AMERICAN ASSOCIATION FOR WIND ENGINEERING
www.aawe.org

THE WIND ENGINEER

NEWSLETTER OF AMERICAN ASSOCIATION FOR WIND ENGINEERING

Bogusz (Bo) Bienkiewicz, Editor

March 2002

2002 Tornadoes Update

According to NOAA's National Weather Service (www.noaanews.noaa.gov) only 11 tornadoes touched down so far in 2002-approximately 6% of the average 178 tornadoes U.S. experiences this time of year. Peak tornado activity occurs during the months of March through early July.

(From NOAA Photo Gallery)

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Wind Hazards in the Global Environment

Michael P. Gaus

The following article was originally prepared to stimulate discussion at an International Affairs Session held during the 2001 ASCE Annual Convention in Houston, TX. It is reproduced herein to encourage discussion and comments by members of AAWE. If you wish to comment or offer suggestions, please forward your e-mail to aawe@aawe.org or send written comments and suggestions to AAWE.

Background

Wind in the planetary boundary layer can be both a friend and a foe. Examples on the friendly side of wind include: beneficial effects in transporting and dispersing gaseous pollutants arising from different sources; wind can make a dreadfully hot day seem more acceptable; wind can provide a nonpolluting source of energy; and wind can make a wonderful subject for party conversation. On the less desirable side, wind and associated water effects has been responsible for large amounts of destruction of both natural and man-made objects and has caused extensive loss of life and human suffering in many parts of the world.

Most civil engineering projects are constructed in the first thousand feet (or so) above the ground and thus occupy a very small slice of the total atmosphere. There are many things that can go on in this slice of atmosphere as the wind moves over the ground surface. Friction effects create a gradient change in mean wind velocity until the boundary layer effect dissipates and other forces govern the wind. Roughness of the surface can cause a "stirring" of the wind and introduces complex three-dimensional movements of the wind. Larger scale atmospheric effects are related to movements of weather systems and their associated winds. The result is that the planetary boundary layer winds have a very complex spatial structure and the interaction of the turbulent wind with relatively bluff objects can introduce more complications. In addition to the complex nature of the spatial wind structure there are possible interactions between the wind and objects that are sufficiently flexible to move in response to wind forces and to further complicate the loads and movements related to the wind.

Although the physical description of the wind presents a very complex problem to be dealt with, the wind hazard problem is not only one of physical forces and reactions but it also involves a complex network of interactions between regulators, constructors, developers, insurance organizations, and many others. Thus the achievement of wind hazard mitigation will require intensive communication between the various stakeholders who are involved in the mitigation process. Unfortunately the level of damage and risk is increasing each year due to increases in population and the concentration of populations in areas that present a significant level of risk. The problem is also complicated due to the existence of large investments in existing structures that were constructed before the need for wind resistance was recognized or the technologies needed to reduce risk were developed. The economics of (possibly) retrofitting these structures is mind-boggling and strategies to deal with this problem need to be developed.

Scope of Wind Hazard Problems

Effective mitigation of wind hazards requires interaction of a broad variety of groups spanning many disciplines and the spectrum of technical, sociological and political areas.

Some of the activities needed for reducing wind hazards are discussed next.

Hazard Identification and Risk Assessment

In spite of many efforts that have been undertaken, the identification of the geographic distribution and levels of hazard have not been adequately identified even in more developed countries. This identification should not only consider the physical nature of wind hazard impacts but it should also include the economic and societal impacts. Much needs to be done to establish the acceptable levels of risk in terms of national impacts and potential frequency of occurrence. Improved models need to be developed to place the impact and risk problem in proper perspective. New technologies such as GIS, new technologies to capture needed information and new capabilities to utilize large data structures will be of value.

