



**American Association  
for Wind Engineering**

# THE WIND ENGINEER

**NEWSLETTER OF AMERICAN ASSOCIATION FOR WIND ENGINEERING**

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



## NEW AAWE WEBPAGE GOES LIVE

The new AAWE webpage ([www.aawe.org](http://www.aawe.org)) is up and running, thanks to the skill of Casey Landreth of MediaTech Productions Inc. and the ongoing work of our Webmaster, Mike Gauss. There are many new and modern features, such as a password-accessible members section with useful reference material in it. Users can renew their membership, or join for the first time, as well as update their personal data and register for workshops and conferences using a secure credit card facility. The many useful links in the body of the webpage have been updated and expanded. There is also a growing photograph and video gallery, as well as our past digital newsletters. If you wish to add to the site please send your item to Mike Gauss at [mgaus@gaussassoc.com](mailto:mgaus@gaussassoc.com) and we will assess its value to AAWE members. If you have photographs of interest please include descriptive text along with photographer, place and year. This is your webpage. Please use it, add to it, and pass it on to other potential individual and corporate members.

*By Leighton Cochran*

## UNVEILING A WEB-BASED SURVEY ON OCCUPANT COMFORT IN TALL BUILDINGS

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Excessive motion of tall buildings in wind has been observed to cause discomfort to occupants and trigger responses analogous to those associated with motion sickness (Khan & Parmalee 1971, Kareem 1992) and accordingly poses significant concerns to designers (McNamara et al. 2002). As a result, a number of studies have been devoted to determining the thresholds marking the onset of these sensations based on the response of individuals to tests using motion simulators (Chen & Robertson 1973, Irwin 1981, Goto 1983, AIJ 2004). In most cases, such experiments rely on sinusoidal excitations. Although recent efforts at Hong Kong University of Science and Technology (Burton et al. 2006) have attempted to create more faithful conditions and excitations,

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there remain questions surrounding the faithfulness of simulated testing environments (Isyumov 1993), since the full-scale motions are narrowband processes with lateral and torsional features, often accompanied by visual and audio cues serving as critical stimuli, particularly for torsional motions.

Due to the sensitivity of the subject, only limited perception studies have been attempted in full-scale, e.g. in control towers (Denoon et al. 1999), but since high-rise design is often governed by habitability requirements, a firmer grasp of realistic perception thresholds in these environments is most welcome to enhance the reliability and economy of design. To address this need, researchers at the University of Notre Dame ([www.nd.edu/~dynamo](http://www.nd.edu/~dynamo), [www.nd.edu/~nathaz](http://www.nd.edu/~nathaz)), Skidmore Owings and Merrill LLP ([www.som.com](http://www.som.com)), and the Boundary Layer Wind Tunnel Laboratory at the University of Western Ontario ([www.blwtl.uwo.ca](http://www.blwtl.uwo.ca)), with advisement from international researchers experienced in occupant perception surveys (Burton et al. 2006), have developed a web-based survey to collect more anecdotal evidence on human responsiveness to motion in tall buildings. The survey has been circulated to various organizations involved in the design and management of tall buildings worldwide. Physical responses to a number of wind events have been noted for buildings across the country, resulting in symptoms such as headaches, dizziness, and nausea.

The authors received numerous responses to a specific wind event, providing an excellent opportunity to evaluate the range of experiences of several persons occupying the same building during the same event. The respondents were standing or walking during the event, with 70% of them looking out the window at the time they first perceived the motion. While 60% sensed motion in some form, only 10% indicated strong perception. Interestingly, while 20% were first alerted by visual cues, 80% did acknowledge the role of other nearby persons' complaints in cuing their own perception. This factor is often not captured in controlled laboratory testing. No respondents experienced any ill effects, though they were only subjected for a brief time.

