AMERICAN ASSOCIATION FOR WIND ENGINEERING
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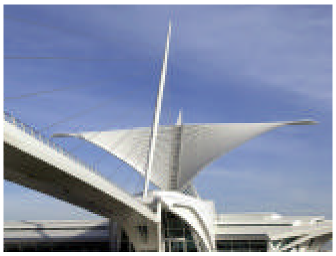
THE WIND ENGINEER

NEWSLETTER OF AMERICAN ASSOCIATION FOR WIND ENGINEERING

Bogusz (Bo) Bienkiewicz, Editor

September 2002



Milwaukee Art Museum
(see story on p. 5)

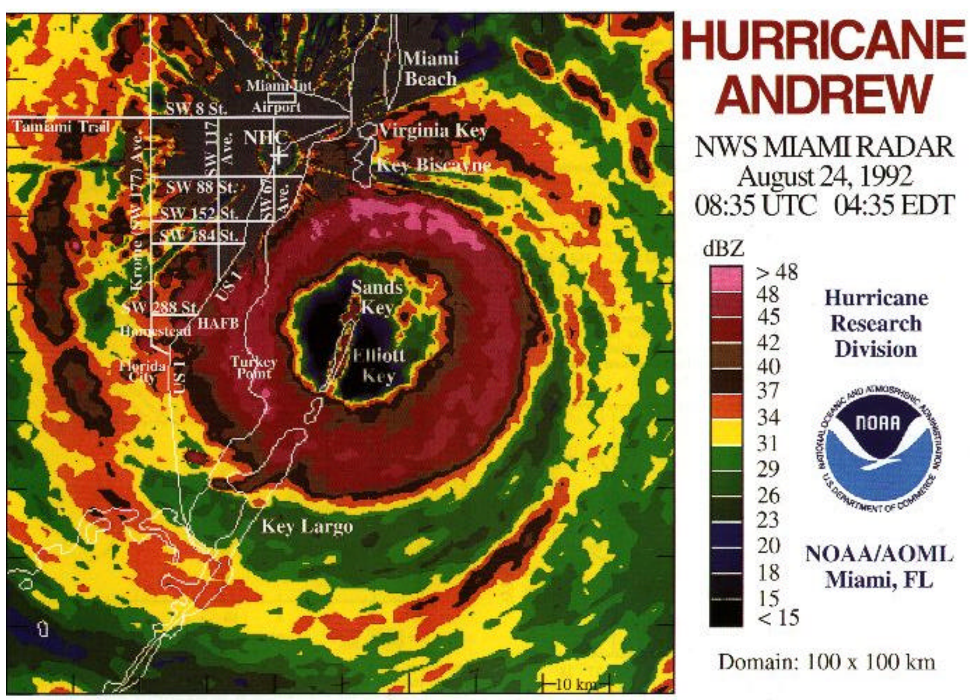
In this issue:

After 10 Years, Hurricane Andrew Gains Strength (NOAA Press Release)

August 21 , 2002 — In the record books, it's still one of America's costliest hurricanes, and today NOAA scientists announced Hurricane Andrew was even stronger than originally believed when it made landfall in south Florida 10 years ago this week. Based on new research, scientists upgraded the storm from a Category 4, to a Category 5, the highest on the Saffir-Simpson Hurricane Scale.

In their re-analysis of Hurricane Andrew's maximum sustained surface-wind speeds, the NOAA National Hurricane Center Best Track Committee, a team of hurricane experts, concluded winds were 165 mph—20 mph faster than earlier estimated—as the storm made landfall. Herbert Saffir, a structural engineer who co-designed the Saffir-Simpson Hurricane Scale, joined the committee as an observer and reviewed the team's results.

The upgrade makes Andrew only the third Category 5 (wind speeds greater than 155 mph) hurricane on record to strike the continental United States. The other two Category 5 storms were the "Florida Keys 1935 Hurricane," and Hurricane



Camille in 1969.