Current and Needed Knowledge

Substantial advances have been made in the science and technology related to wind. Much work has been carried out in meteorology to better understand atmospheric phenomena that are related to extreme wind conditions. In addition, significant advances have been made in observation methods that have lead to improved warnings of extreme wind events. In spite of this progress there is still much that needs to be understood. The global distribution of warning systems is not uniform and perhaps needs to be improved.

Substantial progress has also been made in modeling of wind structure and in understanding some of the problems related to wind interacting with structures. Unfortunately these interactions are complex that it is not yet possible to analytically model these phenomena. For an adequate understanding of many problems it is necessary to utilize special wind tunnels that simulate planetary boundary layer conditions and to carry out specific evaluations for a particular structure. That these studies have been reasonably successful is attested to by the large number of major structures, such as tall buildings and long span bridges, that have been constructed with acceptable results. There are still many problems of wind engineering for major or wind sensitive structures that need further advances in knowledge to improve safety and design efficiency.

A major problem is the large number of low-rise and non-engineered structures that are constructed in every country. Because of the fragmented nature of this sector of the construction industry, there is generally neither the capital for adequate engineering or wind tunnel studies of specific buildings and the construction is guided by codes or tradition. Unfortunately the history of windstorms has demonstrated many inadequacies of this approach. Efforts have been made to develop simplified procedures for analysis using generic wind tunnel studies but the support for such studies has been Spartan and much needs to be done to improve this approach. Another problem arises due to the fact that most of the wind engineering studies have focused on wind loading and have not adequately examined structural response. Much of the structural resistance information has been derived from component tests that may have not adequately simulated the true loadings. There is a serious need for full-scale tests on low-rise structures to better understand how load paths develop and are maintained up to failure. Another area that needs to be evaluated is the impact of new materials such, as FRP's and new adhesives, on the behavior of low-rise buildings and other structures.

Implementation

The implementation of new knowledge and construction practices is a complex problem that involves a chain of interactions that could include building officials and regulators, financiers, developers, insurance and the public, that is the eventual customer. In many countries, present systems are woefully inadequate to move new information that could provide improved wind hazard resistance down this chain. The end point of the chain are perhaps the builders who actually carry out the construction and are (unfortunately frequently) not informed on new possibilities. In addition, they are constrained (by competition) to adhere to existing codes and are fearful that changes in procedures would impose cost penalties and loss of market.

Understanding Economic Losses

The economic impacts of wind hazard events are not clearly understood at the present time. Impacts do not only involve the direct physical losses but they may have impacts on business activity, and whether certain businesses can survive an event. In addition the impact of a wind hazard event is not uniform and impact on disadvantaged persons may be disproportionate, when compared with other sectors of society. These are issues that need to be clarified and better understood.

Mobilizing Resources to Achieve Effective Wind Hazard Mitigation

Effective wind hazard mitigation requires an improved plan to assure that different potential stakeholders work together in utilizing resources and in avoiding duplication and territorial disputes.

Needs for Wind Hazard Mitigation

The past record of loss of lives and damages documents the need for wind hazard mitigation. Unfortunately, in spite of efforts carried out in many countries, the wind hazard risk has been increasing and will continue to increase unless investments are made in improved understanding and forecasting. A part of this increased risk is due to increasing populations who tend to congregate in coastal and other hazardous areas. Reducing the levels of risk will require improved risk assessment techniques, improved planning, as well as technological solutions that provide improved wind hazard resistance.

Global Interaction

Very few countries do not have some level of risk from wind and related water events. As the problem is vast and has many common features among countries it would be of benefit to work together to optimize available limited resources devoted to understanding and improving the wind hazard problem. Hopefully various international activities organized through AAWE and other professional groups will help to focus on common problems and enhance communication between stakeholders in the U.S. and abroad.

