

"THE HYATT HORROR": FAILURE AND RESPONSIBILITY IN AMERICAN ENGINEERING

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ABSTRACT: Nearly 20 years ago, an elegant Kansas City, Mo., hotel was the site of one of the most famous engineering failures in recent history. The collapse of two elevated walkways in the lobby left 114 people dead and nearly 200 injured, and plunged the engineering profession into a dilemma over how to deal with the engineers who were involved. In the mid-1970s, as the Kansas City Hyatt Regency was under construction, the engineering profession's codes of ethics were under construction as well. ASCE leaders argued that their society's new code should reflect a new hierarchy of engineers' responsibilities. "Public welfare," they agreed, should be the "primary concern" of engineers, followed by engineers' duty to "clients, employer or employees," and loyalty to the profession. The implications of the new ethics code became disturbingly clear with the Hyatt. This paper tells the story of how the engineering profession struggled to transform an unspeakable disaster into a powerful, if painful, lesson about the meaning of ethics in engineering.

INTRODUCTION

July 17, 1981, was a humid Friday evening in Kansas City, Mo. Between 1,500 and 2,000 area residents chose to escape the heat at the Hyatt Regency Hotel's tea dance, a weekly event featuring big band music and a dance contest. Some came to celebrate birthdays or anniversaries; others, to end another workweek with a relaxing night out amid the unusual architecture at the Hyatt Regency ("Hyatt" 1981; "Talking" 1981). The Hyatt chain of hotels had become known for its spacious entryways, and the 1-year-old Kansas City facility was as impressive and innovative as its predecessors elsewhere. Delicate steel rods extended from the ceiling of the airy, five-story atrium; on these rods hung three graceful walkways that spanned the lobby at the second-, third-, and fourth-floor levels.

Several groups of friends gathered on these walkways to watch the crowd of partygoers below. Slightly after 7:00 p.m., a thunder-like crack shook the lobby as the fourth-floor walkway tore loose from its supports and dropped 9 m (30 ft) to the lobby floor, crushing the second-floor walk beneath it. Hundreds of guests lay trapped under the more than 63,000 kg (70 tons) of debris (Jackson and Kaskell 1989). Pinned between the skywalks, one survivor reached out for his wife and felt the familiar rings on her hand, she had died instantly. She was not alone. The final count of 114 dead and nearly 200 injured led one group of investigators to declare the Hyatt disaster "the most devastating structural collapse" in U.S. history [National Bureau of Standards (NBS) 1982]. The local newspaper called it simply "The Hyatt horror" (1981).

The above version is not the Hyatt walkways story that is typically taught to engineering students or recounted in engineering ethics textbooks. Various readers have described these paragraphs as melodramatic, sensational, and more suitable for a tabloid than an academic journal. But this provocative language is used intentionally, because it highlights a tension that has emerged in American civil engineering in the late twentieth century. Young American civil engineers in the 1960s had begun to press their profession to develop a "social consciousness" (Hawkins 1965; Riddiford 1965; Ploch 1966; Lee 1967). A decade later, ASCE would revise its code of ethics to place

public safety at the top of an engineer's priorities. In the face of the Hyatt disaster, however, many in the profession came to realize that this shift of priorities would require more than a rewording of society documents.

THE PUBLIC

The collapse of the Hyatt walkways plunged the engineering profession into a dilemma over how to deal with the engineers who were involved. In the mid-1970s, as the Kansas City Hyatt Regency was under construction, the engineering profession's codes of ethics were under construction as well. A series of scandals, criticism, and legal changes in the 1950s, 1960s, and 1970s combined to convince the members of ASCE to reconsider their duties and their code of ethics, which had been in place since 1914. One ASCE member remarked that "in view of certain recent events enforcement [in particular] takes on new significance" (Runyan 1975, p. 203). Previous revisions had been limited to minor rewording or occasionally the addition or deletion of a canon. But the 1976 version was a complete overhaul (Pfatteicher 1996).

