90 Years

Tenth floor of the Asch Building, site of the Triangle Shirtwaist Co. fire in 1911.

PHOTO COURTESY KHEEL CENTER /CORNELL UNIVERSITY

As ASSE begins to observe 90 years as an organization, we have an opportunity to reflect on events that have shaped our profession and this organization. Although we will focus on advances during this time, it is interesting to note that safety's roots can be traced to ancient history. For example, the ancient Chinese (circa 2500 BC) practiced "risk management" when they would place one-sixth of their harvest on each of six boats traveling to market. Early Egyptians (1600 BC) recognized the hazards of breathing fumes produced by melting silver and gold (although it is unclear what steps, if any, were taken to mitigate the problem). Other early examples of this recognition of the importance of occupational safety:

•In 1770, Benjamin Ramizzini, an Italian physician, published the first thesis attempting to prove the connection between occupation and disease.

•In 1730, Benjamin Franklin organized the first firefighting company in the U.S.

•In 1812, an embargo spurred development of the New England textile industry and the founding of factory mutual companies. These firms inspected properties and suggested loss control and injury-prevention methods that policyholders could implement to secure low premiums.

Reflections on the Profession

As part of ASSE's 90th anniversary observance, *Professional Safety* recently spoke with nine former Society presidents and Fellows to gather their thoughts on safety milestones, changes in the industry and ASSE's role in the profession; they also offered some sage advice for those just entering the field. Highlights of those conversations are featured here.

Margaret M. Carroll, P.E., CSP
ASSE President 1994/95
Society Fellow 1999

Edward N. Deck, CSP
ASSE President 1969/70

David V. MacCollum, P.E., CSP
ASSE President 1975/76
Society Fellow 1999

Fred A. Manuele, P.E., CSP
Society Fellow 1986 (?)

Frank Perry, P.E., CSP
ASSE President 1999/2000
Society Fellow 1996

Dr. Milton Rhodes, CSP
Society Fellow 1994

Delmar E. Tally, P.E., CSP
ASSE President 1985/86
Society Fellow 1997

Philip E. Ulmer, P.E.
ASSE President 1992/93

D.A. Weaver, CSP
Society Fellow, 1990

What events/advances would you classify as "safety milestones"?

A range of events was offered. Nearly all cited landmark legislation that led to the formation of OSHA, the National Institute for Occupational Safety and

# of Progress in Safety

By M.E. "EDDIE" GREER

•In 1864, the Pennsylvania Mine Safety Act was passed into law.

•In 1877, the state of Massachusetts passed a law requiring guarding for dangerous machinery.

•In 1896, the National Fire Protection Assn., a group dedicated to fire prevention and code development, was founded.

These are just a few of the events that preceded the beginning of our journey—the birth of ASSE on Oct. 14, 1911. In its early years, the Society was dedicated to developing accident prevention techniques and advancing safety engineering as a profession—a mission that continues today. The organization was headed by a group of leaders who were true visionaries in advancing the industrial revolution and making a difference in the lives of workers every day.

To provide a true picture of the events that have helped shape this profession, let's examine some tragedies that have occurred since 1911—and the results of those tragedies.

THE TRIANGLE SHIRTWAIST FIRE—1911

On March 25, 1911, fire broke out in the Triangle Shirtwaist Co. facility in New York City. The firm, which occupied the top three floors in a 10-story building, had locked the doors leading to the exits to keep the workers at their sewing machines. As the fire spread rapidly, fed by thousands of pounds of fabric, workers rushed to the stairs, freight elevator and fire escape. Many died when the rear fire escape collapsed, and many others jumped to their deaths in an effort to escape the burning building. Although firefighters arrived quickly on the scene, their ladders only extended to the sixth floor.

In total, 146 women died. Despite the public outcry, the owners were acquitted of manslaughter charges, though they were ordered to pay $75 to the families of 23 victims. As a result of the fire, the city established the Bureau of Fire Investigation. This event remains a vivid symbol of the need for all stakeholders to ensure a safe workplace.

THE RMS TITANIC—1912

Labeled the "unsinkable ship," *RMS Titanic* was designed to cater to the rich and famous. In their haste to make a good impression, the owner and officers decided to reduce the number of lifeboats carried because they would "clutter the deck." When it left port, the ship carried enough boats for 1,178 people—well short of the 2,207 passengers and crew on board. The logic behind this decision? "This boat is unsinkable. We don't need lifeboats."

