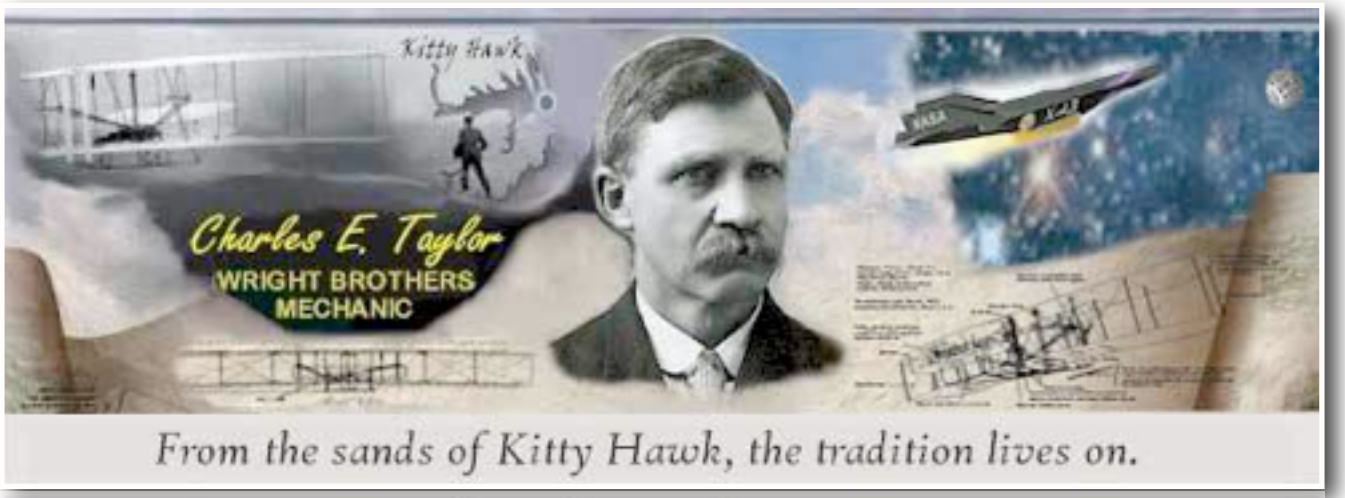
Aviation Human Factors Industry News

Volume X. Issue 05, March 09, 2014



Hello all,

To subscribe send an email to: rhughes@humanfactorsedu.com

In this weeks edition of *Aviation Human Factors Industry News* you will read the following stories:

Slow Down! The Perils of Speeding and Towing Aircraft by John Goglia

With all the pressures of on time performance and meeting a schedule, it's easy for the voice in your head telling you to go slow to be drowned out by the louder voices telling you to hurry up. Sometimes the louder voice is your own, putting the pressure on yourself to move an aircraft quickly but often it's your supervisor. Or air traffic control trying to get you to clear an aircraft movement area.

But a recent incident, related to me courtesy of an airline exec who came to speak to my students at Vaughn College of Aeronautics, should give some pause. It serves as a good reminder of why we should follow prescribed speed limits. Even when it feels like you're barely moving. Just a little speed can be so unforgiving. Those few miles over the limit can ruin your whole day – if not your whole career, at least at some airlines.

The incident that this airline exec described involved an Airbus aircraft being towed at a major airport. The pavement was just a little wet and as the tow entered a slight turn, the speed caused the tractor to jack-knife, damaging the landing gear and underbelly of the aircraft. The damage to the aircraft alone totaled more than $6 million. That $6 million price tag doesn't even begin to reflect the total costs of the incident. So many of the hidden costs are just that: hidden. But they add up. The costs of substituting the aircraft, delays, passenger inconvenience and even the costs of determining what happened and how it happened can mount quickly. Ultimately, the airline's analysts concluded that the cause of the accident was the tow driver was going seven miles over the 10 mile per hour speed limit.

This incident occurred in a congested ramp area where it's not really possible to build up a lot of speed. But the temptation on longer stretches to really put the pedal to the metal can be much greater.

