American Association for Wind Engineering

AMERICAN ASSOCIATION FOR WIND ENGINEERING
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THE WIND ENGINEER

NEWSLETTER OF AMERICAN ASSOCIATION FOR WIND ENGINEERING

March 2007

Americas Conference on Wind Engineering to be held in Beautiful Puerto Rico. See page 1.

Vote for new Board members, a new President-Elect, and on a referendum to the bylass. See page 7

The History of Wind Technology in Denmark

James D. Iversen, Professor Emeritus, Iowa State University

Introduction

Wind – a phenomenon we don't always understand or pay much attention to – perhaps because we can't see it, only its effects. And its effects can be devastating, such as the terrible destruction due to Hurricanes Katrina and Rita, for example in August and September, 2005. As a member of the American Association for Wind Engineering, I am aware of that organization's attempts to influence local government agencies in the southeastern coastal areas of the United States in the improvement of building codes so that buildings can better withstand the destructive power of the wind.

My interest in wind and its effects began when I was just a young engineering faculty member at Iowa State University in the mid-1960s. The opportunity arose to test in the ISU wind tunnel a scale-model of an architectural design for the proposed coliseum to be built on campus. The first step was a visit to the ISU library to see if anyone else had ever done such a thing, and to my surprise, I discovered that most

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In this Issue:

11th Americas Conference on Wind Engineering

Mark your calendars! The next Americas Conference on Wind Engineering will be expanding our geographic focus. It will be held in Puerto Rico in late June 2009. This is the low season for the Puerto Rico Hotel industry, which should make travel and accommodation costs more reasonable. Our host will be Dr. Hector Cruzado from the Polytechnic University of Puerto Rico, while his Organizing Committee will represent his and other academic institutions as well as some professional organizations from within Puerto Rico. The AAWE Board is particularly excited about this venue as it is likely to attract attendees from Central and South America – a first true Americas Conference. To this end the organizers are planning to have some real-time translation available for Hispanic audience members and presenters. The Organizing Committee in Puerto Rico has many exciting ideas for the meeting, including short courses on a variety of topics and sponsors from both those concerned with extreme hurricane events and the wind energy industry. Keep an eye on this space as the planning unfolds.

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of the literature on the subject was from Denmark, some in the Danish language and some important enough to have been translated into English.

Upon some reflection, perhaps it is not too surprising that the early pioneers in the field now called "Wind Engineering" were Danes. At times, Denmark can be a windy place. The Jutland peninsula and accompanying islands protrude out into the North Sea from the North coast of mainland Europe to meet the wind, which sweeps across the sea unchecked by any natural obstacles such as a mountain range or broad forest expanse.

Wind is an important factor in the lives of the people of Denmark. Because of the effects of wind on climate, vegetation, and man-made structures, and its potential for the generation of energy, the wind has long been a subject of study by scientists and engineers in Denmark. Although damaging wind storms are not as frequent as the hurricanes and tornadoes which we experience in the United States, there can be such storms, and one of the most destructive occurred just a few years ago on December 3rd, 1999, when wind gusts of up to 137 mph were measured on the westward island of Rømø, just off the coast of southern Jutland. Seven people were killed in Denmark during that one storm and insurance claims totaled 8.5 billion Danish kroner (approx. 1 billion $US).

There are significant geological features in Denmark, which are due to the wind. There are many square miles of sand dunes along the west coast of Denmark, including the large features of Rubjerg Knude and Råbjerg Mile in the northern part of Jutland. A recent interesting account of the effects of wind erosion control (or the lack thereof) documents the recent changes which have occurred at Rubjerg Knude (Rasmussen, 2005) One of the interesting landmarks is the church which was buried by sand in the 19th century (*tilsandede kirken*), near the northern tip of Jutland at Skagen. There are also several inland dune fields or landscapes influenced by drifting sand in Jutland in addition to the coastal dunes. Recent research on climate evolution indicates that there have been several dune-building periods during the Pleistocene (Rasmussen, 2004)

Because of the presence of the wind, the utilization of the wind for the production of energy has a long history in Denmark. The first mention in print of the windmill in Denmark is a reference to a postmill (*stubbemølle*) in the year 1260. The first Dutch type windmill (for which only top of the mill is turned into the wind) was introduced into Denmark by King Christian IV.

