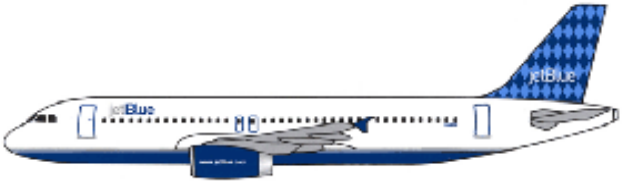

Aviation Human Factors Industry News

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In Memoriam: William F. O'Brien

The aviation maintenance industry lost a key friend on Sunday, November 9, when retired FAA national resource specialist Bill O'Brien passed away. O'Brien was a familiar and much appreciated presence at inspection authorization renewal seminars, gently but firmly and often humorously admonishing mechanics not to cut regulatory corners and afterwards always taking time to answer detailed questions that often turned into confessions and promises to do better.

At IA seminars and in airline and general aviation maintenance shops, O'Brien would be animated when discussing the program he helped create at Eastern New Mexico University to help A&P mechanics obtain their associate's degree or when introducing another deserving recipient of the Charles E. Taylor Master Mechanic Award or handing out FAA maintenance technician training awards.

Since 1990 and until recently, O'Brien wrote a column for *Aircraft Maintenance Technology* magazine, helping thousands of mechanics understand and apply the regulations that govern their careers. "He has been an incredible mentor to so many over his long and distinguished career at the FAA," said Jeremy Cox, vice president, JetBrokers.

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NTSB Issues Update On Near-Collision On Pennsylvania Runway

The NTSB on last Wednesday issued an update into its investigation of a September incident when a Canadair CRJ-700 regional jet taking off with 56 passengers had to swerve to avoid a Cessna 172 that was on the runway. Nobody was hurt, but the jet crew said they cleared the Cessna by only 10 feet, and their flight was cancelled so the jet could be checked for damage. It was about 7:30 at night when the incident took place, and according to the National Air Traffic Controllers Association, both controllers in the Lehigh International Airport, in Allentown, Pa., at the time were trainees. The NTSB's factual report says the Cessna pilot contacted the tower while about 8 miles east of the airport, and was cleared to land on Runway 6. The Mesa jet was then cleared to hold short of Runway 6. The Cessna landed, and the Mesa crew was told to taxi into position and hold. The Cessna pilot was told to exit the runway at taxiway A4, and the Mesa crew was then cleared to take off. However, the Cessna pilot missed the turn, and called the controller asking to exit at another taxiway; the controller responded "...no delay, turn immediately," which the Cessna pilot acknowledged. Mesa Air then radioed the tower controller: "We got it, tower - we're going to need to go back to the gate." Following the incident, both aircraft taxied to a parking area. The tire marks created by the Mesa Air regional jet as it veered around the Cessna can be seen on the left side of the centerline in this image, released by the NTSB.

Police Investigation Assigns Blame for 2007 Brazil TAM Plane Crash That Killed 199

3,264 page report names 10 officials who each could face up to 6 years in prison

SAO PAULO -- A Brazilian police investigation has found that 10 people were to blame for a July 2007 crash at this city's Congonhas Airport that left 199 people dead.

The official report, which had been leaked to the press last week, faulted five heads of the National Civil Aviation Agency, or ANAC, three senior officials of the Infraero Agency that runs Brazil's airports and two executives from TAM airlines.

All were cited for undermining air transport safety and could face up to six years in prison if formally charged and later convicted, Sao Paulo police said in presenting the document.

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On July 17, 2007, a TAM airlines Airbus A-320 flying from Porto Alegre to Sao Paulo went into a skid on landing at Congonhas. The plane ran off the runway, hit a warehouse and burst into flames.

Killed were all 176 people aboard the airplane and 23 others on the ground.

Infraero's former president, Jose Carlos Pereira, and its runway inspectors at Congonhas, Agnaldo Molina Esteves and Esdras Ramos, were named in the report.

The runway at Congonhas had recently been remodeled before the accident and investigators said miscalculations may have been made with regard to ascertaining operating conditions amid heavy rainfall.

Among those from ANAC who may face charges are former President Milton Zuanazzi, former director Denise Abreu, Superintendent Luiz Cazumi Miyada and flight safety chiefs Marcos Tarcisio, Marques dos Santos and Jorge Luiz Brito Velozo.

The TAM officials cited in the report were the airline's safety director, Marco Aurelio dos Santos, and its former operations engineering manager, Abdel Salam Abdel.

The report also said manufacturer Airbus shared blame for the accident, although because Brazilian law does not allow criminal indictment of a corporation it will be up to the Sao Paulo court system to determine who will respond to the allegations in the company's name.

