratory and full-scale experiments to study the dynamic effects of environmental loads under winds, waves and earthquakes on structures and to develop mitigating strategies to enhance the performance and safety of structures.

Kareem is the lead U.S. collaborator for a project titled "New Frontiers of Education and Research in Wind Engineering" at Tokyo Polytechnic University's Global Center for Excellence. The center, founded by the Japanese Ministry of Education, Culture, Sports, Science and Technology, was established to build a sustainable urban environment that is resilient to extreme wind events and is in harmony with regional and local environments.

A member of the Notre Dame faculty since 1990, Kareem has served in the administration, management and organization of numerous professional societies including the American Society of Civil Engineers (ASCE), as well as committees of the National Research Council, NAE and the American Association for Wind Engineering.

He also has served as a senior consultant to several major oil companies, insurance companies, consulting engineering companies and the United Nations.

The research findings of Kareem and his students and postdoctoral fellows are having a major influence in the area of structural engineering, including monitoring of hurricane winds and their load effects; development of innovative structural systems for offshore drilling and production; monitoring dynamics of costal construction, deepwater offshore structures, tall buildings, bridges and industrial structures; risk modeling; and development of cyber-based collaborations for research and education in wind effects.

Among his recent honors are ASCE's State-of-the-Art award for scholarly contributions to full-scale monitoring of tall buildings, an appointment as an advisory professor at Tongji University in Shanghai and selection as the inaugural recipient of the Alan G. Davenport Medal, presented by the International Association for Wind Engineering in recognition of his distinguished achievement in the dynamic wind effects on structures. He also received the Robert H. Scanlan Medal for outstanding original contributions to the study of wind-load effects on structural design and the Jack E. Cermak Medal in recognition of his contributions to the study of wind effects on structures. Both the Scanlan and Cermak medals are sponsored by ASCE.

Kareem's receipt of the Davenport, Scanlan and Cermak medals is an unmatched recognition in this field.

He graduated from the West Pakistan University of Engineering and Technology, with distinction, in 1968 and, through a joint program with the Massachusetts Institute of Technology, he earned his master's degree in structural engineering from the University of Hawaii. He earned his doctorate in civil engineering, with a focus on structural and fluid dynamics, from Colorado State University.

Figure 1.
Example of an exhaust dispersion study being conducted in a wind tunnel.

ENERGY SAVING STRATEGIES FOR LABORATORY EXHAUST SYSTEMS

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Currently, there is a tremendous emphasis on energy conservation. Individuals talk about various ways to save energy (turning off lights, riding a bicycle, etc) and yet there is a huge amount of unrealized energy savings available in our nation's research and teaching laboratories. A typical laboratory consumes up to 10 times the energy per square foot of an office building, while specialized laboratories may consume up to 100 times more energy. Due to the requirements for high air change rates of 100% fresh air, a high percentage of this energy usage (up to 80%) is associated with the ventilation system. The ventilation of a laboratory can be broken down into three systems; the fresh air supply system, conditioning (temperature, humidity, filtration, etc), and the exhaust system.

The fresh air and conditioning systems account for approximately 60% of the ventilation system energy consumption and have been the focus of laboratory designers for the past several decades. Variable Air Volume (VAV) air handler units have become the norm in laboratory design to minimize air flow to match the building's ventilation demands, which can vary throughout the day depending upon the laboratory occupancy and the fume hood activity (when VAV fume hoods are installed). Heat recovery systems have also become the norm, particularly in northern climates, to reduce the energy consumption of the conditioning systems.

The exhaust system, which accounts for the other 40% of the ventilation system's energy consumption, has often been overlooked when considering energy saving strategies even though it may account for about 30% of the laboratory building's total energy consumption. The conventional wisdom has been that the exhaust system must operate at full load conditions 24 hours per day and 365 days per year.

This article will address three strategies that can be employed either during the design of a new laboratory or during the renovation of an existing laboratory that can safely reduce the energy consumption of the exhaust system by at least 50%, which equates to a 15% reduction in the laboratory's total energy use. To put this into perspective, using statistics provided by Laboratories for the 21st Century[1], if half of all American laboratories reduced their energy consumption by 15%, this would result in an annual energy reduction of 42 trillion British thermal units. This is equivalent to the energy consumed by 420,000 households, $625 million, 9.5 million fewer tons of carbon dioxide emitted, removing 650,000 cars from U.S. highways, or saving 28 million trees from harvest.