## NEW IAWE LOGO

Our international, parent organization is called the International Association for Wind Engineering (IAWE) and it now has a new logo – largely due to the efforts of the past IAWE President, Prof. Giovanni Solari. In correspondence from the current IAWE President, Professor Yukio Tamura, the three ribbons represent the three regions within the organization: Europe/Africa, North/South America and Asia/Oceania. The similarity in shape between the three ribbons is intended to indicate the collaboration amongst researchers and engineers in the three regions. The circle around the ribbons reflects the circulations of the wind around the world and the tight collaboration within the wind-engineering community. Lastly, the stylized

It is hoped that as more informal responses are logged, there will be the opportunity to correlate this feedback with full-scale response data, where available, allowing a rare quantification of acceleration levels impeding occupant comfort in actual tall buildings.

The authors encourage AAWE members to share their own perception experiences at [www.nd.edu/~tallbldg/survey.html](http://www.nd.edu/~tallbldg/survey.html).

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pigeon-like bird created by the total image suggests the researchers and engineers desire to provide a safe and peaceful environment for the public. This logo will appear at future IAWE events, such as the quadrennial International Conference, which will next occur in Amsterdam.

By Leighton Cochran



## NEWSLETTER OF AMERICAN ASSOCIATION FOR WIND ENGINEERING

## RESPONSE TO

DISCUSSION BY HERBERT S. SAFFIR: *"PERFORMANCE OF GLASS/CLADDING OF HIGH-RISE BUILDINGS IN HURRICANE KATRINA"*

BY AHSAN KAREEM AND RACHEL BASHOR, UNIVERSITY OF NOTRE DAME

Ahsan Kareem and Rachel Bashor, NatHaz Modeling Laboratory  
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First, the authors would like to express their condolences to the family of Mr. Herb Saffir. He was known for his many valuable contributions to different aspects of wind engineering and its impact on structural engineering practice, particularly the Saffir-Simpson Scale. The first author served with Mr. Saffir on an ASCE's Task Committee on Hurricane Induced Damage Investigations, which was a very rewarding professional experience. Besides professional activities, it was always a pleasure visiting with him; he will be missed by the entire wind community.

We are also grateful that we might be among the last few with whom Mr. Saffir technically interacted by way of his contributed discussion in *Wind Engineer* on our article entitled, "Performance of Glass/Cladding of High-Rise Buildings in Hurricane Katrina," in *Wind Engineer*, December 2006. The authors fully agree with Mr. Saffir's observation that Hurricane Katrina was not a major hurricane event for New Orleans, as noted in our article. Specifically, wind speeds were estimated for the Central Business District of New Orleans to be significantly less than design speeds of both ANSI A58.1 (1982) and ASCE 7-05 (2005). However, despite the relatively low wind speeds, New Orleans sustained considerable

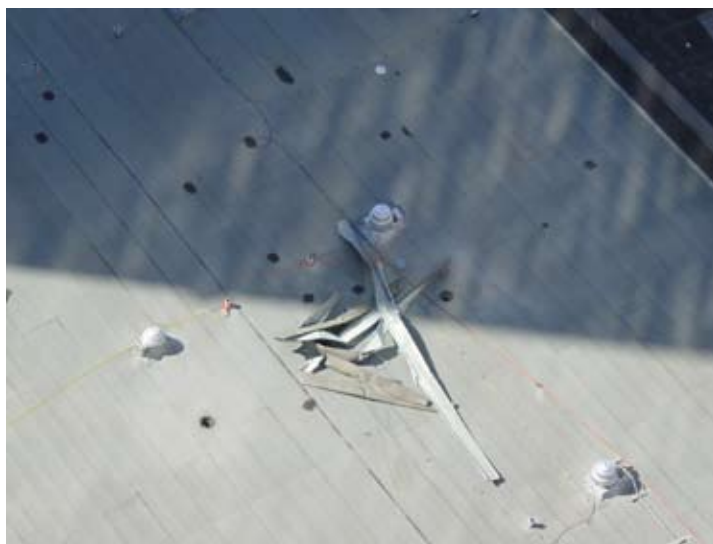
damage from hurricane winds, including glass/cladding damage to high-rise buildings located in the Central Business District of New Orleans.