A worker strings cable—stories above the ground—on the Empire State Building construction site.

During the fateful voyage across the Atlantic Ocean, the ship's officers received at least seven warnings about icebergs. Yet, just after 11:40 pm, the ship struck an ice-

Health (NIOSH) and EPA. "When OSHA and NIOSH were formed, they brought immediate credence that safety and health protection is a 'managed' business," Phil Ulmer explains. "This opened the door for the safety profession to be recognized as a key ingredient to understanding and pushing the state of the art in asset protection." He adds, "These acts . . . set the standard that risk is controlled in a tri-level, prioritized process beginning with sound engineering as the primary defense against injuries and presenting the proper—but highly unpopular view at that time—that putting armor, namely personal protective equipment, on people would be used only as a last resort. This promoted the professional practice of safety engineering as an accepted branch of industrial engineering in the U.S."

According to Margaret Carroll, the laws were vital to the profession's development. "These laws brought the profession to prominence in a new way—employers saw [safety professionals] as necessary and even beneficial," she says. In Milton Rhodes's view, the laws also changed the way companies address safety. "After enactment of these acts, companies had the responsibility of not only looking at the environment outside the industrial complex but within also."

Formation of the Board of Certified Safety Professionals (BCSP) in 1969—and ASSE's leadership role in that process—was noted as well. "[BCSP] came about because of ASSE's insight and foresight. This set the standard of competency for the professional and provided a yardstick for industry and practitioners alike," Carroll says. D.A. Weaver adds, "The CSP endures because ASSE spent 10 years setting it up right." In Del Tally's eyes, certification is crucial to the profession's future. "Certification is recognition by your peers and it's testing of the individual to qualify yourself and skills through unbiased testing."

Similarly, Weaver sees the availability of formal education as a key turning point in the profession. "The involvement of universities in safety curriculum didn't exist until relatively recently. The fact that there is a university way of entering this profes-

The chief design engineer for the Golden Gate Bridge insisted that workers wear protective headgear.

berg, sealing its disastrous fate.

Other factors contributed to the mass loss of life as well. For example, of the lifeboats available, many were launched at only one-third capacity. While some passengers were rescued from the icy waters, many more likely could have been saved had the crew devised a workable plan. Of the 2,207 people on board, only 705 survived.

As a result of this tragedy, all ships must now carry enough lifeboats for all the passengers and crew. The universal distress call "SOS" was adopted as well, because it is easy to send and receive, and ships must have 24-hour radio watch. In addition, travelers on large ships are required to attend lifeboat training and know about donning life preservers. This tragedy also prompted the founding of the International Ice Patrol, which informs ships of ice conditions near shipping lanes.

MINING DISASTERS

Stag Canyon Mine—1913 & 1923

The quiet atmosphere of the mining town of Dawson, NM, was shattered in 1913 by an explosion in coal mine No. 2 that claimed the lives of 263 miners. It was considered the second-worst mine disaster in U.S. history. On Feb. 8, 1923, a fire in mine No. 1 killed 125 miners.

Millfield Mine—1930

Eighty-two employees of the Sunday Creek Coal Co. perished when two explosions ripped through the mineshafts of this operation near Millfield, OH. At the time of the explosion, the company president, other officials and customers were touring the facility. The methane gas explosion was reportedly caused by a short circuit between the trolley wire and rail.

These disasters provide some insight into the nation's mining legislation. As early as 1891, Congress had passed a federal statute governing mine safety. This early law established minimum ventilation requirements and prohibited operators from employing children under 12 years of age.

In 1910, following a decade in which the number of coal mine fatalities exceeded 2,000 annually, Congress established the Bureau of Mines. The agency was charged with conducting research and reducing accidents in the coal mining industry; however, inspection authority was not mandated until 1941.

EMPIRE STATE BUILDING—1930 TO 1931

At 102 stories and measuring 1,472 ft. high, this building was the tallest in the world in 1930. Built at a cost of $24.7 million, the site employed some 3,400 people who worked more than seven million manhours. The framework rose at the rate of 4-½ stories per week.

