Before we begin, use this QR code to pull up the NSPE Code of Ethics.





Providence

OUR MISSION

Focus on our clients' best interests and provide the highest quality services and products with integrity, innovation, and excellence.

OUR TEAM

Our engineers, scientists, and staff collaborate to develop innovative, costeffective solutions for clients across diverse industries.

OUR SOLUTIONS

Our company name, by definition, means "making provisions for the future" — this approach guides our work on every client project.



Senior Air Quality Engineer

ROBYNN ANDRACSEK, **PE**, is a Senior Air Quality Engineer for industrial and utility clients. She assists clients in securing operating and construction air permits for their projects. Robynn also conducts regulatory interpretations, historical and compliance audits, emission calculations, and other critical air permitting issues. Her specialties include PSD Netting, routine maintenance, and dispersion modeling. She brings 26 years of experience and has worked closely with state agencies, including multiple face-to-face meetings and extensive phone and e-mail communication. Robynn has a well-developed reputation for providing quality applications and being able to constructively work through the draft application negotiations process at the state agencies with which she's worked. Robynn is a prolific writer and frequently requested speaker on a variety of permitting and engineering topics.

Robynn is an adjunct instructor at the University of Kansas, teaching Air Quality and Engineering Ethics.

She is a licensed Professional Engineer in LA, TX, FL, KS, GA, MN, IN, UT, NE, and MO.





ETHICAL FAILURES







ENGINEERS, IN THE FULFILLMENT OF THEIR PROFESSIONAL DUTIES, SHALL:

- 1. Hold paramount the safety, health, and welfare of the public.
- 2. Perform services only in areas of their competence.
- 3. Issue public statements only in an objective and truthful manner.
- 4. Act for each employer or client as faithful agents or trustees.
- 5. Avoid deceptive acts.
- 6. Conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession.



https://www.nspe.org/sites/default/files/resources/pdfs/ Ethics/CodeofEthics/NSPECodeofEthicsforEngineers.pdf



NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

Volkswagen Clean Air Act Violation (2015)

The first corrupt step often begins with thinking a requirement is too hard or unfair... \$1.45 billion civil penalty







Louisiana's VW Settlement funding will put an additional **117 Propane school buses** on the road. These buses will contribute to a NOx reduction of approximately **137 tons** over their lifetime. That's **61% cleaner than diesel buses**.





- A product engineered to deceive
- Software sensed when it was in test mode and lowered NOx emissions
- One second after the end of the test, "low NOx temperature conditioning mode" ended



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https://www.nspe.org/sites/default/files/resources/pdfs/ Ethics/CodeofEthics/NSPECodeofEthicsforEngineers.pdf



NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

- World's tallest waterslide
- Child died (caught in overhead "emergency" net)
- Designer had no engineering credentials
- Two people charged with second-degree murder
- Charges dropped due to prejudicial evidence (Travel Channel show)

Judge stated designers couldn't have broken any ride safety laws because the state of Kansas had such lax regulations.





ENGINEERS, IN THE FULFILLMENT OF THEIR PROFESSIONAL DUTIES, SHALL:

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https://www.nspe.org/sites/default/files/resources/pdfs/ Ethics/CodeofEthics/NSPECodeofEthicsforEngineers.pdf



NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

LA Rev Stat § 37:700 (2022)

A. The board shall have the power to take enforcement action against any non-licensee or non-certificate holder found by the board to be guilty of any of the following acts or offenses:

1. (1) Practicing or offering to practice engineering or land surveying in the state of Louisiana without being licensed in accordance with the provisions of this Chapter.



"In terms of loss of life and injuries, this was the most devastating structural collapse ever to take place in this country."