Technological Advances in the 19th century

It is just a little over 100 years since the Wright Brothers made their epic flight over the sand dunes at Kitty Hawk. Most of the preliminary achievements prior to their flight occurred in the 19th century, i.e., the invention of the internal combustion engine, and the contributions by others before the Wright brothers, such as Otto Lilienthal and Octave Chanute. What is not generally known is that some people at the time blamed the great mathematician Sir Isaac Newton for a delay in the advent of flight. As part of his work in the application of mathematics to the solution of physical problems, he had attempted to predict the forces on an object as it travels through the air. In this particular case, he made an assumption about the flow of air about an obstacle, which was later proved to be incorrect, and the result of this assumption is that he predicted a much smaller lift force on a wing than actually occurs.

A Danish engineer and mathematician, Henrik Christian Vogt (1848-1928), became interested in bird flight during a trip around the world in 1877, as he watched the birds soaring about the ship on which he was a passenger. He worked for a time in England before returning to Denmark, and became a member of the English Aeronautics Club. He worked on the theory of lift on a wing, and became convinced that Newton was wrong (Vogt, 1892). He wrote to the Smithsonian's Samuel Langley, for example, and Langley answered back that such a great mathematician as Newton couldn't be wrong. Vogt became well enough known that he was invited to the Aeronautical Congress in Chicago in 1893.

H.C. Vogt finally decided that he needed to perform an experiment in order to prove his theory, so he enlisted the assistance of his friend, Johannes O.V. Irminger (1848-1938), who was director of the Eastern Gas Works in Copenhagen. The Eastern gas works had a very large chimney. Irminger cut an opening into the side of the chimney, and built on to it his first wind tunnel. The year was 1893; 8 years before the Wright brothers built their wind tunnel. This was not the world's first wind tunnel, however. Francis Wenham (in the year 1871) and H.F. Phillips (in the1880s) had built wind tunnels in England, but Irminger's was the first in Denmark, and he started a long history of wind tunnel testing in Denmark, which continues to this day. It was Phillips, in fact, who had suggested to Vogt that he prove his theory by testing an airfoil in a wind tunnel.

Irminger's wind tunnel consisted of a horizontal rectangular tube, 40 inches long and with a 9 inch by 4.5 inch cross section. Powered by the draft of the chimney, it was capable of wind speeds up to about 33 mph. Irminger quickly learned how to measure the pressure distribution on the surface of a wind tunnel model. He built a model of a wing to Vogt's specifications and became the first in the world to measure the pressure distri-

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bution on an airfoil, proving in the process that Vogt was right, and Newton was wrong. Irminger published his work in English (Irminger, 1894).

Technological Advances in the 20th century

Some years after retiring from his job at the Eastern Gas works, Irminger built his second wind tunnel in the 1920's. It was much larger than the first, and he enlisted the assistance of Professor Christian Nøkkentved of the Danish Technical College. Irminger had become interested in the pressure distribution on buildings in the presence of wind, and he and Professor Nøkkentved went on to publish the results of the first comprehensive sets of wind experiments on buildings in the 1930s (Irminger and Nøkkentved, 1930, 1936). Irminger continued to work on building aerodynamics until just a few months before his death in 1938 at the age of 90.

It is interesting to note the close relationships among the people who were advancing the state of the technological art that is now known as "wind engineering". Henrik C. Vogt was responsible for getting J.O.V. Irminger interested in aerodynamics in the 1890s. Vogt, in turn, started working with Professor Christian Nøkkentved in the 1920s, and that collaboration lasted throughout most of the 1930s. Nøkkentved started working with the aerodynamics of snow fences and shelter belts (Nøkkentved and Flensborg, 1938; Nøkkentved, 1939) in the late 1930s, and he enlisted the help during that time of engineering student Martin Jensen.