The real story here is the exposure to falls that workers encountered each day; yet, only one fatality was attributed to a fall. The photo on page 21 offers a sense of the hazards these workers braved to complete this massive structure, which still graces the New York skyline. Looking at this photo, one can also appreciate the strides made since to ensure that workers do not have to depend on luck to stay safe.

GOLDEN GATE BRIDGE—1937

This bridge over the entrance to the San Francisco Bay is considered one of

sion has given us some status [and introduced us] to sources of increasing and evolving knowledge," he explains. "It was only a few years ago that safety existed of one book and a vertical file."

Several recent industrial tragedies have impacted the profession as well. Among those cited were the 1984 explosion at a Union Carbide plant in Bhopal, India; the July 1988 explosion of the Piper Alpha oil platform in the North Sea; and the January 1986 explosion of the Space Shuttle *Challenger*. As Perry explains, the Bhopal incident, in particular, gave rise to OSHA's Process Safety Management Standard, which is designed to enhance awareness of safe handling and storage of highly hazardous chemicals. In response to these tragedies, Carroll says, "Industry knew it could no longer avoid consideration of community health and safety impacts of their operations."

According to Ulmer, the Piper Alpha and *Challenger* events "raised awareness in business management that safety professionals did possess the tools to predict such tragedies, but that the information was useless if the predictions were not elevated to senior levels of decision makers." He adds, "The investigations revealed that safety professionals must be part of the analytical process with their findings being part of the information presented to the management team."

On a related note, David MacCollum sees the formalization of system safety engineering concepts—what he calls "the recognition that safety looks beyond the operator/user/driver to include the design of the machine and environment in which it works"—as another milestone in safety. "When I was working to develop rollover protective structures in the 1950s, I devised the concept that machinery needs forgiveness in the event of operator error. To coin a phrase, 'To err is human, to forgive design.' Since that time, I have seen steady progress of this idea of eliminating hazards at the time of design being infused into every facet of enterprise where the cost of failure is in terms of injury, damage or dysfunction."

How has the safety profession changed during the course of your career?

The "umbrella theme" here seemed to be that safety is now a better-recognized profession and that its practitioners are perceived as key players in the management team. "Safety has changed from a minor consideration on the part of management to where it is now a major consideration of management—and it's a major consideration to the profit margin of a corporation," explains Tally, who adds that safety also influences the consumer. "A good-faith company that has a safe image is the type of company that a customer wants to buy from."

Carroll calls this the "maturing" of the discipline. "We have developed a better understanding of what needs to be done, what preparation—in terms of education and experience—is necessary. [We have also seen] safety departments and functions become more integrated into the business of the business. . . . Safety has become a company value and a contributor to the bottom line." Edward Deck echoes these sentiments. "My goal in safety was to [raise] the safety engineer, the safety manager to the same level as other managers—to increase the stature of the safety engineer," he explains. "That didn't mean learning more programs about safety problems but more things about being a better manager. We haven't quite gotten there yet," he says, "but progress has been made."

According to Ulmer, with that maturity has come confidence. "Safety professionals in the 1960s and 1970s were passive. When they made recommendations to management regarding reduction of workplace risk, senior management may have simply replied with a statement like, 'All jobs have some calculated risk' and dismissed the recommendations." At that time, he observes, "safety professionals did not have the tools nor the assertiveness to

the world's most beautiful bridges. A unique combination of cantilever and suspension design, the bridge spans 9,266 ft., with some 4,200 ft. of that distance over water. This structure makes our list because of the positive safety procedures implemented—many for the first time.

Joseph Strauss, chief design engineer, insisted that protective headgear be worn. Edward Bullard, a local manufacturer of safety equipment, designed what became the prototype of the modern-day hardhat. In addition, glare-free goggles were worn along with special hand and face cream to protect against the wind. The most conspicuous and proactive aspects at this site were the safety nets suspended along the entire expanse of the bridge—another first in the realm of worker safety. The net saved 19 workers, who became known as the "Halfway-to-Hell Club."

One predictor used at the time was the expectation of a fatality for every one million dollars spent. Thus, the expectation for this project was that 24 workers would die during construction. However, from January 1933 until Feb. 17, 1937, only one fatality was recorded—quite a feat given all the factors involved in building such a structure. However, on Feb. 17, 1937—just three months before completion—a paving contractor's scaffold collapsed, sending 12 workers (and 2,100 ft. of safety netting) some 220 ft. to the water below. Ten of them died.

