CHRONICLE OF THE AMERICAN ASSOCIATION FOR WIND ENGINEERING

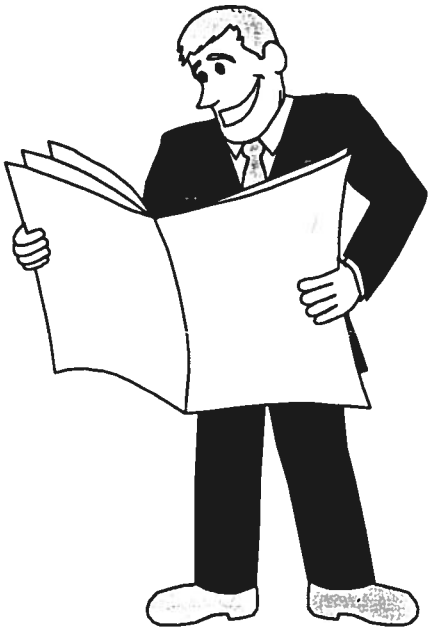
The Wind Engineer

Summer 1996

ASCE 7-95 HITS THE STREETS

ASCE recently released the latest edition of Minimum Design Loads for Buildings and Structures, ASCE 7-95. The windload provisions have significant changes. Here is a highlighted review of the changes.

Adoption of the three-second gust wind speed to replace the antiquated "fastest-mile wind" is the most sweeping change. The main reason for this change is that the National Weather Service no longer collects fastest-mile wind speed data. Three-second gust speed data are collected at more than 450 stations around the country, contrasted with the 129 that previously collected fastest-mile wind data. The three-second gust provides a way to describe wind speed to architects, engineers, and building officials consistent with terminology used by meteorologists and the + media.



Development of a new basic wind speed map relied upon the use of three-second gust data obtained from 485 stations. In the hurricane regions along the Gulf and Atlantic coastlines, the old hurricane wind speed data served well, but it was necessary to draw new contours that included the hurricane gust and the hurricane importance coefficient factor. For non-hurricane regions, measured gust data were assembled from a number of stations to form "superstations", and thus reduce sampling errors. After reducing the sampling errors, there was insufficient variation in the 50-year wind speeds over the eastern three-quarters of the US to justify contours. In the western section, the contours were sufficiently close to state lines to justify use of polical boundaries.

Exposure categories and gradient heights remain unchanged from ASCE 7-93, but power law exponent values change to be consistent with the three-second gust speed. The change in exponent values reduces the difference between profiles for Exposure B and C.

Wind speed-up due to an isolated hill or escarpment calls for application of a new topographic factor to account for this phenomenon. The topographic factor K_{zt} is applied to the velocity pressure q.

The gust effect factor accounts for loading effects in the along wind direction due to wind turbulence and wind/structure interaction. It accounts for along wind loading effects due to dynamic amplification of flexible buildings and structures. The gust effect factor is less than one because the basic wind speed is a three-second gust and because there is a lack of correlation of turbulence over a large area of the structure.

The simplification of the basic wind speed map is arguably the greatest instigator of changes in wind pressure from ASCE 7-93 to 7-95.

Pressure coefficients for main wind force resisting systems (MWFRS) may be treated in two different ways.

(1) Buildings of all heights
(2) Low buildings less than or equal to 60 feet.

Pressure coefficients for buildings of all heights reflect the actual loading on each face of the building as a function of wind direction, namely winds perpendicular or parallel to the ridge. For low buildings, less than or equal to 60 feet, the values of GC_f represent "pseudo" loading conditions, which envelop the structural actions of bending moment, shear and thrust independent of wind direction. To capture all appropriate structural actions, the building must be designed for all wind directions by considering each corner of the building. Exposure C is used for all terrains, but a 15% reduction in pressure is permitted for MWFRS in Exposure B.

Pressure coefficients for components and cladding (C&C) are also envelope values independent of wind direction. Additional roof shapes, such as hip roofs, stepped roofs, multi-span gable roofs and monosloped roofs, are now included in ASCE 7-95. The pressure zones for buildings with height greater than 60 feet have been reduced in number and simplified.

The numerical values of GC_{pi} for internal pressures have been changed as a result of wind tunnel tests at the University of Western Ontario and Colorado State University and full-scale data obtained at Texas Tech University. The standard recognizes the concept of enclosed, partially enclosed and open buildings.