Discussion Questions

1. What should be done about the large inventory of existing construction that has insufficient resistance to extreme winds?
2. The role of shelters versus retrofit.
3. Can warnings be sufficiently reliable so that shelters reduce the need for retrofit or wind-resistant design and retrofit?
4. What is the role of warnings in wind hazards?
5. How can technologies such as GIS be used to more effectively assess potential vulnerability?
6. How can we improve the database on extreme wind characteristics?
7. Is it practical to work toward more uniform global specification for wind characteristics?
8. To what extent should warning activities be expanded?
9. How adequate are current building design and construction practices for achieving wind hazard mitigation for new and existing buildings?
10. Is it possible to work toward more consistent building codes?
11. Should more attention be paid to water problems associated with wind?
12. How can improved mitigation response methods be developed?
13. For non-engineered structures – how can methods to transmit proper construction techniques be improved?

14. What could be the role of new information technologies in wind hazard mitigation?
15. Can failure and vulnerability prediction methods for structures be improved?
16. Can learning from post-disaster investigations be improved?
17. How can information from post-disaster investigations be better achieved and disseminated?
18. What role could improved computer programs for wind loadings and structural resistance play in achieving wind hazard mitigation?
19. Can an international effort be organized to improve pressure coefficients used in codes?
20. What will be the role of computational fluid dynamics in wind hazard assessments?
21. What should be the balance between preparedness and the development of new technologies?
22. How can evaluation of wind hazard mitigations be improved?
23. What is the impact of government relief and recovery efforts on wind hazard mitigation?
24. How can wind loading and design codes be improved?
25. How can we encourage more students to study and carry on research in wind engineering?
26. Will there be a need for one or more very large-scale boundary-layer wind tunnels that could test entire small buildings?
27. Is there a need for more full-scale testing of non-engineered structures to determine resistance of entire structural systems, evaluate load paths and load transfer and system failure characteristics?
28. Do programs such as Project Impact in the U.S. reduce the need for wind engineering research?
29. How can building code groups incorporate new wind engineering knowledge more rapidly?
30. How can the anchorage of manufactured homes be more effectively achieved within economic constraints?
31. How can new knowledge and construction techniques be incorporated in the reconstruction of buildings demolished by extreme wind so that they are not reconstructed in exactly the same way as originally built?
32. How can wind-zoning maps be improved in countries around the world?
33. Do some events such as tornadoes have to be taken as events for which we are helpless to provide mitigation solutions?

Americas Conference on Wind Engineering-2005

In response to the announcement requesting an interest in hosting the next Americas Conference on Wind Engineering, Louisiana State University (LSU) has offered to host the Conference. This Conference will be the 10th meeting held under the sponsorship of the American Association for Wind Engineering and it's predecessor, the Wind Engineering Research Council.

LSU has recently established the LSU Hurricane Center that has provided leadership in developing an integrated interdisciplinary approach to wind hazard problems. This background provides an ideal environment for planning and hosting the conference.

The Conference is tentatively planned for late May or early June 2005. The local sponsors will be the LSU Hurricane Center and the Department of Civil and Environmental Engineering. LSU is the flagship institution of the state. It is located on the Mississippi River in Baton Rouge (the State Capitol), just one hour from New Orleans. Dr. Marc Levitan, Director of the Hurricane Center, will chair the Conference. Planning is at a very initial stage but consideration will be given to having some sort of tie-in with New Orleans. Both Baton Rouge and New Orleans have interesting problems and projects related to extreme winds and associated water problems.

By starting planning for the Conference early there is ample time to solicit input from many sources, to establish the Conference Committee, to plan for session topics and to encourage broad participation from North and South America, the Caribbean and Central America. Updates on the Conference will be published in the AAWE Newsletter, on the AAWE website and through conference announcements. Input by AAWE members is welcome and should be forwarded to AAWE at aawe@aawe.org or to Dr. Levitan at levitan@hurricane.lsu.edu.

Wind Engineering

Topics of wind engineering practice and research within the scope of AAWE activities include the following:

WIND LOADING ON STRUCTURES

Local loading on the building envelope, mean and dynamic response, bluff body aerodynamics, vortex-shedding, galloping and flutter, fatigue life estimates, effects of architectural details, impact of wind-driven missiles, curtain wall analysis, design loads, codes, and specifications, uncertainty analysis.