COCOANUT GROVE NIGHTCLUB—1942

The tradegy at this Boston establishment makes the list because of its impact on building occupant safety. The nightclub—an "in place" in the city—occupied a full block along Piedmont Street; it featured a Polynesian motif with fake palm trees, and its walls and ceiling were covered with flimsy colored cloth and rope braiding running up poles topped with artificial palm leaves and coconuts. Club capacity was 600, but on Nov. 28, 1942, more than 1,000 patrons filled the club.

A flash fire started when a 16-year-old bar attendant lit a match to screw in an electric bulb. The fire moved up a palm tree decoration, enveloping nearby draperies and pouring choking smoke throughout the club. Lights failed within three minutes of the start of the fire. Means of escape were the revolving doors at the entrance, a side door equipped with a panic lock designed to open under pressure and another door that opened inward. The side door panic lock was broken, so it was secured by another lock. Some 492 people died in the fire. More than 200 bodies were found stacked behind the revolving doors; another 100 were found near the locked and inward-opening doors.

As a result, several occupancy and fire safety regulations were promulgated.

- Revolving doors must have additional means of egress that provide a clear path of travel.
- Exit doors must swing in the direction of the exit.
- Authorized occupant capacity must not be exceeded.
- Exits must be maintained free and clear of storage or any obstructions.
- Decorative material must be fire-resistant, flame-retardant or non-combustible.
- At least two means of egress must be available in places of public assembly.

In addition, this fire prompted requirements of emergency lighting and the placement of fire exits.

HOOVER DAM—1931 TO 1936

This structure is located in the Black Canyon on the Colorado River, about 30 miles southeast of Las Vegas. Some 726 ft. high, it weighs more than 6.6 million tons. The dam, powerplant and appurtenant works contain nearly 4.4 million cubic yards of concrete—enough concrete to pave a standard 16-ft.-wide highway from San Francisco to New York City.

On average, 3,500 workers were on site—with employment reaching its peak at 5,218 during summer 1934. The cost of the dam was $126 million. Working conditions, especially during the summer, were horrific, as daytime temperatures reached 130ºF, while nighttime temperatures hovered in the 90s. But the workers on this project were hardy—many considered any injury that did not result in death as "minor."

Using the formula of one death per million dollars spent, one would have expected 126 workers to die during construction. While the official "industrial" total number of fatalities was 96, the real figure comes closer to 213. Many deaths caused by heart attacks, heat prostration and other "natural causes" were not included in the official tally. (It was also rumored that many workers were buried in the con-

overcome such statements and would passively yield to management." Now, safety professionals respond with an "assertive boldness." Put another way, "The profession has evolved from one that limited safety professionals to decisions based on 'gut feel' to decisions based on 'sound data' that can be proven through empirical research or established math and/or science," Ulmer says.

Perry also singles out the impact of automation. "We've gone from moderate automation in the 1970s to highly developed technical abilities, skills and demands on our jobs that are totally different than what we used to have," he observes. "Through it all, we have had to adapt. If you don't, you will be left behind." He adds that the safety professional must take the lead in seeking out this new information. "Your employer isn't going to say 'You need to do this.' It's the individual who needs to say, 'I'm going to do this a) for my own personal and professional advancement and b) it will be good for the company to do this.'"

As professionals have adapted to their ever-changing roles, Weaver sees the "specialization" of the profession as a defining change. "There was a time when you could not become a full-time member of ASSE unless you were an engineer," he recalls. "This perception that engineering was the only discipline that applies to this hydra-headed monster [safety] we deal with was extremely restrictive. Now that we have perceived what we are dealing with, we are doing much better." As he further explains, "Safety is a generalist profession with a specific application. Safety has made me continue to learn anthropology, history, engineering, statistics. None of these things I know well. I've seen it stated this way, 'Jack of all trades but master of some.' You have to be a master of some discipline amongst all of our disciplines—that's your entering wedge. Then you must know where to go to get the information you need."

MacCollum also cites the lasting impact of legal obligations that have grown over time. "The real driving force in safety and industry has been largely the result of the justice system, which has placed an economic value on human life," he says. "This has made moral responsibilities become a legal duty to provide for safe products, facilities, services and workplaces that will not harm the environment we live in. . . . This really has been the thing that has made management responsible and provided incentives for the legislative branch of government to become involved and to promote general welfare."