"There is always some uncertainty in determining the maximum winds in a hurricane, and Andrew is no exception," said Max Mayfield, director of the National Hurricane Center, a part of NOAA's National Weather Service. "Our previous estimate was 145 mph, based on the science available in 1992. With advanced research techniques and technology, we now estimate the winds were stronger."

Andrew was directly responsible for 23 fatalities in Florida and Louisiana, and about $25 billion in damages (1992 dollars), according to NOAA.

The National Hurricane Center has had an ongoing program to review the historical record of all storms. Scientists and other researchers note that society needs an accurate account of the frequency and intensity of past catastrophic events to best plan for the future.

"We have recently completed a review of a re-analysis of storms from 1851 to 1910," said Colin McAdie, chairman of the National Hurricane Center's Best Track Committee. This re-analysis effort was undertaken by a team led by Chris Landsea of NOAA's Hurricane Research Division and supported by a grant from the NOAA Office of Global Programs.

Hurricane Andrew is one of the most significant cases studied. According to McAdie, scientific understanding of the wind structure in strong hurricanes has significantly increased since 1992. For Andrew, the Best Track Committee considered input from scientists at the HRD, including the "re-analysis team" and National Hurricane Center.

Since 1997, forecasters have used Global Positioning System dropwindsondes, a measuring device dropped from hurricane reconnaissance aircraft into the eyewall—the windiest part of the hurricane. The sonde system measures temperature, barometric pressure, water vapor and wind data every 15 feet on its way down.

This new method gave meteorologists an important glimpse into the true strength of these devastating storms. The analyses of the dropwindsonde data indicated that, on average, the maximum sustained surface-wind speed was about 90 percent of the wind speed measured at the 10,000-foot aircraft level flown as Andrew approached south Florida. In 1992, Andrew's wind speed was estimated at 75 to 80 percent of the aircraft observations. The research findings resulted in an increase in the estimated wind speeds of Hurricane Andrew from 145 mph to 165 mph.

Best Track Committee Findings:

- Hurricane Andrew was a Category 5 over open water on approach to South Florida.
- Hurricane Andrew was a Category 5 on the Saffir-Simpson Hurricane Scale at time of landfall, with Category 5 winds occurring in a small area on the immediate coast having open exposure to Biscayne Bay.
- Winds at specific locations over land in Miami-Dade County are unknown due to remaining scientific uncertainties.
- There should be continuing research aimed at better determining hurricane winds immediately preceding, and during landfall. The "Hurricane Landfall" component of the U.S. Weather Research Program is structured to address such a question.

When Hurricane Andrew hit southeast Miami-Dade County, Fla., Aug. 24, 1992, flying debris in the storm's winds knocked out most ground-based wind measuring instruments, and widespread power outages caused electric-based measuring equipment to fail. The winds were so strong many wind-measuring tools were incapable of registering the maximum winds. Surviving wind observations and measurements from aircraft reconnaissance, surface pressure, satellite analysis, radar, and distribution of debris and structural failures were used to estimate the surface winds.

NOAA's National Weather Service is the primary source of weather data, forecasts and warnings for the United States and its territories. NOAA's National Weather Service operates the most advanced weather and flood warning and forecast system in the world, helping to protect lives and property and enhance the national economy.

Statement form Dr. Mark Powell in Response to NHC Best Track Committee Assigning a 145 kts Wind Speed to Hurricane Andrew at Landfall in South Florida

It is very important to accurately and objectively determine the intensity of hurricanes during landfall. The extreme wind climate is based on this information and has an influence on wind load standards used in building codes as well as the risk associated with insurance rates. External scientific oversight and assistance from the atmospheric science, oceanographic, and wind engineering communities is needed to help drive a well-balanced assessment.