DYNAMICS OF WIND SENSITIVE STRUCTURES

Dynamics of tall buildings, long-span bridges, transmission lines, towers and stacks, chaotic vibrations and aeroelasticity, mitigation of structural motion.

SOCIO-ECONOMIC FACTORS

Damage assessment and mitigation, insurance, legal considerations, risk assessment, cost-benefit analysis.

BOUNDARY-LAYER WINDS

Distribution of wind speeds and temperature, turbulence characteristics, orographic and urban effects.

SEVERE STORMS

Engineering micrometeorology, thunderstorms, hurricanes, tornadoes, extra tropical cyclones, down slope winds, extreme wind statistics, post-disaster inspections.

PHYSICAL MODELS

Wind-tunnel facilities, criteria for simulation, wind characteristics for complex geometry, structural response, diffusion and dispersion, special facilities, pedestrian comfort, snow drifting, wind energy.

COMPUTATIONAL WIND ENGINEERING

Atmospheric surface-layer , turbulence, calibration, validation, effects of incident turbulence, near-wake flows, flow past and loading on buildings and structures.

FULL-SCALE STUDIES

Instrumentation development, meteorological variables, wind pressures on building envelopes, structural response, pollutant concentration.

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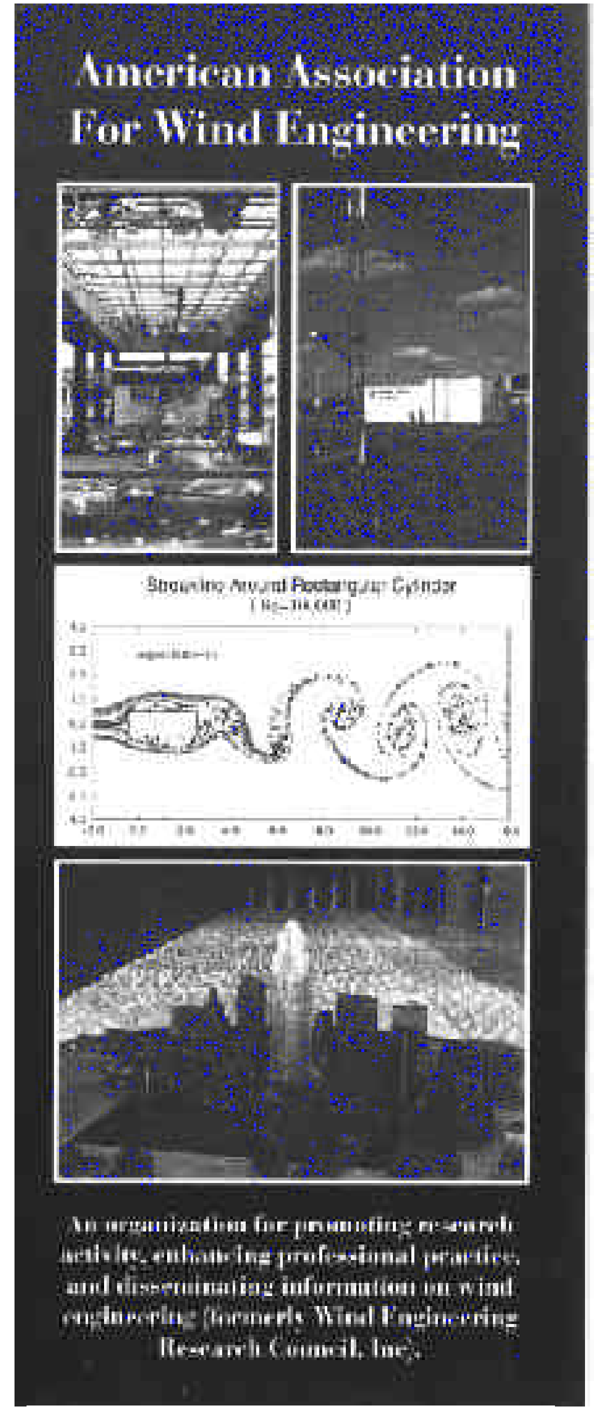