Martin Jensen (1914-1991) became an extremely clever and capable scientist-engineer, and his contributions are so significant and well-known that he became known world-wide as the "Father of Wind Engineering". The work by Nøkkentved and Jensen was interrupted by the occupation of Denmark by the Nazis in World War II, but immediately after the War, Jensen started work on a long series of experiments, both in nature and in the wind tunnel. He very early recognized the need to duplicate the characteristics of the natural wind when working at small scale in the wind tunnel laboratory, and eventually discovered that the way to do this was to build a very long wind tunnel, and then model the surface roughness to scale as far upwind of the model as possible. The model can represent a snow fence or building or some other obstruction to the wind, (M. Jensen, 1958, 1959).

Modern Wind Engineering

Martin Jensen's work forms the basis for a number of laboratories around the world today (including several in North America), which specialize in modeling the atmospheric boundary layer (wind and turbulent layer nearest the surface). The primary laboratory for this work in Scandinavia today is the wind engineering research laboratory of the Danish Maritime Institute (located in the northern Copenhagen suburb of Lyngby). This laboratory uses three wind tunnels (1. cross-section 0.8 m x 0.8 m, 80 m/s; 2. cross-section 2.6 m x 1.8 m, 25 m/s; 3. cross-section 13 m x 1.7 m, 8 m/s). Jensen assisted in the design of the new Little Belt Bridge (*Ny Lillebæltsbroen*), completed in 1971.

Like all suspension bridges, the effect of the wind is extremely important in design. The newest suspension bridges in Denmark, the Great Belt Bridge (*Storebæltsbroen*), and the bridge across the Sound between Denmark and Sweden (*Øresundsbroen*), were both tested extensively in both of the second and third wind tunnels at the Danish Maritime Institute. Allan Larsen was one of the primary aerodynamicists who contributed to the design of the two newest bridges (Larsen, 1992). Bridges built or being built in other countries are also being tested in this laboratory. The first wind tunnel mentioned was the only one in existence when this writer spent a very enjoyable 8 months on sabbatical at the laboratory (Iversen and V. Jensen, 1981).

The meteorological study of the atmospheric boundary layer is today called micrometeorology, and there is a large research group at the Risø National Laboratory, which has studied the boundary layer for many years. Niels Busch and Niels Otto Jensen are two of the better-known people in this area (N.O. Jensen and Busch, 1982).

Wind-blown sand and soil

The soil in the western two-thirds of the Jutland Peninsula is very sandy and subject to considerable wind erosion, even in the damp Danish climate. Reclamation of the heath land in western Jutland intensified after the war of 1864, because of the loss of the Duchies of Slesvig and Holstein. The resultant problem of wind erosion was, of course, the motivation for the wind tunnel experiments of Nøkkentved (1938, 1939) and Martin Jensen (1954, 1955) who studied the aerodynamics of shelter. More recently, interest in the physics of sand and soil movement has been led by a group of scientists at the University of Aarhus in Denmark led by geologists Jens Tyge Møller (1985) and Keld Rømer Rasmussen. The writer has been fortunate enough to work with these people, primarily with Rasmussen (Rasmussen 1999a). Keld Rasmussen invented and built a tilting wind tunnel, the only one of its kind, and some significant research has been conducted in this wind tunnel on the effect of slope on sand transport (Rasmussen et al, 1996; Iversen and Rasmussen, 1994, 1999a). Rasmussen and Michael Sørensen of the University of Copenhagen are continuing a collaborative effort combining the effects of

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theory and experiment to further understand and predict the effects of wind on sand movement and soil erosion (Rasmussen and Sørensen, 2005).