Historically, laboratory buildings have utilized Constant Volume (CV) exhaust ventilation systems, even when VAV systems are employed on the supply side. When the building ventilation requirements reduce the need for supply air, by-pass dampers are used to add additional air flow through the exhaust system to keep the fans operating at full load conditions. For a conventional fan system this correlates to an exit velocity of at least 3000 fpm. If entrained flow exhaust stacks are installed, the exit velocities may exceed 5000 fpm to 6000 fpm. When properly designed, a CV system will limit the concentration of the exhaust plume that is re-entrained into a nearby air intake to safe levels, but at the cost of high energy consumption.

Using state of the art engineering techniques, controls, and exhaust fans, exhaust ventilation systems now have the opportunity to be designed to optimize energy consumption by employing VAV technology on the exhaust side. A VAV system allows the air flow in the exhaust ventilation system to match (or nearly match) the supply air flow requirements of the building. However, care needs to be taken that the VAV system is designed so that it does not compromise the air quality present at nearby air intake locations or sensitive locations. This may occur if existing CV systems are blindly converted to VAV systems without a clear understanding of how the system will perform at the lower volume flow rates.

In order to safely employ a VAV system, one must understand the entire purpose of the exhaust ventilation system. An exhaust system not only removes contaminated laboratory air from the building, but it also serves to discharge the exhaust away from the building such that fumes do not re-enter the building though air intakes or impact sensitive locations. This is achieved by the proper combination of stack height and exhaust discharge momentum. If a short stack height is used, a high exhaust discharge momentum is necessary to transport the exhaust safely away from the building (typical of an entrain flow exhaust system). Alternately, if the exhaust stack is taller, a smaller amount of exhaust discharge momentum is necessary to transport the exhaust safely away from the building. Since the exhaust discharge momentum is related to the energy consumption, a taller stack will always require less energy to safely discharge the contaminated laboratory air. So how do you determine the proper combination of stack height and exhaust discharge momentum? This is defined using an engineering technique called exhaust dispersion modeling.

The preferred state-of-the-art method for conducting an exhaust dispersion study is through the use of physical modeling in an atmospheric, boundary-layer wind tunnel. Wind-tunnel modeling is conducted by releasing a precise amount of tracer gas from exhaust stacks on a scale model of a laboratory building and measuring the exhausted tracer concentrations at air intakes and sensitive locations. An example of an exhaust dispersion study being conducted in a wind tunnel is shown in Figure 1. Additional information on conducting wind-tunnel studies to evaluate the performance of exhaust systems can be found in the July 2005 ASHRAE Journal[2] and in the Laboratories for the 21st Century's best practice guideline[3].

Standard VAV Exhaust System

Using the information from the wind-tunnel modeling, three different strategies can be utilized to maximize the energy saving potential of a VAV system. The first is a standard VAV system where the exhaust flow rate is based entirely on the building's air flow demand. These systems must be designed so that safety is maintained at the minimum volume flow rates. This typically involves either taller stacks or optimizing the placement of air intakes to minimize re-entrainment of the exhaust. For a 50% turndown ratio, which can typically be achieved during unoccupied hours, this might result in an increase of 5 ft to 10 ft in the stack height. From a controls stand point, this is likely the simplest system to employ, particularly for retrofit of existing laboratories.

VAV Exhaust System with Wind Sensor

The second design strategy involves connecting the Building Automation System (BAS) to nearby wind speed/direction sensors. The performance of an exhaust stack is impacted by the wind speed at the top of the stack. For high volume flow stacks there is a direct relationship between downwind concentrations of the exhaust plume and the local wind speed. As the wind speed increases the plume rise decreases, increasing downwind concentrations. For lower volume flow stacks there is a critical wind speed that results in the maximum downwind concentration (the wind speed that results in limited or no plume rise). Similarly, when the wind is blowing from directions where there are no sensitive receptor locations nearby, the volume flow rates through the system can be reduced. During a typical exhaust dispersion study the exhaust stacks are designed to achieve acceptable plume concentrations at the critical wind speed and wind direction. Thus, by definition the systems are over designed for all other wind speed/wind direction combinations. When this design strategy is used the exhaust dispersion study is expanded to provide the minimum exhaust flow rates as a function of the local wind conditions. The BAS determines the current building loads and the minimum exhaust flow rate base on the current wind conditions and then sets the exhaust volume flow rate based on the larger of these two values. A flow chart for this system is shown in Figure 2. To ensure the reliability of the system, multiple wind speed/direction sensors may be used and yearly calibrations should be conducted.