As was noted in the December article, a number of previous hurricane events, including Hurricane Celia in Corpus Christi, Texas, Hurricane Andrew in South Florida, and Typhoon York in Hong Kong, demonstrated that an overall lack of wind resistant provisions is responsible for most structural damage, including glass and cladding, rather than simply the severity of the storm. This conclusion was reached by the first author in a paper in ASCE conference Hurricane Alicia One Year Later in Galveston 1984 and subsequently in the *Journal of Structural Engineering* of ASCE in several articles following Hurricane Alicia in Houston, TX in 1983. The wind speeds in Hurricane Alicia were also less than the design wind speeds.

The authors noted several examples in the December article of damage due to poor connections and lack of redundancy. For example, the rooftop penthouse of the Amoco Building was nearly destroyed, partially due to the shearing of bolts connecting the columns to the main roof (see Figure 1). The partial collapse of the penthouse allowed a large amount of debris to become airborne, which then likely impacted the Hyatt Hotel, immediately southwest of the Amoco building. As part of the on-going research, the authors are reviewing the building code requirements in-place for these structures and the conclusions will be made available once completed.



(A)



(B)

FIGURE 1 ROOFTOP PENTHOUSE ON AMOCO BUILDING WAS NEARLY DESTROYED (A) AND THE BOLTS WERE SHEARED (B).

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FULL-SCALE DATA IN AUSTRALIA



Circle on Cavill north tower is on the left. Data were collected in the penthouse.

Graeme Wood has been collecting full-scale natural frequencies and damping values for tall buildings in Australia for quite a few years now. With a database of a few dozen antipodean buildings under his belt, I was lucky enough to join him in February at the penthouse (level 68) of the north tower of Circle on Cavill in Surfers Paradise as he collected data with two accelerometers and low-pass filters. The data were collected at a sample rate of 20 Hz with an analogue low-pass filter set at 2 Hz. For such

a prominent residential building the structural engineer (Hyder) wanted to compare measured data with those used in the design process from an ETABs dynamic analysis.

It was a very windy day and the building was naturally excited by the onshore breeze. Sadly, this meant that we could not collect damping data, due to the strong energy input from the wind. However, the 221-m building did yield fundamental natural frequencies that were remarkably close to those calculated three years earlier. Graeme tells me that this is not typical, and that generally the dynamic analysis underestimates the measured natural frequencies by a substantial amount. If you wish to contact Graeme about his full-scale data he may be found at [gwood@cppwind.com](mailto:gwood@cppwind.com).



Leighton Cochran, Graeme Wood and Geoff Brown (structural engineer) inspect the data as it was collected.

Mode number	Measured data [Hz]	ETABs data [Hz]
1	0.17	0.18
2	0.23	0.23
3	0.31	0.31

By Leighton Cochran



AMERICAN PETROLEUM INSTITUTE UPDATES WIND LOADS

On January 1, 2008, the American Petroleum Institute (API) released the 3rd Edition of ANSI/API Spec 4F, Specification for Drilling and Well Servicing Structures, which becomes effective on July 1, 2008. This specification states requirements and gives recommendations for suitable steel structures for drilling and well-servicing operations in the petroleum industry, provides a uniform method of rating the structures and provides two product specifica-

tion levels. This specification is applicable to all new designs of all steel derricks, masts, guyed masts, substructures, and crown blocks. Among the more notable changes to this specification, that may impact AAW members, are updates to the wind load design requirements. More information about this revised specification can be obtained at <http://www.api.org/Publications/new/spec-4f-pa.cfm>.