Fred Manuele also sees a change in performance expectations. "Those engaged in the practice of safety are expected to demonstrate a higher level of performance. Education requirements are higher and certification has become widely recognized," he explains. "Industry has changed significantly as the content of work performed, and the safety results achieved are noteworthy," he says, citing statistics that show a dramatic drop in the death rate between 1949 and 1999. "I believe safety professionals can share in this achievement." Manuele also suggests that management now better understands its role. "Many more executives have recognized their role in providing leadership in attaining a safer workplace," he says.

What role has ASSE played in those changes?

Echoing ASSE's mission, advancement of the profession and the professional were cited as the Society's marks of distinction. According to Weaver, "ASSE has been the sole motivation towards professionalism in this business." Ulmer adds, "The Society has been the most-critical organization to acknowledge state-of-the-art changes at their earliest stages of development and inform the profession of their existence. . . . Through its professional journal and professional conferences, it became the logical forum for advancements in the profession to have proper 'hearing and debate.'"

For Rhodes, the Society's various programs—

crete. This is untrue—a so-called "dam rumor." The dam was built in interlocking blocks placed on top of each other. These blocks ranged from 25x25 ft. to 25x60 ft.; an eight cubic yard bucket would only raise the concrete level from three to six inches—no room to hide a worker.)

SAFETY LEGISLATION

Certainly, these tragedies and others like them focused public attention on the need for occupational safety. Our story would be incomplete, however, if it neglected the effect that legislation has had on our profession and industry. Between 1912 and 1999, the work-related death rate per 100,000 population dropped more than 90 percent.

In 1912, some 18,000 to 21,000 work-related deaths occurred compared to 5,100 in 1999. While progress has clearly been significant, the toll is still unacceptable. Even as recently as the 1970s and 1980s, between 11,000 and 14,000 work-related deaths occurred each year.

In 1918, the American Standards Assn. was founded. This group developed many voluntary safety standards, some of which were later referenced in laws. The organization eventually evolved into the American National Standards Institute (ANSI).

In 1947, Congress authorized formulation of the first federal regulations for mine safety. The Federal Coal Mine Safety Act of 1952 provided for annual inspections of certain underground coal mines.

This act gave the Bureau of Mines limited enforcement authority, including power to issue violations and imminent danger withdrawal orders.

In addition, civil penalties could be assessed for non-compliance with withdrawal orders or for refusing access to mine property; at that time, however, no provisions were made for monetary penalties for noncompliance.

In 1970, the Occupational Safety and Health Act was signed into law. This created the Occupational Safety and Health Administration and the National Institute for Occupational Safety and Health. The enforcement arm of OSHA forced many companies into a compliance mode—a situation which remains true in many settings today. OSHA continues to promulgate standards that address myriad work-related hazards, offers compliance assistance, and conducts outreach and training designed to advance safety and health in the workplace.

In 1977, Congress passed the Federal Mine Safety and Health Act, which consolidated federal safety and health regulations of the mining industry to include coal and non-coal mining.

JOURNEY NOT YET COMPLETE

This article has provided a glimpse of some key events and milestones that have helped shape the safety profession. It is tragic that so many lives have been lost along this road—and even more tragic that more than 5,000 workers continue to die each year.

Throughout history, the safety profession and safety professionals have attempted to improve working conditions. Through these efforts, many lives are spared each day. Our work is not complete, however. Until each worker returns home in the same condition s/he came to work, we still have a formidable task at hand. ■

from the annual PDC, to its technical publications and journal—have helped the individual professional advance. "*Professional Safety* acts as a clearinghouse of ideas . . . and provides up-to-date know-how to the individual professional. It is a catalyst that brings some 30,000 members together as a vital force in the SHE area."

The Society has also taken the lead in "managing the profession," according to Carroll. "ASSE had the vision to define the profession and made managing the profession not just a vision, but a goal that we have achieved," she says. "We now have a broad consensus on what it means to be a safety practitioner. As the leading safety and health organization, we manage that profession and are responsible for doing so in governmental affairs and more-public roles." Tally concurs. "Through its governmental affairs efforts and professional development conferences, ASSE's voice has been more professionally presented to the public, government leaders and the industry itself. It is a trusted source."