Investigators who worked on the 3,264-page police report were unable to conclusively determine whether the accident was the result of human or mechanical error.

Based on what was left of the aircraft, it was "not possible in the report to affirm with 100 percent certainty that there was mechanical failure, although according to experts the possibility is remote, but we also cannot be 100 percent certain of human error," police inspector Antonio Carlos Barbosa, who headed the probe, said Wednesday.

He said, however, that the actions or errors of omission by the accused government officials "contributed" to the accident, since in meetings prior to the crash they did not take steps to improve the airport's deficient runway, which in addition to being short also had a damaged drainage system.

Fatal air crash report points finger at Transport Canada

Proper oversight by regulator found lacking

Transport Canada broke its own rules when it cancelled an audit program just months before a fatal plane crash during its transition to a self-policing civil aviation system.

The information was contained in a confidential draft report obtained by Canwest News Service.

The Transportation Safety Board's draft investigation report, dated Aug. 1, 2008, documents the events leading up to a Transwest Air (TWA) crash in Sandy Bay, Sask., on Jan. 7, 2007.

In addition to finding "repeated" and "routine" regulatory infractions on the part of King Air pilots at the regional airline -- to the point where crew were "likely unaware that many were actual policy and procedural deviations" -- the board found big gaps in Transport Canada's role as regulator.

"Although Transport Canada safety oversight processes identified the existence of supervisory deficiencies within TWA, the extent of the deficiencies was not fully appreciated because of the limitations of the current inspection/audit oversight system."

Two flight crew and two emergency medical technicians were aboard a King Air aircraft en route to pick up a patient from the Sandy Bay Health Centre when it crashed into trees near the runway after an aborted landing attempt. The 52-year-old pilot died of his injuries; the other three suffered non-life-threatening injuries.

The board's findings, related to causes and contributing factors, focus on TWA's deficient supervision of the King Air operation and failures of the crew. But the board also identifies several "findings as to risk" concerning Transport Canada's deficiencies. It's one of three crash reports expected in the coming months to single out the department's failure to provide proper oversight during the implementation of the safety management system (SMS). The system is similar to changes being made to Canada's food inspection, where the onus shifts to companies to identify hazards and manage their own risks.

The pilot's widow, Debbie Wolsey, is challenging the findings. In her brief to the safety board, she places blame on Transport Canada's failure to properly regulate the company, to which her husband Rick Wolsey voiced concerns about his 24-year-old crew member.

"It all ties in to Transport Canada not fulfilling their responsibility in ensuring safety in the aviation industry," Wolsey said in an interview.

"I do not want Rick's death to have been worthless. If it has to prove a point in regards to the safety of the aviation industry, so be it," she said.

At the time of the crash, TWA was at Phase 2 of SMS implementation, championed for civil aviation under the previous Liberal government, which introduced SMS to the railway industry in 2001. The draft report said TWA was not yet in a position to identify hazards in any proactive way, and Transport Canada was not slated to conduct an on-site SMS assessment until April 2007.

Coroner attacks systemic failures that led to 10 deaths on Hercules downed in Iraq

A "serious systemic failure" meant that an RAF Hercules plane shot down in Iraq with the loss of 10 servicemen was not fitted with safety equipment that might have saved their lives, a coroner ruled yesterday.

David Masters said it was difficult to see the logic in a decision to ignore recommendations from air tactics experts to fit the Hercules fleet with foam designed to stop fuel tanks igniting. Delivering his verdict, he demanded that all RAF combat aircraft be fitted with safety systems to minimize the risk of this kind of explosion.

The verdict is the latest in a series of inquests to be highly critical of the Ministry of Defense over the deaths of British personnel in Iraq and Afghanistan.

In yesterday's verdict, the coroner said a second "systemic failure" meant an intelligence report from the Americans about an ambush of two helicopters did not reach the Hercules - with the result that it flew into the same trap hours later.

Since the tragedy in 2005, explosion-suppressant foam (ESF) has been fitted to all Hercules planes in Iraq and Afghanistan and changes have been made to how intelligence reports are handled. But Masters, the Wiltshire coroner, told the families of the men that he would be making more than a dozen recommendations to the MoD to try to make sure the failings never happened again.

Hercules XV179 was flying a special forces mission from Baghdad at low level in January 2005 when its right wing was struck by enemy fire. A fuel tank exploded and the plane crashed on to farmland.

It later emerged that British Hercules were not fitted with ESF, though American Hercules have been equipped with it for about 40 years. The inquest, at Trowbridge in Wiltshire, heard how during the 90s the question of fitting ESF was raised on a number of occasions.