The general philosophy of the windload subcommittee was not to increase or decrease the design wind pressures on buildings and structures as specified in ASCE 7-93. Due to the many changes introduced, some variation in loads at different geographical locations is noted. The simplification of the basic wind speed map is arguably the greatest instigator of changes in wind pressure from ASCE 7-93 to 7-95.

MEHTA STEPS DOWN AS ASCE 7 WINDLOAD SUBCOMMITTEE CHAIRMAN

With the completion of ASCE 7-95, Kishor C. Mehta passed on the reigns of windload subcommittee chairman. He held the position since 1978. "It's time for some new leadership," Mehta said. Mehta is Director of the Wind Engineering Research Center at Texas Tech University.

Larry Griffis, who is with Walter P. Moore in Houston, is the new subcommittee chairman as of May 31, 1996. The first meeting of the subcommittee is scheduled for August 17, 1996 in Chicago.

Larry seems to have hit the road in a dead run. The committee membership has been reformulated. He appointed a number of subcommittees, including; organization/editorial, internal pressure/openings/building classification, wind speed map/load factors/ directionality, exposure/topographical effects, low-rise buildings, international standards, dynamic/crosswind/torsional models, gust effect factors and building envelope/missile impact/roof coverings.

THIRD ANNUAL CONGRESS ON NATURAL HAZARD LOSS REDUCTION

Texas was center stage for America's catastrophe mitigation efforts June 10-11, 1996 when the Insurance Institute for Property Loss Reduction hosted the Third Annual Congress on National Hazard Loss Reduction in Dallas, Texas.

Neil Frank, Chief Meteorologist, KHOU-TV Houston, and former Director of the National Hurricane Center, gave the keynote address. He stressed the importance of building codes as one of the major lines of defense in protecting people and structures with high exposure to weather-related damage. Protection should be directed at three elements of hurricanes; namely, high winds, storm surge and inland flooding due to rain. The dynamic presentation followed the theme of the congress, "Build Better Now and Plan for a Safer Tomorrow".

Other topics addressed by the invited speakers at the congress included climate change, wind and the built environment, sustainable development and our built environment, the cultural redefinition of building codes, the wildland-urban interface, earthquakes and the built environment. The first day was devoted to the topic of wind.

Professor Dale M. Perry, Texas A&M University spoke on Wind Engineering and damage mitigation. He looked at future disasters and asked the questions, "Where are we? Where do we need to go?" He pointed out that wind engineers have done well in defining wind pressures and designing structural elements of buildings and structures. Engineered structures do not collapse, and therefore the trend of fatalities and injuries is downward. However, the building envelope is another story. Property damage due to breach and failure of the building envelope continues to increase and will get worse before it gets better. He advanced two avenues to improve the building envelope and to change the trend of property losses. One is to improve testing of wall and roof material and panels. Current testing procedures and standards do not reflect actual conditions in high winds. Establishing a laboratory with a "Wall of Wind" may be an answer to testing. A second avenue is to work with mitigation stakeholders

including engineers, architects, meteorologists, the insurance industry, building code officials, builders, consumers and others to develop an integrated approach.

Robert L. Halveson, Deputy Commissioner, Safety, Texas Department of Insurance provided an overview of current efforts by the State of Texas to reduce hail loss through public education and more effective roofing materials. He showed a video of the hailstones and resulting damage that occurred in North Texas in May 1995. The property losses were estimated at $1.1 billion in that one incident. New Underwriters Lab (UL) standards for hail testing (using steel balls) have been approved and are in-place for use.

"BUILD BETTER NOW AND PLAN FOR A SAFER TOMORROW"

Dr. Joseph Golden, Senior Meteorologist, NOAA and a former AAWE Board Member, presented a talk entitled "Structural Impacts, Costs and Mitigation Opportunities" for tornadic storms. Dr. Golden has been investigating tornadoes for the past twenty years. The most comprehensive effort to understand tornadoes, to capture the storms on film and to simultaneously record measurements during the storms, is project VORTEX. Completed last year, Project Vortex should provide new insights on tornadoes after complete analysis of the data. It will be a few years before all the data are analyzed. Preliminary results from Doppler radar indicate that wind speeds are as high as 280 mph in the bottom 2000 ft. Since radar covers a volume of air rather than a point, it is not possible at this time to indicate how close to the ground these wind speeds occur. The Wind Engineering community and other stakeholders should take advantage of the interest generated by the movie "Twister" to promote research resources needed to mitigate the effects of tornadoes. "In particular, we should give a high priority to calibrate the Fujita scale wind speeds for F4 and F5 categories", Dr. Golden recommended.