Wind Energy

Poul la Cour (1846-1908) was one of the first scientists to tackle the problem of extracting electrical energy from the wind. Born in Aarhus, he was educated in meteorology, and after some time in that field, in 1878 he was hired to become a teacher of science at Askov Folkehøjskolen. He was one of the few Danes who was interested in the work of Vogt and Irminger, and he began to study the wind turbine from a technical standpoint. He was an inventor, and his work with early electrical instruments earned him the unofficial title as “Denmark’s Edison”. His first electricity-generating windmill was finished in 1891, and in 1897 he built the world’s first wind tunnel designed for the purpose of testing windmill designs (Nissen, 2003). He is known by some as “The Father of Wind Energy.” Mostly because of his work, wind generators became fairly common in Denmark in the early part of the 20th century. One of his students, Johannes Juul, was the designer of the world’s first AC (alternating current) wind turbine at Vester Egesborg in the 1950s. Juul designed the 200 kW wind turbine at Gedser, which was built in 1956-7. This turbine was later refurbished in 1975 at the request of NASA which wanted test results for the US wind energy program. That wind turbine is now on display at the Electricity Museum at Bjerringbro, Denmark (Olsen, 2005).

Denmark today is one of the world’s primary producers of wind energy and wind energy devices. In the year 2000, there were approximately 6000 electrical generating wind turbines in Denmark. The Danish wind energy industry is among the world’s largest. A significant portion of the present global total of almost 40,000 MW wind energy capacity has been provided by the Danish wind energy companies Vestas and NEG Micon. The efforts of those early pioneers in wind technology, i.e., Vogt, Irminger, la Cour, Nøkkentved, Jensen, and others have certainly reaped dividends for Denmark and the Danes.

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Discussion by Herbert S. Saffir of "Performance of Glass/Cladding of High-Rise Buildings in Hurricane Katrina" by Ahsan Kareem and Rachel Bashor, Universitiy of Notre Dame

by Herbert S. Saffir, P.E., Hon.M.ASCE

The "Performance of Glass/Cladding of High-Rise Buildings in Hurricane Katrina", Wind Engineer, December 2006, is a valuable commentary on the destruction of glass and cladding on high-rise buildings in New Orleans during the hurricane.

In the opinion of this writer, Hurricane Katrina was not a major hurricane event for New Orleans. The central eye of Katrina made landfall in Mississippi, approximately 30 miles east of the center of the New Orleans business district. New Orleans was in the weak quadrant of the storm. It is interesting to note that the paper confirms that wind speeds were only about 90 miles per hour, in 3 second gusts in Katrina, in New Orleans; these speeds are well below the design speeds of 118 mph given in ANSI A58.1 (1982) and the design speeds of 130 mph, 3 second gust, given in ASCE 7-05 (2005).

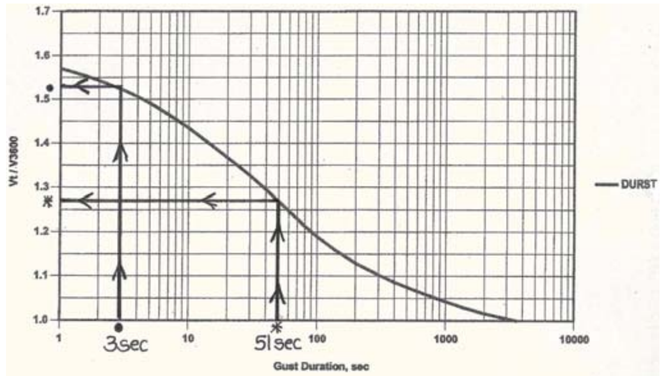
The writer believes that much of the damage in New Orleans was similar to high-rise building damage in Hurricane Alicia in Houston (1983), where winds were probably not over 90 mph.

The writer also believes there was insufficient attention to design and installation of cladding and glass, and poor code enforcement, in New Orleans. Unfortunately, this paper does not review the building code requirements in force for glass and cladding; it does not review and analyse the individual design plans for those structures in New Orleans damaged by Katrina.

Technical Note: Windspeed Averaging Times

by Amit Mishra, M.S.