By Bob Bailey

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## NEWSLETTER OF AMERICAN ASSOCIATION FOR WIND ENGINEERING

## PRELIMINARY ANNOUNCEMENT

FIFTH INTERNATIONAL SYMPOSIUM ON  
COMPUTATIONAL WIND ENGINEERING (CWE2010)

May 23-27, 2010

*Convened by*<http://www.iawe.org><http://www.aawe.org>*Hosted by*

and the

<http://www.ie.unc.edu>

AT THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL  
WILLIAM AND IDA FRIDAY CENTER FOR CONTINUING EDUCATION  
CHAPEL HILL, NORTH CAROLINA USA

<http://www.fridaycenter.unc.edu/fc/index.html><http://www.unc.edu/visitors>

The International Symposium on Computational Wind Engineering is an event co-convened every 4 years by the International Association of Wind Engineering (IAWE) in rotation with one of its 3 global regional organizations. CWE2010 is being co-convened with the American Association of Wind Engineering (AAWE). Members of the AAWE are especially needed immediately to assist the CWE2010 chairman.

Please contact *Alan Huber*: [chairman@cwe2010.org](mailto:chairman@cwe2010.org) with suggestions and willingness to be involved in planning the technical program for CWE2010.

Sessions are being planned to cover all wind engineering topics and chairman will be needed for each topic. CWE2010 will include some special sessions linked to homeland (societal) security. Each International Symposium on Computational Wind Engineering has reflected the significant scientific advances in the rapidly developing computational wind engineering science linked to advances to computing software and hardware. Significant new development and growth in computing software and hardware can be anticipated in time to be highlighted at the 2010 symposium. The futures of computing will change the way we all do business including wind engineering. Keynote speakers will be solicited to discuss future technologies that will influence what will be possible to support future CWE applications.

*By Alan Huber*

## POSITIONS AT IOWA STATE UNIVERSITY

The College of Engineering at Iowa State University seeks applications for faculty members at all ranks (assistant, associate, and full professor) who possess the talent and passion to positively impact our students, nation, and world. These new faculty hires will be clustered in five interdisciplinary research and education areas. One of the cluster areas focuses on Engineering for Extreme Events with emphasis on engineering science framework for preparing, responding to, remediating and rapidly recovering our critical infrastructure systems after extreme events.

## ADDITIONAL DETAILS CAN BE FOUND AT:

<http://www.eng.iastate.edu/clusters/index.asp>

Multiple positions are available.

For more information and application instructions, please see: [www.iastatejobs.com](http://www.iastatejobs.com), and search for vacancy ID# 070840.

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## JACK REED

This is an obituary for Jack W. Reed, a long time friend and colleague. He was a meteorologist with Sandia in Albuquerque and worked principally with blast waves, but he attended many of our wind engineering conferences. He was very visible in wind engineering circles.

Jack W. Reed, 84, a resident of Albuquerque, passed away on Friday, November 30, 2007, after a brief but feisty bout with lung cancer. He spent his last days at the Care Center of Manzano del Sol Good Samaritan Village, which he helped to found. Jack was a brilliant mathematician and meteorologist, who went on from an early love of flight to become an invaluable part of the team that conducted the U.S.'s historic nuclear tests in the 1950s and early 1960s. He enjoyed a long, productive scientific career at Sandia National Labs and at Kirtland Air Force Base, where he served as a Reserve Officer in the New Mexico Air National Guard. In his later years, Jack was one of the much-loved "Weather Wizards," for the Albuquerque International Balloon Fiesta, while he maintained an active research life until his death. Jack was born in Corning, IA on September 24, 1923. At the age of nine, he moved with his mother, Vera Gibson and his step-father, Charles Reed to Santa Fe, where his step-father was the State Highway Engineer. He graduated from Santa Fe High School in 1940. Jack was drafted into the US Army at the onset of World War II. He was an early weather specialist in the Air Corps, serving in the Philippines. In September 1944, Jack married Lois Linville of Chicago, IL. When he was discharged from the Army in 1947, they settled in Albuquerque, where he finished his schooling at the University of New Mexico, receiving a Bachelor's Degree in Mathematics. They had two children, Roger and Margaret. Jack became a meteorologist at Sandia National Labs, with the important task of predicting the fallout and shock patterns of numerous atmospheric nuclear tests, both in Nevada and in the South Pacific. Jack worked in various capacities at Sandia National Labs for 46 years. After his retirement from Sandia, he founded a consulting firm, JWR, Inc., where he continued to offer his expertise to clients worldwide. Jack published countless papers on atmospheric studies, wind energy, and nuclear matters and tests. He was active for years in the Democratic Party, the Boy Scouts, the New Mexico NAACP, and fought tirelessly for civil rights in New Mexico. Jack was a longtime member of First Congregational Church. Jack loved to travel around the globe and across the nation. He was a wine connoisseur and made numerous trips to California wine country and the various wine regions of France. He is survived by his wife, Lois Reed; daughter, Margaret "Marti" Reed, both residents of Albuquerque (after Albuquerque Journal on Sunday 02 December 2007).