I know when I worked at Logan, there was a stretch of about two miles between the airport terminals and the aircraft hangar where we would tow the aircraft basically as fast as the vehicle was capable of going. The supervisors all looked the other way as long as the aircraft were being moved without damage. But I am sure there would have been hell to pay if an aircraft had been damaged and the reason was driver speeding. In hind sight, it was risky; and unnecessarily risky given the repercussions of even a small “fender bender” when an aircraft is involved.

Moral of the Story: If you have not checked the speed limits for the equipment you operate in a while, check it again. You may be surprised to learn that it is lower than what you thought. It might be a good idea to do what this particular airline did and placard the speed limit in the equipment.

Jet Clips Concrete Pillar

The incident happened just after 8:30 a.m. on March 3, at the DFW Airport.

According to the airline spokesman the flight was inbound from Leone, Mexico. As it was being towed to the gate, the jet’s left wing struck a concrete pillar that supports the terminal. Douglas Thompson was a passenger on the flight, and captured a photograph after the incident occurred.“As they made the turn to the gate, the wing clipped the concrete pillar,” Thompson said afterward. “Passengers had to wait until they got someone out, pull it out, and they moved all of us to another gate.”

No injuries were reported during this incident.

Miller said that the aircraft was scheduled to continue flying after its stop in DFW on Monday, but that has now changed. The plane is being taken out of service for an inspection and any required maintenance.

NTSB Safety Alert - Proper helicopter maintenance is critical

NTSB

SAFETY ALERT

National Transportation Safety Board

★ Helicopter Safety Starts in the Hangar ★

Proper helicopter maintenance is critical to flight safety.

The problem

- Appropriate maintenance procedures and postmaintenance inspections are particularly critical for helicopters because of their mechanical and operational complexity and the potentially adverse environments they operate in.
- A lack of vigilance in performing maintenance tasks or in verifying that the work was done correctly can lead to accidents. One improperly torqued or degraded piece of hardware may result in an uncontrollable helicopter.
- Fatigue and other human performance issues (such as stress, complacency, distraction,

Citing several recent maintenance-related accidents, the NTSB called on mechanics to get proper training, use work cards to document all completed maintenance steps, get independent inspection of critical maintenance items, verify that all work is performed in accordance with manufacturer procedures, work with flight check pilots to ensure all checks are completed and review training materials regarding human performance errors triggered by items such as fatigue, pressure and company procedures that are at variance with the manufacturer's guidance.

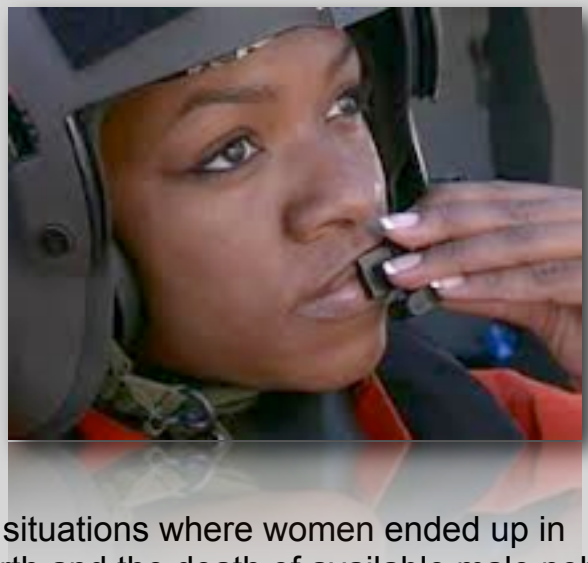
The two Safety Alerts issued Tuesday are:

- **Safety Through Helicopter Simulators (SA-031)**
- **Helicopter Safety Starts in the Hangar (SA-032)**
-

Accompanying the safety alerts are two videos, produced in conjunction with Helicopter Association International.

Featured in the videos are NTSB investigators sharing their perspectives about the lessons learned from helicopter accident investigations.

