THE CHRONICLE OF THE WIND ENGINEERING RESEARCH COUNCIL

the Wind Engineer

Summer 1994

Kareem Elected WERC President

Dr. Ahsan Kareem, Professor of Civil Engineering, University of Notre Dame was elected to a four-year term as President of WERC. He replaces Dr. Dale C. Perry, who held the office the past four years. A graduate of the University of Hawaii, MIT and Colorado State University, Dr. Kareem is internationally known for his research in Wind Engineering. His principal research interest is dynamic load effects on structures through experimental and computational methods. He served on the faculty at the University of Houston prior to going to Notre Dame.

While at the University of Houston, Dr. Kareem was recognized as a Presidential Young Investigator by the White House Office of Science and Technology and NSF. He organized the first "One Year Later Conference," after Hurricane Alicia in August 1984. He also served as general chairman for the Sixth U.S. National Conference on Wind Engineering. The conference was held in Houston, Texas in March 1989.

Another of his significant activities is the ASCE 7 Wind Load Task Subcommittee. He has had an active role in the 1995 revisions of ASCE 7. Among other assignments, he is responsible for developing gust response factors applicable to the 3-second gust wind speed that will be used for design in the 1995 edition of the Standard.

Dr. Kareem brings to the Office of President exceptional leadership qualities, enthusiasm and a strong work ethic. He asks help and support from the membership in molding WERC into a viable and active organization during the next four years.

New Board Members

New Board member Robert Akins is Professor of Physics and Engineering at Washington and Lee University, Lexington, Virginia. Like Dr. Kareem, Akins also received his Ph.D. in the Fluid Mechanics and Wind Engineering Program at Colorado State University. He has worked in the application of wind engineering to wind power as well as wind loadings on structures. Dr. Akins also will serve as Vice President of WERC.

The other three new Directors are Lawrence G. Griffis, Senior Vice President, Walter P. Moore & Associates, Houston, Texas, Dr. Henry W. Tieleman, Professor of Engineering Science, Virginia Polytechnic Institute, Blacksburg, Virginia and Dr. Mark Powell, Research Meteorologist, Atlantic Oceanographic and Meteorological Laboratory, Miami, Florida.

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Insurance Institute for Property Loss Reduction

At an October 27, 1993 press conference, the insurance industry launched a major, new, long-term and comprehensive effort to reduce deaths, injuries and property losses resulting from natural hazards. The occasion was the announcement of the formation of the Insurance Institute for Property Loss Reduction (IIPLR).

The Institute is a transformation of the National Committee on Property Insurance and its Natural Disaster Loss Reduction Committee (NDLRC). The new organization will provide the opportunity to focus on new approaches to mitigation which will benefit both the insurance industry and the insurance buying public. E.L. Lecompte, former NCPI President is CEO of the new Institute.

Calendar of Upcoming Meetings and Events

World Conference on Structural Control
Los Angeles, CA
August 3-5, 1994
Contact: U.S. Panel on Structural Control
c/o Dept. of Civil Engineering
USC
Los Angeles, CA 90089
FAX (213) 744-1426

Second U.K. Conference on Wind Engineering
The University of Warwick
Birmingham, England
September 19-21, 1994
Contact: Paul Freathy
0737-360284

International Conference on Building Envelope Systems and Technology
Singapore
December 7-8, 1994
Contact: Ms Annabel Ooi
(65) 799 5243/FAX (65) 791 6178

Third International Conference on Stochastic Structural Dynamics
San Juan, Puerto Rico
January 1995
Contact: Professor Hamid Davoodi
(809) 832-4040 Ext. 2431

Ninth International Conference on Wind Engineering
New Delhi, India
January 9-13, 1995
Contact: P.N. Godbole
91-1332-72349, Ext. 5416

ASCE Structure Congress
Boston, MA
April 1995

The Sixth Asian Congress of Fluid Mechanics
Singapore
May 22-26, 1995
Contact: Ms. Annabel Ooi
FAX (65) 791-6178

First International Conference on Flow Interaction cum Exhibition/ Lectures on Interaction of Science and Art
Hong Kong
Contact: Professor N.W.M. Ko
Dept. of Mechanical Engineering
FAX 852 8585415

The Fourth International Wood Engineering Conference
New Orleans, LA
October 28-31, 1996
Contact: IWEC '96 Conf. Secretary
Department of Civil Engineering
LSU
Baton Rouge, LA
(504) 388-8698

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Current Board Members

Current Board Members, Dr. Timothy Reinhold, Assistant Professor of Civil Engineering, Clemson University, Clemson, South Carolina and Dr. James R. McDonald, Director, Institute for Disaster Research, Texas Tech University, Lubbock, Texas, will continue to serve for two years.