VAV Exhaust System with In-Situ Monitor

The third approach includes the use of a VAV system with in-situ concentration measurements in the exhaust duct. When the monitor does not detect any adverse chemicals in the exhaust stream the exhaust system is allowed to operate at a reduced volume flow rate. While there may be an increase in the plume concentrations at the nearby air intakes, air quality will not be adversely impacted since the exhaust plume is essentially "clean". To ensure safe operating conditions the maximum allowable concentration levels at the nearby air intakes are limited to a value of 1500 $\mu g/m^3$ per g/s, as illustrated in Figure 3. This corresponds to the concentration limit prescribed by ANSI[4] for the maximum concentration present at a manikin standing in front of the fume hood. Therefore, under the worst-case conditions, the concentration of a "clean" plume at a nearby air intake is no greater than the maximum allowed concentration of contaminated air present in front of the fume hood. When adverse chemical concentrations are detected in the exhaust stream, the system increases the exhaust volume flow rate to achieve the design criteria of 400 $\mu g/m^3$ per g/s, as illustrated in Figure 4. The 400 $\mu g/m^3$ per g/s design criteria is the standard that is typically applied to laboratory exhaust operating under worst-case conditions.

By relaxing the design criteria to 1500 $\mu g/m^3$ per g/s when the plume is "clean", the volume flow rate through a typical exhaust system can be reduced by 50% to 75% of the flow rate required to achieve the 400 $\mu g/m^3$ per g/s. This means that if adverse chemical concentrations are not detected in the exhaust stream, the laboratory exhaust system can operate at flow rates corresponding to the building load.

Data collected at operating research laboratories with an in-situ monitor indicate that emission events that would trigger the higher volume flow rate requirements typically occur no more than approximately 1 hour per month. Thus, a typical system will be able to operate without the need for by-pass air more than 99.9% of the time, resulting in significant energy savings.

The cost for installing an in-situ monitoring system will be somewhat greater than the wind speed/direction sensors, if the monitoring system is not already used within the laboratory. If a monitoring system is already installed, the additional cost to add sensors within the exhaust stream is minimal.

Energy Savings

The energy consumption for a typical laboratory was calculated for each of the three VAV operating strategies described above along with a CV system. The case study laboratory is configured with four exhaust stacks operating at a maximum volume flow rate of 40,000 cfm each and a maximum building load of 120,000 cfm and a minimum turndown ratio of 50% during off hours. For the CV system this corresponds to an n+1 system where only three of the four stacks are in operation. For the three VAV scenarios all four stacks are used. (If one fan is down for maintenance, the system can still operate at 100% load with just three of the four stacks operating). Table 1 demonstrates the energy savings that can be achieved for this case study. It is assumed that the Standard VAV system is designed to allow the volume flow rates to be reduced to 60% of full load (24,000 cfm per fan, 96,000 cfm for the system). For the VAV systems with the wind sensors and with the in-situ monitors, the minimum flow rates were set at 37.5% of full load (15,000 cfm per fan, 60,000 cfm for the system).

In general, the annual energy savings that one can reasonably expect when employing a standard VAV system is on the order of \$0.50/cfm of total exhaust flow. By adding in either wind sensors or in-situ monitors the savings can increase to around \$0.75/cfm per year. The savings with the wind sensors will vary depending upon the local wind speed distribution with greater saving being available for areas with lower mean wind speeds and less for those areas with higher mean wind speeds.

Conclusion

Laboratories' possess a tremendous potential for energy savings. An energy savings of 15 percent or more is available through the use of VAV exhaust ventilation systems that are designed to minimize exhaust air flows to meet building demands. When properly designed, a VAV system can provide these savings without adversely impacting the air quality at downwind air intake locations or sensitive locations. The specific energy saving opportunities that are available for a new or existing laboratory can be determined by conducting a wind tunnel based exhaust.