- I am in ***agreement*** with the assessment of Hurricane Andrew as a Category 5 storm during periods when it was over the ***open ocean in deep water***. HRD research on boundary layer structure determined from GPS sondes indicates that the sea surface becomes covered with foam at very high wind speeds and that the roughness of the sea surface actually decreases. The HRD hurricane wind analysis system has a method (based on GPS sonde research) to estimate surface winds from flight level measurements at 10,000 ft. Applying this method to the Andrew reconnaissance aircraft data results in sustained maximum surface winds over open sea of 150 kts (172 mph), consistent with the methods used by NHC. The uncertainty of this estimate is ~ +/- 22 kts (25 mph).

- However, once Andrew reached shallow waters, waves generated by the strong winds became closer together and steeper, causing a much rougher surface than over the deeper ocean further offshore. Limited GPS sonde data near land are consistent with this process. Therefore the winds over areas where waves are breaking on the outer reefs, the bays, and shorelines, would tend to be flowing over a rougher surface than over the open ocean, leading to a wind speed decrease.

- The highest official wind measurements from Fowey Rocks (about 4 miles southeast of Key Biscayne) are consistent with this condition but the instrument failed while in Andrew's north eyewall. An analysis of aircraft winds adjusted to the surface based on the new GPS research (for open ocean conditions) shows overestimates of ~ 29 % at Fowey Rocks and ~ 20 % in Perrine.

- I disagree with the estimate of Andrew as a Cat 5 storm during any point of its history when over shallow water or land. I believe that ***Andrew's wind speeds were consistent with a strong Cat 4 storm at landfall*** in south Florida, or ~ 132 kts (152 mph). However the uncertainty of this estimate is high, +/- 26 kts (30 mph), since we know very little about sea surface roughness in extreme winds.

- Research is needed to investigate how shoaling and breaking waves influence the wind over shallow water. Additional GPS sonde measurements are needed in hurricanes with strong winds over deep and shallow water. New remote sensing instrumentation must be evaluated and calibrated for use in this type of condition.

- Additional research is needed to document: a) the transition of the flow from open sea to rough sea, and finally to variable terrain over land, b) the turbulent wind structure in landfalling hurricanes, and c) to determine how the wind changes with height in coastal areas.

- The HRD Hurricane Field program in cooperation with our federal agency and university partners will attempt to answer these questions in the coming years.

More information on HRD research and the annual HRD Hurricane field program can be found at: http://www.aoml.noaa.gov/hrd.

Info on Dr. Powell's hurricane research and PDF files of his peer-reviewed publications can be found at http://www.aoml.noaa.gov/hrd/Powell/indc.

Applied Technology Council to Publish Wind Design Guide

James M. Delahay, P.E., Vice-Chairman, ASCE 7 Task Committee on Wind Loads

What good are all the advances in wind engineering if the practicing engineers who design structures do not understand how to apply the new knowledge? The answer is – not much! We have learned from trial design studies that a majority of today's practicing engineers do not fully understand wind loads. It appears that a great deal of engineering intuition is based on gravity loads, so that the concepts of applying environmental loads such as wind, snow, and earthquake are often counter-intuitive to most engineers. Too few engineering schools teach the fundamentals of wind engineering. The literature available to the practicing engineer is either brief code commentaries consisting mainly of worked examples or thick textbooks full of climatological theory, fluid mechanics, and advanced mathematics. The Applied Technology Council (ATC) is attempting to fill this gap in available resources with the impending publication of a new design guide for wind loads. The mission of ATC is "to develop and promote state-of-the-art, user-friendly engineering resources and applications for use in mitigating the effects of natural and other hazards on the built environment." ATC has long been known in the earthquake engineering field for its ability to develop technology transfer mechanisms such as guidelines, training manuals, and design guides. In recent years, ATC has expanded into the areas of wind and flood damage mitigation. The second in ATC's new series of design guides for the practicing structural engineer is "Basic Wind Engineering of Low-rise Building Structures". This guide will attempt to fill the intuition gap by presenting the basic concepts of wind engineering that control the application of wind forces to buildings.