Professor Kerry A. Emanuel from MIT discussed, "Climate Change: Preparing for an Uncertain Future". A small amount of climate change can cause significant change in frequency and intensity of hurricanes. He noted that the frequency of a hurricane and the intensity of a hurricane are separate issues. If frequency of hurricanes increases with climatic change, it does not automatically translate into increase in intensity of hurricanes. A model is developed to assess the probable upperbounds of hurricane intensity.

Other papers at the congress were presented by Kathleen McGinty, Chair of the Council on Environmental Quality, on "Challenges of Changing Climate"; Dr. Dennis Mileti, Director of Natural Hazards Research and Applications Information Center on "Sustainable Development"; Dr. Robert Olshansky, University of Illinois, Champaign-Urbana on "Land Use Practices"; Mary Jo Levin, Director of Fire and Aviation Management, USDA, on "Managing the Fire Risk"; Ronald Hamburger, Vice President of EQE on the "Northridge Earthquake and Steel Frame Buildings"; and Dr. Christopher Rojahn, Executive Director of Applied Technology Council on the "Los Angeles Retrofit Program".

A panel discussion of the Model Codes was presented by Paul Heilstedt, CEO of BOCA, William Tangye, CEO of SBCCI and Jon Traw, President of ICBO. A uniform single plumbing code and a private sewage code are being developed by the National Code Council. An International Building Code is targeted to be developed by October 1999. At that time it will be presented to the memberships of the three model code organizations for discussion and voting. The IBC development is governed by a Steering Committee made up of representatives of the three code organizations. Both performance and prescriptive code requirements are being developed. The committee for the performance code has fifteen members; nine building officials (three from each organization) and six representing academic, research and professional constituencies. The goal is to have one set of model code requirements for the country by the year 2000. A code based on prescriptive requirements will follow later.

THE NATIONAL MULTI-HAZARD MITIGATION PARTNERSHIP

The purpose of the national multi-hazard mitigation partnership is to reduce loss of life and property caused by earthquakes, hurricanes, tornadoes, aging and hostile acts. The partnership is to include all involved and interested parties; such as industry, insurers, building code officials, government agencies, engineers and researchers.

The prime instigators of the program are Idaho National Engineering Laboratory (INEL), the US Department of Energy, and the Federal Energy Management Agency. A key component of the partnership is full-scale testing of structures for both earthquakes and wind effects. Those who use the technology resulting from the partnership's activities will share costs and help define the testing program. This applied engineering is not intended to replace on-going work, but instead will enhance it by adding full-scale testing and integrating current efforts into a nationally coordinated program.

The Advanced Combined Environment Test Station (ACETS) is envisioned as a facility at INEL for testing structures under a variety of environmental conditions, such as earthquake motion, extreme windstorms, bomb blasts, aging and extreme temperatures. It will be unique in ability to test large-scale and full-scale structures.

Ten wind engineering and damage mitigation experts from US universities, industry associations and government agencies joined a dozen INEL specialists in prioritizing the testing needs of the wind engineering community.

Several universities around the country have specialized capabilities, including wind tunnels and full-scale test buildings. A variety of tests are conducted at Colorado State, Clemson, and Texas Tech Universities. Canada, Japan, and Europe have large wind tunnel test facilities.