The origins of the new code date to 1971. That October, ASCE directors had reluctantly removed Article 3 from the code of ethics. The article in question forbade engineers from participating in competitive bidding for services, a canon that the Justice Department felt violated antitrust regulations ("Professionally" 1972; Runyan 1975, pp. 199–200). The following month, ASCE president Oscar Bray appointed a Task Committee on Review of Ethical Standards, which joined three other committees to consider whether the existing code was relevant to late twentieth century civil engineering in America. Following their 6-month review, the committee reported that several "impressions" of the code had emerged: "1. It does not express concern for the public; 2. [it] deals heavily with the 'business' aspects of engineering; and 3. [it] takes the negative approach by stating what you should not do rather than what you should do" (Runyan 1975).

By September 1973, ASCE concluded that the code should be rewritten to address "the professional man and his relations to society." The committee members argued that the society's new code should reflect a new hierarchy of engineers' responsibilities. "Public welfare," the committee members agreed, should be the "primary concern" of engineers, according to the new code. Second should come the engineer's duty to his "clients, employer or employees," and third should be an engineer's loyalty to his profession, thus turning the earlier code on its head (Runyan 1975, p. 201).

"Dismayed by . . . scandals and uneasy about the initiatives taken by academe and government," the board of direction on September 26, 1976, officially adopted the new code. Instead

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of excluding unacceptable behavior and leaving ASCE members free to do whatever they chose, the revised code now detailed the primary duties required of an engineer and made dereliction of these duties grounds for discipline by the board. The earlier code assumed an engineer was ethical until he was found otherwise; the replacement code assumed an engineer was unethical unless he fulfilled certain fundamental obligations. The most significant change from the original 1914 code appeared in Fundamental Canon Number One, which stated that "Engineers shall hold paramount the safety, health and welfare of the public in the performance of their professional duties" (ASCE 1976; "Code" 1977; Florman 1981, p. 162).

Reformers who supported the new code viewed the change as both inevitable and positive. Why then had it taken so long? Some engineers continued to prefer the old code, with its emphasis on "gentlemanly conduct," and lobbied for its continuation. Samuel Florman, one of the most outspoken critics of the new codes, explained the "apprehension" that he and some other engineers felt toward the new ethics. According to Florman, the "paramountcy" of public safety was far from obviously positive. Elevating the public interest came only at a price, and one that Florman and his compatriots were unwilling to pay because they felt the primacy of public safety could only come by compromising other interests. "Considering the public," according to Florman, could easily blur from being responsible for ensuring a building will stand to being accountable for the unforeseeable environmental and social impact of that building on the wildlife of the area. Florman called efforts to discipline engineers for such unfortunate effects "the irrational search for scapegoats." Preferring not to be accountable for mistakes for which they felt no responsibility, engineers such as Florman argued against what seemed obvious: engineers had an obligation to build safe structures (Florman 1981, pp. 162–163).

Prior to the 1970s, ASCE had developed a pattern of responding to failures by focusing on technical explanations rather than questioning the role of the designers, if they responded at all. To have suggested that engineers might be accountable for failures would require accepting liability. But to deny any responsibility would have undermined the profession's claims to authority. The safest option seemed to be to avoid the question altogether. As Florman had predicted, the new ethics code would pose new and difficult questions. The first test of the new ethics code and the new interpretations of licensing law that accompanied it came with the Hyatt.

THE COLLAPSE

Investigators representing the NBS, the local Kansas City newspapers, the hotel, the victims, the engineers, etc., traced the walkway collapse to poor connections between the walkways and the hanger rods from which they were suspended. The design of the skywalks had called for both the second- and fourth-floor walks to hang from a single set of rods suspended from the lobby ceiling and running through both walkways. But the skywalks were not built according to the original plan. Instead, the fourth-floor walk hung from rods connected to the ceiling, and the second-floor walk hung from an additional set of rods connected to the fourth-floor walk ("Critical" 1981; NBS 1982; J. D. Gillum, personal communication, Sept. 14, 1994; Petroski 1994, p. 61). The change effectively doubled the load on the fourth-floor walkway connection (Florman 1982, p. 88). Disaster was almost assured.