www.aawe.org

Purpose

The American Association for Wind Engineering (AAWE), formerly Wind Engineering Research Council, Inc., has promoted and disseminated research results in the field of wind engineering since 1970. In 1983 it was incorporated as a non-profit professional organization. The multi-disciplinary field of wind engineering encompasses problems related to wind loads on buildings and structures, societal impact of hurricanes and tornadoes, risk assessment and cost-benefit analysis, codes and standards, dispersion of urban and industrial pollution, wind energy, and urban aerodynamics.

The primary objectives of the AAWE are:

* Stimulate research efforts in wind engineering;
* Encourage the exchange of information among researchers and practitioners;
* Assess and prioritize leading-edge research in wind engineering;
* Provide advice to governmental agencies and other interested parties on wind research efforts and needs;
* Maintain communication with similar organizations in other countries and international organizations;
* Develop and execute plans for learning from future windstorms and hurricanes by gathering post-disaster data and analyzing and disseminating information.

Related Fields of Application

Aerospace Engineering, Agricultural Engineering, Architecture, Chemical Engineering, Civil Engineering, Engineering Mechanics, Environmental Engineering, Mechanical Engineering, Meteorology, Oceanography, Offshore Engineering, Structural Engineering, and others.

Activities

The AAWE organizes periodic national conferences dealing with wind engineering research and practice. These meetings consist of reports on current research and discussion by working groups on directions for future research and research implementation. The proceedings of the national conferences are published for the benefit of researchers and practitioners. In addition, a newsletter reporting on activities and forthcoming events in wind engineering is published bi-monthly. The AAWE serves as a voice of the wind engineering community and provides a forum for review of national needs in wind engineering research and practice.

The AAWE has co-sponsored numerous meetings called for by other organizations in the United States and abroad. These include topical meetings dealing with tornadoes, hurricanes, probabilistic methods, structural control, computational wind engineering, International Conferences on Wind Engineering, International Conferences of Structural Safety and Reliability, ASCE Specialty Conferences on Structures and Probabilistic Methods, and others.

Membership

Membership in AAWE provides a means of communicating with engineers, architects, meteorologists and other professionals having an interest in wind engineering. Conference proceedings, white papers, a newsletter, and a web site provide up-to-date information on new developments, trends, and activities in this field.

Annual membership dues are:

Individual Member	$50
Student Member	$10
Corporate Member	$500 or more

For further information and membership application please visit: www.aawe.org

AMERICAN ASSOCIATION FOR WIND ENGINEERING

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American Association for Wind Engineering

OBJECTIVES

The American Association for Wind Engineering (AAWE) was established in 1966. The objectives of AAWE are: (1) the advancement of the science and practice of wind engineering and (2) the solution of national wind engineering problems through transfer of new knowledge into practice.

CURRENT OFFICERS

President: M. P. Gaus (Univ. at Buffalo)
Vice President: B. Bienkiewicz (Colorado State Univ.)
Secretary/Treasurer: P. Sarkar (Iowa State Univ.)
Board of Directors: A. Chiu (Univ. of Hawaii), T. Gibbs (Consulting Engineers Partnership, LTD), J. Golden (NOAA), M. Levitan (Louisiana State Univ.), T. L. Smith (T. L. Smith Consulting, Inc.), A. Kareem (Univ. of Notre Dame).

WHY YOU SHOULD JOIN:

AAWE provides networking opportunity with U.S. wind engineering community through regular and special publications, e-mail communication, internet resources, and technical meetings.