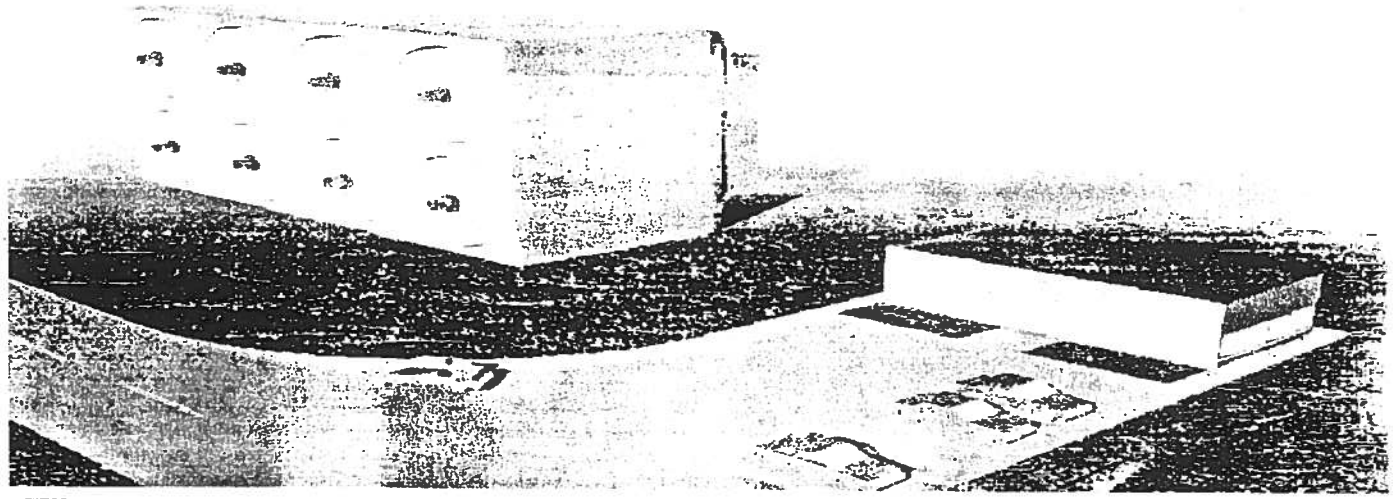
Wind tunnel tests give important air flow and pressure distribution data; tests on full-size buildings in the natural wind give real data, but only rarely under full-scale windstorm conditions.

The workshop participants concluded that the ACETS wind facility should provide 200 mph winds over a size and distance large enough to effectively study severe wind phenomenon on a full-scale, two-story residence.

"I'm impressed with the thought and planning that has gone into the concept development," said Dean Flesner, Vice President, State Farm Fire and Casualty Co., "We've certainly established the need for a wind testing facility."

Clemson, Texas A&M and Notre Dame Universities, in conjunction with INEL's University Research Consortium, are developing the "wall of wind" concept. The technology features model plane engines built into a 1/20-th-scale model of the wind simulator that may eventually be built at INEL.

Industrial support is necessary to make the large scale testing facility a reality. While support is building for the facility, possible sources for funding are still being contacted.



International Wind Engineering Forum

Introduction

Increasing international activities in the design and construction industry resulted in new demands for an international exchange of technical information and collaborative initiatives in may areas of civil and architectural engineering. A framework arose and was established to address these new challenges in wind engineering, the International Wind Engineering Forum (IWEF).

Establishment, Purpose and Goals of IWEF

The idea for establishing an organization promoting and facilitating international collaborative activities focused solely on wind engineering was first informally proposed by Dr. Kunio Fujii of the Wind Engineering Institute, Japan in Spring of 1993. Since then, the organizational structure and the scope of activities have been discussed during a series of meetings between the U.S. and Japanese sides, held both in Japan and in the United States. The inaugural meeting of the IWEF was held in Tokyo, March 17-18, 1994. During the meeting, which attracted over 100 participants, the establishment of the IWEF was proposed, Invited presentations, made by four U.S. and four Japanese speakers, provided background for a discussion of the IWEF.

The purpose of the IWEF is to promote and facilitate international exchange of technical information, collaborative research, joint education and service activities in the area of wind engineering.
Specific goals include:

(A) Exchange, disseminate and synthesize wind engineering technical information
(B) Organize, facilitate and promote educational activity focused on selected topics of wind engineering
(C) Promote and aid transfer of wind engineering technology
(D) Offer technical expertise in wind engineering
(E) Promote activities beneficial to wind engineering in other areas of engineering and science.

Current Structure and Activities of IWEF

Since the Inaugural Meeting, the IWEF has been co-chaired by Profs. B. Bienkiewicz and T. Ohkuma, with Dr. K. Fujii serving as Coordinating Secretary. One of the two IWEF Offices has been established at the Japan Association for Building Research Promotion, Tokyo, Japan; the other office has been established at Colorado State University. The Charter of IWEF has remained unchanged since the Inaugural Meeting

Since its inception, the IWEF has organized and coordinated three technical meetings: a seminar in 1994, and a technical meeting, and a workshop in 1995. In November of 1994, the inaugural issue of the IWEF Newsletter was published, and in September of 1995, a home page for the IWEF was established, the address is **http://www.arch.t-kougie.ac.jp/IWEF/** .