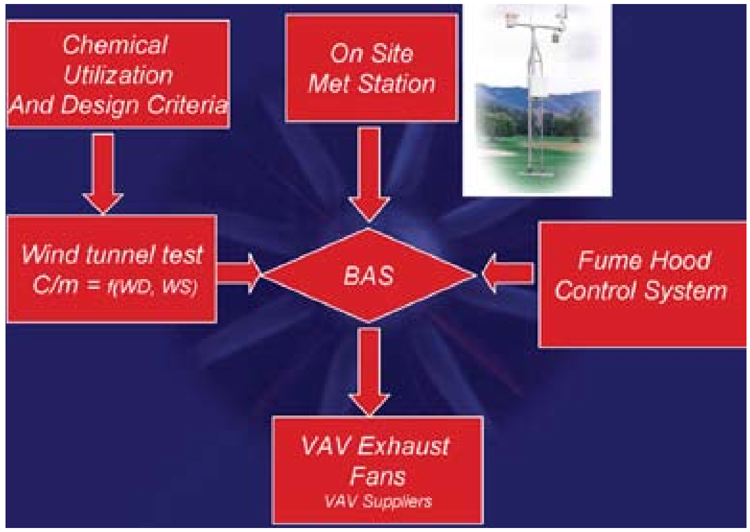

Figure 2.
Flow chart of the control strategy for a Variable Air Volume exhaust system inter-connected with local wind speed and wind direction measurements.

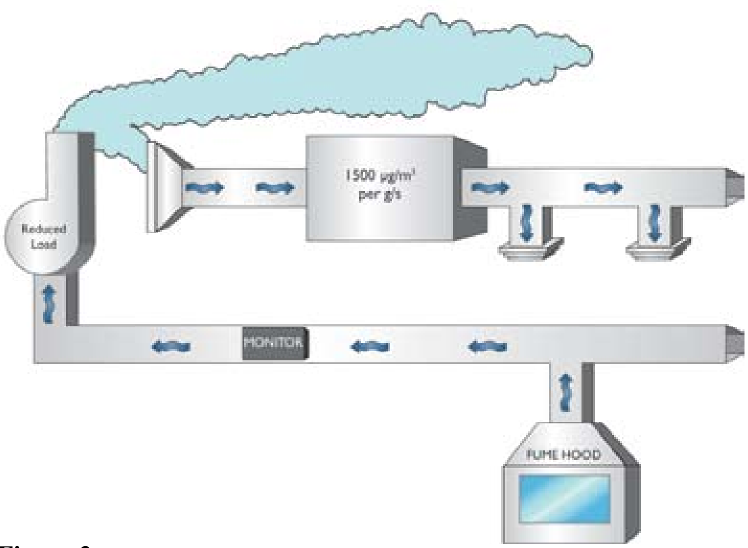

Figure 3.
Illustration of an exhaust system operating with an in-situ monitor does not detect adverse chemical concentrations in the exhaust stream.

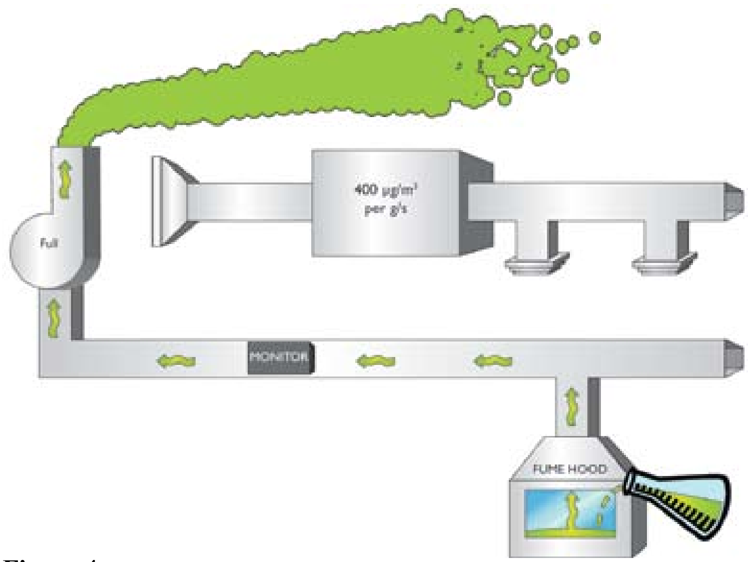

Figure 4.
Illustration of an exhaust system operating with an in-situ monitor when the monitor detects adverse chemical concentrations in the exhaust stream.

Table 1.