(National Bureau of Standards)









WRONG THEORIES:

- 1. Swaying from dancing
- 2. Poor workmanship in welding
- 3. Math error
- 4. Not built as designed
- 5. Design not properly reviewed
- 6. Project was rushed

WHAT REALLY HAPPENED:

Engineer sealed drawings without checking to see if the design could hold the stresses





The Hyatt Construction Team





Engineer's Framing Plan

4th Floor Bridge



First Chance: No math done on original design by structural engineers

DETAILS 10 & 11 Sheet S405.1





FABRICATOR'S DILEMMA





FABRICATOR'S DILEMMA





FABRICATOR'S DILEMMA 4th Floor Connection







DUNCAN' SOLUTION

Second Chance: No math done on revised design by structural engineers



SHOP DRAWING REVIEW AND APPROVAL





ORIGINAL SINGLE-ROD DESIGN CONCEPT

REVISED TWO-ROD CONNECTION DESIGN

WEIGHT OF SKYWALK SPAN

4 spans x 17,960 lbs. = approx. 36 tons
2 skywalks x 36 tons = approx. 72 tons





FRAME OF REFERENCE

72 Tons Equals:





SKYWALK ASSEMBLY





SKYWALK ASSEMBLY



PROVIDENCE

SKYWALK ASSEMBLY





EVENTS TIMELINE

- 2/22/78: Construction begins
- 8/24/78: Structural documents issued
- 2/79 WRW calls Havens; Havens calls Dan Duncan re: discrepancy in design
- 2/26/79 Shop Drawing approved
- Architect Herb Duncan voices concern over change; he is assured that change is safe and does not affect structural integrity.
- June 1979 Kemper Arena roof collapses

Third Chance: Questioned by Architect - No math done by structural engineers



KEMPER ARENA COLLAPSE

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PITTSBURGH (UP) Gare warried about wheth be could make the Los Angele Dedgers' star-studded ross as a rehever, rooke Ro Sutchiffe now faces the task. trying to help hold the tw Lengue champion lea logether during a critic shortage of healthy and o perionced starting pitchers, fi's a tough situation, b Subcliffe is thriving on it evidenced by the four-hit en-plote game be pitched Mond night in a 4-2 victory over 1 Pitisbargh Pirates that bro the Dodgers' three-game is ing streak. The victory ga Rookie tosses s United Pross International Rockie Randy Niemer may be balling opposing h ters during his first go arous in the National League, but I knows they'll be ready for h next time. Niemann, who pitched h IICINED BY RAIN Aenal new they source the most of Actual view hey source the most of Kompor-Arcturin Kaneau Coy, Mo. atter in vehapsed Minday due to beary rais. The root of verrugated resolution are not gravelieft plos of rubble bleet deep is the arena. An interior merking of this access condition Niemann, who pitched b first major-league comple game last week against Ci cinnath, fossed a six-hilter earn hes first shutout as i Astros defeated ti Philideiphia Phillies, 3-0, 1 heir seventh thingish idense before of the areas (right) shows use of the areas (right) shows use of the few things left shardong after the collapse - an American Itag - along with a EChanner (UPI) their seventh straight victo "Right now my pliches a new to them," said Nieman who refies on a slow curve a a sinker to bail him out of tig Major spots "But the next time, might be expecting it. standings its! the what harnen Philadelphia Manager I ny Otark was nel overly pressed with Niemann and was even less impressed w National League East W L Pet. 29 18 517 27 19 587 28 28 338 25 29 38 338 25 29 38 40 NHL-W **Abortineal** St Louis Phila Pillsbyth Chicago New York may be WENL POL GB ¹NASSAU, Bahamas (UF - Hopefully, Winnipeg, E mouton, Quebec and Hartle Houston Circi Los Ang San Fran Mariners rout Tigers, 33 23 .589 29 24 .347 haven't tried on their Nata Hockey League uniforms

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structural failures of such sary to cut down the weight of infi

buildings are a symptom of a the roof to build them. But a Ric



EVENTS TIMELINE

- 8/8/79 construction of skywalks starts
- 10/14/79 A portion of atrium roof collapses
- Owner & Architect direct Gillum-Colaco to check the design of all atrium steel
- Owner's rep asks Dan Duncan to inspect steel in bridges, including the connections
- Dan Duncan reports "Everything in the atrium checked out very well."
- 12/12/79 Meeting with Owner, Architect and Engineer. Minutes show engineers had checked all "steel-to-steel" connections
- July 1980 Hyatt Regency Hotel opens
- Feb. 1981 A drywall worker observes deflection in box beam connections; He sees no significance and tells no one.