The IWEF technical seminar held in 1994 focused on "Wind for Roofs". The seminar took place in Tokyo on August 26, 1994, and attracted approximately thirty participants. The seminar lectures concerned wind resistant design, damage to steel and tile roofs, and countermeasures in the U.S.

As mentioned above, the IWEF coordinated two events in 1995: the IWEF Meeting on Structural Damping (MSD) and the IWEF Workshop on Computational Fluid Dynamics (WCFD) for Prediction of Wind Loading on Buildings and Structures. Both the meetings will be described in the forthcoming Spring (1996) issue of the IWEF Newsletter. Presented below are brief summaries of the meetings:

The MSD was held on September 8, 1995, in Atsugi, Japan. It was co-chaired by Profs. Y. Tamura of the Tokyo Institute of Polytechnics and by A. P. Jeary of the City University of Hong Kong. The meeting brought together over 180 participants representing the wind, earthquake, and structural engineering communities The program included five keynote lectures by invited speakers. Speakers from the U.S. included; Dr. M. Celebi, U.S. Geological Survey, Prof. G.C. Hart, UCLA, and Prof. A. Kareem, University of Notre Dame. Prof. A. P. Jeary, City University of Hong Kong, and Prof. G. Solari, University of Genova, complete the list of speakers. These lectures were supplemented by eleven

additional technical presentations by Japanese presenters. Overall, the meeting addressed various kinds of damping and their effects, including nonlinear aspects, methods of damping evaluation, and other topics. The meeting proceedings will be published by Elsevier Science Publishers in mid-1996. A follow-up meeting on damping is planned in the future.

The WCFD was held on September 9, 1995, at the Tokyo Institute of Technology, Yokohama, Japan. It was chaired by Prof. T. Tamure, Tokyo Institute of Technology. The meeting addressed present status and future outlook for practical application of CFD in analysis of wind effects on buildings and structures. Advantages, accuracy, and limitations of the computational techniques and turbulence modeling were discussed from the wind and structural engineering point of view. The workshop was attended by approximately 80 participants representing both practitioners and researchers in wind engineering and structural engineering, and in fluid mechanics as well. Technical presentations were given by seven invited speakers: Prof. B. Bienkiewicz, Colorado State University, Prof. J. H. Ferziger, Stanford University, Prof. A. Kareem, University of Notre Dame, Prof. H. Kawai, Tokyo Denki University, Dr. S. Kawamoto, Nippon Sheet Glass Co., Prof. T. Nomura, Nihon University, and Prof. T. Tamure, Tokyo Institute of Technology. The workshop was concluded with a discussion session. It was agreed that CFD should be promoted within the area of wind engineering and through interdisciplinary exchange involving researchers and practitioners in civil, mechanical, and aeronautical engineering as well as atmospheric science. A planned follow-up CFD workshop is to be held in the summer of 1996, in conjunction with the Second International Symposium on Computational Wind Engineering, scheduled to be held at Colorado State University in August 1996.

Concluding Remarks

The response by the wind engineering community to the initiatives undertaken by the IWEF has been encouraging. It is hoped that future activities of the IWEF will attract wider participation of wind and structural engineers, architects and other professionals dealing with wind and its effects.

For more information regarding the IWEF, contact:

INTERNATIONAL WIND ENGINEERING FORUM

Colorado Sate University, Engineering Research Center
Fort Colleens, Colorado 80523, USA,
FAX: (970) 491-8200
or
Japan Association for Building Research Promotion
5-26-20 Kenchiku-kaikan, Shiba, Minato-ku, Tokyo, 108 JAPAN
FAX: 03-3453-0428

Ed. Note: Thanks to Profs. B. Bienkiewicz, T. Ohkuma and K. Fujii for providing this information- JRM

The Wind Engineer

PRESIDENT.....Dr. Ahsan Kareem
EDITOR.....Dr. James R. McDonald, P.E.
Department of Civil Engineering
Box 41023
Lubbock, TX 79409-1023
(806) 742-3476
ASSISTANT EDITOR.....Ms. Kimberly K. Aycock

Published periodically by the
American Association for Wind Engineering
P.O. Box 1159
Notre Dame, IN 46556-1159
Phone: (219) 631-6648
FAX: (219) 631-9236
E-mail:KAREEM@NAVIER.CE.ND.EDU