Attrition: Female Pilots Sharply Reduce Helicopter Losses



U.S. Army Aviation has come to realize what automobile insurance companies have known for a long time; women are safer drivers. While ten percent of army helicopter pilots are women, only three percent of helicopter accidents occur when a woman is the pilot. This not a new or unique situation. For thousands of years it was known that women were better than men for a lot of combat support tasks, like camp management and tending the wounded. There have been numerous situations where women ended up in command (usually because of noble birth and the death of available male nobles to command) and performed exceptionally well. As firearms replaced weapons that depended more on muscle (which men still have a lot more of) women began to show up as superior for combat tasks as well. During World War II Russia found that women made better snipers. This was a task that did not depend on a lot of muscle, but did require exceptional stealth, concentration and patience. By the end of the war over 2,000 women had served as snipers and the list of the best snipers during the war was full of females. Several of the female snipers got over 300 kills. The best male snipers had over 500 kills but there were only a handful of them. Most Russian snipers did not survive the war. Only 25 percent of the female snipers did. It was much harder for a woman to become a sniper in the first place because women were not allowed in the infantry. But early on it became common knowledge that many women were good at sniping and many commanders let their female support troops know that there was always a need for effective snipers for those who wanted to try out.

The Russians had a similar experience with female pilots, although there was a lot of resistance to having women fighter pilots. But those who did get into fighter units did so because they were exceptional pilots and had no problem pulling the trigger.

Like the United States, Russia used women pilots for a lot of non-combat flying jobs. But the United States never even let the women wear a uniform, the female pilots were all contractors. As such they performed a lot of difficult tasks, like flying aircraft from factory to air bases despite frequent encounters with horrendous weather. In Russia female pilots wore a uniform and were treated as military pilots.

Eventually women got into military aviation and eventually served as combat pilots. As their numbers and flight hours increased there was enough data to show trends. One result is that the army now knows what the insurance industry has known for over half a century. The military also found that women excelled at intelligence work and many administrative tasks. As more women entered these fields the average effectiveness of people in those jobs increased and the military benefitted. These are lessons commercial firms learned decades ago and once more another military “innovation” is little more than adopting ideas that have already been discovered, tried and proven in commercial organizations.

FAA seeks new safety measures for Boeing 737 planes: report

U.S. aviation regulators last week plan to propose improving cockpit automation to help prevent pilot errors that have caused fatal airline crashes, according to a media report. The Federal Aviation Administration wants cockpit automation fixes in nearly 500 Boeing Co (BA.N) 737 planes to ensure pilots have adequate safeguards if airspeed falls too low, particularly during landing approaches, the Wall Street Journal reported on Sunday.

Foreign regulators are likely to follow suit, the newspaper said.

The FAA was not immediately available for comment.

Boeing, in an email to Reuters, said the company "works closely with the FAA to monitor the fleet for potential safety issues and take appropriate actions."

The U.S. aircraft manufacturer said "the proposed rule mandates actions Boeing previously recommended to operators."

The crash of Asiana Airlines Flight 214 into a seawall in San Francisco airport on July 6 raised questions about whether pilots relied too much on automated flight controls in large passenger jets.

The pilots of that flight realized too late that the plane was flying too low and much too slowly even though they had set a control system, called an auto-throttle, to keep the Boeing 777 at a constant speed.

Decision Layers Help Manage Responder Risk

Paul Ratté, insurance underwriter USAIG's director of aviation safety programs and a former Coast Guard helicopter pilot and station commander, called for additional layers of organizational support for first-responder missions during his HAI safety challenge presentation here yesterday. While noting that the general aviation accident rate has improved steadily since 1960, Ratté noted that "we're in the slog now" with accident rate improvement becoming more difficult. The chief reason for that, he said, is that initial safety gains were made due to mechanical improvements in aircraft, with the next surge coming from a better understanding of human factors. Future gains, Ratté said, are likely to come from strengthening organizations and their ability to support and provide more resources to flight crews, particularly for decision-making.

Ratté noted the recent FAA mandate in the new helicopter rule for EMS pilot risk assessments before mission launch as part of the increasing focus on organizational performance to enhance safety. He said the risk assessment requirement could delay first responder helicopter launches by up to 10 minutes.

Ratté gave the following example of how increased decision support might work: a low-risk mission would be at the flight crew's discretion, a medium-risk would require middle management concurrence, such as the approval of a dispatcher and a high-risk mission would require the approval of those two layers and the director of operations. While pilots may not always see it as such, "adding a decision layer" almost always enhances safety, Ratté said.