Forth Chance: Hired to doublecheck all steel-to-steel connections- No math done by structural engineers

THIRD FLOOR – DEFLECTION ON CONNECTION THAT DID NOT FAIL







EYEWITNESS ACCOUNTS OF WHERE PEOPLE WERE AT TIME OF COLLAPSE



PROVIDENCE











114 people killed216 people injured

NBSIR 82-2465

INVESTIGATION OF THE KANSAS CITY HYATT REGENCY WALKWAYS COLLAPSE

R. D. Marshall E. O. Pfrang E. V. Leyendecker K. A. Woodward

Center for Building Technology National Engineering Laboratory

R. P. Reed M. B. Kasen T. R. Shives

Center for Materials Science National Measurement Laboratory

U.S. DEPARTMENT OF COMMERCE National Bureau of Standards Washington, DC 20234

February 1982

U.S. DEPARTMENT OF COMMERCE, Malcolm Baldrige, Secretary NATIONAL BUREAU OF STANDARDS, Ernest Ambler, Director

FEBRUARY 1982

"It is concluded that the most probable cause of failure was insufficient load capacity of the box beam-hanger rod connections."

TEST RESULTS

- Box beam buckling at just 7,500 lbs. applied load
- Failure load at 20,500 lbs.
- Design capacity should have been 65,000 lbs.
- Design off by 800% +

"Two factors contributed to the collapse:

1) inadequacy of the original design;

2) a change in hanger rod arrangement during construction that essentially doubled the load at the fourth-floor walkway."

April 1982: Jackson County Prosecutor initiates criminal investigation February 1983: U.S. Attorney joins criminal investigation of manslaughter

May 1983: Gillum-Colaco changes name to GCE International, Inc.

1984: Eldridge & Son forfeits charter

February 1984: Mo. Atty. Gen. files complaints against Gillum, Duncan and GCE International with State Board

July-Aug. 1984: Hearings held for 26 days; 6,000 pages of testimony

i ai mai carcarenne ni and with the Women's Club of our national survival than Belle Vernon. any foreign enemy is corrup-

Engineers say Hyatt walkway design poor

- A lawyer says two hotel's lobby, several Kansas ion engineers hired to investigate City attorneys questioned the ips the fatal disaster at the Hyatt move, asking why the ges to Regency Hotel believe the massive task was done in the collapsed skywalks were dead of night without any an-CY. nd destined to fall.

ise a Kansas Cily law firm that torney who has filed two has filed suit on behalf of the lawsuits in connection with ien lak engineers hired by the firm removal of the skywalk a enby believe the skywalks were time bombs just waiting to take away a major exhibit collapse. that might have revealed urt ak- collapse

ade red

dumped tons of steel and con- other skywalks.") it crete on close to 2,000 people attending a popular tea dance, killing 111 and injur- turned out to be a major piece ing ing 186

reluctant to explain their findings until their investigation is complete, they believe the said the removal of the general structural design of skywalks probably was a the rods and beams used to good idea to ensure safely, he support all three skywalks was inadequate. on

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Johnson said Lee Lowery. an engineering professor at Texas A&M, reported an examination of the third skywalk conducted before it was taken down by hotel officials proved even that walkway was deteriorating gradually.

Of the six support rods used to suspend the walkways, two were badly bent out of shape, Johnson said. All six rods were deformed in some way. "We believe the third

skywalk could have fallen at any time," Johnson said. "Whether that skywalk had two people on it or 50, it would have gone eventually. The

KANSAS CITY, Mo. (UPI) remaining skywalk from the nouncement

Lynn Johnson, a partner in Clayton Chittim, an atfamily of a victim, said two the Hyatt disaster, called the "thinly disguised attempt to The collapsing skywalks what went wrong with the

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'In my view, they destroyed what could have of evidence to show what hap-Although the engineers are pened with the two skywalks," Chittim said.