Laboratory Exhaust Ventilation Case Study – Annual Energy Consumption

System Type	Annual Energy Consumption	Annual Cost (Assumed $0.12/kw hr)
Constant Volume	814 MW hrs/yr	$122,200 / yr
Standard Variable Air Volume (20% system turndown)	321 MW hrs/yr	$48,100 / yr
Variable Air Volume w/ Wind Sensors (up to a 50% system turndown)	200 MW hrs/yr	$30,000 / yr
Variable Air Volume w/ In-Situ Monitor (up to a 50% system turndown)	163 MW hrs/yr	$24,400 / yr

References.

[1] EPA, "An Introduction to Low-Energy Design," Laboratories for the 21st Century, U.S. Environmental Protection Agency, Office of Administration and Resources Management, DOE/GO-102000-1112, August 2000.

[2] Carter, J., R. Petersen, and B.C. Cochran, "Specifying Exhaust Systems," ASHRAE Journal, American Society of Heating, Refrigeration & Air Conditioning Engineers, Inc., Atlanta, GA, July 2005.

[3] EPA, "Best Practices: Modeling Exhaust Dispersion for Specifying Acceptable Exhaust/Intake Designs," laboratories for the 21st Century, Environmental Protection Agency, Office of Administration and Resources Management, DOE/GO-102005-2104, May 2005.

[4] ANSI/AIHA, American National Standard for Laboratory Ventilation, Standard Z9.5-2003, 2003.

Engineering Supervisor - Massachusetts Wind Turbine Technology Center

Requisition #569BR

The National Renewable Energy Laboratory (NREL) is a leader in the U.S. Department of Energy's effort to secure an energy future for the nation that is environmentally and economically sustainable. Our mission is to develop renewable energy and energy efficiency technologies and practices, advance related science and engineering and transfer knowledge and innovations to address the nation's energy and environmental goals.

Job/Research Summary

Will perform and supervise blade testing engineering and technical activities at the Wind Turbine Technology Center (WTTC) in Boston, Massachusetts. Responsible for conducting tests on large wind turbine blades in accordance with international standards (IEC) following accredited protocol (A2LA), work delivery and scheduling, creation of test plans and budgets, interfacing with customers, and execution of custom mechanical test systems including large oscillating machinery. Leads engineering/R&D activities or technology applications; works independently in support of center management.

The successful applicant will be responsible for the day to day supervision of staff. Responsible for performance management, career development, coaching, and mentoring assigned staff. Documents and addresses disciplinary issues as required. Promotes and models ethical and professional behavior and a diverse work environment. Maintains compliance with laws, ES&H requirements, contractual requirements, and NREL policies and procedures.

Job Duties

1. Perform and supervise blade testing engineering and technical activities at the Wind Turbine Technology Center (WTTC) in Boston, Massachusetts to include applying state-of-the-art mechanical engineering skills, abilities, and techniques to design, construct, install, operate, maintain, and evaluate equipment, facilities, and instrumentation specific to structural testing of wind turbine blades up to roughly 80m in length.

2. Responsible for WTTC test scheduling, accreditation, labor and equipment resource planning

3. Co-responsibility for preparing and presenting periodic assessments for MTC and NWTC management

4. Serves as director during periods of the director's absence

5. Work within laboratories, test bays, and on turbines at elevated heights. Provide hands-on operation of associated specialized test gear and equipment (e.g. test apparatus, measurement instruments, shop tools, cranes, man lifts, etc.). Complete required training (e.g. hoisting & rigging, machine shop safety, electrical safety including compliance with "NFPA 70E Electrical Safety in the Workplace", lock-out tag-out, fall protection, and hazardous materials safety).

6. Develop test plans and methodologies, design and oversee construction of specialized test fixtures. Coordinate development of safe operating procedures. Conduct engineering analyses to ensure safe movement, alignment, installation, and dismantling of heavy objects, test articles, and test apparatus.

7. Specify and install test sensors and transducers (e.g. strain gages, accelerometers). Operate test instruments, computers, and data acquisition systems. Process and analyze test data. Produce and publish test reports.

8. Interacts with customers to negotiate deadlines and work requirements to support timely and efficient workflows

9. Supervises day to day activities of assigned personnel to maintain appropriate task assignments and workloads

10. Supports career development opportunities for staff members including formal professional and personal development sessions, cross training, stretch assignments and other educational opportunities.

11. Implements equal employment opportunity, affirmative action, and harassment prevention programs, policies and procedures within the group.