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Almost exactly three years before Hercules XV179 was shot down, a military think tank called the UK tactical analysis team highlighted the vulnerability of the fuel tanks to small arms fire and called for ESF to be fitted. Masters, who had a sample of the foam on his desk, said he took this to mean: "Get on and do it."

The recommendation went to RAF chiefs but was not treated as a priority. Masters said it was "unbelievable" that there was no record of who took this decision or why. Trying to explain, one senior officer said during the inquest that fitting foam "just wasn't sexy".

Giving his narrative verdict, the coroner said the lack of ESF was a "contributory factor" in the loss of the aircraft. He could not say the crew would have lived but ESF might have given them the chance.

During the inquest, a string of Hercules pilots and crew revealed that they did not know of this key weakness and almost all had not even heard of ESF. One said he was "astonished", another "horrified".

CALLBACK ASRS
From NASA's Aviation Safety Reporting System

The "Dirty Dozen" in ASRS Maintenance Reporting

"Stress, Fatigue, and Distraction"

A triple whammy of human factors led to failure of a B737-300's engine reversers to stow on landing rollout:

Stress: Rushing to finish jobs
Fatigue: Not getting enough sleep
Distraction: Interrupted work assignments

- **I was assigned 2 aircraft…Working the B737 window heat problem #2 right window, I pulled circuit breakers and 2 boxes, window heat controller [WHC] and the engine accessory unit [EAU] in the electronics bay to gain access to the back side of the WHC bench plugs to do resistance checks, reference maintenance manuals and wiring diagrams. Once I found the problem, I gathered the parts and crimpers I needed. At this time I was told by my lead to drop what I was doing and start working write-ups on a B747. I was told that a widebody had priority over a narrow body.**
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- **Because I was in the middle of a job on the B737 I finished repairing the broken feed wire to the #2 window, replaced WHC and EAU, and pushed in all breakers. Checked and tested window heat in which the #2 window heat was operating OK. I started working on the B747 until the end of shift. I received a call from the shift supervisor telling me that the B737 landing at another airport had the reversers deployed but would not stow on rollout. Pilots shut the engines down and were towed to the gate. Maintenance noticed that the EAU was missing. A new EAU was installed and the original EAU was found lying inside [the] E&E compartment on top of the drip curtain above the E&E door opening.**

Preventive measures: Do not rush to finish job no matter what stress is put on you. Not getting enough sleep (fatigue). Pressure from management and leads, poor lighting inside the E&E, and working outside in the early morning.

Outsourcing by airlines could tighten

For years, U.S. airlines have been moving aircraft maintenance work to Asia, Mexico, Central America and other locations with low labor costs.

Now, with the incoming Obama administration and a more Democratic Congress preparing a new aviation agenda, efforts to slow the outsourcing trend may intensify. At the least, Congress likely will order the Federal Aviation Administration to more closely track how and where maintenance is done on U.S.-owned aircraft.

"Foreign repair station reform is going to be a priority," said Maria Speiser, a spokeswoman for Sen. Claire McCaskill (D-Mo.). This year, McCaskill introduced the Safe Aviation Facilities Ensure Aircraft Integrity and Reliability Act of 2008 to ensure that all certified foreign repair stations receive FAA inspections twice a year.

As a senator from Illinois, President-elect Barack Obama co-sponsored the bill. He also sent the Teamsters Union a letter in March that said, "The practice of outsourcing aircraft maintenance overseas raises security concerns and pits our skilled mechanics making a middle-class living against less skilled, less well-protected workers abroad."

Unions representing airline mechanics are eager to get government to tamp down on the growing shift of aircraft maintenance work overseas. They already have some key supporters in Congress.

In February at a Teamsters-sponsored conference in Washington on outsourcing, House Transportation Committee Chairman James Oberstar (D-Minn.) said in videotaped remarks that he opposes foreign outsourcing because "these are good-paying jobs."

His committee asked the Transportation Department's inspector general to study the issue. On Sept. 30, the department reported that the FAA had certified 709 foreign repair stations to work on U.S. aircraft.

"Foreign repair stations performed 27 percent of outsourced heavy airframe maintenance checks in 2007, up from 21 percent in 2003," it said.

The inspector general's report found that at many repair stations "problems existed" such as "untrained mechanics, lack of required tools, and unsafe storage of aircraft parts."

Investigators said most of the problems were "not immediate safety-of-flight issues," but they could "affect aircraft safety over time if left uncorrected."

They concluded the FAA "relies too heavily on air carriers' oversight procedures, which are not always sufficient."