Many concepts that are second nature to wind engineers are foreign to practicing engineers. A discussion of climatology helps explain the atmospheric events that the wind codes are attempting to anticipate (and the ones that they are not). Thunderstorms, tornadoes, and hurricanes are all part of this complex science. An introduction to these storms, mean recurrence interval, and other concepts are important to understanding the wind speed map and the importance factor. A brief explanation of boundary layer theory builds the engineer's knowledge base about the nature of the wind flow, surface roughness, and the wind velocity profile. The aerodynamics of bluff bodies adds to the design engineer's intuition about the nature of wind pressures on a building. Ideas like separation zone and internal pressure, which wind engineers take for granted, are new to most design engineers, and this knowledge will aid these designers in the application of loads to non-standard building configurations.

After preparing the user with these background concepts, the guide briefly takes him or her through the development of provisions in the current wind standards. Concepts such as "Main Wind Force Resisting System" and "Components and Cladding" are discussed in regard to the development of their corresponding pressure coefficients and their proper application in design. The theory behind the wind pressure equation is discussed and broken down into the various parts, both aerodynamic and atmospheric. The provisions of the new national wind load standards (ASCE 7-98, IBC-2000) are then presented in a step-by-step manner, with a look behind the equations. Using example problems, the wind provisions are explained for the design of low-rise buildings. Several examples in each category of design are provided. The guide is limited to common building types and effects for buildings under 60 feet in height. Tall buildings, dynamic effects, nonbuilding structures, and wind tunnel applications are not included.

Several useful appendices are included in the guide. Brief comparisons to the wind provisions of each of the model codes (UBC, BOCA, and SBC) are presented to aid the transition from these standards to the new codes, as well as useful information on the wind provisions of the new Florida Building Code. Helpful guidance for design situations on which the new code is silent is provided on such common elements as parapets, L, T and U shaped buildings, and canopies. Wind-borne debris protection requirements are also discussed.

Publication of the wind design guide is scheduled for early 2003. Interested parties can contact ATC

Wind Engineering for Milwaukee Art Museum

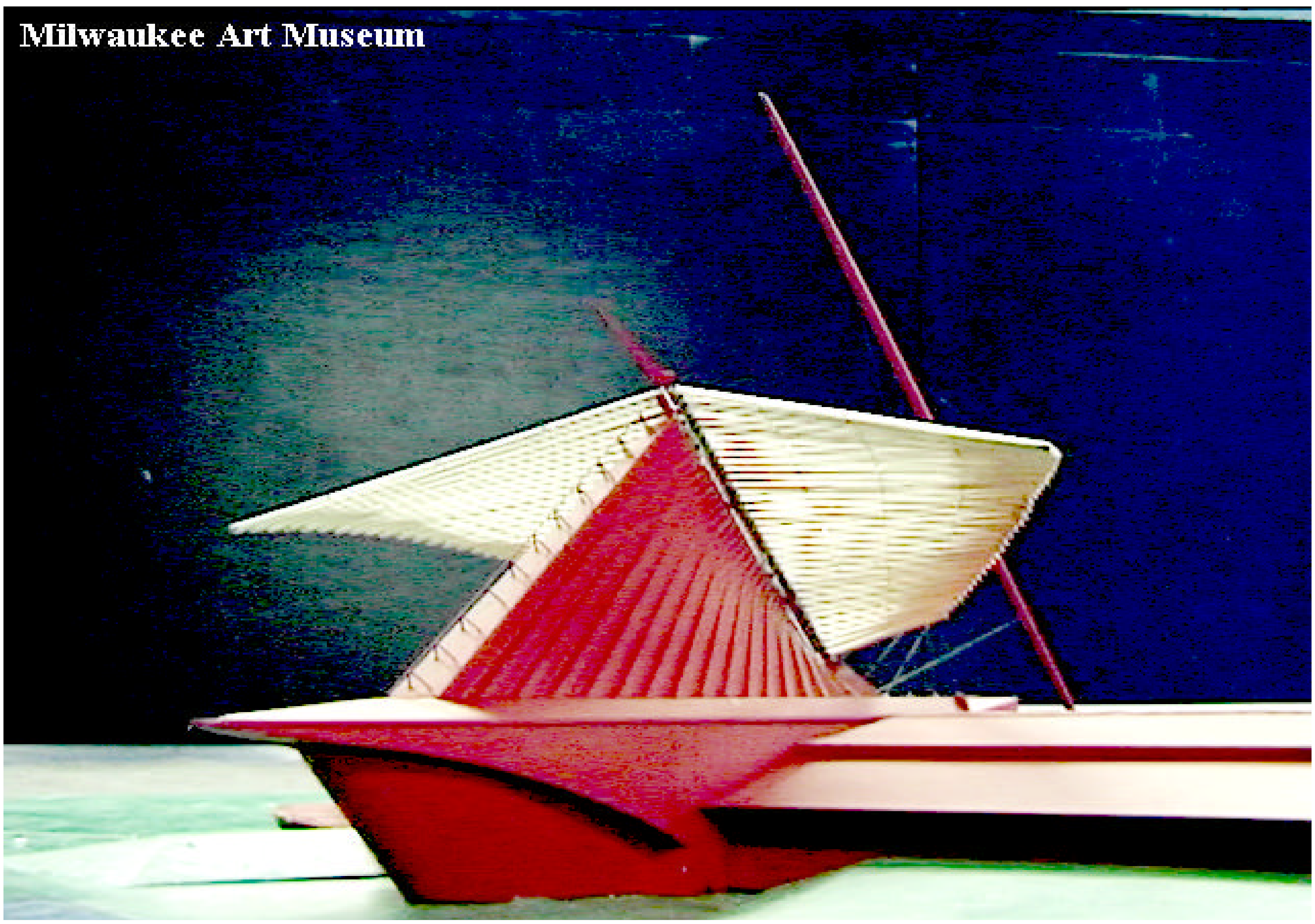
Peter Irwin and Bryan Hayter, RWDI Inc.