As a US Navy plane captain, I have many critical duties that can become routine. With repetition and currency, it can be easy to take these duties for granted and allow complacency to creep in. The key to safety and success is strict adherence to publications and training. I'm reminded of this because I recently learned a hard lesson. At the beginning of my shift, I was asked to perform a daily inspection on one of our EA-6B jets, so I walked out to the line to get started. When it came time to check the ducts, for some reason that I can't quite explain, I cut corners by not diving the ducts, inspecting the blades, and ensuring that the intake was debris free.

Later that morning when it came time to launch, I started my preflight inspection with the pilot. Almost immediately he noticed that there were large chips in the first-stage compression blades of the port motor. After closer inspection of the blades, we determined that the engine had ingested debris, causing significant damage. We downed the jet and cancelled the flight for foreign object damage (FOD). I was embarrassed. My complacency posed a serious safety issue for the people working on the line, and an even greater safety issue to the aircrew assigned to fly the jet that day. Had the damaged blades not been noticed, one or possibly both engines could have been lost to fire, seizure or catastrophic failure. We could have lost a jet that day.

Even scarier is that we could have lost aircrew. These situations could have been avoided by doing things by the book and not being lazy.

Complacency, laziness, and not adhering to correct maintenance practices in my shop or in the maintenance department are unacceptable at any time. Aircrew and their families put their trust in us to bring their loved ones back by making sure we give them a good product to fly. This is why there are publications for everything we do and the reason we follow the proper steps in their entirety.

To prevent complacency, great care and respect must go into every task we perform, and with any certification or qualification one may hold. Along with correct training, mistakes made in the past and the consequences must be shared. Always keep in mind what might happen if we let complacency creep into the maintenance department. Do things by the book, and always make sure you are giving aircrew the best aircraft.

CALLBACK

From NASA's Aviation Safety Reporting System

ASRS

Situation #1 EMB-145 First Officer's Report

- Takeoff was normal. At around 400 feet, Tower…[advised] that our left engine was producing smoke. No specifics were given on the amount or color. Tower then asked for our intentions…. Both the Captain and I checked engine and all system instruments. There were no abnormal readings. We could not detect any smell of smoke or any abnormal flight characteristics….

We said we would continue and Tower handed us off to Departure. Departure told us they had received the smoke notification from the Tower. We checked all our instruments and systems again and could still not find any faults.

The Captain then called…Maintenance Control. They said that it was most likely the cold engines that had just warmed up combined with the cold temperature of -2C.

What Would You Have Done?

Situation #1 EMB-145 First Officer's Report

The Reporter's Action:

- We continued the flight and no problems were encountered….

While in cruise, the Captain and I reviewed the situation and both agreed that we should have returned after Tower notified us of the smoke. We both agreed that it would have been better to have erred on the safe side and returned, as opposed to continuing based on our instrument indications and flight characteristics.

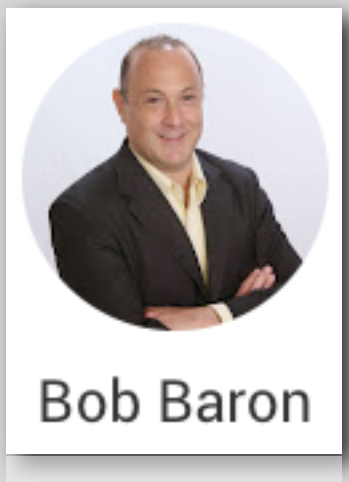
Aviation Safety Management

A blog about current aviation safety issues.
Brought to you by Dr. Bob Baron and The Aviation Consulting Group

Writer's Cramp...But Well Worth It!

By Bob Baron, Ph.D

Hello all, just a quick update to let you know that, if you haven't noticed, I have been writing and writing and writing (and did I mention writing?).



I write about aviation safety because it affords me the opportunity to share a broad range of insights and experiences with all in the business. I write because it makes me feel good. I write because if just one article helps to avoid an error, an incident, or an accident, then that makes it all worthwhile! I write for YOU!!!!