HOW TO JOIN

Fill–in the Membership Application/Renewal Form and forward it to AAWE Secretary/Treasurer. For more information visit AAWE web site or contact Mike Gaus (mgaus@gausassoc.com, 757-258-1273, voice) or Bo Bienkiewicz (bogusz@engr.colostate.edu, 970-491-8232, voice).

Get involved in formulating
National Wind Hazard Reduction Program

Please Post

AMERICAN ASSOCIATION FOR WIND ENGINEERING

www.aawe.org
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Tel: 757-258-1273
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AAWE
American Association for Wind Engineering

Membership Application/Renewal

Membership Year: January 1, 2002 - December 31, 2002

Dues (Check appropriate category):

Individual Membership: $50___, Student $10 ____

Corporate Membership; $500 or more: ___ . Corporate membership can include up to five individual members. Complete one form for each individual member.

Please make checks or other payments (in U.S. $ equivalents only) payable to American Association for Wind Engineering and mail to:

Dr. Partha Sarkar, Dept. of Aerospace Engr. & Engr. Mechanics,
2271 Howe Hall, Room 1200, Iowa State University, Ames, IA 50011-2271
E-mail: ppsarkar@iastate.edu, Tel: 515-294-0719, Fax: 515-294-3260

Name: ____
Title:____
Affiliation ____
City_________________________ State/Zip________________________________
Country ____
Ph:__________________________ Fax:_____________________________________
E-mail____

Your Wind Engineering Interests____
____
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NSF FY2003 Budget Request for Engineering

The NSF FY 2003 Budget Request for Engineering (ENG) is $487.98 million, an increase of $15.66 million, or 3.3 percent, over the FY 2002 amount of $472.32 million. A major focus of ENG investments is in emerging technologies- nanotechnology, information technology and biotechnology. Support for research in these areas contributes to major advances in health care, manufacturing, business, education, and the service industry. The Small Business Innovation Research (SBIR) program provides funding at the mandated level of 2.5 percent of extramural research. It will be funded at $78.98 million, an increase of $2.95 million over FY 2002. The program emphasizes commercialization of research results at small business enterprises through the support of high quality research across the entire spectrum of NSF disciplines. In FY 2003, ENG will provide $4.67 million, an increase of $170,000, for the Small Business Technology Transfer (STTR) program, which partners small businesses with academic institutions, to promote industrial innovation. Total ENG support of the National Earthquake Hazards Reduction Program (NEHRP) is projected for FY 2003 to be $45.39 million. This would provide funding for fundamental research focused on more earthquake-resistant buildings and facilities. Foundation-wide, support for NEHRP in FY 2003 is requested to be $57.39 million, including $12.0 million in the Geosciences Activity. (*Based on info posted on NSF website at www.nsf.gov*).

NSF Seeking to Fill Staff Positions

The National Science Foundation in Washington, DC is conducting searches for a number of staff positions, several of which have a very direct relation to wind engineering activities. The positions to be filled that are of specific interest to the wind engineering community are:

Director, Division of Civil and Mechanical Systems (CMS), Directorate for Engineering (ENG)

Description of duties. The Division Director serves as a member of the ENG Directorate leadership team and as the Foundation's principal spokesperson in the areas of research and education involving civil and mechanical engineering, structural systems and materials, and earthquake and other natural and man-made hazard mitigation. Implements, in a divisional context, overall strategic planning and policy setting; provides leadership and guidance to Division staff members; determines funding requirements; prepares and justifies budget estimates; balances program needs; allocates resources; oversees the evaluation of proposals and recommendations for awards and declinations; and represents NSF to relevant external groups. Fosters partnerships with other Divisions, Directorates Federal agencies, professional scientific and engineering organizations, and the academic community.

Program Managers

In addition to the Division Director position the CMS Division has vacancies for Program Managers in three Program areas: Structural Systems and Hazards Mitigation of Structures (SSHM), Dynamic System Modeling, Sensing and Control (DSMSC), and Solid Mechanics and Materials Engineering (SMME).