Outgoing Board Members

Outgoing Board members who served during the past four years are Joseph Golden, Office of Chief Scientist, NOAA, Lynn Beason, Texas A&M University, Joe Calaco, CBM Engineers, Leon Kempner, Bonneville Power Administration, and Ahsan Kareem, University of Notre Dame. Joe Golden held the office of Vice President.

Automated Surface Observing System (ASOS)

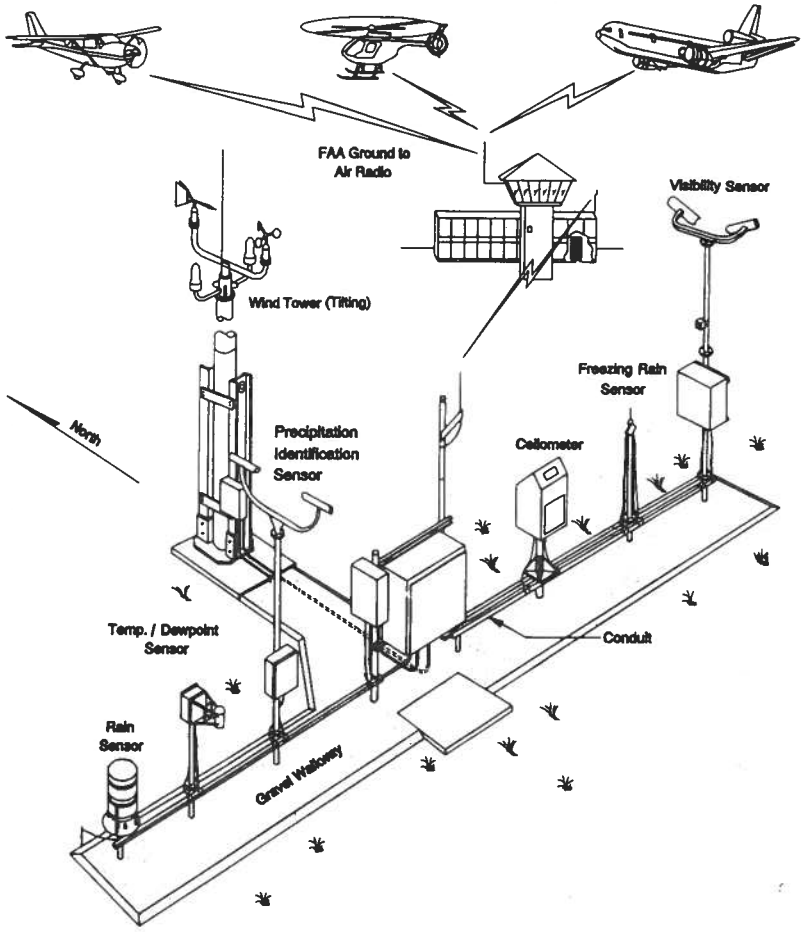
New Automated Surface Observing Systems (ASOS) are currently being installed at over 850 locations throughout the U.S. The ASOS is a joint effort of the National Weather Service, the Federal Aviation Agency and the Department of Defense. When completed in the mid-1990's, the ASOS system will serve as the nation's primary surface weather observing network. ASOS is designed to support weather forecast activities and aviation operations and at the same time, support the needs of the meteorological, hydrological and climatological research communities, including wind engineering.

The ASOS network will more than double the number of full-time surface weather observing locations. ASOS works non-stop, updating observations every minute, 24 hours a day, every day of the year. The ASOS sensors include: closed height, visibility, precipitation identification, freezing rain, pressure, temperature/ dew point, wind direction and speed, and precipitation accumulation.