12. Represents the group to external customers, vendors and other internal organizations

13. Communicate and collaborate with the senior engineers and managers at the National Wind Technology Center (NWTC).

14. Travel to the NWTC for extended periods for training, planning, and collaborative projects as needed.

Minimum Qualifications
Relevant Bachelor's Degree and 5 years experience in a business or technical discipline or equivalent education/experience.

Preferred Qualifications
Doctoral degree in science and/or engineering, or equivalent relevant education/experience with 10 years of relevant R&D experience.

Previous demonstrated experience working on mechanical components and systems specific to wind energy technology and testing including:

- Installation and operation of wind turbines
- Design and testing of wind turbine components including blades and rotor systems.
- Design, specification and installation of instrumentation and data acquisition systems specific to wind energy technology testing.
- Knowledge of loads simulation techniques for wind turbines.
- Knowledge of certification guidelines with emphasis on wind energy systems.
- Applies broad and in-depth knowledge of engineering procedures and techniques.
- Demonstrated leadership in areas of team, task, or project lead responsibilities.
- Works independently and demonstrated excellent interpersonal and communication (oral and written) skills.
- Experience in project management of moderately complex and/or impact projects.
- Demonstrated expertise and innovation in mechanical design including use of design and analysis computer tools and techniques (e.g. AutoCAD, Solid Works, Excel, Ansys and LabView).
- Demonstrated knowledge of principles involved in production of precision technical plans, drawings and models.
- Knowledge of safe use and maintenance of machines, equipment, and tools.
- Knowledge of materials and methods used in wind turbine structures and mechanical systems.
- Experience supervising staff, in collaboration with scientists, engineers, and technicians.
- Responsibility for work delivery and performance of assigned projects and subtasks.

Pre-employment drug testing required.

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Mechanical Engineer - Massachusetts Wind Turbine Technology Center

Requisition #570BR

Job/Research Summary
Will provide technical support for large blade testing facilities at the Wind Turbine Technology Center in Boston, Massachusetts. Support experiments to test and characterize structural performance of full-scale wind turbine blades. Work in collaboration with senior scientists and engineers on research, development and testing projects. Design and operate custom mechanical test systems including large oscillating machinery. Responsible for conducting tests on large wind turbine blades in accordance with international standards (IEC) following accredited protocol (A2LA). Understanding of integrated wind turbine mechanical systems and components including blades, rotors, and hydraulic systems.

Job Duties

1. Provide technical support for large blade testing facilities at the Wind Turbine Technology Center in Boston, Massachusetts to include applying state-of-the-art mechanical engineering skills, abilities, and techniques to support the design, construction, installation, operation, maintenance, and evaluation of equipment, facilities, and instrumentation specific to structural testing of wind turbine blades up to roughly 80m in length.

2. Work within laboratories, test bays, and on turbines at elevated heights. Provide hands-on operation of associated specialized test gear and equipment (e.g. test apparatus, measurement instruments, shop tools, cranes, man lifts, etc.). Complete required training (e.g. hoisting & rigging, machine shop safety, electrical safety including compliance with "NFPA 70E Electrical Safety in the Workplace", lock-out tag-out, fall protection, and hazardous materials safety).

3. Responsible for developing test plans and test loads in conjunction with clients' loads teams.

4. Responsible for developing test methodologies, designing, and overseeing construction of specialized test fixtures.

5. Coordinate development of safe operating procedures.

6. Conduct engineering analyses to ensure safe movement, alignment, installation, and dismantling of heavy objects, test articles, and test apparatus.

7. Specify and install test sensors and transducers (e.g. strain gages, accelerometers). Operate test instruments, computers, and data acquisition systems. Process and analyze test data. Produce and publish test reports.

Minimum Qualifications

Relevant Bachelor's Degree and 3 years experience or equivalent relevant education/experience.

Preferred Qualifications

Master's degree in Mechanical Engineering or related discipline. Six years of relevant engineering and/or R&D experience. Previous demonstrated experience working on mechanical components and systems specific to wind energy technology and testing including:

Evolved R&D knowledge of engineering procedures and techniques. Good interpersonal and communication (oral and written) skills. Demonstrated expertise and innovation in mechanical design including use of design and analysis computer tools and techniques (e.g. AutoCAD, Solid Works, Excel, Ansys and LabView). Demonstrated knowledge of principles involved in production of precision technical plans, drawings and models. Knowledge of safe use and maintenance of machines, equipment, and tools. Knowledge of materials and methods used in wind turbine structures and mechanical systems. Capable of working under supervision of senior staff, and in collaboration with scientists, engineers, and technicians. Responsibility for work delivery and performance of assigned projects and subtasks.