Once the detailed and thorough NBS report (1982) appeared, the Missouri licensing board began quietly to pursue its own inquiry. The board proceeded discreetly with good reason. The local newspapers were filled with calls for justice such as that of William Tammeus (1981), who declared:

Surely we will demand action. . . . Surely it is not too much to ask that our public architecture, construction, and building maintenance be competent enough to avoid killing people willy-nilly. . . . Surely [a people] can demand no less from its public officials. . . . And unless I badly misread my outraged, grieving city, this demand [for action]—unlike more than 100 of our family, friends and neighbors—will not die.

The board did not want to be seen as the sole source of justice in the case. As a result, the board, according to Chairman Paul Munger, "took steps to shelter itself. It held no press conferences and did not present any fanfare over its work" (P. Munger, personal communication, July 13 and 19, 1994). The board's efforts to remain invisible seem to have been successful; one official from the case recently acknowledged that "few people seemed to be aware that the board was involved in the matter" (P. Spinden, personal communication, July 5, 1994).

Though the board kept its actions quiet, the public was well aware of other aspects of the tragedy. The local newspapers repeatedly published gruesome, minute-by-minute accounts of the collapse and its aftermath, covering everything from what the victims had eaten for breakfast that morning to how many severed body parts had arrived at the morgue that night. Such detailed descriptions haunted even those who had not been at the Hyatt or known someone there ("In memoriam" 1981; "Rescuers" 1981; Hopkins et al. 1984, pp. 174–175).

Tammeus had hit upon at least one reason why the board might have found it difficult to ignore the case. The reaction of Kansas Citians was strengthened by an unusual characteristic of the Hyatt disaster: the victims and the accident site were both local. Unlike the victims of the 1979 DC-10 crash at O'Hare Airport or the 1980 Las Vegas MGM Hotel fire, for example, most victims of the Hyatt had lived in the community where they died, thus making the tragedy all the more immediate to their friends and family and encouraging the survivors to join in the efforts at seeking justice.

THE ENGINEERS

Jack Gillum had worked on other Crown Center projects and had won awards for "Engineering Excellence" for a variety of projects, including the Lake Placid Olympic Fieldhouse and an earlier Crown Center Hotel project. In the 1980s, he held licenses in 28 states, including Missouri. Gillum had begun his practice as a single engineer working independently, moved on to supervisor of 5–10 other engineers, and by the time of the Hyatt project was an engineer-of-record (sealer of plans) responsible for 50–100 engineers and specialists. Each of his approximately 10 associate engineers was supervising six or seven projects at a time; Gillum knew he "couldn't personally design and supervise all of the engineers, technicians or experts required to do these structures." Thus, he "made a practice of seeking out and hiring the best personnel available, those who possessed not only, [sic] technical smarts and ability, but . . . above all were conscious of the responsibility the structural engineer had, and willing to accept that responsibility." Daniel Duncan was one of those trusted associates, an "exceptional engineer" (J. D. Gillum, personal communication, Sept. 14, 1994; "Petition" 1994, exhibit D, p. 5).

The Hyatt Regency Hotel, to which Gillum assigned Duncan, was a fast-track construction project, meaning that the construction team had begun to build the hotel while the design team was still finalizing the plans. In the midst of this confusion, the design of the connection between the skywalks and their supporting rods became muddled. The engineers left the detail unspecified, indicating that the fabricators were to complete the calculations for the design. The fabricators later argued that the connection was not their responsibility. The

engineers' sketch seemed to indicate that a single set of hanger rods should connect both walkways to the ceiling. Apparently, on the construction site it became clear that such a setup was unworkable. The chain of events has never been exactly determined, but two possible scenarios have been proposed in studies of the Hyatt. One possibility is that the fabricators were unable to obtain rods long enough to construct the walkways with single rods. The other scenario is that the construction team realized that threading 30-ft-long rods for the required nuts would be impractical, if not unsafe. In any case, the walkways were built with two sets of rods. Gillum's seal appears on the plans, indicating that the engineering firm agreed to the design, no matter who had suggested or calculated it (NBS 1982; "Designers" 1984; "Hyatt" 1984; Deutsch 1985; Hauck 1993).