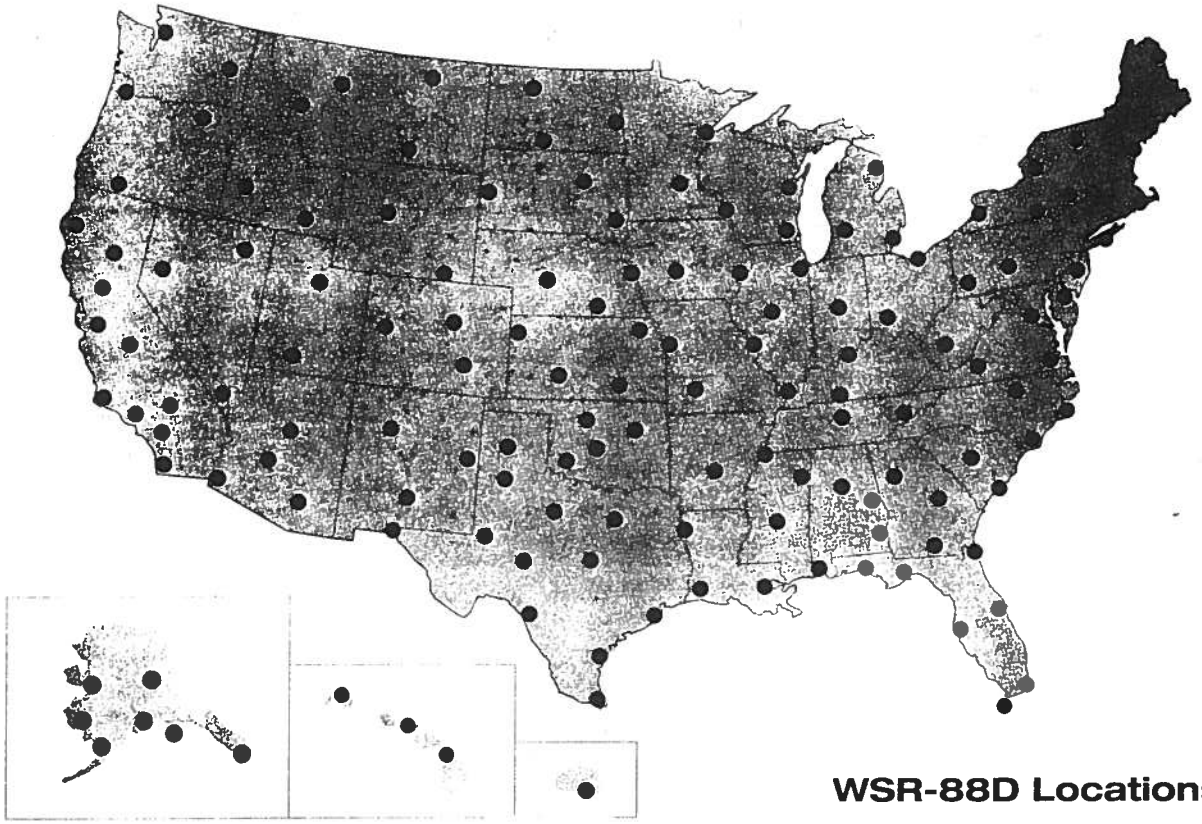
At the urging of WERC, wind speed records are sampled for one-minute and 10 minute averages continuously. These data are archived for climatological future use.

ASOS Features

Observes, formats, archives and transmits observations automatically. When preselected weather element thresholds are exceeded (e.g., the visibility decreases to less than 3 miles), a "special" report is transmitted.



ASOS Sensors



WSR-88D Locations

Weather Surveillance Radar (WSR-88D)

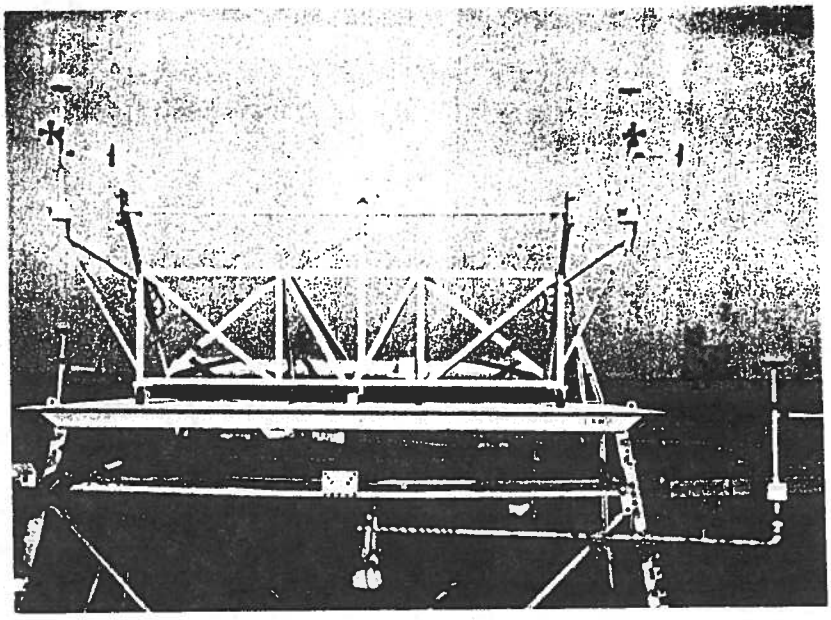
The National Weather Service (NWS) is undergoing a major modernization program to improve the quality and reliability of its products and services. The keystone of this modernization is the new Doppler weather surveillance radar (Model WSR-88D). The program has been referred to in the press as NEXTRAD, (the Next Generation of Radars). The WSR-88D detects severe weather events that threaten life and property, including early detection of damaging winds to estimating rainfall amounts. Perhaps most important, WSR-88D can increase advanced warning of short lived catastrophic events such as tornadoes, down bursts and flash floods.