Beginning experience in project management.

- Installation and operation of wind turbines.

- Design and testing of wind turbine components including blades, rotor systems, drive trains, power conversion systems.

- Design, specification and installation of instrumentation and data acquisition systems specific to wind energy technology testing.

- Knowledge of certification guidelines with emphasis on wind energy systems.

Pre-employment drug testing required.

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Report on Plans for CWE2010

Alan Huber, alan.huber@unc.edu

The Fifth International Symposium on Computational Wind Engineering (CWE2010) will be held May 23-27, 2010 at the William and Ida Friday Center for Continuing Education, Chapel Hill, North Carolina, USA. The International Association for Wind Engineering co-convenes this Computational Wind Engineering (CWE) symposium every four years in rotation with one of its three global regional organizations. The American Association for Wind Engineering is co-convening the 2010 event. Announcements, submission instructions, program, registration, hotel accommodations, and general related information are posted on the symposium website (www.cwe2010.org).

The Place

The Friday Center has excellent faculties to host a symposium. There is easy wheelchair access to the whole facility. It will be a comfortable environment with no outside traffic though the building. There is free high speed wireless internet connection throughout the facility and public access telephones are conveniently located. There is a message center. The Friday Center maintains the latest audiovisual technology and support for each room. The Friday Center is part of the University of North Carolina at Chapel Hill (UNC) and is adjacent to the main campus area. UNC is the oldest public University in the USA. The normal University class sessions will have finished 2 weeks before CWE2010. This is a quiet period in Chapel Hill with limited summer students and campus activities. May is a colorful period in North Carolina with many blooming flowers and trees. The average high and low temperatures for this period are 27 deg C and 15 deg C.

There are non-stop flights to RDU from many major USA Cities and a few from cities outside the USA. The travel time from Raleigh-Durham International Airport (RDU) to Chapel Hill is only 15-20 minutes using public transportation. There is only one hotel adjacent to The Friday Center. A group of hotels near the Friday Center will be selected for preferred symposium housing and will be connected to The Friday Center by a shuttle bus so everyone may attend without needing a rental car. Arrangements are being planned to provide dormitory type housing on the UNC campus, especially for attending students.

Travel by automobile or airplane to all eastern USA cities is convenient for pre or post CWE2010 vacation or business plans. There are also several special interest areas for vacations in North Carolina. North Carolina is a golfer's paradise, especially in the Pinehurst Area which is less than 60 minute travel time south of Chapel Hill. In the western part of North Carolina is the Application Mountains with the highest elevation east of the Rocky Mountains and America's biggest house, the Biltmore House. In the eastern part of North Carolina are the Outer Banks with kilometers of undeveloped beaches with sand dunes. This area includes a National Monument at the site of the Wright Brother's first powered flight. The National Monument includes replicas of their airplane and wind tunnels used to help design the airplane. The Outer Banks is also home of England's first settlement in America. If there is enough interest arrangements could be made for planned group travel to several areas following CWE2010.

Sponsorship Opportunities

Sponsorship Packages have been posted on the symposium website. Tell your favorite companies about the unique marketing opportunity while supporting computational wind engineering. A technical exposition is planned for areas near the symposium sessions. Funds from sponsors will help offset symposium costs and provide sponsored events such as the symposium banquet.

Symposium Agenda

The symposium includes a Sunday Evening Reception with buffet dinner and a Wednesday Evening Banquet. Optional evening events will be planned for Monday, Tuesday, and Thursday. Each day will begin with a plenary session. Each day will include a lunch buffet in the dining room. Each day will include a light breakfast, a morning refreshment break and afternoon refreshment break in the atrium.

Both pre- and post-symposium workshops are possible. Professors Meroney has already planned a 3-day workshop "Introduction to Computational Fluid Dynamics/Computational Wind Engineering for the 21st Century" for May 21-23.

Posters as well as oral presentations on all computational wind engineering topics are invited. CWE2010 will provide a platform for discussing and exchanging the latest information associated with the application of Computational Fluid Dynamics (CFD) simulations to wind engineering problems and the tremendous advances in CFD technology in the past several years. Poster presentations will be a significant element of the program, including convenient display in the atrium for easy viewing throughout the day and several periods will be set for direct interaction with all attendees. Poster presenters will be provided a 2-3 minute period for a brief oral overview of the poster as part of the technical sessions.