I hope that you are enjoying my new blog and please, by all means, share it with your colleagues. This blog is growing quickly with lots and lots of aviation safety topics, and many more to come.

http://airsafetymanagement.blogspot.com/

Human Factor Events

Master Human Factors & Error Management Workshop - Toluco, Mexico

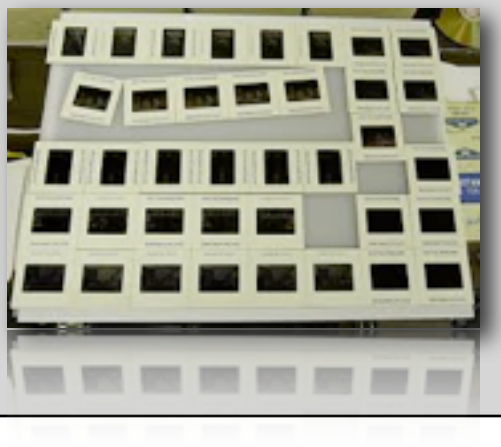
Apr 3- 5, 2014 with Mr. Gordon Dupont

If you know of someone or an organization that may want to take advantage of attending the workshop, please click on the links below.

http://www.system-safety.com/Events/human_factor_events.htm

Featured Slideshows

Insight into UPS Flight 1354



The aerospace community and larger public have turned their attentions once again to the National Transportation Safety Board (NTSB) in the U.S., as a "go-team" of 26 investigators strives to piece together the events that lead to the crash of UPS Flight 1354 on 14 Aug. 2013.

http://www.avionics-intelligence.com/content/avi/en/articles/slideshow/2013/08/isight-into-ups-flight-1354.html

ALPA: NTSB Hearings on Crash of UPS 1354 Reinforce Need for One Level of Safety

Supports 'Safe Skies Act of 2013'

The Air Line Pilots Association, Int'l (ALPA) has reiterated its support for immediate passage of the Safe Skies Act of 2013 that would end the "cargo carve-out" and help ensure that every pilot is a well-rested pilot.

"As we learn more about the events leading to the UPS crash in Birmingham, Alabama, it is becoming more apparent that separate rest requirements for cargo and passenger pilots is unsustainable, unsupportable, and unconscionable," said Capt. Lee Moak, president of ALPA."Pilots who operate in the same skies,

take off from the same airports, and fly over the same terrain must be given the same opportunities for full rest, regardless of what is in the back of the plane."

Earlier this year, the FAA implemented FAR 117, which established strict rest-requirements for passenger pilots; however, these rules don't apply to cargo pilots. ALPA was fully engaged in the FAA's Aviation Rulemaking Committee regarding pilot fatigue and has long maintained that the new flight- and duty-time limits and minimum-rest requirements must cover all airline pilots. Science-based studies show that all airline pilots experience fatigue in the same ways, regardless of whether they are transporting passengers or cargo.

Southwest Airlines, Delta Air Lines, Singapore Airlines make Fortune's most-admired list

Southwest Airlines and Singapore Airlines, perennial residents of Fortune's 50 most-admired companies, made it again in 2014. This year, Delta Air Lines joined them.

Southwest was ranked 9th with a score of 5.07 (lower is better). Singapore ranked 18th with 6.36, while Delta was 48th at 6.45.

"The employees of Southwest Airlines are the secret ingredient in our recipe for success, and they are the reason we are consistently recognized as one of the most admired companies in the world," Southwest chairman and CEO Gary Kelly said.Southwest finished 12th in 2010 (6.26); fourth in 2011 (6.17); 10th in 2012 (6.08); and seventh in 2013 (5.52).

Delta CEO Richard Anderson noted in a memo to employees that it was Delta's first appearance on the list.

"This honor recognizes the hard work and great accomplishments of Delta's nearly 80,000 people worldwide who are clearly focused on making Delta a better airline for our customers, a better investment for our shareholders and a better place to work," he said.

"Thank you for your continued focus on living by our Rules of the Road and executing on our Flight Plan despite the many challenges we have already faced this year. You are truly the most admired employees in the global airline business."

Scientists Identify the Switch that Says It's Time to Sleep

The switch in the brain that sends us off to sleep has been identified by researchers at Oxford University's Centre for Neural Circuits and Behavior in a study in fruit flies.

The switch works by regulating the activity of a handful of sleep-promoting nerve cells, or neurons, in the brain. The neurons fire when we're tired and need sleep, and dampen down when we're fully rested.'When you're tired, these neurons in the brain shout loud and they send you to sleep,' says Professor Gero Miesenböck of Oxford University, in whose laboratory the new research was performed.