May 4, 2001 was the official unveiling date for the Milwaukee Art Museum's new expansion and renovation featuring the first North American design by Santiago Calatrava - the Quadracci Pavilion. This dramatic structure includes a glass-walled reception hall enclosed by the Burke Brise Soleil, a wing-shaped sunscreen that can be raised or lowered thus creating a moving sculpture overlooking Lake Michigan.

Rowan Williams Davies & Irwin Inc. (RWDI) was retained by Kahler Slater Architects to conduct wind tunnel studies, including an aeroelastic model, of the proposed Brise Soleil. The objectives of this study were: 1) to investigate the potential for aerodynamic instabilities, and 2) to determine the wind-loads acting on the Brise Soleil.

The Brise Soleil consists of two halves, each comprising 36 fins, attached to the museum on a common spine. The length of the fins varies from 102.9 feet to about 24.3 feet. The fins are attached to each other at several points. There is an operating mechanism which will open and close, as well as hold open the Brise Soleil in any position. Three configurations of the Brise Soleil were tested: Open Configuration; Half Open Configuration; and One Quarter Open Configuration. The geometry of the Brise Soleil and Art Museum is illustrated by the photograph of the aeroelastic model.

A part of RWDI's contribution to this project was initial advice on methods of minimizing the possibility of wind induced vibrations or fluttering of the fins. The suggestion was made to tie the fins together so as to avoid relative motion between individual fins. This approach was adopted and proved effective.



Aeroelastic Model of Brise Soleil

A 1:100 scale aeroelastic model of the Brise Soleil structure was designed and constructed based on drawings and information provided by Kahler Slater. In order to obtain the important wind loading information on the Brise Soleil, the model was designed to simulate the first vertical mode of vibration (0.429 Hz). The dynamic analysis was performed by structural designers Graef, Anhalt, Schloemer & Associates and it was incorporated the flexibility of the museum structure supporting the Brise Soleil.