Each international symposium on CWE reflects the significant scientific advances in the rapidly developing computational wind engineering sciences linked to advances in high performance computing hardware and software. CWE does not necessarily mean CFD, but can include various techniques using computers. Presentations with critical full-scale data and wind tunnel data needed to support advancing CWE are also invited. The theme and a plenary session for CWE2010 are entitled "CWE applications for homeland/societal security including natural and human-caused hazards and disasters." There are many emerging issues for computational wind engineering, not only in wind hazard mitigation, but also in air contamination problems near and in the far field of buildings, and in natural/cross ventilation or wind energy phenomena to preserve natural resources and to realize a sustainable society. Additional plenary sessions entitled "CWE model development, validation, and applications linked to future computing software and hardware", "Development, validation, and application of atmospheric boundary layer models and turbulence models for CWE", and "Coupling Computational Wind Engineering and Mesoscale Meteorological Models" are being planned. For more details see the AAWE Newsletters in 2009.

Call for Presentations

Please submit your abstract electronically via the symposium website (www.cwe2010.org) by 1 October 2009.

Full papers (including supporting electronic applications) must be submitted electronically by 1 March, 2010 in order to be included on the symposium USB flash drive.

For further information please contact
the symposium chairperson :
Alan Huber
Institute for the Environment
Campus Box 6116
University of North Carolina
Chapel Hill, North Carolina, 27599
(email: chairman@cwe2010.org or alan.huber@unc.edu).

President's Corner

I write to you from San Juan, Puerto Rico, while attending the 11th Americas Conference on Wind Engineering. The location is fabulous, the attendance excellent and the quality of the technical exchanges very high! My thanks and congratulations to Hector Cruzado, Rolando Vega and the rest of the conference team for organizing a wonderful meeting, and continuing the great tradition of the ACWE.

A number of important meetings are taking place at ACWE, including the Regional Assembly and the AAWE Board of Directors meeting. The Regional Assembly meeting is an important opportunity to hear from the leadership of the constituent organizations, as well as from your International Association for Wind Engineering (IAWE) representatives. Your Board of Directors wrestles with the details of administering the organization from finances to awards to membership, but in addition, as indicated in my last letter, we have begun the important task of developing a sound and visionary strategic plan for the Association. It remains my goal to navigate this process so that one year from now we will have a plan in place that will guide us through the next 5 to 10 years. As we embark on this process, we need your input and support. For those of you who have a moment to do so, I would very much appreciate hearing your vision for what AAWE should do and be as it evolves over the next decade. What services should AAWE provide? How can it best represent its membership? What will you look for AAWE to be doing for you that other professional organizations don't? Please give these questions some thought, and feel free to email any ideas you might have to me at nick@jhu.edu. Your suggestions will all be valued and carefully considered as we proceed with this important activity.

There are two other important items on which your Board needs input. First, we need to elect two additional board members, and a president elect, and we need to do this very soon. Please communicate any nominations to me as soon as possible so that they can be passed to the nomination committee for inclusion in the ballot. Second, we invite proposals to host the next ACWE in 2013. Any proposals from AAWE members will be transmitted to the IAWE regional structure for discussion and selection. Again, this needs to be done as soon as practical so that decisions can be made and formal planning commence.

One of the truly exciting things about wind engineering is that it is a global discipline, and in my view draws much of its strength from the diversity that derives from that global connectedness. A number of developments globally are worth special mention in this letter. The IAWE continues to become more active and engaged globally in hazard mitigation activities and programs; it is critical that we position ourselves to contribute effectively to assist in any way we can. I am pleased to report as part of this process the launch of an International Group for Wind-Related Disaster Risk Reduction headed by Yukio Tamura, President of IAWE. I am also very excited to report the formation of the Latin-American Wind Engineering Association, which is requesting status as an IAWE Member Organization. This is an exciting development for the global wind engineering community and for our neighbors in the Americas.

After the excitement of the conference winds down, we brace and prepare once again for our severe storms season. As much of the Americas face this threat, again, I rest assured that many of you continue to work to make your country, continent and world a safer place in the face of hurricanes, tornados, and other severe weather events.

Sincerely,
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American Association for Wind Engineering

Objectives:

- The advancement of science and practice of wind engineering.
- The solution of national wind engineering problems through transfer of new knowledge into practice.

Established in 1966

Corporate Members of AAWE

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