The basic wind speeds in ASCE7-05 correspond to 3-second gust speed measured at 10m above ground in open country. Historically, however, averaging times in which the mean wind speed is most often reported has been fastest mile, 1-minute and hourly. For consistency in the code a criterion to convert mean wind speeds from one averaging time to another was needed. The IBC (2003) provided Table 1609.3.1 which can be used to convert the 3-second gust wind velocities into fastest-mile wind velocities and vice-versa. On the other hand to convert the 1-minute or the hourly mean wind speeds to the 3-second gust wind velocity, the ASCE7-05 provides the Durst Curve (ASCE 7-05 commentary Figure C6-2). This figure provides a graph which defines the relation between probable maximum wind speed averaged over t seconds, V_t, and mean wind speed over one hour V_{3600}. An example of converting the fastest-mile wind speed to a 3-second gust speed is provided below:



Fastest mile wind speed = 70 mph

Time required for 1 mile of wind to pass through the measuring point = (3600/70) = 51 seconds/mile

The next step would be to find out the hourly mean wind speed corresponding to a fastest mile wind speed of 70 mph. From the durst curve as shown in the attached figure we have;

$V_{51}/ V_{3600} = 70 / V_{3600} = 1.27$

Hence, $V_{3600} = 55$ mph

Again using the durst curve estimate the 3-second gust speed is calculated as follows:

$V_3/V_{3600} = 1.53$

Hence, $V_3 = 1.53 * V_{3600} = 1.53 * 55 = 84$ mph

This value can also be estimated or verified using the Table 1609.3.1 provided in IBC (2003). The above methodology can be used to convert maximum speed averaged over a certain period into hourly mean speeds and vice versa.

Amit Mishra, M.S.
CPP Inc.

President's Corner

As of January 2007 I have the privilege of taking over from Prof. Marc Levitan as President of the American Association for Wind Engineering. I would first like to pass on my sincere thanks to Marc for his huge effort over the last two years. His frequent ventures into the world of national and state politics on our behalf are truly appreciated – much of which we never fully hear about or understand the time consumption involved. Naturally we all remember the wonderful quadrennial Americas conference that he organized in Baton Rouge in May 2005. When this is combined with Hurricane Katrina in his home state his leadership will be a hard act to follow. Thank you very much, Marc.

My first few weeks at the helm have been consumed with some house-keeping issues required to keep our organization afloat. Not the least of which is a set of elections for the three open AAWE Board vacancies and the choice of a President-Elect for the 2009/2010 term. The candidates are all presented to you in this newsletter. There is also one Referendum item that asks that we alter our Bylaws to allow for the creation of a "Senior Executive Council", proposed to be made up of all the AAWE Past Presidents. It will have no voting rights, but will serve as an advisory body with a wealth of knowledge and past experience. The motivation for this addition to AAWE is twofold. To date the most useful and immediate aid I have received since taking office has been from Past Presidents. Formalizing this asset for future AAWE Presidents will be very useful indeed. Also, many Past Presidents continue to represent us in some manner with government agencies. These activities would be enhanced if they can introduce themselves as Past Presidents of AAWE **and** ongoing members of the AAWE Senior Executive Council. I ask that you vote yes on this small addition to our Bylaws. In a couple of weeks you will receives a pdf voting paper for these elected positions and referendum, as well as instructions on how to vote. Please get involved in this activity.

Last year was the fortieth anniversary of our Association's foundation – originally under the name Wind Engineering Research Council. Many of the newer members may not realize the rich history of the AAWE/WERC, and I plan to use this space in our Newsletter to introduce some ideas to help us grow into the future. One exciting piece of news is that the 11th Americas Conference on Wind Engineering will be held in Puerto Rico in late June 2009. With some or all of the sessions planned to have simultaneous Spanish translation we hope to see much more input from The Caribbean, Central and South America. This will help us to more fully satisfy the "Americas" label in the conference title. Thank you so much to Dr. Hector J. Cruzado and his team for taking on this organizational task.