*From Joe Minor*

## REGISTER FOR THE AAWE WORKSHOP

The Inaugural AAWE Workshop will be held in Vail, Colorado, this August. Now is the time to register for the Workshop (early bird rate prior to 23 May 2008) and to book your room at the Vail Marriott at the special rate of \$149 per night. We have 27 rooms left locked in at this price with the possibility of expanding that low rate if they fill up quickly. The same rate also applies for two days before and one day after the Workshop. So make it a fun summer get away in the beautiful Rocky Mountains. All this can be done on the new AAWE webpage, under the conferences section. The Workshop registration and payment should be done on the AAWE webpage and the link to the hotel via the Marriott symbol will take you directly to their booking page for our special rate. Get in now before they are all gone!

Presenters of papers should submit their six-page, wind-engineering paper to Jeff Reifschneider ([jreifschneider@cppwind.com](mailto:jreifschneider@cppwind.com)) in pdf format by Friday 18 July 2008. Application forms for a \$500 AAWE travel bursary will be issued shortly. If the student's paper is accepted, these monies will be passed on to them when he/she arrives in Vail to present their paper to the Workshop. Keep an eye on your email for this financial assistance.

*By Leighton Cochran*



## NEWSLETTER OF AMERICAN ASSOCIATION FOR WIND ENGINEERING

## PRESIDENT'S CORNER



The big news in this issue is that the new AAWE website is now live with many new and updated features.

Email [lcochran@cppwind.com](mailto:lcochran@cppwind.com) for your password to access the members section if you are currently paid up for 2008. Annual (2008) dues and Workshop registration payments may be made via credit card on our secure server.

We have a new Corporate Member. We welcome Engensus Engineering and Consulting out of Baton Rouge in Louisiana. Feel free to visit their website, listed on the back page of the newsletter.

There are some meeting announcements in this newsletter including the next Computational Wind Engineering Conference at the University of North Carolina in 2010. Before then the AAWE Workshop will be happening in Vail this August and you are encouraged to register and book your accommodation in the near future, via the AAWE website. We would also like to thank the three Major Sponsors of the Workshop, RWDI, CPP and High Velocity who are all helping significantly to keep the costs down for the event.

There are also a couple of technical notes pertaining to the motion of tall buildings in this newsletter. Please contribute to the Notre Dame building motion perception survey noted at the top of page 2.

This Newsletter continues to need articles from the members. Please send publishable items to me at [lcochran@cppwind.com](mailto:lcochran@cppwind.com) as Word files and image files for us to review and place in future editions. I would also ask the members to encourage others interested in wind engineering to join AAWE, either as individuals or as a corporation. Pass this newsletter on to them so they can see what we do and encourage them to visit the website to become a member (note that the membership calendar year of 2008 now applies).

**Leighton Cochran**

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**American Association  
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**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**

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