



Overcoming Safety Skepticism

We are in an age of disbelief. The March 2015 issue of *National Geographic* included a feature story called “The War On Science.” Unfortunately, our system safety profession is right in the middle of this battlefield. Most people have no understanding of science, and even less of safety. Many are unable to accept that science can improve safety.

The symptoms of skepticism of science have been around for centuries. At the time Columbus sailed to the New World in 1492, almost everyone believed the world was flat. A hundred years later, Galileo claimed the Earth rotated on its own axis and orbited the sun. His findings were rejected by the church and he was forced to recant. It was not until 450 years later that the church admitted its error. During the 1830s, Charles Darwin developed his theory of natural selection that led to the proposition that humans are distant cousins of monkeys. This was a concept that was hard to swallow for most people, as they believed they had a Divine beginning. Science skepticism made national news in 1925 in Dayton, Tennessee, where John Scopes stood trial for teaching evolution in high school. When science conflicts with the public’s core beliefs, it usually loses.

Even today, some people believe that landing on the Moon several times by astronauts was just a mock-up in Hollywood movie studios. Dentists have been targeted for advising cities to provide fluoridation in water systems to prevent tooth decay. Vocal opponents do not like the idea of local government adding chemicals to our water. These people totally

ignore evidence that fluoridation in weak concentrations hardens tooth enamel, helps teeth to resist decay and does no harm to human health. The medical profession has experienced a backlash against vaccination to prevent contagious diseases such as polio, measles and smallpox. Currently, 46 states allow vaccination exemption for “religious reasons” that put

children in danger. Agriculture is confronted by those who wish to abolish genetic improvement of food sources.

Currently, our nation is confronted with a lagging economy, low wages, crime, high unemployment and hazardous conditions.

Additionally, our infrastructure needs upgrading as bridges, highways, water and sewer systems are failing. These are symptoms of national poverty and are directly related to our lack of industrial economic engines. America is falling into a third-world economy while activists protest new mine development, pipeline construction, offshore oil wells in Northern Alaska and all sorts of other new developments. Our system safety engineers are best able to push back against this type of speculation with scientific information on how design overcomes hazardous circumstances. The real truth is design safety is a money maker.

The trend of safety is moving from behavior-based safety to design-based safety, and is resisted by many safety practitioners. Overcoming system safety skepticism requires us to be aware of three issues: the mechanics of hazard identification, the potential impact of hazards to cause harm and the need to address these anti-safety issues.

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This anti-science nonsense is like a virus that infects the public's perception of all disciplines of science and engineering. The most obvious cause of distrust in system safety is the profound lack of a diversity of knowledge by anti-system safety advocates. The members of some societies and special interest groups who find fault with design-based safety hide behind sound bites of safety culture, risk management and root causes as being the victim's unsafe act. Their vocal and published diatribes are harmful, in that they gain public support to challenge the engineering technology that develops automation and autonomous safety systems. The following is a list of "fringe factors" of circumstances and conditions that tend to resist and oppose system safety applications.

- Small businesses engaged in construction, manufacturing, maintenance and operation are very sensitive to the cost of adding features that enhance reliably safer performance. They are confronted with the priority to be cost competitive to retain their customer base.
- Uninformed managers who resist change often view safety features as questionable "bells and whistles."
- Equipment users often view safety features as an encroachment on their skills as operators and view automated systems as a threat to their job security.
- Behavior-based specialists often proclaim that

training ensures proper use and safety features are unnecessary.

- Risk managers with a bias for insurance entertain the thought that insurance is cheaper than safety systems.
- The public has a fear-driven concern that safety systems will endanger the environment, including certain species of plants and animals.
- Communities may conclude that safety systems reduce employment or that they unreasonably monitor people's performance as a revenue or taxation program.
- Some individuals object to system safety because they believe it results in automation that eliminates hand labor and creates unemployment.

The above are just a few of what becomes the basis for false objections made by anti-safety advocates. What these advocates do know is that if a falsehood is repeated enough times, it becomes a "truthful" statement.

The impact of these falsehoods is to discredit safety practitioners. Anti-system safety proposals are often widely included in television, radio, newspapers, magazines and other media outlets. Further, these anti-proponents will publicly demonstrate at town halls, legislatures and courts. Their approach is to use sound bites crafted to catch the concern of the public with unfounded fears based on unsubstantiated haz-

ards. The anti-system safety advocates will use any means to achieve their goals, including the dark side of public conduct or law. These anti-system safety public interest groups are tightly governed and allow for no opinions differing from their inflexible ideology. Confronting their claims is like talking to a brick wall. The usual outcome: When industrial developers plan to locate in a community with state-of-the-art systems that embrace new technology that ensures the safety of people and the environment, the naysayers begin to pull the feathers of the “golden goose” that is the economic engine of the community until the goose just flies away.

Overcoming skepticism is not achieved by ignoring challenges to the system safety. Approaches or methods to overcome public skepticism of system safety should avoid dignifying the opponent’s allegations. There are some easy measures that can be used to reduce antagonistic questions by those who challenge scientific advances. System safety is an integral part of design and the features that ensure failure-free performance.

Embedded within the design are features that protect the user, the public, the environment and management’s investment. Early disclosures to the public in trade journals, advertising and the news media should address the *miracles* included in the design by system safety engineering. This allows both sales and public promotion of the product, service or production facility. In lay terms, the hazards and their elimination should be described. It is important to list all the benefits that a system safety approach brings to an entire community. No basis for fear can then exist in the public mind. Often, some astute public relations firms, prior to the publication of advanced promotions, run a sample test to find out what the public’s reaction is apt to be.

System safety is constantly being dragged through the mud of public opinion — a public that has little understanding of our profession as separate and distinct from behavior-based safety. The April 2015 issue of *The Jere Beasley Report* included a section on premise liability, which involved a summary of a 24 million-

dollar verdict involving a 24-unit apartment complex. Six people were seriously injured when a second-story stairway landing collapsed. This case was an example of extreme neglect over a long period of time by the corporate management company. The article stated, “For example, the corporation’s safety officer, who was totally unaware of the safety standard involved in the case, actually was our best witness.” The rest of the story details the safety officer’s duties, which included only those of a maintenance person’s work practices with no emphasis on unsafe structural conditions. Our International System Safety Society needs to reach out to licensed structural engineers. A prominent member of our Society is Michael C. Wright, P.E. a structural engineer and the president of Safety Through Engineering (STE), who has exemplary experience in ensuring safe structural design. Our own Society members have experience in how to overcome skepticism in structural design.

System safety professionals are creative and look for innovative answers. During World War II, our Army Air Corps was confronted with many wheels-up, belly-landing crashes on B-17s and B-25s. Skeptical commanders who had no technical knowledge were quick to blame the pilots and imposed penalties. Next, they tried massive re-training, which also didn’t work. Then, a pilot who had engineering training before the war looked inside the cockpit and found that the wheel and flap controls were next to each other. He recognized that pilots only made belly-landings with the wheels up when returning from a long bombing flight, when they were just exhausted. This astute pilot engineer attached a small rubber wheel on the top of the wheels lever. Miraculously, the wheels-up crash landings stopped!

No one should ever be skeptical of our profession, but they will be until we make an effort to push back. Our International System Safety Conference is always a gathering of innovative people. We need to advertise our conference in trade journals that are read by engineers and invite those who are engaged in design-based safety to come to our gathering. We need to engage those who can help us spread our message. ●

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