> Although attorney Johnson protested the secrecy surrounding the move. Such secrecy could prompt observers to question whether Hyatt officials and the owners of the Hyatt building are cooperating as fully as possible with the many investigations under

way, he said. Debris from the two walkways that collapsed, and the sections of the third that was removed Thursday will be maintained by Crown Center in a secure condition under the terms of an agreement approved Friday by the Circuit Court of Jackson County.

The agreement, which authorizes Crown Center to

Hyatt skywalk engineers face disciplinary hearing

By Pam Auchmutey Editor

For most engineers, the term "structural integrity" refers to the soundness of building members and their connections in any construction project.

But the term has taken on a deepermeaning in the long aftermath of the collapse of the Kansas City Hyatt Hotel skywalk. Although the disaster occurred 41/2 years ago, the incident has stirred engineers to reflect upon who is ultimately responsible for a building's structural design.

Two engineers in particular have borne the brunt of that very question. Shortly before Thanksgiving, a Missouri administrative hearing judge ruled that the two men - Jack D. Gillum and Daniel M. Duncan of the St. Louis firm GCE International Inc. were negligent in their review of shop drawings of the double hanger rod box. beam connections which gave way on

the skywalk in July 1981, killing 114 people and injuring more than 200.

Now the engineers face a disciplinary hearing before the Missouri Board of Architects, Professional Engineers and Land Surveyors (which originally brought charges against the engineers) on January 22. At that time, the engineers and the state will testify in what is expected to be a twoday hearing. The engineers could file an appeal in the state courts, depending on the board's decision.

In his November 1985 ruling, Judge James B. Deutsch recommended that Gillum and Duncan be disciplined for "gross negligence, misconduct and unprofessional conduct" in the practice of engineering.

"The decision indicates that the engineers showed a conscious disregard for the safety of the public," said Attorney General William L. Webster, whose office represented the Missouri See HYATT page 14

Hyatt engineers' defense: Industry practices at fault

By Rick Alm staff writer.

coording to the Hyatt Regency hotel's structural engineers, the nation's construction industry, not they, should be made to answer charges of negligence that led to the collapse of the hotel's sky walks.

"It happened. It was unfortunate. It was tragic," said Daniel M. Duncan. Mr. Duncan is one of the two St. Louis structural engineers facing the possibility of a career-ending license revocation.

"They pointed a finger at us. But the real problem that has to be looked at is the process by which we build large projects in this country," he said in an interview last week.

Blame for the tragedy that claimed 114 lives three years ago has been aimed only at Mr. Duncan, Jack D. Gillum and their firm, GCE International Inc., by a state licensing board that regulates the profession.

A 25-day hearing into the allegations

is expected to conclude Monday or Tuesday in Jefferson City-at the Harry S. Truman State Office Building, which also was designed by the Hyatt's engineers and which also utilizes sky walks.

One of the most troubling revelations to emerge from the hearings, held until now in a suburban St. Louis courtroom, has been the repeated testimony from other engineers that current practices in the construction industry "breed mistakes" that often are never detected.

Ticking away

Experts at the hearing-including some called by the state-testified that socalled "fast track" construction methods, developed over the last decade to speed up design and construction work in order to cul owners' costs, inevitably demand a price in quality control.

The process, they said, has made narrow specialists of many in the industry. As the evidence in the Hyatt case has shown, legal responsibility for construc-

See Hyatt, pg. 37A, col. 1

The McGraw-Hill Construction Week! November 21, 1985

ENR News

Hyatt engineers found 'guilty' of negligence

The two St. Louis structural engineers licensing board, says the finding "is a who designed the Hyatt Regency hotel personal tragedy for Dan Duncan and who designed the Hyatt Regency hotel walkways showed "conscious indifference" to their professional duties, a Missource judge ruled last week. They should be punished for the 1981 collapse in Kansas City that claimed 114 lives, he said.

