great achievements

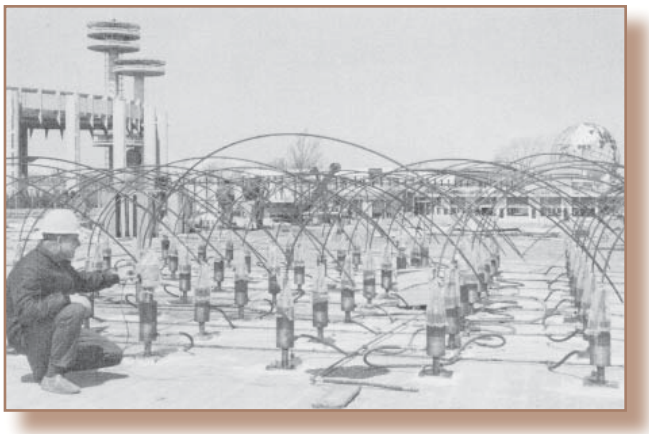
Jack Janney

Structural Failure Investigator Extraordinaire

By Richard G. Weingardt, PE

At the height of his career, the intense but unpretentious man from a small, non-descript municipality at the base of a valley in the rugged mountains of southern Colorado - Jack Raymond Janney - was admired worldwide. He achieved recognition for investigating more structural failures than any one alive, a reputation earned through years of taking daring forks in the road. Because of his daring, Janney became an industry icon. "A bigger-than-life figure," said John Reins, head of WJE's Denver office.

Over his 50-year-plus career, Janney investigated at least 500 major structural collapses and more than 4,000 cases of suspected structural distress. He conducted research and/or supervised investigations for an estimated 7,000 private and public sector clients around the globe. Additionally, he pioneered the use of three-dimensional structure models as design and/or research aids - crucial tools before the advent of sophisticated computers. The exploits of the hero - a brilliant forensic engineer - in the 1984 novel *Skyscraper* by Robert Byrne closely parallel Janney's experiences and reflect his persona.



Jack Janney with testing equipment at site of the 1964 NYC's World Fair (1966)

A second-generation Coloradoan, Jack was born on June 17, 1924 and raised in Alamosa, the eldest child of Charles and Agnes (Disbrow) Janney. During his youth, Jack, his brother Bill and sister Norma helped with family chores - their father owned and operated a dairy and milk bottling plant. Jack's love for mathematics and science drove his decision to become an engineer and, immediately after graduating from Pueblo's Central High in 1942, he enrolled in the College of Engineering at the University of Colorado.

After one semester at college - with the United States fully engrossed in World War II following the horrific bombing of the Pearl Harbor the previous December - 18-year-old Janney enlisted in the U.S. Navy. He became a top-notch pilot, flying dive-bombers in the European theater.

After the war, Jack returned to Colorado where he re-entered the University and married one of his high school classmates, Margaret "Peg" McKay. The couple would have two sons

Jack Janney (standing, center) with his partners Wiss and Elstner - displaying wind tunnel test model - in front of WJE's headquarters, Chicago, IL (1968c)

- Charles (named after Jack's father) and Hugh. Both would become registered professional nurses. While his sons were growing up, Jack was active in their youth groups, especially the Boy Scouts. He also managed little league baseball teams, even after they became adults.

After completing his bachelor's degree in architectural engineering, Janney continued his education, earning his master's degree in structural engineering in 1950. Originally he planed to pursue a career in the aircraft industry, but he changed his plans in 1949 when his graduate-school concrete design professor persuaded him to get a research grant and write his master's thesis on prestressed concrete - a relatively new product at the time. Jack's thesis became recognized as one of the first comprehensive, in-depth papers written on the subject in the U.S. As a result, the Portland Cement Association (PCA) quickly hired him to head up its research on prestressed concrete at its new laboratory in Skokie, Illinois. His work at PCA from 1950 to 1956 strengthened his interests in research and testing, while clearly establishing him as a leading expert on prestressed/precast concrete design, fabrication and construction.