Safety advocates such as the Business Travel Coalition urge Congress to pass legislation that would increase the frequency and depth of FAA inspections at domestic and foreign repair stations, require foreign contractors to do criminal background checks and drug and alcohol screenings, and create consistent standards for all repair stations.

Robert Mann, head of the airline consulting firm R.W. Mann and Co. Inc., said that while the FAA should do a better job of overseeing maintenance work wherever it's done, global outsourcing will continue.

"It's been going on for 20 years, and there's no evidence it will stop," he said. That's because most carriers find that "the work is top-notch and the costs are better" at many foreign facilities.

Unlike other industries, the airline industry is particularly well positioned to take advantage of global cost savings. They own "portable assets that can move all over the world," he said. "You go where there is the best price point."

As part of organized labor's battle against foreign outsourcing, the Teamsters this month won a partial victory in a bankruptcy court case. The judge overseeing the restructuring of Denver-based Frontier Airlines ruled that the company could outsource its aircraft maintenance to El Salvador only after exhausting every option for performing the work in Denver.

Matthew Fazakas, president of the Teamsters' local representing Denver mechanics, condemned any outsourcing. "Why on Earth does Congress allow laws to encourage the foreign outsourcing of good, skilled, middle-class and critically important jobs?" he said in a statement.

In an interview this year, Teamsters President James Hoffa said he was particularly worried about Delta Air Lines' merger with Northwest Airlines, noting that "Northwest does an extensive amount of outsourcing overseas."

The airlines recently completed their merger. But Delta said that rather than sending work overseas, it plans to earn money by expanding its in-house maintenance business, known as Delta TechOps.

Last year, Delta TechOps generated more than $377 million in revenue. In just the first three quarters of this year, revenues have jumped to $405 million, Delta spokesman Kent Landers said. "It continues to grow" at a quick pace, he said.

Defenders of global outsourcing say Delta TechOps' growth reflects another trend: More foreign carriers are sending their work to the United States. The Transportation Department's inspector general found that indeed, "foreign companies are also sending work to the United States. There are approximately 1,200 FAA-certificated repair stations in the United States that also have European Aviation Safety Agency certifications, which allow them to perform repairs for foreign companies."

The investigators did not report how much such work is done in the United States.

Damaged jet in airport collision

A Qantas jetliner damaged by a midair explosion over the South China Sea in July has sustained more damage in a collision with another Qantas aircraft on an Australian airport Tarmac.

Qantas general manager of engineering David Cox said in a statement that both Boeing 747 jets were being towed and had no passengers aboard when they collided at the Qantas maintenance base at Avalon Airport, outside Melbourne.

Mr Cox said the extent of the damage to both aircraft was being assessed.

On July 25, an oxygen tank exploded aboard one of the jets, ripping a gaping hole in the fuselage and causing rapid cabin decompression.

A Qantas official said the jet was repaired in the Philippines and returned to Australia last week for final maintenance work.

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Controller Mistakes In Dallas Misclassified, Now Forgiven

Last Thursday, the U.S. Office of Special Counsel confirmed that local managers at Dallas/Fort Worth International Airport air traffic control center had hidden controller mistakes ... and that makes it twice in three years. The FAA has responded by initiating an amnesty program to help make sure the errors are properly reported and resolved. Controllers are being told they may now report any unsafe situations without concern of reprisal, which some feel risks retention of sub-par controllers. Local managers have been assigned responsibility for the misclassifications, but it seems FAA administrators at the facility may have escaped blame.

The report showed that the local air traffic control managers had masked the real safety issues facing DFW air traffic control by active misclassification of some 62 errors from 2005 through 2007. Two of those errors were falsely blamed on pilots. The Office of Inspector General for the Department of transportation has attributed those safety issues to the negligence and incompetence of the local ATC managers. For its part, the National Air Traffic Controllers Association feels the report absolves its members and points to a failure on the part of FAA management.

Whoops! Boeing Engineers To Blame For 787 Fastener Problems

Installation Specs Confusing; So's the explanation given the problematic nature of Boeing's relationship with its suppliers on the oft-stalled 787 Dreamliner program... perhaps it's understandable that many assumed the latest problem involving fasteners on the composite-bodied airliner was the fault of one of those contractors.

Well, you know what they say about 'assuming' anything.

According to The Seattle Times, up to 8,000 fasteners will need to be replaced on each of the first 12 Boeing 787s now in various stages of assembly at suppliers and Boeing's production line in Everett, WA. As ANN reported earlier this month, Boeing inspectors found some fasteners projecting slightly from their mounting holes, instead of lying flush with surrounding panels.