Jack Gillum. But it will do a lot toward straightening out confusion in the industry. In a written statement issued hours

als ... that the structural engineer is re-

does not design all items nor is he on

the job site with authority to control the

Blame. The ruling is the only declara-

tion of blame for the Hyatt tragedy that

quality of construction."

Walkway collapse

The two engineers, Jack D. Gillum

after the report was made public, Gillum and Duncan said, "We are shocked and dismayed by the findings. We con-

cled and diamayed by the findings.

and Daniel M. Duncan, as well as their firm, GCI International, Inc., abdicated formed to the highest standards of their responsibility to review shop draw- professional conduct. ings of the critical steel-to-steel connections that failed, said James B. Deutsch, Missouri administrative law judge. The decision comes 14 months after the conclusion of a 20-day hearing into allegations of gross negligence and misconduct (ENR 9/27/84 p. 10). The charges were leveled in 1984 by the Musouri Board for Architects, Professional Engineers and Land Surveyors. The engineers could lose their licenses to practice in the state. The board is expected to schedule a

two lawsuits, of the hundreds filed by disciplinary hearing before the end of victims and others, have now been actded out of court. No civil court jury was the year. It will determine, based on the ever asked to consider evidence on the sudge's findings, whether to reprimand cause of the collapse. In 1983, a grand the engineers, suspend them from pracjury in Kansas City cited a lack of evitice or permanently revoke their lidence in declining to naue indictments censes. Revocation in Missouri could lead to revocation in other states. for criminal negligence. In his 442-page ruling, Judge Patrick McLarney, an attorney for the

END/November 21, 1985

tinue to believe we have always con-

The decision appears to be telling Connection through box beam was inadequal design and construction profession-

Deutsch, however, said he found evisponsible for each and every item of dence of deliberate traud on the part of design, fabrication and construction the engineers. even though the structural engineer

In 1979, while the hotel was still under construction, a section of the atrian roof collapsed. At that time, the engineers were asked to undertake a complete design review of all structural elements in the atrium lobby where the has been or is likely to be made. All hut walkways were located. The judge said evidence showed that some structural elements were checked, but the complete review pledged by the engineers was not done.

Gillum's "later conduct in misreper senting that he had in fact done such a complete design review when he had not was worse than unacceptable and

BEFORE THE

ADMINISTRATIVE HEARING COMMISSION

STATE OF MISSOURI

MISSOURI BOARD FOR ARCHITECTS, PROFESSIONAL ENGINEERS AND LAND SURVEYORS P.O. Box 184 Jefferson City, Missouri 65102

Petitioner,

Case No. AR-84-0239

DANIEL M. DUNCAN, JACK D. GILLUM and G.C.E. INTERNATIONAL, INC. 100 North Broadway St. Louis, Missouri 63102

vs.

Respondents.

STATEMENT OF THE CASE, FINDINGS OF FACT, CONCLUSIONS OF LAW AND DECISION

Statement of the Case

This matter appears before the Administrative Hearing Commission upon a Complaint filed February 3, 1984, a First Amended Complaint filed June 8, 1984 and a Second Amended Complaint filed July 23, 1984 by Petitioner, Missouri Board for Architects, Professional Engineers and Land Surveyors. Petitioner seeks a determination that the certificates of registration held by Respondents Daniel M. Duncan and Jack D. Gillum and the certificate of authority held by Respondent G.C.E. International, Inc., are subject to discipline pursuant to Section 327.441 RSMo 1978. In its Complaint, Petitioner charges Respondents with

November 15, 1985

to Respondent G.C.E. International, Inc. and its licensed status pursuant to Section 327.441 RSMo 1978.

ORDER

It is the decision of this Commission that Petitioner has established that cause for discipline exists under Section 127.441, RSMo 1978, to suspend or revoke the certificates of registration of Respondents Daniel M. Duncan and Jack D. Gillum and the certificate of authority of Respondent G.C.E. International, Inc., for gross negligence, misconduct and unprofessional conduct in the practice of engineering.