In May 1956, Jack formed his own company - Janney and Associates, consulting engineers. As one of his first significant commissions, he consulted on the creation of plants to

Bailey Crossing Apartments Crash, Washington, DC (1973).

manufacture precast, prestressed concrete girders for 185 bridges to be used on the Illinois Toll Highway System. Because these types of girders were firsts for Illinois, Jack was subsequently hired to consult during the construction of the project and to load test prototype bridges.

Shortly after, Janney convinced his neighbor Jack Wiss that consulting engineering had great business possibilities and the two became partners. They renamed Janney's firm Wiss, Janney and Associates - Wiss's name first because, Janney joked, "Wiss was older." In 1959, Dick Elstner joined the two Jacks and the firm took on its current name, Wiss, Janney, Elstner Associates (WJE). Still headquartered in the Chicago area, WJE has several successful branch offices scattered around the country today.

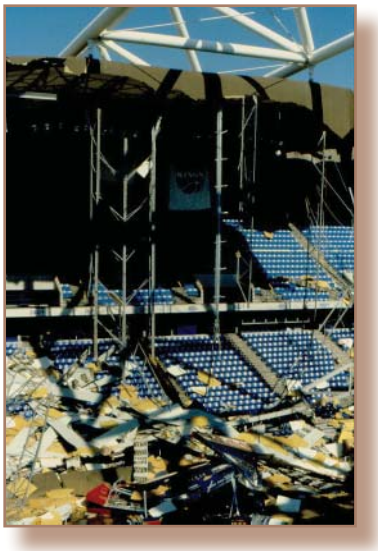
In WJE's early years, its engineers pioneered the use of scale models for determining the distribution of strains and stresses. From 1958 to 1969, they performed more than 60 structural scale-model studies on landmark structures, among them Chicago's First National Bank, O'Hare International Airport's elevated roadway and the U.S. Air Force Academy's three-dimensional truss roofs in Colorado Springs.

Rosemont Stadium Crash, Chicago, IL (1979).

In 1966, the National Academy of Science (NAS) retained WJE to conduct full-scale load tests - some to destruction - on buildings at the site of the 1964 New York World's Fair. "This NAS assignment put WJE on the map," said Janney. It established the firm's reputation as forensic experts internationally as well as nationally.

In its June 20, 1972 issue, *Engineering News Record* (ENR) portrayed the three partners on the cover for a story. It featured WJE's accomplishments and a number of its high-status assignments including:

- Wind loading measurements on Chicago's John Hancock Center to establish engineering data for the structural design of the 110-story Sears Tower then underway by SOM's Fuzlar Khan.
- Building performance studies for Chicago's 1000 Lake Shore Drive structure that, when completed at 602 feet in 1965, was the tallest reinforced concrete building in the world.



Kemper Arena Roof Failure, Kansas City, MO (1979).

Hartford, Connecticut Civic Center Collapse (1978).

- A 1:10 scale model of the hyperbolic parabolic roof for the Trans World Airlines (TWA) maintenance hangers at Kansas City's international airport - the largest micro-concrete model.

Listed in WJE's vibrant portfolio of notable assignments is its structural integrity tests on the containment vessels for most of the nuclear power plants constructed in the United States.

Ten representative structural disasters investigated by Janney in his heyday include Pleasant Silver Bridge collapse (1969), Chicago, Illinois; Bailey Crossing Apartments crash (1973), Washington, DC; Cooling-tower scaffolding failure (1976) at the Willow Island Nuclear Plant in West Virginia; Civic Center Coliseum collapse (1978), Hartford, Connecticut; Rosemont Stadium failure (1979), Chicago; Kemper Arena roof failure (1979), Kansas City, Missouri; MGM Hotel fire (1980), Las Vegas, Nevada; Harbor Cay Condominium collapse (1980), Cocoa Beach, Florida; Hyatt Regency Hotel walkway failure (1981), Kansas City; and Cline Avenue Overpass collapse (1982), Chicago.

Janney's involvement in professional organizations included years of service on the Research Council on the Performance of Structures for the American Society of Civil Engineers (ASCE). He was also an original member of the joint ASCE/American Concrete Institute (ACI) committee charged with formulating code provisions for prestressed concrete requirements in the ACI Building Code.