Boeing made the discovery near the end of the 57-day-long strike by workers represented by the International Association of Machinists. The news followed Boeing's announcement of yet another delay for the Dreamliner's first flight, now tentatively scheduled in early 2009.

The plane maker initially said the fasteners had been improperly installed... but as it turns out, the blame for the glitch lies instead in the hands of Boeing's own engineers, who wrote the specs on the proper way to fasten sections of the plane's carbon-fiber composite skin to its titanium structure.

Given the groundbreaking nature of the 787's construction, Boeing had to write many series of instructions on how to join various sections of the airplane together... and one set of those specifications was apparently quite confusing.

An operations manager at a Boeing supplier plant -- who asked not to be identified, out of concern for angering Boeing -- told the Times he reviewed Boeing's instructions on how to join composite materials to titanium, and found it was entirely possible to misinterpret the spec.

"If I'm struggling and a 25-year design engineer is struggling, how can you expect a mechanic to understand this?" said the manager.

Even the simplified explanation of the problem is confusing. In essence, Boeing's instructions on how to fasten the dissimilar components differ, depending on which side -- composite or titanium -- the fastener head would be on, and on whether the composite piece needed to be drilled.

Measurements on the spec governing drilled composite pieces being fastened to titanium panels -- with the fastener head on the titanium side -- were inaccurate, as well as headache-inducing. If a machinist followed the instructions, the fastener would protrude slightly in its hole... as it wasn't made clear in the spec that a bevel needed to be drilled first.

Got all that?

In any case, it's fair to say workers feel slightly vindicated by the revelation. "I don't think it should be pushed on the inexperience of the mechanics," said Joy Romero, VP of the 787 program for Vought Aircraft, which assembles aft fuselage sections for the 787 in Charleston, SC. "It's more about the clarity of the specifications and the confusion of the specifications."

Alas, it's a small victory... as quality control inspectors must now locate and replace the errant fasteners. In many cases, that includes ripping off insulation and interior panels already put in place. Teams will need to work about a week at a time to find and reinstall the fasteners in one aircraft.

Lessons as Pilot Help Speaker in Nurse Seminars

Joann Waterhouse and Karen Russell look over Russell's presentation during the Winter Haven Hospital Sixteenth Annual Nursing Research Seminar.

Working as an airline pilot made Gary Sculli a better nurse by teaching him management and safety techniques that he now shares with nurses and hospital officials nationwide.

Among them are moving away from a dictatorial style in which physicians intimidate nurses and nurses direct nursing assistants without making them feel part of a team in which their concerns matter.

The airline industry, where captains were kings, recognized the danger of that approach through disasters such as the Tenerife collision 31 years ago in which two planes collided after a pilot knowingly took off without clearance, Sculli said.

'Five hundred and eighty-three people died because three people couldn't communicate with each other,' he told 140 nurses Saturday at Winter Haven Hospital's 16th annual Nursing Research Seminar.

In the health field, he said, communication failures between doctors and nurses are involved in four of every 10 errors. He urged nurses to stop communicating with doctors by 'hint and hope' and employ assertive communication.

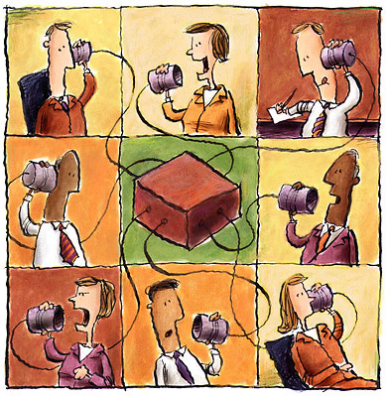
To do that, he suggested a four-step communication tool:

State the name or position of the person to whom you're talking.

State your concern, for example, 'I'm uncomfortable with this patient's condition.'

Offer an alternative, such as a change in dosage or that the doctor re-evaluate a patient.

Pose a question such as 'Do you agree with this?'



Doctors and nurses who supervise others need to 'invite and expect participation.' They can prime that process by asking strategic questions during the pre-shift briefing, he said, and by telling others on the team: 'If you say something to me and I don't respond, ask it again.'

His talk kicked off a day in which Winter Haven Hospital nurses, with assistance from Florida Southern College nurses, spoke and presented posters on research and evidence-based programs. Topics included hypothermia treatment after cardiac arrest, ways of overcoming pain after open-heart surgery and how more nurses can be involved in research.

Sculli, a registered nurse with a master's degree in nursing administration, returned to nursing from being a pilot and now works with a national patient safety organization. He also works as a consultant and speaker on nursing procedures and safety.