WHEREPORE, it is the Order of this Commission that, pursuant to Section 621.110, RSMo Supp. 1984, Case No. AR-84-0239 is dismissed from the docket of this Commission, effective this date. SO ORDERED this 15th day of November, 1985.

tomes B. Dentard

HON. JAMES B. DEUTSCH Commissioner

-442-

"While the engineer may properly delegate the work of performing engineering design functions, he cannot delegate his responsibility for the structural engineering design where it concerns professional engineering functions. This responsibility is not delegable."

"Duncan's failure to even look at or analyze the connections shown on the Shop Drawing 30, constitutes gross negligence ... and demonstrates a conscious indifference to his professional duties."

ASCE board suspends engineer-

The Board of Duestion of the American Society of Guid Engineers has suspended Jack D. Gillum for three years for violating a lunchamental capon of the society's code of ethics, that "engineers shall hold paramount the safety, health

7. The Alabama Board ordered that Respondent's registration practice engineering be revoked. | Said Findings of Fact and Conclu Law and Order are attached as Exhibit B.

8. On July 17, 1987, the Colorado State Board of Registration for Professional Engineers and Professional Land Surveyors filed a Stipulation. Surrender of Certificate of Registration, and Order in its disciplinary case against Respondent.

IT IS FURTHER ORDERED:

That the Wisconsin Examining Board of Architects, Professional Engineers, Designers, and Land Surveyors; Professional Engineers Section accepts the voluntary surrender of Jack Dean Gillum's certificate of registration to practice engineering.

IT IS FURTHER ORDERED:

That Respondent may never apply or reapply for registration in the State of Wisconsin without prior approval of the Board and that if the Board withholds approval it shall not be considered a denial of a license within the meaning of Wis. Stats. sec. 227.01(3)(a) and shall not entitle Respondent to a hearing on the Board's decision not to allow Respondent to apply for a certificate of registration.

Court OKs pulling of Hyatt engineers' licenses

By Rick Alm staff writer to block action by state the order.

officials that strips the professional licenses from the two engineers who designed the Kansas City Hyatt Regency hotel and its sky walks. The decision Tuesday by Cir- had been "grossly negligent" in cuit Judge Jack L. Koehr permits their design work. The 1981 col-

the Missouri Board for Archi-tects, Professional Engineers blamed on a design flaw, killed and Land Surveyors to act imme- 114 persons. diately on its Jan. 22 decision to

revoke the licenses of engineers Jack D. Gillum and Daniel M. Duncan, both of St. Louis, while law judge's findings on several

heir appeal is pending. Lawyers for the engineers vagueness of the civil charges this, and that's long enough." their appeal is pending. could not be reached for comagainst them, which Judge Koehr St. Louis judge has refused ment on whether they will appeal rejected, said John Murphy, a

Kansas City lawyer hired to rep-Following a lengthy hearing in resent the state board. 1984 and 14 months of delibera-"They (the engineers) had tion, a state administrative law argued there was no threat judge and the licensing panel against public safety" if they determined that the engineers were allowed to continue to practice during the appeal, Mr. Murphy said today after learning of

Judge Koehr's decision. In February the engineers

appealed the board's revocation Murphy said. "The public inter- engineers are licensed. decision. In it they challenged the est is to see that the engineers

In January, after the board's decision was announced, the en-

gineers voluntarily stopped performing any engineering duties at their firm.

Mr. Murphy said several other elements of the engineers' appeal that questions the law judge's factual findings still must be heard by Judge Koehr.

The Missouri board's revoca-"I argued that the public inter- tion decision is expected to trigest was a broader concern than ger reciprocal revocations in just that of public safety." Mr. about 30 other states where the

MISSOURI COURT OF APPEALS

"Design of connections is, under the [licensing] statute, a matter for which the engineer is responsible. Custom, practice, or 'bottom line' necessity cannot alter that responsibility."

ATRIUM – JULY 1981

ATRIUM – TODAY

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NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

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Volkswagen

https://www.enr.com/articles/39020-engineered-to-deceive

Skywalk

Read the investigative report https://www.nist.gov/node/603536?pub_id=908286

robynnandracsek@providenceeng.com

CONTACT ME