UPCOMING CONFERENCES AND MEETINGS

AAIII

The Third International Colloquium on Bluff Body Aerodynamics and Applications,
Donaldson Brown Hotel and Conference Center,
Blacksburg, Virginia, USA, J
July 28 - August 1, 1996.
Contact: Dr. M.R. Hajj
Organizing Secretary
Phone: (703) 231-4190
Fax: (703) 231-4547
E-mail: hajj@vtml.cc.vt.edu

CWE 96

The 2nd International Symposium on Computational Wind Engineering,
Colorado State University,
Fort Collins, Colorado, USA,
August 4-8, 1996.
Contact: Office of Conference Services
Colorado State University
Fort Collins, CO 80523-8037
Phone: (970) 491-7501
Fax: (970) 491-3568
E-Mail: ocsreg@nt.sc.colostate.edu

IVAPSOWE

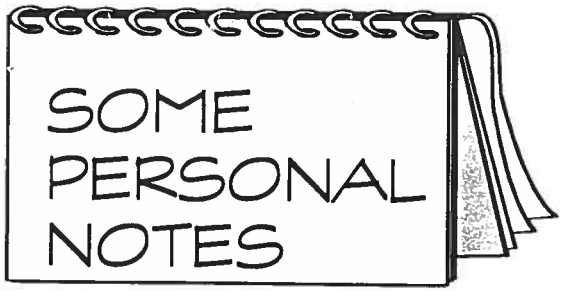
The 4th Asia - Pacific Symposium on Wind Engineering ,
ANA Hotel, Surfers Paradise,
Gold Coast, AUSTRALIA,
July 14-16, 1997
Announcement and call for papers.
Contact: Sally Brown
IVAPSOWE Secretariat
ICTE Conference
The University of Queensland
Brisbanc, Queensland
AUSTRALIA 4072
Phone: 61 7 3365 6360
Fax: 61 7 3365 7099
E-mail: sally@ceu.uq.oz.au

4ISRT

4th International Symposium on Roofing Technology, National Institute of Standards and Technology, Garthersburg, Maryland, September 17-19, 1997.
Contact: Tom Smith
National Roofing Contractor Association
10255 W. Higgins Road, Suite 600
Rosemont, Illinois 60018-5607
Phone: 847-299-9070
Fax: 847-299-1183

ICOSSAR '97

7th International Conference on Structural Safety and Reliability
Kyoto University
Kyoto, Japan
November 24-28, 1997.
Contact: ICOSSAR '97 Secretariat
c/o School of Civil Engineering
Kyoto University
Kyoto 606-01
Japan
Fax: + 81-75-761-0646
E-mail: icos97@brdgeng.gee.kyoto-u.ac.jp



Prof. Emeritus Arthur N.L. Chiu was installed as a member of the Board of Directors of the Applied Technology Council (ATC) at its quarterly meeting on April 27 in Scottsdale, Arizona. ATC is dedicated to serving the needs of the practicing engineers and has been involved in many large projects related to the earthquake hazard.

AAWE members **Arthur N.L. Chiu**, **Gregory L.F. Chiu**, and **Kishor C. Mehta** were selected to serve on the Building Seismic Safety Council (BSSC) steering council for the development of a National Multihazard Mitigation Council (NMMC). The committee will build a framework to establish the council, whose goal is to integrate the activities of all parties active in mitigation of various natural hazards. The concept of NMMC evolved out of the forum organized and sponsored by FEMA in June 1994.

Dean Flesner, Vice President, State Farm Fire and Casualty Company, will retire in July 1996. Dean has been a very effective spokesman for the insurance industry in building a solid relationship between wind engineers and the insurance industry.

"TWISTER" GENERATES INTEREST IN TORNADOES

The blockbuster movie ***TWISTER*** has generated unprecedented interest in tornadoes this season. Due to this increased public curiosity concerning tornadoes, the news media has featured several stories on tornado chasing and tornadoes in general. In talking to a number of wind engineers, the general consensus is that the movie was entertaining with its spectacular special effects, but contains a good deal of misinformation about the behavior of storms. One cannot help but be amazed by the stars', Helen Hunt and Bill Paxton, ability to remain out in the open during a F5 tornado without sustaining any injuries from flying debris.