In addition to his participation in ASCE and ACI, Jack was active in the Prestressed Concrete Institute (PCI), National Society of Professional Engineers (NSPE) and the American Society for Testing and Materials (ASTM), serving as chair of a number of committees in each. He also served on the board of directors for both ACI and PCI. In his most active years, he was a registered professional engineer in six states.

Janney's pioneering book *Guide to Investigation of Structural Failures* (ASCE Press 1979) remains a landmark text in the industry. His articles written for ASCE's Special Technical Publications Division remain industry trendsetters,

while his paper presented at the 1983 World Conference of Prestressed Concrete received PCI's State-of-the-Art Award for 1983.

Although Janney retired from WJE at the young age of 56 and returned to Colorado in 1980, he remained on its Board of Directors and continued as a consultant to the firm. In addition to staying active in the profession, he became a key member of the Charlou Water District and a leader on the Board of Appeals for Cherry Hills Village (an exclusive township near Denver where he lived).

In the chaotic days after the Hyatt Regency Walkway Collapse, many structural engineers were left high and dry with regard to obtaining errors and omission insurance at affordable prices. So, in the late 1980s, Janney joined forces with insurance guru Roy Vince to help form Architects and Engineers Insurance Company (AEIC) - a risk-retention group offering affordable errors and omissions insurance. Jack was instrumental in establishing AEIC's quality control and risk management standards and, for 15 years, was one of its main peer reviewers for acceptance of A/E firms into AEIC.

Around the time of the Hyatt disaster, Janney became an enthusiast of alternate dispute resolution procedures to resolve construction and engineering problems, and has served as an expert on numerous dispute review boards (DRBs) since. His reasoned, pragmatic thinking as an arbitrator and/or mediator on a wide array of construction disputes over the last three decades has helped defuse many difficult lawsuits. Among his successful DRB cases are the innovative concrete structures on I-70 in Glenwood Canyon, Colorado, and the spectacular Natchez Trace Bridge in Tennessee.

In the mid 1990s, Jack wrote a paper "Small Project Dispute Review Boards: An Affordable Alternate to Resolve Construction Disputes" (*The Punch List*, Fall 1995), co-authored with Don Pyle, that outlines how to make the procedure effective for small as well as large projects.

Janney received many professional honors throughout his life including the following: Distinguished Engineering Alumnus from the University of Colorado (1985), John F. Parmer from the Structural Engineers Association of Illinois (2000), Forensic Engineer of the Year from the Technical Council on Forensic Engineering (1991) and Civil Engineer of the Year from the Chicago Chapter of ASCE (1979). In 1991, Jack was elevated to Honorary Member status in ASCE.

Engineering News-Record (ENR) twice honored Janney with its "Those Who Made Marks" designation - in 1967, for his full-scale testing (to failure) of several buildings at the New York World's Fair and, in 1982, for innovations employed in the rehabilitation of Chicago's Soldier Field. In 1999, he was named by ENR as one of the world's top 20 structural engineers of the last 125 years.

A quiet, thoughtful man with a ready smile, Jack has been a fatherly role model and patient mentor for young engineers, especially those passionate about leading-edge design and research.

Kansas City Hyatt Regency Hotel walkway failure (1981).

Cline Avenue Overpass failure, Chicago, IL (1982).

Impressed with structural engineers who dare to push the envelope and improve the industry, Jack was always quick to praise his peers. At the top of his list of highly thought of leaders was his close friend Fuzlar Khan. Of him, Janney said, "He [Khan] was the finest engineer I've ever known." Jack also greatly admired inventive engineers like Lev Zetlin, saying, "He [Zetlin] was one of the most innovative structural designers of the 20th century, by far."

In 2003, Jack suffered a stroke, and he and Peg moved to Lawrence, Kansas, to be near their son Hugh who is active in the medical profession.▪

Schoharie Creek Bridge failure (1987).

Richard G. Weingardt, PE is CEO of Richard Weingardt Consultants, Inc., Denver, CO. He is the author of eight books. His latest, Engineering Legends, which is being published by ASCE Press and is due out in early 2005, features many great structural engineers. Weingardt was the 1995-96 national president of ACEC.

Photos provided by Wiss Janney Elstner Associates, Inc., Denver, Colorado