From the Editor's Desk...

JSS Technical Editor
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GMOs

How far does the system safety concept extend? Does system safety apply only to autos, trains, aircraft and weapon systems, or does it also apply to other types of systems, such as the ecosystem and the food chain system? Many years ago, Rachel Carson showed how DDT was an unsafe product, and how it contaminated our food chain and caused human diseases. It seems that there is now a similar controversy emerging. Genetically modified organics (GMOs) are common foods that have been genetically modified for various reasons — mostly for business gains rather than for health improvements. Monsanto, for example, has modified common food sources, such as soybeans, corn and wheat, to be able to survive the use of the commercial pesticide weed killer, Roundup. Farmers growing GMO foods can then regularly apply Roundup to kill bugs without damaging the crop. This sounds good and makes a lot of money for Monsanto, but the downside is that Roundup is now in these foods — and research is showing that the modified food has bad effects on test animals and, therefore, possibly on humans.

Another interesting side effect is that Monsanto has patented the GMO foods it has developed and is suing farmers when it finds GMO crops in their fields. It seems, however, that when a farmer in the next field legally grows GMO crops, the wind can blow the seeds into the unlicensed field, where they can overpower the standard seed crop. Although Monsanto claims that Roundup pesticide residue is safe for human consumption, just the thought is somewhat distasteful. It should be noted that several European countries have already banned the sale of GMO foods. To me, this looks like a perfect problem to which system safety should have been applied at the beginning. As usual, though, big business money always triumphs.

The first technical paper in this issue, "Research On Product Item's Safety-Critical Degree" by China-based Wu Qiong and Lyu Mingrui, demonstrates an international interest in system safety. This article details a method to quantify an element's degree of safety-criticality in order to positively influence the element's design for safety. The authors speculate that the composite safety-critical degree of an element is a time-dependent function. They then convey this logical relationship through Dynamic Fault Trees and search for the spot where an element's critical degree has sharp change.

The second technical paper in this issue, "A Structured Scenario Based Approach for Performing Functional Hazard Identification Analyses" by Tom Woodbridge, describes the structured scenario-based approach for a functional hazard identification analysis used by the NASA Constellation Program's Level 2 Ground Integration Hazard Analysis Team. The team used this method to determine system functions and identify the hazards associated with the Constellation Ares I rocket while on the launch pad.

In his "System Safety in Healthcare" column, "Software, Technology and Humans — A Safe Team Sport?," author Dev Raheja cites a 2014 study searching for the root causes of medical equipment-related events resulting in death or permanent loss of function. The study found that human factors were the leading cause, followed by problems in leadership, physical environment, communication, assessment, information management, care planning, operative care, medication use and continuum of care. Human factors may be the obvious visible factors that lies at the surface, but when we delve deeper, other causal factors lie below the surface. Recent studies have found that rapid implementation of new medical technology — surgical devices, electronic health records, monitoring systems and other tools — can lead to adverse patient events when these tools are not thoughtfully and carefully integrated into the workflow. This integration requires not only a thorough understanding of how the new tool works, but also how it can be safely integrated into the system. This includes

human-factor analysis, such as in environments where people interact with these devices repetitively or in high-pressure situations. This safe integration of tools involves the medical industry applying the system safety discipline.

In his "TBD" column, Charles Hoes takes a slightly different tack than his usual style of thoughtful analysis. In this article, he discusses preparing for retirement and building a sustainable home. This task requires a considerable amount of technical knowledge, which he presents in detail. Surprisingly, the task also involves system safety considerations.

In the "Unintended Consequences" column, Terry Hardy discusses the lessons learned from the ship *Ethan Allen*, which sank on October 2, 2005, carrying 47 passengers and one operator. The ship capsized while on a cruise of Lake George, New York. Twenty passengers died in the accident. The National Transportation Safety Board (NTSB) determined that the probable cause of the capsizing was that the E*than Allen* was unstable in the rough waters that day, primarily due to overloading.

In the "Design-Based Safety" column, Dave MacCollum discusses reliability and how it interacts with system safety, particularly in the arenas of automation, manned systems and high-tech unmanned systems.

Remember, if you wish to opine, send me an email at journal@system-safety.org.

Until next time,
Clif

Chapter News

Singapore Chapter

On September 16, 2014, the Singapore Chapter held its first sharing session for the new Society Year, reaching out to students for the first time. It was heartening to see a huge turnout for this sharing session. A total of 75 system safety practitioners and 55 third- and fourth-year students from the Singapore Institute of Technology (SIT) attended the session, which was held at Republic Polytechnic. Professor Chris Johnson, head of computing at the University of Glasgow, gave a talk on "Techniques to Increase the Resilience of Singapore's Safety-Critical Systems to Cyber-Attacks." Tan ShenChin, software safety section head of the Safety Assurance Centre of Singapore Technologies Kinetics, spoke about the interpretation of the software control categories for MIL-STD-882C. The well received sharing session was a good start in meeting the Chapter's target of reaching out to students in the new Society Year.

Mark Your Calendar

3rd Scandinavian Conference on System & Software Safety
March 24-25, 2015
KTH Royal Institute of Technology
Stockholm, Sweden
safety.addalot.se/

2015 Symposium on Human Factors and Ergonomics in Health Care
April 26-29, 2015
Baltimore Marriott Waterfront Hotel
Baltimore, Maryland
www.hfes.org

60th annual Business Aviation Safety Summit (BASS) 2015
May 13-14, 2015
Bonaventure Resort and Spa,
Weston, Florida
flightsafety.org/meeting/bass-2015

33rd International System Safety Conference
August 24-27, 2015
Manchester Grand Hyatt San Diego
San Diego, California
issc2015.system-safety.org/

System Safety and Cyber Security 2015
October 20-22, 2015
London Savoy Place
London, England
http://www.theiet.org/events/

2015 International Annual Meeting of the Human Factors and Ergonomics Society (HFES)
October 26-30, 2015
JW Marriott Los Angeles
Los Angeles, California
www.hfes.org//Web/HFESMeetings/2015AnnualMeeting.html