In the wake of the movie, several members of AAWE were interviewed by the national press. Joe Golden, Director of the Atmospheric Modification Program, NOAA, and former AAWE Director, was interviewed by Tom Brokaw on NBC and by Ted Koppel on ABC's *Nightline*. Jim McDonald appeared on a segment of the NBC Today Show, as well as a number of local tornado features, these included Dallas, TX, Tulsa, OK, Perioia, IL, and Minneapolis, MN. One of the best appearances was by Tim Marshall, tornado expert and dedicated tornado chaser, on the *Ophra Winfrey* show. Tim appeared with three of the stars of ***TWISTER*** and the director. He had the opportunity to dispel some tornado myths and provide excellent tornado safety tips. All of the programs have featured spectacular films of tornadoes in action.

The publicity and the advice given by the National Weather Service on occupant safety when tornadoes threaten seems to be paying off. The recent tornadoes south of Louisville, KY, in Bullet County destroyed hundreds of homes but there were no deaths and only a handful of injuries. With almost no warning, people knew what to do when the tornado suddenly appeared out of a severe thunderstorm

EIGHTH U.S. NATIONAL CONFERENCE ON WIND ENGINEERING

Every four years the U.S. National Conference on Wind Engineering provides a major forum for the exchange of information and the discussion of recent developments in, and applications of, wind engineering.

The 8th U.S. National Conference on Wind Engineering will be held on the campus of the Johns Hopkins University in Baltimore, MD, June 5-7, 1997. The tranquil 140-acre Homewood campus is just minutes away from downtown Baltimore and all the attractions of the inner harbor. Professor Nick Jones is Conference Chairman. Dr. Jones has a web site for the conference http://www.ce.jhu.edu/~8usncwe/index.html that will contain up-to-date conference information.

For further information on the conference, contact

Dr. Nick Jones
Conference Chair
Department of Civil Engineering
The Johns Hopkins University
Baltimore, MD 21218-2686

Call for Papers

Prospective authors are requested to submit a 2-page abstract by November 30, 1996. The abstract should contain sections addressing the objective of the work presented, the methods employed and conclusions. Submit abstracts to Dr. Jones at the address listed above. Submission by e-mail is encouraged.

Authors of accepted papers will be notified by January 31, 1997 and will be requested to submit a 10-page (maximum) camera-ready manuscript prepared in accordance with guidelines by April 15, 1997. Accepted abstracts will be published on the WWW site before the conference. All invited and contributed papers will be published in a volume of the conference proceedings, to be made available at the time of registration. All papers will be reviewed for possible publication in the *Journal of Wind Engineering and Industrial Aerodynamics* provided they are presented by the authors at the conference.

DON'T FORGET TO PAY YOUR DUES!!!!

WE'VE LOST YOU!!!

Over the last couple of years, we have lost touch with some of our AAWE members because of address changes. If you are on the list below, or know the address of some one on the list, please drop a note to the AAWE office at Notre Dame.

Vit Babuska
Buoh
Vincent R. Bush
Michael Cauldwell
Phil H. Dawson - HDH Associates, P.C.
Ken French Jr.
Mike Gaus
Joe R. Hale
Hart Consultant Group
Hal Ivengar - Skidmore, Owings & Merril
Stephen W. Jones
Richard Kennon - Electric Power Research Inst.
R. Kozlowski
Henry Liu
Timoth E. McCrate- Lorenz & Williams
Caroll E. Marston
John Mehnert
Merril
Franklin Montross, IV
Schickendary
John E. Stout
Jorge Luis Vasquerz
Womsle
R. Wadzinki

AAWE MEMBERSHIP APPLICATION
(Print or type)

Name_____
Title_____
Address_____
City, State, Zip_____
Phone ( )_____

Detach and Mail with Check to: Dr. Ahsan Kareem
Foreign remittance by international money order in U.S. dollars.
American Association for Wind Engineering
P.O. Box 1159
Notre Dame, IN 46556-1159

Check one:	Annual Dues
☐ Individual member	$40
☐ Student Member	$10
☐ Corporate Member	$500

Amount Enclosed $_____

The American Association for Wind Engineering
P.O. Box 1159
Notre Dame, IN 46556-1159

Dr. Leighton Cochran
Cermak Peterka Peterson, Inc
3400 Stanford Road, Unit B210
Fort Collins, CO 80525-2783