Other lessons he brought from aviation are 'the sterile cockpit rule,' which prohibits activities and distractions during critical times that could keep crew members from fully concentrating.

Distractions occur routinely for nurses, he said, and can be particularly risky when medications are given.

Admitting patients, which takes an hour or more, occurs at all hours, he said, and can overload nurses to a point they struggle to keep track of other patients and duties. When that occurs, he said, 'Give nurses power to halt admissions temporarily so they can catch up ... If patients are coming in on top of each other, situational awareness becomes low.'

Situational awareness, keeping track of individual patients' needs and those of the whole group, is critical for nurses, Sculli said, adding that he considers it 'harder for a nurse to maintain situational awareness than for a pilot in the cockpit.'

ROUSH P-51A Mustang: Aviation-themed car for 2009

ROUSH® Performance is to launch the P-51A Mustang, an aviation-themed Sports GT car for 2009. The car is to be based on the World War II fighter plane; this is the second time that a Mustang has been based on a plane. This limited edition car is to be based on the 2009 Ford Mustang Chassis, and will have a limited run of just 51. The ROUSH P-51A Mustang uses the 4.6L, 3-valve engine, and the ROUSH technicians have worked hard to squeeze 510 horsepower and 510 lb.-ft. of torque from the power unit.
There are a number of changes to this themed Mustang, such as the black chrome wheels, ROUSH vent pod gauge with a boost gauge, and ROUSH 6-piston brakes for extra stopping power. The six-piece ROUSH aero body kit will help the car stand out in the crowd.

Snap-on Tools - Gifts Guaranteed to Fit

Under the Tree or as a Stocking Stuffer, Great Gifts for Your DIYer

It can be the most wonderful time of the year, especially if that special DIYer in your life gets something from Snap-on Tools for the holidays. From the 100-piece General Service Set to the 3/8" Ratchet with Dual 80(R) Technology, Snap-on has the perfect holiday gift for that special someone.

"Every year we get phone calls, e-mails and letters from people wanting to know how they can get something from Snap-on to give as a holiday gift," said Alicia Smales, vice president of marketing for Snap-on Tools. "We are excited to make these special items available for the holidays and we hope people will take advantage of this great opportunity. But as the saying goes, shop early as these tools go fast and are only available for a limited time at these great prices."

The Snap-on Tools holiday specials are available for order at http://www.snapon.com. The prices listed below are special for the holiday season and are only good from November 1 through December 19, 2008 or while supplies last. No rain checks are available for these items.

Most Expensive Accidents in History

The greatest cost of accidents is injury and death. Human life is beyond monetary value. But property losses can also be devastating and crippling to a business. What are the 10 most expensive accidents in world history, in terms of property loss and measured in dollars? Keep reading.

10. SINKING OF THE *TITANIC*, 1912: $150 Million

This figure reflects just the value of the ship, not the insurance claims, litigation costs and other indirect costs as a result of the sinking. The *Titanic* cost $7 million to build. That's $150 million in today's dollars.

9. TANKER TRUCK EXPLODES ON GERMAN BRIDGE, 2004: $358 Million

A tanker truck hauling 32,000 liters of fuel collides with a car on the Wiehltal Bridge. The truck crashes through the guardrail and falls 90 feet off the A4 Autobahn. The resulting explosion destroys the bridge.

8. CALIFORNIA METROLINK CRASH, 2008: $500 Million

A Metrolink commuter train crashes head-on into a Union Pacific freight train in Los Angeles this September. 25 people are killed. The liability costs of the resulting wrongful death lawsuits are expected to reach $500 million.

7. B-2 BOMBER CRASH, 2008: $1.4 Billion

A B-2 Stealth bomber crashes shortly after taking off from an air base in Guam this February. It's the most expensive aviation accident ever. The good news: The two pilots are able to eject safely.

6. *Exxon Valdez*, 1989: $2.5 Billion

The costs of cleaning up the world's largest oil spill (10.8 million gallons) were driven up by the fact that the spill occurred in a reef accessible only by boat and helicopter.

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5. Piper Alpha Oil Rig, 1988: $3.4 Billion

The worst off-shore oil disaster killed 167 and completely destroyed a 300-foot platform.

4. Space Shuttle *Challenger* Explosion, 1986: $5.5 Billion

The explosion of *Challenger* 73 seconds after takeoff will be remembered most for the psychological damage it inflicted on the national psyche. But the costs of replacing the equipment and investigating the incident also left a mark.