The aeroelastic model was constructed of balsa wood, aluminum, and brass flexural members which were selected to produce: the desired mode shapes, the ratio of model to full scale frequency in the desired range, the appropriately scaled down mass properties, and the geometrical details. The flexibility of the main museum structure was incorporated into the flexure supports on the Brise Soleil model. The Brise Soleil was mounted to a rigid model of the museum (Pavilion) via these flexures. Housed inside the Pavilion model was a strain gauge system capable of measuring the overall rolling moment, and lift and drag forces. The lift was defined as being in the direction normal to the spine of the Brise Soleil, and in a vertical plane. The drag was defined as parallel to the spine. The mounting allowed the Brise Soleil to be positioned and held in three configurations representing various stages of opening and closing.

Testing was performed in RWDI's 8 x 15 ft boundary layer wind tunnel. The tests were conducted for a wide range of wind speeds. During the tests, the strain gauges were connected to the wind tunnel's digital data acquisition system which recorded the time-histories of the signals for post-test analysis.

Based on the investigations it was determined that the Brise Soleil would be aerodynamically stable. The wind-induced motions that were observed in the tests were identified as being due to buffeting, primarily from the wakes off other surrounding structures.

Wind loads for design of the structure were developed from the tests and from local wind statistics. Besides assisting in the structural design, the wind tunnel data were also used to help set the operational criteria, i.e. threshold wind speeds for opening and closing the Brise Soleil.

National Construction Safety Team Act Passed

Mike Gaus

After being voted on by the U.S House of Representatives and the U.S. Senate, a joint authorization bill HR 4687 was sent to the President for signature on Sept. 25, 2002.

This bill provides for the establishment of investigative teams to assess building performance and emergency response and evacuation procedures in the wake of any building failure that has resulted in substantial loss of life or that posed significant potential of substantial loss of life. To the maximum extent practicable, the Director (of NIST) shall establish and deploy a Team within 48 hours after such an event. The Director shall promptly publish in the Federal Register notice of the establishment of each Team. Among the duties of the investigative teams are:

- Establish the likely technical cause or causes of the building failure.
- Evaluate the technical aspects of evacuation and emergency response procedures.
- Recommend, as necessary, specific improvements to building standards, codes, and practices.
- Recommend any research and other appropriate actions needed to improve the structural safety of buildings.
- Improve evacuation and emergency response procedures, based on the findings of the investigation.

Not later than 3 months after the date of the enactment of the Act, the Director, in consultation with the United States Fire Administration and other appropriate Federal agencies, will develop procedures for the establishment and deployment of Investigation Teams. *(Continued on p. 9)*

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

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Secretary/Treasurer: P. Sarkar (Iowa State Univ.)
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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

at www.atcouncil.org.

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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

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Title:____
Affiliation ____
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Your Wind Engineering Interests____
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Each Team of investigators will be composed of individuals selected by the Director and led by an individual designated by the Director. Team members will include at least one employee of the National Institute of Standards and Technology and will include other experts who are not employees of the National Institute of Standards and Technology. They may include private sector experts, university experts, representatives of professional organizations with appropriate expertise, and appropriate Federal, State, or local officials. Team members who are not Federal employees will be considered Federal Government contractors.

Team members, on display of appropriate credentials provided by the Director and written notice of inspection authority, will be able to:

- Enter property where a building failure being investigated has occurred.
- During reasonable hours, inspect records related to the investigation.
- Inspect and test any building components, materials, and artifacts related to the building failure.
- Move records, components, materials, and artifacts as required for the investigation.

To the maximum extent possible the team members will not interfere with the provision of services or with any search and rescue efforts that may be underway.

Under the act, the Director or his designee will have the power to hold hearings and issue subpoenas. The act also spells out requirements for reporting, public hearings, accessibility of information and other activities related to the team investigations and the drawing of conclusions. There is a requirement for the establishment of an Advisory Committee and the publication of an annual report on investigation team activities.

This authorization measure has the potential to increase the number and quality of failure investigations and to establish a clear line of responsibility in dispatching investigating teams that hopefully will be done with smooth coordination with other agencies. Unfortunately at this time this is only an authorization measure that assigns responsibility to NIST but no specific funds have been provided to carry out the objectives of the act. It will remain to be seen whether specific provision is made to provide funds to carry out activities required under this act.