Although the research was carried out in fruit flies, or Drosophila, the scientists say the sleep mechanism is likely to be relevant to humans.

Dr Jeffrey Donlea, one of the lead authors of the study, explains: 'There is a similar group of neurons in a region of the human brain. These neurons are also electrically active during sleep and, like the flies' cells, are the targets of general anesthetics that put us to sleep. It's therefore likely that a molecular mechanism similar to the one we have discovered in flies also operates in humans.'

The researchers say that pinpointing the sleep switch might help us identify new targets for novel drugs – potentially to improve treatments for sleep disorders.

But there is much still to find out, and further research could give insight into the big unanswered question of why we need to sleep at all, they say.

‘The big question now is to figure out what internal signal the sleep switch responds to,’ says Dr Diogo Pimentel of Oxford University, the other lead author of the study. ‘What do these sleep-promoting cells monitor while we are awake?

‘If we knew what happens in the brain during waking that requires sleep to reset, we might get closer to solving the mystery of why all animals need to sleep.’

The findings are reported in the journal Neuron. The work of the Centre for Neural Circuits and Behavior is funded by the Wellcome Trust and the Gatsby Charitable Foundation. This study was also supported by the UK Medical Research Council, the US National Institutes of Health, and the Human Frontier Science Program.

The body uses two mechanisms to regulate sleep. One is the body clock, which attunes humans and animals to the 24 hour cycle of day and night. The other mechanism is the sleep ‘homeostat’: a device in the brain that keeps track of your waking hours and puts you to sleep when you need to reset. This mechanism represents an internal nodding off point that is separate from external factors. When it is turned off or out of use, sleep deficits build up.

What makes us go to sleep at night is probably a combination of the two mechanisms,’ says Professor Miesenböck. ‘The body clock says it’s the right time, and the sleep switch has built up pressure during a long waking day.’

The work in fruit flies allowed the critical part of the sleep switch to be discovered. ‘We discovered mutant flies that couldn’t catch up on their lost sleep after they had been kept awake all night,’ says Dr Jeffrey Donlea.

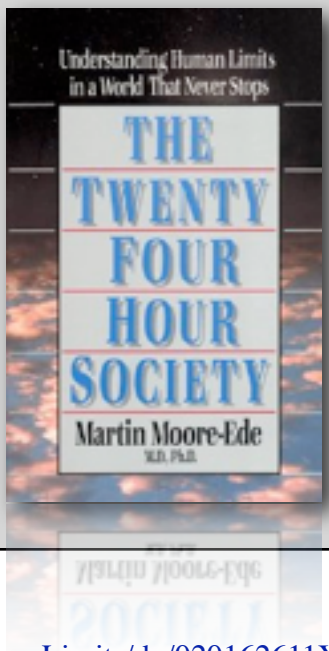
Flies stop moving when they go to sleep and require more disturbance to get them up. Sleep-deprived flies are prone to nodding off and are cognitively impaired – they have severe learning and memory deficits, much as sleep loss in humans leads to problems.

Professor Miesenböck says: ‘The sleep homeostat is similar to the thermostat in your home. A thermostat measures temperature and switches on the heating if it’s too cold. The sleep homeostat measures how long a fly has been awake and switches on a small group of specialized cells in the brain if necessary. It’s the electrical output of these nerve cells that puts the fly to sleep.’

In the mutant flies, the researchers were able to show a key molecular component of the electrical activity switch is broken and the sleep-inducing neurons are always off, causing insomnia.

Book - The Twenty Four Hour Society

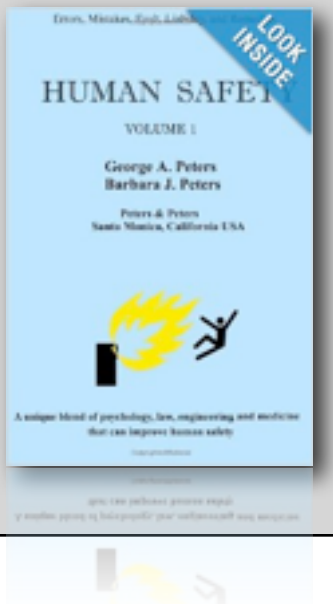
Today's sophisticated technology and integrated global economy have led to great advances but have failed to consider human limitations. The Chernobyl explosion, the Space Shuttle Challenger disaster, Three Mile Island, and tens of thousands of smaller accidents, as well as billions of dollars of productivity losses, were the result of human fatigue. Dr. Moore-Ede brings together the latest scientific findings and presents an array of management tools and technologies that monitor alertness and performance impairment. He shows how to rethink work schedules, manage information flow and improve working environments.