Continuing education programs and networking opportunities are also important contributions. Manuele believes "the quality and scope of the PDC" is representative of ASSE's accomplishments. "My recollection is that the first PDC attracted less than 100 people. I have commented favorably on the 2001 PDC as to its quality and breadth of content. It was great." Perry adds, "ASSE has provided professional development and networking opportunities for the safety practitioners and professionals in the trenches to have their skills honed and get the job done efficiently. When I joined the profession in 1970 . . . there really wasn't a professional development conference in the truest sense of the word." In MacCollum's view, "ASSE has been the principal identifying group for those involved in the safety profession. The Society provides an opportunity to meet and become acquainted with peers who have a similar focus," he says. "[In ASSE you can] find those who have the same interest in the same basic problem you're working on—that is invaluable."

What role will (or should) the Society continue to play?

Carroll identifies two areas—governmental affairs and public relations—as key to expanding the Society's influence and enhancing the status of the profession. "In governmental affairs, ASSE has forged a well-conceived-and-executed plan for achieving recognition as a viable player on that stage, of not only being recognized, but valued for our opinions," she says. "[Through our public relations efforts], we are gaining in a credible and responsible manner. Public understanding of our role needs to be a continuing impetus for the Society and the profession."

Deck also sees a need for ASSE to continue its efforts to help the SHE professional gain greater credibility as managers. "Too many upper-level executives still see safety professionals as technicians. [As long as this continues], they won't be perceived as managers," he says.

The Society must continue to watch the horizon for new developments as well, Manuele explains. "ASSE's future role is to be aware of trends, anticipate evolving opportunities and provide the leadership that would result in educating and preparing its members. For example . . . major transitions [are] occurring in behavioral safety. At ASSE, some group should be examining what is occurring in a field to which it gave prominence and try to anticipate what is emerging."

What is the future direction of the profession?

Globalization headed the list. "There are changes ahead, which are accelerating faster than at any time in the past," says Rhodes. "ASSE has to keep up with these changes and not feel that it is a distinct entity in the world of safety, but an integral part of what the SHE profession stands for." Weaver adds, "The world

What advice/counsel would you offer someone just entering the field?

Carroll: Never stop learning. You never know it all. It is great, sometime into your career, to take college courses in the field that will cause you to examine why you "know" what you know and why you do what you do.

Never let your job eclipse the importance of your profession. Make time to keep learning, to network, to reflect on the profession and your conduct within it, and to take an active part in it as an ASSE member and as a CSP. If you focus on a job, that's just what you will have, a job (and probably your current job). If you focus on a career, you have a profession, you grow and you contribute to the field. A profession is for life. A job is for as long as it lasts. Like the Smith System of driving exhorts, "Aim high in steering."

Learn to lead, to influence others. And know that there will be hard choices—that you may have to choose professional and personal ethics above other considerations.

Deck: To start, you need an engineering/scientific background. Then, start thinking about getting an M.B.A. so you can understand the business aspects.

MacCollum: This profession isn't for wimps and the weak at heart. You can't go along to get along—that's rule number one. In addition, you need three tools 1) technical expertise—must know what engineering is, what causes things to fall; 2) a willingness to take on management hierarchy; and 3) the ability to show management that it can make money by using safeguards—that the company loses money when people are injured.

It's also about how you divide your time. You have to spend half your time finding out why certain failures occur—it might be going to school, reading books, spending time in the field watching what people do. Then you spend one-quarter of your time devising a game plan—what you're going to do. The other quarter you spend telling top management what they need to do. Top management needs to be educated about safety—and the safety professional needs to provide that education. Sometimes you have to be like a bull in a china shop. Go in and tell top management they are screwing up.

Manuele: Develop a sound technical and managerial base. Recognize that fads come and go and that they should not dissuade the professional from sound fundamentals. Get a master's degree—and if your undergraduate degree is in safety, consider an M.B.A. If the degree held is not in safety, consider an advanced degree in safety. Learn the basics of financial management. Look for opportunities to impact on productivity, cost efficiency and quality—as well as safety. Recognize that the future is greater if one is perceived as contributing to financial results.