This newsletter continues to need articles from the members. Please send publishable items to me at 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. Pass them this newsletter so they can use the rear pages to join. We are starting the year with a very active individual and corporate membership drive that will allow us to grow new events. For example, I am planning to introduce the idea of an AAWE Workshop to be held every 18 months (potentially venues in the north during summer and south in alternate winters). The goal is to provide a venue for students to present the latest research to a knowledgeable, but congenial group. The sequential sessions (you see everything) of this proposed two-day meeting is modeled off the highly successful AWES Workshops held by the Australasian Wind Engineering Society. Some of you may have attended one of these meetings over the last fifteen years or so.

On the legislative front, the National Windstorm Impact Reduction Program Act has been signed, but not funded. In the next Newsletter Prof. Bogusz Bienkiewicz will have an article summarizing the status of this ongoing work. Lastly, do not forget to book your flights and accommodation for the 12th ICWE to be held in Cairns, Queensland, Australia, early this July. See www.awes.org for details and plan to explore Far North Queensland and the Great Barrier Reef while you are there.

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BALLOT ITEMS

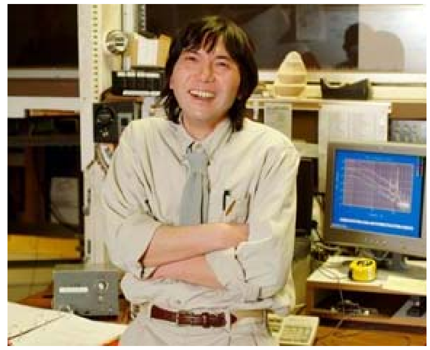
As mentioned in the President's Corner, the following are the items that will be voted on shortly. This includes the three seats for the AAWE Board, the President-Elect for 2009/2010, and a proposed amendment to the Bylaws.

AAWE Board Candidates

Kurtis R. Gurley

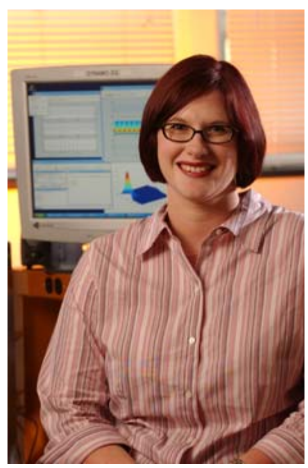
Dr. Gurley is an Associate Professor in the Department of Civil and Coastal Engineering at the University of Florida. Prior to joining UF in 1997, he received M.S. and Ph. D. degrees from the University of Notre Dame, with a focus on stochastic mechanics and wind effects on structures. His primary research focus has been structural / wind engineering from a stochastic modeling perspective. He has developed analysis and modeling techniques for accurate probabilistic representations of extreme loads and prediction of the response of complex structural systems. Dr. Gurley has largely focused on the application of his expertise to in-field measurement and modeling of the turbulent structure of ground-level hurricane winds and wind loads, and the evaluation of the vulnerability of typical Florida residential structures to hurricane wind damage. He is the Associate Editor of the ASCE Journal of Structural Engineering – Wind Effects Committee, and contributes regular reviews to wind, earthquake, signal processing, and probabilistic mechanics related journals.

Dr. Gurley has been the Principal Investigator for the Florida Coastal Monitoring Program since 2000, working closely with partnering universities to capture full-scale hurricane wind data and the dynamic pressure on occupied coastal structures. He has also spent hundreds of hours in the field conducting post hurricane damage assessments of residential construction, and recently worked closely with IBHS personnel conducting a detailed statistical study of the performance of the Florida Building Code based on observed damage after the 2004 hurricane season. This study was a contributing factor to recent changes to the Florida Building Code. Dr. Gurley has been an invited speaker at numerous hurricane conferences and State of Florida hurricane mitigation government commissions.