http://www.amazon.com/The-Twenty-Four-Hour-Society-Understanding-Limits/dp/020162611X

Book - Human Safety

Our motivation was to explore why so many design defects, discrepancies, recalls, and preventable catastrophes were occurring almost unabated. Vol. 1 (& Vol. 2) present means of analyzing causes of catastrophes, determining remedies, and finding ways to prevent future catastrophic injury. It examines memory, vigilance, messages, communication, human error, neuropathy, poisoning, bus incidents, nuclear safety, lasers, ships, guarding, chemical leaks, oil drilling incidents such as Deepwater Horizon, fatigue, aircraft, pipelines, ships, implants, negligence, environmental chemicals, responders, Jones Act, Quality issues, Liabilities, product safety, risk transfer. It is a 2 volume set of ideas, cases, and prevention with a multi-disciplinary point of view.



SUPPLEMENT

This is a clarification on “how to use” the 230 risk mitigation techniques in Volume 2 of Human Safety (available from Amazon.com) relative to Human Factors problems.

Risk Mitigation

An example of the risk for a human characteristic under specific conditions of use or exposure, would be operator fatigue. The primary risk “characteristic” (parameter) is a grossly episodic fatigue. There are three associated human “factors” (covariants). These factors, for a railroad train operation includes alertness, vigilance, and response to signals. Each of these may have different “factor loadings” (strengths or weights). This might require three specific safety features to moderate, minimize, or eliminate any unwarranted residual risk.

The first human factor remedy is for “responsiveness” and it would be a deadman’s bar or switch having the three positions, OFF-ON-OFF (page 81). The railroad train would operate if the switch were held in the middle ON position. But, a train operator who is significantly suffering from fatigue may release his hold on the spring-loaded switch that would move to an OFF position. An unconscious operator may fall forward or rearward and actuate the OFF position (this is the “deadman” switch position).

The second remedy for “vigilance” would be a “vigilance button” (page 84) that the train operator must push after passing a slow or stop signal or, if not pushed the train would be automatically stopped.

The third remedy for “alertness” would be a “safe space” (page 93) device. This is a moving space block between the head of the train and the rear of the train in front of it. If the train crew fails to respond when there is an incursion into the safe space, the electronic management system backstops the crew and stops the train. If reed switches are used, a safety controller with self-diagnostics, may be advisable (page 95). Any major uncertainties would be automatically taken care of by these remedies, although some minor residual risk may remain.

Risk Analysis

A detailed risk analysis may be conducted on each human hazard by determining:

- The relevant human characteristic (parameter)
- The associated human factors and factor loading (covariants)

- Uncertainties, bias, and skewing, and
- Selection and testing remedies

There are more than 40 causation methods used in interdisciplinary professional practice (Vol. 1, pages 405-440).

Risk Acceptance

The Biologic Sensitivity Curve (Vol. 1, page 211) shows 3 different safety criteria. The Human Error Risk Levels (Vol. 1, page 380) shows 4 zones of acceptability. The Toxic Exposure Categories Chart (Vol. 1, page 218) shows the results of a revised classification system.

A similar risk analysis may be performed on non-human factors variables.

http://www.amazon.com/Human-Safety-Dr-George-Peters/dp/1490564454/ref=sr_1_1?s=books&ie=UTF8&qid=1392844304&sr=1-1&keywords=Human+Safety

Inspiration:

A Dear Soldier Post-em (A lifetime direction)

When Myles Eckert found $20 in a Cracker Barrel parking lot, he thought about what he might buy with this newfound fortune, but he changed his mind when he laid eyes on the man in uniform.

http://www.cbsnews.com/videos/ohio-boy-turns-found-fortune-into-act-of-kindness/