3. *Prestige* Oil Spill, 2002: $12 Billion

One of the 12 tanks on the *Prestige* oil tanker explodes during a storm off the coast of Spain. The Spanish, Portugese and French governments all refuse to let the damaged ship harbor. The tanker ultimately splits in half and dumps 20 million gallons of oil into the sea.

2. Space Shuttle *Columbia* Explosion, 2003: $13 Billion

***Columbia* is destroyed in re-entry over Texas by an explosion resulting from a hole in its wing that took place during launch 16 days earlier. All aboard are lost. The $13 billion price tag doesn't even include the cost of replacing the shuttle.**

1. Chernobyl, 1986: $200 Billion

Damage had to be cleaned up, people had to be resettled and compensation had to be paid out to the victims. Nobody knows exactly how much the world's worst nuclear accident cost. $200 billion is considered a fairly conservative figure.

Preparation key to surviving air crashes

It's important to pay attention to safety drills and be ready to act in an emergency, aviation experts say

Whenever he flies, U.S. crash-safety expert Mac McLean is the model passenger when it comes to paying attention to the safety drill and poring over the safety card.

The analyst with the Federal Aviation Administration made the point yesterday when commenting on the weekend crash of a Pacific Coastal Airlines flight from Vancouver to the Powell River area that killed seven men.

There was only one survivor.

The subject of the discussion was how to survive a plane crash.

Twenty years in the air-safety field has taught Dr. McLean that airplane passengers are more likely to pay attention to safety drills if they see others doing so.

The Oklahoma City-based analyst with the FAA's Civil Aerospace Medical Institute likes to be an inspiration.

"It could be that those people that aren't paying attention are going to be between me and the exit should something happen. And I want them to know what to do and get out as well so they don't impede my flow," he says.

Analysts asked about surviving air disasters - involving an Airbus or a small plane - say the key is paying attention to safety drills and being ready to act in an emergency.

"In the event [a crash] does happen, you need to have the mindset to react appropriately. Your reaction to the event will dictate whether you do the things to survive or not," says Denver-based Tom Barth, a research engineer and accident investigator for AmSafe Aviation.

"The more familiar you are, the more second nature are those standard safety procedures for you, the more likely it is that you're going to follow them quickly and appropriately rather than become confused and disoriented."

Survival is unlikely in some air disasters, Dr. McLean says.

"Hitting a mountain at 500 miles an hour at 15,000 feet in the dark? There's just not much likelihood that you will walk away from that one."

But there is always hope, he added. "It's not hard to imagine that even the most severe crash would have some chance ..."

Mr. Barth agrees.

"Most of the studies say something like 90 per cent or more of airplane accidents are survivable. When people think of an airplane accident, they tend to think of the most catastrophic event," he said.

"They don't think [crashes] can happen at relatively low elevations and low speeds and that people do have the opportunity to survive. In the majority of airplane accidents, you do have the opportunity to survive."

Relevant factors, he said, include "survivable cabin volume" - being in part of the aircraft that is not compromised by outside objects. "There must be space for the occupant to live. In [the B.C. crash], that may have existed for some of the occupants and it may not have existed for others."

He noted that the Pacific Coastal Airlines plane crashed into trees. "If a large branch comes intruding through the cabin in certain places, then a particular seat position would no longer be considered survivable, but at least one of the seating positions did maintain a survivable volume, because the guy survived."

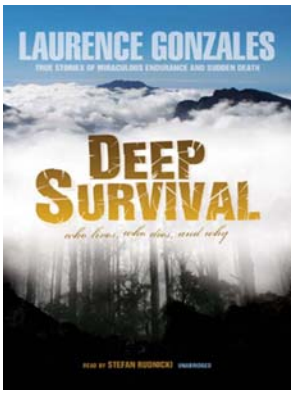
Also relevant are environmental factors, such as the cabin not being compromised by flame or water. And the passengers being conscious and able to get out.

"Luck has a big part to play in it as well," he said.

Dr. McLean said research has failed to pinpoint a seating area on aircraft that is safer than others.

"Being buckled up and being prepared is probably more important than exactly where you're sitting," he said.

BOOK: Deep Survival



***Deep Survival* has made a profound and lasting impression on wilderness travelers and extreme sport enthusiasts. It is being used by the head of training for the Navy SEALs and by wildland firefighters, police, and others. But it has also been embraced by a growing number of people who do not take great risks or seek adventure. Legg Mason Capital Management recently featured Gonzales in its in-house book club, and the National Football League has embraced *Deep Survival* by distributing it to all its members. Readers everywhere are finding that the principles in *Deep Survival* apply to any challenge life poses, from coping in the business world, to extreme trials like having a life threatening illness or dealing with addiction and recovery.**

Hearing Protection Is Sound Sense!

