

SOLUTION FOR HOMEWORK NO. 2 (ETHICS CASE STUDY)

ETHICAL DECISION (ASCE)

SITUATION: In July 1980, the Hyatt Regency Hotel in Kansas City, Missouri, opened for business, boasting among its design features a multistory atrium with three suspended walkways—a fourth-story walkway spanning directly above a walkway on the second floor, with a third-story walkway offset by a few meters. One year after the opening, the walkways on the second and fourth stories collapsed under the weight of partygoers, killing 114 people in one of the most devastating structural failures in U.S. history in terms of lives lost.

The collapse was traced to failure of the connections between the fourth-story box beams and the hanger rods supporting the second-story and fourth-story walkways. An investigation revealed that the original design sketches had called for the two walkways to be suspended by a single set of hanger rods threaded through the upper walkway box beams and terminating beneath the box beams of the lower walkway. Although that design proved to be in violation of Kansas City's minimum load requirements, the primary cause of the failure was a change from the original design to a double-rod system, one hanger rod connecting the ceiling to the upper walkway and the other connecting the lower and upper walkways. This change had the effect of doubling the load on the upper walkway connections, resulting in a design capable of withstanding only an estimated 30 percent of the mandated minimum.

The engineer of record attributed the fatal design flaw to a breakdown in communication. He stated that he had assigned supervision of the project to an associate structural engineer, who was not an asce member. As the engineer of record was responsible for roughly 10 associate engineers, each of whom supervised six or seven projects at a time, he acknowledged that he could not personally oversee every aspect of the design. Instead, he entrusted the responsibility to the associate in charge of each project.

The engineer of record further contended that it was common practice in the industry for the structural engineer to leave the design of steel-to-steel connections to the fabricator. The original design provided in the structural drawings was intended only to be conceptual.

When the fabricators found that design to be impracticable, they requested approval of the double-rod system by telephone. The structural engineer verbally approved the change, with the understanding that a written request for the change would be submitted for formal approval. This follow-up request was never honored. In fact, the fabricators had just begun work on the shop drawings when a sudden increase in workload required them to subcontract the work to an outside detailer. That detailer, in turn, mistakenly believed that the double-rod connection on the

shop drawings had already been designed and therefore performed no calculations on the connection himself.

The design documents were returned to the engineer of record with a request for expedited approval. He assigned review to a technician on his staff; however, the connections were not detailed on the drawings and the technician did not perform calculations on the connections. The structural engineer performed "spot checks" on portions of the shop drawings, and the engineer of record affixed his seal to the documents. The latter stated that he had not personally checked all calculations and had relied on the work of his project engineer and design team.

QUESTION: Did the engineer of record's actions in placing his seal on design documents without verifying the soundness of the structural design violate ASCE's Code of Ethics?

DECISION: Canon 1 of the Code of Ethics at the time of the walkway collapse read as follows: "Engineers shall hold paramount the safety, health, and welfare of the public in the performance of their professional duties." Category (a) of the guidelines to practice for canon 1 had this to say: "Engineers shall recognize that the lives, safety, health, and welfare of the general public are dependent upon engineering judgments, decisions, and practices incorporated into structures, machines, products, processes, and devices." Further, category (b) in the guidelines for that canon read as follows: "Engineers shall approve or seal only those design documents, reviewed or prepared by them, which are determined to be safe for public health and welfare in conformity with accepted engineering standards."

The Committee on Professional Conduct (CPC) was not persuaded by the engineer of record's argument that each person in the design process was responsible for his or her own part of the work. Finding that the engineer's seal made him responsible for all elements of the structural design, the CPC held that the member had violated the Code of Ethics, and it voted to recommend to the Board of Direction that he be **expelled from the Society**. However, the board disagreed as to the extent of the member's ethics violation, holding that the engineer had been "vicariously responsible" for the tragedy "but not guilty of gross negligence nor of unprofessional conduct." It voted to **suspend the engineer from membership for a period of three years**.

Space does not permit a full exposition of the circumstances surrounding the Hyatt Regency collapse. Readers wishing a more thorough treatment of this subject are directed to the following articles:

Gillum, J.D. "The Engineer of Record and Design Responsibility." *Journal of Performance of*

Constructed Facilities 14, number 2 (2000): 67–70.

Luth, G.P. "Chronology and Context of the Hyatt Regency Collapse." *Journal*

of Performance of

Constructed Facilities 14, number 2 (2000): 51–61.

Moncarz, P.D., and R.K. Taylor. "Engineering Process Failure—Hyatt Walkway Collapse."

Journal of Performance of Constructed Facilities 14, number 2 (2000): 46–50.

Pfatteicher, S.K.A. "The Hyatt Horror": Failure and Responsibility in American Engineering."

Journal of Performance of Constructed Facilities 14, number 2 (2000): 62–66.

Special thanks are in order to Paul R. Munger, Ph.D., P.E., F.ASCE, for his contributions to this article.

LEGAL DECISION (STATE BOARD)

The point was "nowhere better shown" than in *Duncan v. Missouri Board for Architects*, a case stemming from the 1981 Hyatt Regency skywalk collapse in Kansas City, Wolff said. In that case, engineers were held legally responsible for failing to review and check the ultimately faulty work.

February 3, 1984: Missouri Board of Architects, Professional Engineers and Land Surveyors files complaint against Daniel M. Duncan, Jack D. Gillum and G.C.E. International Inc., charging gross negligence, incompetence, misconduct and unprofessional conduct in the practice of engineering in connection with their performance of engineering services in the design and construction of the Hyatt Regency Hotel in Kansas City, Missouri.

November, 1984: Duncan, Gillum, and G.C.E. International, Inc. found guilty of gross negligence, misconduct and unprofessional conduct in the practice of engineering. Subsequently, Duncan and Gillum lost their licenses to practice engineering in the State of Missouri, and G.C.E. had its certificate of authority as an engineering firm revoked. American Society of Civil Engineering (ASCE) adopts report that states structural engineers have full responsibility for design projects. Duncan and Gillum now practicing engineers in states other than Missouri.

Team	Class of 2008	Class of 2007	Actual Case
Consultant	No action	License suspension for at least 3 years	
Contractor	<p>Engineer of record: Suspension of the <u>right to practice</u> for <u>several</u> years</p> <p>Associate structural engineer: Suspension of the <u>right to practice</u> for <u>several</u> years</p> <p>10 Other engineers: Suspension of the <u>right to practice</u> for <u>several</u> years</p> <p>Engineering company: Fines and compensation for the damage and injuries</p>	License suspension	
Client (Hyatt Hotel)	<p>Engineer of record: License suspension (indefinitely)</p> <p>Associate structural engineer: Reprimand and license suspension for 5 years</p> <p>Design team: Reprimand and license suspension for 5 years</p>	<p>Engineer: License suspension</p> <p>Engineering Company: Fines and retribution for the damages and reconstruction of the hotel</p>	

<p>Agency (ASCE CPC)</p>	<p>License suspension</p>	<p>License suspension for 5 years</p>	<p>ASCE CPC: Expulsion from ASCE</p> <p>ASCE Board of Directors: <u>membership</u> suspension for 3 years</p> <p>Missouri Board of Architects, Professional Engineers and Land Surveyors: Engineer of record, associate structural engineer, and the engineering company found <u>guilty</u> of gross negligence, misconduct and unprofessional conduct in the practice of engineering.</p> <p>Engineer of record: License suspension in Missouri</p> <p>Associate structural engineer: License suspension in Missouri</p> <p>Engineering company: had its certificate of authority as an engineering firm revoked</p>
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