The Division Director and Program Directors recruited will be appointed under the Visiting Scientist/Engineer or the Intergovernmental Personnel Act (VSE or IPA rotator" position), as a Temporary Federal Employee, or as a permanent Federal Employee. The specific arrangement will be decided on an individual basis. The preferred starting date for these positions is August, 2002. However, consideration may be given for a January, 2003 start date for some of the Program Manager positions. NSF is particularly interested in attracting qualified candidates from under represented groups (women and minorities) to these positions.

Persons in the wind engineering community are encouraged to consider applying for the NSF positions. To learn more about the Engineering Division activities at NSF and to find more information about the vacant positions visit the NSF web site: www.nsf.gov and go to Engineering, Eng jobs. Additional information can be obtained by contacting Dr. Richard J. Fragaszy, CMS Personnel Search Coordinator, Dir. for Eng., NSF, 4201 Wilson Blvd., Rm. 545, Arlington, Virginia 22230, Ph: (703) 292-8360, Fax: (703) 292-9053, E-mail: rfragasz@nsf.gov.

Update on Wind Energy in the U.S.

As reported in the February issue of the Newsletter of the American Wind Energy Association (AWEA, www.awea.org), the U.S. wind industry installed in 2001 nearly 1,700 MW of new generating equipment (worth $1.7 billion) in 16 states. This is more than twice the previous record year of 1999, when the industry installed 732 MW. The 2001 number boosts total wind electric capacity in the U.S. to 4,260 MW, more than 60% higher than in 2000. New wind farms installed last year will produce enough electricity to satisfy the demand of 475,000 average American households and displace emission of 3 million tons of carbon dioxide and more than 27,000 tons of air pollutants annually.

While the growth recorded in 2001 is remarkable, the industry's performance in 2002 may be slowed by the expiration of a key incentive, the federal wind energy production tax credit (PTC), which expired on December 31. Although bills to renew the PTC had strong bipartisan support in both the House and Senate, the credit was not renewed by Congress. As a result, wind power investments are at risk in many states, including Montana, Oregon, South Dakota, and West Virginia. It is anticipated, however, that by 2020 wind power will provide six percent of U.S. electricity.

A Toolbox for Global Disaster Reduction

The Toolbox for Global Disaster Reduction is a unique product designed to assist researchers, practitioners, and policymakers in ongoing efforts (especially in developing countries) to find the common agenda of political and technical solutions that will reduce unacceptable risks in their communities from natural, technological, and willful hazards in the most time- and cost-effective ways. The cost is $100 US. A portion of this sum will enable professionals in developing countries, who are working against greater odds for success, to receive a copy at the same time as professionals in developed countries.

The Toolbox was created within the framework of the Global Alliance for Disaster Reduction, a voluntary network of over 1,000 professionals and organizations throughout the world. These professionals and organizations are working together voluntarily to reduce the unacceptable risks associated with natural, technological, and willful hazards. The goal is to involve these professionals and organizations in activities, which will accelerate the processes needed over time to build political and technical capacity in every community of every nation of every region of the world. The objectives are to advance:

- Sustainable urban development (i.e., the planning, sitting, design, construction, and maintenance of disaster resilient buildings and infrastructure),
- Professional education, and
- Disaster technical assistance.

Creation and distribution of the Alpha edition of the Toolbox is underway now and will be completed during calendar year 2002. Rapid distribution and immediate implementation will facilitate the planned growth of the Global Alliance from 1,000 to 4,000 members during this same time period and will equip professionals for participating effectively in preparatory meetings during 2002-2004 and eventually in a World Congress on Disaster Reduction.

For further information on the Global Alliance, the World Congress on Disaster Reduction, and on the Toolbox, contact Walter Hays at walter_hays@msn.com or call 703-255-2458 for further information.