If Duncan and Gillum had merely overlooked the dangers of the new design, the accident, similar to dozens of other American engineering failures that had preceded it, could perhaps have been accepted as a very costly yet innocent mistake. But the Hyatt case was unusual in that the faulty connection had been the subject of concern before the accident. The board's investigation revealed that project engineer Duncan had been asked about the implications of the design change on at least six separate occasions during construction. Duncan assured each inquirer that replacing the single, long hanger rods with double, offset rods would not compromise the safety of the walkways. Duncan later testified that the connection and any changes to it were not his responsibility because the engineers had not designed it in the first place ("Petitioner's" 1984; Deutsch 1985; ASCE 1986; D. Duncan, personal communication, Jan. 5, 1995).

Supervising engineer Gillum's involvement soon came into question as well. First, as engineer of record, Gillum placed his seal on the plans, making him responsible for their contents. Second, an error seemed to implicate Gillum further. In October 1979, two accidents at the Kansas City Hyatt (one resulting in a death) had brought attention to the hotel's design ("Cause" 1981; "Collapse" 1981). Gillum informed the owner that the engineering firm would review "all members comprising the atrium roof" (J. D. Gillum, personal correspondence to Keith Kelly, Oct. 20, 1979). Duncan later wrote, incorrectly, that the firm "had checked the entire atrium design, including the bridges." The firm's records and Gillum's later testimony confirmed that no one had rechecked the skywalks (Deutsch 1985; ASCE 1986; J. D. Gillum, personal communication, 1994; "Petition" 1994, Exhibit C; D. Duncan, personal communication, Nov. 14, 1995).

THE DISCIPLINE

The licensing board members faced a difficult decision. Since its establishment more than 40 years earlier, the Missouri board had declared that its mission was to protect the public, not to punish engineers (Constance 1988, p. 29). Its operating policy had been to "rehabilitate when at all possible" and to avoid disciplinary action ("Complaint" 1991; "The Complaint" 1993; T. Hearst, personal communication, Oct. 27, 1993; J. Kempker, personal communication, Oct. 27, 1993; "Methods" 1993). The board members claimed that the massive loss of life at the Hyatt and the immense public outcry that followed did not enter into their decision on whether to consider the Hyatt case. In December 1983, the county prosecutor and the U.S. Attorney announced that they had found insufficient evidence to convict anyone involved in the Hyatt construction with criminal negligence and that no criminal charges would be filed. By this time, insurance companies had paid out over \$78,000,000 to settle civil lawsuits filed by many of the victims and their families, but no one had yet taken responsibility for the collapse (Cope 1989; "Hotel" 1983; Hopkins et al. 1986).

The board members still felt they could not dismiss the case. They stated that the "magnitude" of the Hyatt disaster, their desire to bolster the public's confidence in the profession, and the evidence against Duncan and Gillum forced them to do what no state board had done before (R. C. Flory, personal communication, July 15, 1994; P. Munger, personal communication, July 13 and 19, 1994). The licensing board appeared in the local newspapers for the first time on February 4, 1984, when the chairman officially filed a complaint against Duncan, Gillum, and their firm. In accordance with Missouri law, the board then presented its case in front of Administrative Law Judge James B. Deutsch, to obtain permission to discipline the two engineers ("License" 1983; "Engineers" 1984a; "State" 1984).

The licensing board had gone against tradition and attacked two of its own, but since the day of the collapse, Duncan and Gillum had believed themselves innocent. They were particularly troubled and hurt that the licensing board had not contacted them during its investigation, nor had anyone else asked for their version of the events leading up to that terrible night (D. Duncan, personal communication, Jan. 14, 1995; J. D. Gillum, personal communication, Jan. 14, 1995). The board had also chosen, for reasons that remain unclear, not to investigate the architects, over whom they also had licensing authority (R. C. Flory, personal communication, July 15, 1994). Duncan and Gillum's first chance to tell their side of the story came at the hearing before Judge Deutsch. They both felt that, if they had been able to discuss the situation with the board without any attorneys present, the case would have been settled without any charges ("Engineers" 1984b; Warner 1986; D. Duncan, personal communication, Jan. 14, 1995; J. D. Gillum, personal communication, Jan. 14, 1995).