Noriaki Hosoya

Noriaki Hosoya is currently an Associate at CPP (Cermak Peterka Petersen, Inc.) He was originally an aeronautical engineer, and has been actively practicing wind engineering for 30 years, including graduate work at Colorado State University. His professional career began at CPP 20 years ago. He is specialized in studies of wind-induced loads on various types of flexible and rigid structures, special structures, and other structural components. Over the years, he has developed advanced software tools to analyze dynamic wind loads on structures that are routinely used today. He has also been involved in a number of data acquisition development projects with notable contributions to a multi-pressure transducer system and a three-component wind speed sensor. He is a member of ASCE, AAWE, and Japan Association for Wind Engineering, and currently a PhD candidate at Colorado State University.



Tracy Kijewski-Correa

A native of the Chicagoland area, Dr. Tracy Kijewski-Correa currently holds the position of Philip B. Rooney Assistant Professor in the Department of Civil Engineering and Geological Sciences at the University of Notre Dame. Though not a common occurrence, Tracy received all of her degrees from this same university, with a Bachelors of Science in Civil Engineering (Magna Cum Laude) in 1997, a Masters of Science in Civil Engineering in 2000 and a PhD in Civil Engineering in 2003, all with focuses in Structural Engineering.

Tracy oversees the *Structural DYNAmics & MOnitoring (DYNAMO) Laboratory* (www.nd.edu/~dynamo) at the University of Notre Dame, where she and a team of students and visiting researchers perform research largely focused upon improved understanding of structural response under dynamic loads in order to enhance performance and damage diagnosis through innovative monitoring technologies. These efforts include an NSF-

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funded, full-scale monitoring program for tall buildings that began in the City of Chicago and is now branching overseas, aiming to systematically validate in-situ performance against predictions made in design. She has specifically focused on the use of GPS technologies in the context of this work to capture the background response component rarely observed in full-scale. Other activities in the DYNAMO Laboratory include quantification and modeling of structural damping in tall buildings, based on numerous full-scale databases in the US and Korea and wireless sensor networks for built and natural environments. The latter research is in collaboration with a multi-disciplinary, college-wide research team focused on damage detection in civil infrastructure and the evolution of plumes subject to urban aerodynamics in the wake of a chem-bio terrorist attack on a major city. The work involves real-time integration of sensor data into simplified computational fluid dynamics models and will involve a series of field demos in both suburban and urban environments. In addition, Tracy serves as the director of an NSF-funded Undergraduate Research Experience in Tsunami Impacts and Mitigation.

Professor Kijewski-Correa has published over 20 peer reviewed articles, over 40 articles in conference proceedings, and two book chapters. Tracy currently offers 4 courses in Structural Engineering and Dynamics at the senior and graduate levels and recently deployed a new first module on lateral deflection of flexible structures for the College's Freshman Engineering Course. Her excellence as a teacher and scholar has been recognized with numerous university awards, AAWE's Richard Marshall Award (2005), the Skidmore Owings & Merrill Traveling Fellowship in Structural Engineering (2000), a National Defense Science and Engineering Fellowship (1997) and an NSF GRT Fellowship (1998). Tracy is a member of a number of professional societies, including ASCE (and is secretary of its Tall Buildings Committee), AAWE, CTBUH, Tau Beta Pi and Chi Epsilon.

Greg Kopp

Greg Kopp is Professor of Civil & Environmental Engineering and Canada Research Chair of Wind Engineering at the University of Western Ontario. He is also an Associate Research Director with the Alan G. Davenport Wind Engineering Group at Western. His work attempts to link interests in both fundamental research and practical applications relevant for the discipline. His current research interests include the aerodynamics of wind-borne debris, full-scale testing at the new 'Three Little Pigs' research facility, wind loads on low-rise buildings and various problems involving vortex shedding. He has worked on more than 40 industrial wind-tunnel testing projects during his 10 years at Western.

Forrest Masters

Dr. Masters joined the University of Florida as an Assistant Professor of Civil and Coastal Engineering in 2006. His research interests include field measurement of surface-level tropical cyclone winds, wind effects on structures and stochastic simulation of natural hazard events.