TCC II – Hemispheric Conference on Vulnerability Reduction in Trade Corridor Development

The University of South Florida's Center for Disaster Management and Humanitarian Assistance (CDMHA), the USF Globalization Research Center, and the Organization of American States' Unit for Sustainable Development and Environment, invites participation in a hemispheric conference on the impact of natural hazards on Trade Corridors. Policy makers from financial institutions, government, academia, and the private sector will examine *Trade Corridors* as the goods and service production and distribution areas that cut across the nations and regions of the Western Hemisphere. The purpose of the conference is the promotion of research, training, and technology transfer toward reducing the vulnerability of trade corridor human populations and health, water/natural resources, and urban information and transportation infrastructure to the impacts of natural and technological hazards.

Hazards vulnerability will be addressed through the following sub-themes:

1. Historical impacts of natural and technological hazards on Trade Corridors,
2. Resilience/recovery of Trade Corridors from disasters, and
3. Mitigation Strategies for reducing vulnerability of Trade Corridors to future events.

The Conference will be held June 12-15, 2002 at the Hyatt Regency, Downtown, Tampa, Florida. For more information contact the web site at: www.cdmha.org.

From the Editor

Contributions to the AAWE Newsletter by AAWE members and other readers of the Wind Engineer are very welcome. Please forward your contributions and other materials suitable for publication in the Newsletter, as well as comments on the content of the current and past issues of the Newsletter, to B. Bienkiewicz, at bogusz@engr.colostate.edu.

Wind Engineering and Related Conferences - March 2002 Update

2002

APRIL 4-6
ASCE/SEI Structures Congress & Exposition
Denver, CO, USA
E-mail: fcharney@schnabel-eng.com
http://www.asce.org/conferences/structures2002
APRIL 15-17
Mitigating Severe Weather Impacts in Urban Areas - A National Symposium
Houston, TX, USA
http://www.rice.edu/flood
MAY 21– 25
3rd East European Conference on Wind Engineering
Kiev, Ukraine
E-mail: vgr@ihm.kiev.ua
MAY 30-31
Hurricane Andrew 10-Year Anniversary Conference
Miami, FL, USA
Contact: R. Alvarez
E-mail: alvarez@fiu.edu
http://www.ihc.fiu.edu
JUNE 19-21
A.G. Davenport Symposium (AGD 2002)
London, Ontario, Canada
E-mail: agd-conf@blwtl.uwo.ca
AUGUST 21-23
2nd International Symposium on Advances in Wind and Structures (AWAS'02)
Taejon, Korea
E-mail: technop@chollian.net
SEPTEMBER 4-6
5th UK Conference on Wind Engineering
Nottingham, U.K.
E-mail: wes02@pfconsultants.co.uk
http://www.pfconsultants.co.uk/wes2002

2003

MAY 29-JUNE 1
ASCE/SEI Structures Congress & Exposition
Seattle, WA, USA
Contact: C. W. Roeder
E-mail: croeder@u.washington.edu
JUNE 2-5
11th International Conference on Wind Engineering,
Lubbock, TX, USA
Contact: K. Mehta
E-mail: 11icwe@wind.ttu.edu
http://www.icwe.ttu.edu

2004

2005

Americas Conference on Wind Engineering
Baton Rouge, LA, USA
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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:

Boundary Layer Wind Tunnel Laboratory, Univ. of Western Ontario
www.blwtl.uwo.ca

Cermak Peterka Petersen, Inc.
www.cppwind.com

Factory Mutual Engineering and Research Group
www.factorymutual.com

Lockheed Martin Technologies Co.
www.lmco.com

Rowan Davies Williams & Irwin Inc.
www.rwdi.com

Wind Engineering and Fluids Laboratory, Colorado State Univ.
www.windlab.colostate.edu

Wind Engineering Research Center, Texas Tech Univ.
www.wind.ttu.edu

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