Perry: Education, professional development and certification. You need to ensure upward mobility. Don't be content with your lot as it is today. If you have not finished your degree, get it done. Then get your certifications. These are what establish your credibility with your peers and with your employers. To be a professional, this is so important. Without that, you're another pea in the pod. It separates you from the rest.

Rhodes: I entered the SHE profession late in my career but I found it to be rewarding and used all that I had learned in my entire career. Many people look at safety as an entry-level position. While this can be true, one should always be open to movement to many areas of a company and companies. Many firms offer tuition reimbursement to enlarge one's academic background. Take advantage of them.

Above all, innovate not just a service but a position. By innovation, you will be noticed and eventually marked for promotion. Computer skills are important and an absolute necessity as well. If there was ever a time in history when change is a significant factor, it is now.

Tally: Education, education, education. Get the tools you need through both our universities and technical training courses.

I also encourage certification because it is key to holding the corporate safety jobs in the future.

Get involved with ASSE and network with some seasoned professionals who have already stumbled over the rocks in the road.

Get involved in some of the voluntary leadership roles in your local ASSE chapter and share your abilities through monthly meetings.

Ulmer: Do not blindly accept conventional wisdom solutions to safety issues. Think for yourself and prove solutions to your satisfaction. Base all opinions and thoughts on verifiable research or proven science. Don't make things worse by guessing. Maintain the highest standards of professional ethics. Be loyal to your employer, but not at the expense of compromising established professional ethics and professional conduct. Be as diligent in your understanding of professional ethics in your profession as you are the state of the art of the profession itself.

Weaver: Define what aspects of safety they want you to do—is it industrial safety, does it include the salespeoples' autos, what about fire, product liability, wellness programs? Define what they expect you to be working in. Don't take the overall stance, "I'm in charge of everything." Then, find out who within the structure of the organization has clout over the aspects that you are expected to influence. Safety professionals don't get something done until someone barks an order—and safety professionals don't bark many orders. Safety gets other people to bark the orders. Don't end up preaching in vain. Find out who wants it done and help him cause it to happen. All your life, learn beyond your job.

is globalizing and ASSE must move with it." Carroll also sees the need to learn from what's transpiring in other countries. "Understanding has grown that issues are virtually the same worldwide; standards and regulations are becoming international [in scope]. Even if our professional duties are not international in scope, we must be cognizant of these developments and use the expertise developed in other countries."

Ulmer also sees a need for U.S. safety professionals to play "catch up" with their international colleagues. "We have a basic naivete to the global business presence and what 'global economy' means to us," he says. "We are in a position to 'catch up' to some of our colleagues in other countries who are out in front of us in safety management techniques and technology. ASSE will have a critical role to ensure that this will take place."

Like many other professions, SHE will continue to feel the effects of downsizing, rightsizing and decentralization as well. "The days of extreme loyalty—of an individual employee to a company and vice versa—are gone," Perry observes. "Safety professionals must be able to adapt to those types of changes. It's no longer a matter of 'I have a job, I have an employer, I'm set.' The profession is becoming more project-oriented. . . . Safety professionals must anticipate these changes and not get caught by surprise."

With respect to the individual practitioner, Manuele believes safety professionals must "develop an appreciation of the importance of being perceived as part of the management and business team." This means professionals must "become astute in the basics of financial management to understand the language, the measures used and how the financial trends present opportunities and difficulties."

In addition to strengthening their business skills, SHE professionals must also expand their expertise. "Not only must we be able to address 'pure' safety issues, we must also be able to address the environmental issues, the industrial hygiene issues, the ergonomics issues, the entire scope of what a good loss-control program would entail," Tally explains. However, he cautions that SHE professionals must know their limits. "Safety professionals must be experts in their areas, then have some general knowledge in others and be able to work with a peer to assist in those areas where they don't have the expertise."

Distance learning will be a leading way to develop this broader knowledge, Weaver says. "We are in the midst of a learning and teaching revolution, not only in safety but in everything," he observes. "And safety, by its very nature, is so all-encompassing that distance learning is the easiest way for a safety professional to say 'I need to know that now.' It gives it an immediacy."

MacCollum also sees the day when the safety engineer/system engineer will be the key player in every design and construction management team. "Management cannot afford the cost of hazards that are not addressed at the time of design," he says. ■