Although they were forced during testimony to admit they had nominally approved of the change (and had subsequently not caught the error), Duncan and Gillum refused to concede that this made them responsible, particularly as there was no proof as to who had altered the plans. The *New York Times*, for instance, reported that Duncan and Gillum "had told the board the accident was the result of poor communication," rather than negligence or malpractice; a claim both repeated nearly a decade later ("Panel" 1986; J. D. Gillum, personal communication, Sept. 14, 1994; D. Duncan, personal communication, Jan. 5, 1995). The Missouri licensing law states that a professional engineer is "responsible for the contents of all" documents on which he places his seal (Missouri Revised Statutes, Chapter 327.411). Gillum and Duncan, however, claimed that, because of the complexity of most engineering projects and the number of people involved in the design process, many professional engineers routinely sealed plans that they had not personally checked (J. D. Gillum, personal communication, Sept. 14, 1994; D. Duncan, personal communication, Jan. 5, 1995). Judge Deutsch pointed out that even if such a practice was common, it was still "unreasonably dangerous." He further noted that "while the engineer may properly delegate the work of performing engineering design functions, he cannot delegate the responsibility" (Deutsch 1985, pp. 243, 246).

Although the licensing law clearly made the professional engineer "responsible for the whole . . . engineering project," Duncan and Gillum further argued that they were merely members of the design team, not leaders of it, and should not be held solely responsible for a mistake no one had caught (Missouri 1978; J. D. Gillum, personal communication, Sept. 14, 1994; "Petition" 1994). The complex hierarchy of the Hyatt project lent plausibility to this argument, but Duncan and Gillum seemed unaware of the irony of their position (Bucciarelli 1994). Their profession had accepted self-regulation precisely to establish engineers' authority, particularly over less well-trained laborers, and now Duncan and Gillum

seemed to be suggesting they had no more responsibility than the fabricators. Judge Deutsch confessed to “puzzlement” as to how the two engineers could so misunderstand the licensing statute their own predecessors had written. He concluded that “this attempt by [the engineers] to join the construction team” occurred not because of the realities of practice, but “for no greater purpose than their own convenience and financial benefit” (Deutsch 1985, pp. 241, 247).

On November 15, 1985, Judge Deutsch filed his decision. Although Deutsch declared that “the purpose of professional licensing is to protect the public, and not necessarily to punish the offender,” he did decide that punishment was warranted in the Hyatt case (Deutsch 1985). He found Duncan and Gillum guilty of gross negligence and misconduct and added unprofessional conduct to Gillum’s list of transgressions. Deutsch gave the licensing board permission to revoke the engineers’ licenses. Despite receiving more than 60 letters of protest, mainly from Duncan and Gillum’s friends and colleagues, the board carried out the punishment on January 22, 1986, 4 1/2 years after the walkway collapse, and the two Hyatt engineers became the first to lose their licenses for gross negligence (J. D. Gillum, personal communication, Sept. 14, 1994). Duncan and Gillum had continued to work as engineers during most of the interim. Between them, the two engineers held licenses in nearly 30 other states. Though the Missouri board informed all other state boards of its decision, the others were free to make their own determination as to Duncan and Gillum’s responsibility for the collapse. Not all chose to be as strict as the Missouri board (Special 1984; Kaskell 1992).

Meanwhile, ASCE struggled to make its own decision as to how to pursue the case (ASCE 1986, exhibit 3). Throughout the NBS and licensing board investigations, the society continued to view its mission as promoting the profession, not policing it. Although the code of ethics had been revised in 1976 to make public safety “paramount,” enforcement of the code had never become a priority. Duncan was free from any discipline by an ethics committee because he had never been a member of any national society. The ASCE had still not taken any public action against Jack Gillum.

But now, faced with the fact that the licensing board had gone so far as to revoke the two licenses, the ASCE Committee on Professional Conduct felt obliged to address the case (J. D. Gillespie, personal communication, June 22 and July 12, 1994; P. Munger, personal communication, July 13 and 19, 1994; G. Wald-Vogel, personal communication, Spring and Summer, 1994). The committee responded with a confidential hearing on the matter during the summer of 1986. Two ethics committee members abstained from the proceedings: Paul Munger, who was also the chair of the Missouri licensing board; and Edward Pfrang, who had headed the NBS investigation. Largely on the basis of the licensing board’s evidence, the committee members concluded unanimously that Gillum should be “expelled with no privilege ever to rejoin” and submitted their recommendation to the board of direction. After more than 12 h of heated deliberation, the board members chose to ignore that recommendation and instead found Gillum “vicariously responsible . . . but not guilty of gross negligence nor of unprofessional conduct” (ASCE 1986; “Petition” 1994). They voted to suspend him for just 3 years. Gillum voluntarily relinquished his membership altogether. Although the board’s decision appeared in ASCE publications, society policy kept additional details confidential.