For more detailed information of the provisions of the National Construction Safety Team Act go to the Congress pages on the web and search for HR 4687.

U. S –Japan Panel on Wind and Seismic Effects - Proceedings of the 34th Joint Panel Meeting

Mike Gaus

In 1961 Engineers and Scientists in the U.S. and Japan created the U.S.-Japan Cooperative Science Program to improve engineering and scientific practices through the exchange of technical data and information, research personnel, and research equipment. A U.S.-Japan Cooperative Program in Natural Resources (UJNR) was created in 1964 as one of three activities under the cooperative program. A part of the UJNR was the establishment of a Panel on Wind and Seismic Effects that was established in 1969. Since the establishment of this panel annual meetings alternating between the U.S. and Japan have been held.

The U.S. side chair and secretariat has been the responsibility of the National Institute of Standards and Technology (NIST). The Public Works Research Institute (PWRI) provides the chair and secretariat in Japan. Annual meetings have been held since the inception of the panel and proceedings have been published as a result of each meeting.

The 2002 meeting was held at NIST in conjunction with a series of site visits to a number of locations of technical interest. Papers were presented on currently important topics in wind and seismic engineering, followed by discussion and the formulation of resolutions regarding topics for future study.

The 2002 meeting was administered through Knowledge Access and Services International, a company that was established by Dr. Noel Raufaste who at one time was a staff member of NIST.

With oversight from Knowledge Access and Services International, a Proceedings of this 34th joint meeting has been published by NIST. This Proceedings - Wind and Seismic Effects, Proceedings of the 34th Joint Panel Meeting - is identified as NIST Special Publication 987. This 360 page document includes papers on earthquake and wind engineering from researchers in the U.S. and Japan.

Information on how to order a copy of the proceedings can be obtained by contacting the Superintendent of Documents, U.S. Government Printing Office, Mail Stop SSOP, Washington, DC 20402-0001, or bookstore.gpo.gov, Ph: (202) 512-1800, Fax: (202) 512-2250.

Additional information on the past and current UJNR meetings can be obtained by contacting: Dr. Noel Raufaste, President, Knowledge Access and Services International, Ph: (301) 467-6767, E-mail: nraufaste@erols.com.

Risk Communication: A Natural Disasters Roundtable Forum

October 31, 2002, The National Academies, 500 Fifth Street, NW, Room 100, Washington, DC

Objective: The objective of this forum is to provide the opportunity for researchers, decision-makers, practitioners, and other interested parties to exchange views and perspectives on communicating risk information to the public about various kinds of hazards and disasters. This is intended to provide a broad view on risk communication, facilitate understanding across relevant disciplines and professions and offer a basis for future risk communication action and research.

For further information contact: Natural Disasters Roundtable, The National Academies, 500 5th Street, NW, Washington, DC 20001, William A. Anderson, Assoc. Executive Director Division on Earth and Life Studies, and Director, Natural Disasters Roundtable, E-mail: wanderson@nas.edu, Phone: (202) 334-1964, FAX: (202) 334-1961.

Possible Workshop on Full-Scale Studies of Wood-Framed Houses

Proposed Workshop Date; Dec. 3 – 4, 2002

A new collaborative research initiative of The University of Western Ontario and the Institute for Catastrophic Loss Reduction envisages building a facility to test full scale timber-framed houses under simulated extreme environmental loads. The central research question is whether current housing in Canada and elsewhere is optimal in terms of resisting environmental demands due to wind, snow and earthquake loads as well as exposure to heat and moisture.

The possibility of holding this workshop on December 3 and 4 of this year (2002) in Toronto is being studied to bring together members of research, insurance, and government communities to discuss the feasibility and practicality of constructing a full-scale house testing facility around which many research projects would be focused, including extensive wind tunnel testing of house shapes. This presents a tight timeline and therefore workshop details must be finalized as soon as possible. As broad input is essential to planning an effective research program, it is hoped that a broad cross-section of persons concerned with the safety of wood houses subjected to extreme environmental loads will be willing to attend and contribute their ideas and experience for this subject. In spite of the large number of timber-framed dwellings in Canada, the U.S. and elsewhere there have been almost no experimental programs carried out to study the full-scale behavior of such structures under extreme loadings.