Since 1999, Dr. Masters has deployed for 19 named tropical cyclones, including all of the major hurricanes in 2004 and 2005. During landfall, he and his colleagues deploy mobile weather stations to capture ground-level wind speeds and instrument single-family homes to measures wind pressure loading. After the storm, damage assessments are conducted to evaluate the performance of the building stock and the codes and standards that guided their construction. Currently, he is developing a new hurricane simulator to reproduce the actual dynamics of Saffir-Simpson Hurricane Scale 2-4 winds impinging on a low-rise structure at full scale.

Douglas A. Smith

Dr. Doug Smith is an associate professor at Texas Tech University and a member of the ASCE 7 Wind Loads Task Committee. He has a combination of experience and background in the areas of structural and wind engineering, statistical analyses, expert systems and has personally conducted windstorm-induced damage documentation for the Institute for Disaster Research. He has directed research on many projects, including area averaging ef-

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fects for a roof purlin, wind loads on frames, site characterization for the Wind Engineering Research Field Laboratory (WERFL), integral scales measured at WERFL, wind damage prediction using Doppler radar, time domain modeling of wind-induced pressures and load factors for combined hurricane wind and surge levels. He is currently working his research to establish uncertainties associated with model- to full scale extrapolation wind-induced pressure coefficients on low-rise buildings. In addition, Doug has over 10 years of practical experience in the analysis and design of industrial structures and foundations, particularly those related to power plant construction.

Professional Chronology: Research Assistant, Institute for Disaster Research, Texas Tech University (1978-79); Structural Engineer, Southwestern Public Service Company (1979-83); Supervisory Structural Engineer, Southwestern Public Service Company (1983-1987); Senior Structural Engineer, Utility Engineering Corporation (1987-1990); Research Associate, Civil Engineering, Texas Tech University (1990-1994); Research Assistant Professor (1994-1998), Assistant Professor (1998-2002), Associate Professor (2002-present).

Memberships: American Society of Civil Engineers; Member, Wind Effects Committee of the American Society of Civil Engineers; Past Chairman, Texas Section Structural Division of the American Society of Civil Engineers; Member, Wind Engineering Research Council; Tau Beta Pi, Chi Epsilon, Phi Kappa Phi, Phi Theta Kappa, Registered Professional Engineer (Texas, New Mexico).

President Elect Candidates

Nicholas P. Jones

Nicholas P. Jones was appointed Dean of the Whiting School of Engineering in August 2004. A native of New Zealand, he received his undergraduate degree in Civil Engineering from the University of Auckland in 1980 and came to the U.S. to earn his master's and doctoral degrees from Caltech in 1981 and 1986, respectively. Dr. Jones joined Johns Hopkins as a faculty member with the Department of Civil Engineering in 1986 and was appointed chair of the department in 1999. In 2002, he joined the University of Illinois at Urbana-Champaign to head the Department of Civil and Environmental Engineering until his return to Hopkins to serve as fourth dean of the Whiting School of Engineering. Dr. Jones' research interests include various aspects of structural dynamics, flow-induced vibration, and wind engineering. He has received numerous awards for both teaching and research and has served on a number of national committees, including the Wind Effects Committee of the American Society of Civil Engineers (ASCE) Structural Engineering Institute, ASCE's Aerospace Division Executive Committee, as well as service on the Board of Directors for the American Association for Wind Engineering, to name just a few. Dr. Jones is the past editor of the Journal of Wind Engineering and Industrial Aerodynamics.

Bylaws Referendum

It is proposed that a new Section 7 in Article V of our Bylaws, as discussed in the "President's Corner", be written and approved by AAWE members so that a Senior Executive Council may be formed. Specifically,

Section 7 Article V

Section 7— A "Senior Executive Council" of AAWE will consist of all the Past Presidents. This Council will have no voting rights, but will serve as an advisory body with a wealth of knowledge and past experience.

AMERICAN ASSOCIATION FOR WIND ENGINEERING

www.aawe.org
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AAWE
American Association for Wind Engineering

Membership Application/Renewal

Membership Year: 1 January - 31 December 2007

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:

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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

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