THE STRUGGLE

The mid-1970s changes to the code of ethics and contemporary changes in liability law forced engineers to ask new and difficult questions about how to deal with disasters and the engineers who were involved in them. Engineers’ oppo-

sition to the licensing board action and that of ASCE appeared in a variety of forms, but especially in letters and articles in the technical press (“Hyatt” 1985b). Some opponents simply restated Duncan and Gillum’s arguments from the hearing. Others pointed out that no civil or criminal charges had ever stood up against either engineer. A few even declared that a certain level of risk accompanies any engineering project and that periodic failures should be expected and, indeed, accepted. Some commentators, however, argued that Duncan and Gillum deserved their punishment. Interestingly, like the Missouri licensing board, many who advocated disciplining the two engineers argued not that punishment would avenge the deaths and injuries suffered at the Hyatt, but that punishment would help to rebuild public confidence in their profession (Petroski 1982, pp. 90–91; Letters 1986; “New York” 1986; Rubin et al. 1986; Rubin and Banick 1987; J. W. Gillespie, personal communication, June 22 and July 12, 1994; P. Munger, personal communication, July 13 and 19, 1994; “Petition” 1994; P. Spinden, personal communication, July 5, 1994).

Even those engineers who supported Duncan and Gillum’s punishment wrestled with the implications of the disciplinary actions. For example, a member of the licensing board during the Hyatt case argued that the board’s discipline was sufficiently strict because the revocation robbed the engineers of their means of making a living, but then was forced to concede that this was not strictly true (R. C. Flory, personal communication, July 15, 1994). Flory believed that, after the revocation, Duncan had continued to work as an engineer in Illinois, thanks to the fact that, unlike doctors and lawyers, engineers are not required to be licensed to practice. Actually, Duncan has not practiced engineering since his Missouri license was revoked (D. Duncan, personal communication, Jan. 5, 1995). Although Gillum lost 24 of his 28 state licenses, Ohio never saw fit to revoke his certificate, 3 other states simply never renewed his license, and California granted him reinstatement in July 1994 (J. D. Gillum, personal communication, Jan. 31, June 15, and Aug. 17, 1994; “Petition” 1994). In 1992, he became president of an engineering firm in southern California. Gillum remains free to resume his ASCE membership at any time, though he has not yet chosen to do so (D. Lee, personal communication, Oct. 27 and 28, 1993). Both engineers continued to believe that they had “always conformed to the highest standards of professional conduct” and both continue to struggle with the memories of that awful night (D. Duncan, personal communication, Jan. 14, 1995; J. D. Gillum, personal communication, Jan. 14, 1995; “Hyatt” 1985a, p. 10).

CONCLUSIONS

Duncan and Gillum’s license revocation may be a first in the history of engineering self-regulation, but it did not signal the start of a new era of “social responsibility.” Duncan and Gillum faced the stiffest penalties their profession could dispense. The collapse also forced a number of engineers to reconsider how much responsibility they wanted. Gillum and Duncan argue, however, that “very little has changed in the profession” as a result of the devastating collapse and its heart-breaking aftermath (J. D. Gillum, personal communication, Sept. 14, 1994; “Petition” 1994; D. Duncan, personal communication, Jan. 5, 1995).

POSTSCRIPT

In the nearly 20 years since the tragedy at the Hyatt, much has been transformed. The Kansas City community continues to bear the scars of a disaster that, by some estimates, directly affected half of the residents of that city. The hotel has been transformed as well. The three walkways were removed

shortly after the collapse. In their place stands a single span, supported not by delicate, graceful rods, but standing on stout, sturdy columns meant to instill a renewed sense of safety and security to those who pass through the now historic site.

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