Persons interested in participating in the proposed workshop are encouraged to contact: Lizeanne St. Pierre, MESc, Research Coordinator for ICLR Housing Project, BLWTL, The University of Western Ontario, London, Ontario, Canada N6A 5B9, Ph: (519) 661-3338, Fax: (519) 661-3339, Email: lms@blwtl.uwo.ca.

11th ICWE

The American Association for Wind Engineering wishes to invite you to the 11th International Conference of Wind Engineering to be held 2-5 June 2003 in Lubbock, Texas, U.S.A. The conference is being hosted by the Wind Science and Engineering Research Center of Texas Tech University.

For those wishing to present papers, an abstract submission form is available on the website (*www.icwe.ttu.edu*). Abstract submission deadline is 31 October 2002. Two-page abstracts will be reviewed by the selection committee and authors will be notified of acceptance by 15 January 2003. Special sessions that are planned focus on Hurricane Alicia's impact on professional practice (20th anniversary), learning from Hurricane Andrew, revising the Fujita Scale, and a practice-oriented track geared toward professionals. Sessions on economic aspects of windstorms, ISO, HAZUS, wind energy and environmental aerodynamics are also expected.

A guest program is planned which includes visits to the Buddy Holly Center, a winery tour and antique mall. Other attractions include the American Wind Power Center, a museum of historic windmills, and the Ranching Heritage Center - an outdoor museum of historic ranch buildings.

Additionally, events planned for the entire group include a BBQ dinner with a fiddle band and Mexican buffet with traditional performances. Post-conference tours of the southwestern U.S. are being offered through a local travel agency. These will include visits to Santa Fe, the second oldest city in the U.S.; San Antonio, home of the Alamo; and the Grand Canyon.

Provisions have been made for exhibitors at the conference venue. The expected exhibitors include: meteorological and instrumentation companies, software companies, weather data providers, windstorm mitigation products, risk consulting companies, and wind-related organizations. If you would like further information on reserving booth space, please contact *11icwe@wind.ttu.edu*. The conference is co-sponsored by AAWE, International Association for Wind Engineering, the National Science Foundation and Texas Tech University.

More information on the conference, lodging, transportation, the guest program and abstract submission is available at *www.icwe.ttu.edu*.

From the Editor

Contributions to the AAWE Newsletter by AAWE members and other readers of the Wind Engineer are very welcome. Please forward your articles, notes and other materials suitable for publication in the Newsletter to B. (Bo) Bienkiewicz, at *bogusz@engr.colostate.edu*.

Wind Engineering and Related Conferences - September 2002 Update

2003

MAY 29-JUNE 1
ASCE/SEI Structures Congress & Exposition
Seattle, WA, USA
Contact: C. W. Roeder
E-mail: *croeder@u.washi*ngton.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*

SEPTEMBER 16 - 18
International Workshop on Wind Effects on Trees
Karlsruhe, GERMANY
Contact: B. Ruck
E-mail: ruck@uka.de
http://*www.ifh.uni-karlsruhe.de/ifh/science/aerodyn/windconf.htm*

2004

MARCH 31 - APRIL 2
International Conference on Building Envelope Systems Technology, ICBEST (2004)
Sydney, AUSTRALIA
Contact: J. Perry
E-mail: *icbest2004@bigpond.com.au*

2005

Americas Conference on Wind Engineering
Baton Rouge, LA, USA
Contact: M. Levitan
E-mail: *levitan@hurricane.lsu.edu*

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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

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www.cppwind.com

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Lockheed Martin Technologies Co.
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Wind Engineering and Fluids Laboratory, Colorado State Univ.
www.windlab.colostate.edu

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