Equipment operating, airplanes flying overhead and transit trains speeding past - these are all normal work day noises for most of us.

But, being exposed to noise, either too loud or for too long a period, will gradually damage your hearing.

Even the noise of speed boats on your favorite lake, music on the car stereo, or motorcycle races you attend on the weekend can create hearing loss.

We are born with approximately 40,000 little hair cells inside our ears. These hair cells transmit sound impulses to our brains via the auditory nerves. As we age, a number of these cells die. Others are destroyed by infections and loud or prolonged noises.

In time, you may lose the ability to hear the good sounds of life. You may not hear the football game on television, the laughter of a small child, or the voices of your friends and family. You may become completely deaf. Deafness is a very lonely disability.

Impaired hearing is also a safety hazard. At work, you may not hear safety instructions, warning devices or fire alarms. Out on the street you may not hear police sirens, fire trucks or everyday traffic sounds. If you can't hear a vehicle coming your way, you may step out in front of it. And that could be fatal!

Noises at 85dB (decibels) for an eight-hour period may damage your hearing. A variety of sources fall into that category; for example, certain large manufacturing equipment or even a small electric hand tool, such as a sander. A jack hammer, on the other hand, operates in the range or 100-120 decibels and rock concerts around 120-130 decibels. The firing of a gun can reach 140 decibels or higher. The space shuttle launch reportedly reaches 180 decibels.

But keep in mind a noise at 90 decibels is actually ten times stronger than a noise at 80 decibels. And 100 decibels is 100 times stronger than 80 decibels. The bigger the number the greater the risk to your hearing.

Here are some safety suggestions for protecting your hearing at work:

- Wear proper hearing protectors whether they are the disposable plugs, reusable plugs, headband style or earmuffs. With a choice of literally hundreds of styles, you should be able to find a type that feels comfortable and protects your hearing.
- Regularly clean and maintain any re-usable ear protectors.
- Make sure your protectors fit. Your voice should sound louder to you if they are correctly fitted.

- **Maintain and lubricate your tools and equipment to reduce or eliminate any noise, rattles and squeaks. Don't alter or interfere with noise reduction equipment on machines or tools.**
- **Wear the required hearing protection even if you are only doing a quick task - or just visiting the plant. Noise exposure adds up!**

Protect your hearing off the job as well:

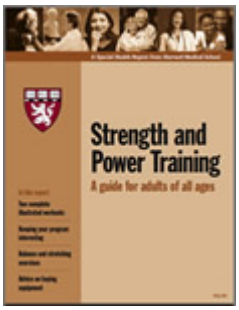
- **Choose quiet appliances for your home when making new purchases.**
- **Keep your personal stereo turned down in your car or at home.**
- **Don't use stereo headphones because they can expose your ears to loud sounds.**
- **Use hearing protectors for shooting, boating, watching auto races, snowmobiling, using power tools and lawn mowers, and participating in or watching other noisy recreational activities.**
- **Escape - on your days off, choose a quiet activity like hiking, fishing or walking to give your ears a noise break.**

Take responsibility for protecting your own hearing. It is not a renewable resource.

FACT CHECK

Among all motor vehicle crashes in 2005, 1 percent of vehicle occupants who wore seat belts were ejected from a vehicle, compared with 31 percent of unrestrained occupants.

Strength and Power Training: A guide for adults of all ages



Strength Training Exercises & Equipment

If you're like many people, you've never lifted weights in your life and you may wonder why start now? As you age, muscle tissue and strength dwindles, but weight or strength training can reverse this process. It can also lighten your heart's workload, boost levels of good cholesterol, help prevent and treat diabetes, ease stiffness from arthritis, lead to weight loss, and improve your mobility.

While it's clear that there are plenty of reasons to include strength training in your routine, you may not know where to start. This report answers your strength training questions and helps you develop a program that's right for you. It includes more than 25 illustrated strength training exercises with step-by-step instructions, as well as information on choosing weights and strength training equipment, avoiding injury, and stretching. You'll also find information on power training, a new approach that can help you ward off frailty in your later years.

Copy web address into your search engine:

http://www.health.harvard.edu/special_health_reports/Strength_and_Power_Training.htm?utm_source=HEALTHbeat&utm_medium=email&utm_campaign=111808

PICTURE THIS!

Minnesota's OSHA inspectors would probably prefer not to be quite so busy. But how can they rest when there are people like these geniuses working out there? There's a name for people like this. In fact, there are three that spring to mind: Larry, Curly and Moe.