Using Doppler technology, the WSR-88D calculates both speed and direction of motion of severe storms. By providing data on wind patterns within developing storms, conditions leading to severe weather such as tornadoes can be identified. This means early detection of the precursors to tornadoes, as well as data on the direction and speed of tornadoes once they form.

The NWS anticipates a total of nearly 160 radars to be deployed by the mid-1990's. An integrated network of radars will span the entire United States and its island territories.

"Free-Air-Wind-Tunnel" Research at TLMRC

Electrical conductor drag coefficients are components of the relationship between wind pressure on conductors and wind velocities used in the process to compute conductor wind loads for transmission line design. In general, conductor drag coefficients have been determined by wind tunnel tests. However, significant differences between conductor drag coefficients generated in wind tunnel tests and conductor "drag coefficients" derived from full-scale field load measurements have been reported. Most of these full-scale wind loading experiments measure swing angles and insulator forces on long conductor spans in the open air while wind tunnel tests measure drag force directly on short conductor segments under laboratory conditions. Difficulties arise when attempting to identify the causes of discrepancies in drag coefficients derived from these two different types of testing.



To identify what causes the discrepancies in drag coefficients, the Electric Power Research Institute's (EPRI) Transmission Line Mechanical Research Center (TLMRC) started a multi-phased research program. The first phase of this research was to build a "free-air-wind-tunnel" to measure conductor drag coefficients in the open air with a wind tunnel-like test setup. This experiment was conducted to see if the same drag coefficient can be obtained by measuring conductor loads in open air as were measured in wind tunnel for similar conductor models.

The tests were performed on one smooth cylinder and three conductor models with similar surface roughness. A test frame with necessary instrumentation attached was installed on a platform 20 meters above the ground. Prior to data acquisition, the frame was rotated to a position where the wind direction was approximately perpendicular to the axis of the test specimen. The time length of data recorded was 10 seconds for most of the data collected. The existing wind tunnel drag coefficient data were compared with the drag coefficient data recorded at the TLMRC. In addition, the "free-air-wind-tunnel" was calibrated on a regular basis so that the integrity of the data was maintained over months of testing.

The results of this study show that the drag coefficients from the "free-air-wind-tunnel" agree favorably with those obtained from quality wind tunnel tests in the wind velocity range (< Reynolds No. of 89,000) that the field data were recorded. This implies that wind tunnel drag data are sufficient to determine the drag forces on a short segment of conductor in open air.

The discrepancies between predicted conductor loads and measured loads were not resolved. The variation of wind profile or other factors that do not usually exist in the wind tunnel environment need to be further explored by full-scale testing. As the second phase of the research, a full-scale conductor wind loading experiment is currently being conducted at the TLMRC.

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Guide for Conducting Convective Windstorm Surveys

Wind and structural engineers are sometimes involved in conducting damage surveys following tornado and other severe windstorm events. The National Oceanic and Atmospheric Administration (NOAA) and the National Weather Service (NWS) recently published a very helpful guide. Written by William Banting (NWS) and Brian Smith (NOAA), with input from the Institute for Disaster Research at Texas Tech University and the National Severe Storms Laboratory in Norman, Oklahoma, the document provides information on logistical consideration, an engineering prospective, surveying the damage and other issues. Known as NOAA Technical Memorandum NWS SR-146, the document can be obtained from National Technical Information Service (NTIS), U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia, 22161 (703-487-4650). Accession number PB93-148427.