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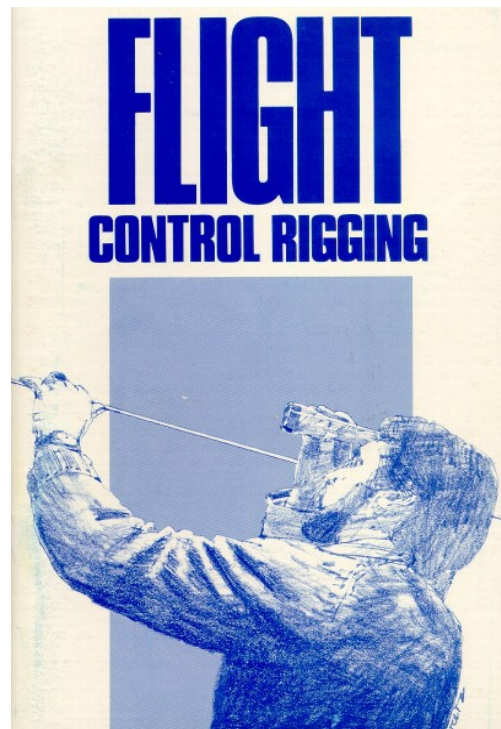
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Improperly Routed

On Losing The Ties That Bind

In an incident very reminiscent of the Air Midwest Flight 5481 crash at Charlotte North Carolina on Jan. 8 2003, a **Swearingen SA226TC Metro II** crew of Key Lime Air earlier this year experienced a very similar heart-stopping take-off rotation. The NTSB Report [DEN06IA056] covering the April 5, 2006 incident on N770S has just been published.

Prior to departure from Denver, the pilot of Key Lime Flt. 515 completed the pre-takeoff checklist, which included checking the flight controls, for full and free movement in the correct sense. At around 85 knots during the takeoff roll, the pilot "**noticed that the aircraft seemed very light in pitch**". At rotation speed he pulled back on the yoke and the aircraft broke ground. At this point the yoke lost all back-pressure resistance, came all the way back and the aircraft began to quickly pitch nose upward. It was an almost identical replication of Flight 5481's last moments.



The Metro pilot reported that moving the yoke forward had no effect and that it felt disconnected from the elevators. The quick-thinking pilot, on the verge of a stall,



began to run the trim nose down and reduced power to stop any further excessive nose up pitch.

After regaining an interim semblance of control via trimming, the pilot declared an emergency for "a flight control problem" and turned downwind for runway 17L. During the downwind leg he experimented with the degree of control by using the elevator trim and attempted to configure for landing. A shallow approach allowed him to iron out phugoid oscillations resulting from "flying on trim only" and he landed uneventfully.

An inspection revealed that "the elevator down cable was improperly routed at the pulley in the vertical stabilizer, just below the elevator bell crank". The resultant binding had caused the cable to "wear against a guide until the cable failed". The aircraft had undergone an inspection 10 days prior to the incident. A review of the inspection checklist revealed that "the elevator cables and related components were inspected with no anomalies noted". Upon discovery of the improperly routed cable, the operator checked the other 18 aircraft in their fleet. No similar discrepancies were found.

Aircraft maintenance records established that the elevator cable had been installed by another operator on Feb. 4, 1998, as required by Airworthiness Directive (AD) 87-02-02. Key Lime Air, Inc. maintained the aircraft under a manufacturer approved continuous airworthiness inspection program. On March 24, after its "Letter Check E" inspection, the aircraft got a clean bill of health.

Recall the NTSB's findings on the Jan. 8, 2003 Air Midwest Beech 1900D crash that killed 21:

*The accident airplane's elevator control system was incorrectly rigged during its maintenance check, which restricted elevator travel to 7° airplane nose down, or about one-half of downward travel.

*Changes in the elevator system resulting from incorrect rigging were inconspicuous to flight crew.

*The Raytheon Aerospace quality assurance inspector did not provide adequate on-the-job training and supervision to the mechanic who examined and incorrectly adjusted the elevator control system on the accident airplane.

*Because the Raytheon inspector and the mechanic did not diligently follow the elevator control system rigging procedure as written, they missed a critical step that would have detected the misrig and prevented the accident.

*Air Midwest did not adequately oversee the work performed by Raytheon personnel at its Huntington, West Virginia, maintenance station and did not ensure that the accident airplane was returned to service in an airworthy condition.

*Air carriers that use contractors to perform required inspection item maintenance tasks and inspections need to provide substantial and direct oversight during each work shift to ensure that this work is being properly conducted.

Flight control cable failure is no stranger to the Metro II. Note incident CHI87IA047 initially involving only Metro regn: N323BA, but later found to be a chronic fleet-wide malady. Just after the beginning of a descent for landing, a rudder cable failed completely, rendering the rudder inoperative. The aircraft landed uneventfully. Metallurgical analysis revealed that the cable had worn severely until it failed.

Following an examination of two operators' SA226 fleets, other binding and worn control cables were found. The FAA published a cable inspection AD. It also recommended that the manufacturer clarify its published cable inspection procedures and that maintenance schools review their cable inspection teaching.

Heavy pressure on a rudder cable would typically occur during asymmetric handling, during and following engine failure. It's unlikely that a rudder cable breaking in that circumstance would permit a successful single-engine landing. Unlike the ability to detect inflight wire-arcing at a crash scene (from the molten beading), the frayed broken strands of a burnt cable are bound to be dismissed as crash breakup damage.

Only a close inspection will find that a cable's binding caused it to break under flight-loads. The NTSB isn't looking that closely -- not in the Small Aircraft Directorate, anyway. Like carburetor icing, cable-breaks can be as inconspicuous as suspended water in fuel.

[3 hurt in O'Hare jet blast](#)

Two disembarking passengers and an airline baggage handler were injured at O'Hare International Airport this morning when they were struck by a luggage cart that was knocked over by the blast from a jet engine from a plane on the tarmac, authorities said.

The accident occurred about 8:20 a.m. at gate F1 outside Terminal 2, according to Chicago Department of Aviation spokeswoman Wendy Abrams.



The baggage handler was reported in serious condition and taken to Advocate Lutheran General Hospital in Park Ridge, according to the Chicago Fire Department.

The passengers were less seriously hurt, Abrams said. One of them refused treatment. The other was taken to Resurrection Medical Center in Chicago.

(Earlier, the Department of Aviation had reported that all three of the injured persons were O'Hare workers.)

The mishap came as passengers were deplaning a SkyWest Airlines jet via a stairway onto the tarmac, Abrams said. A jet blast from an incoming Mesa Airlines jet that was heading to a gate knocked over a baggage cart serving the SkyWest flight, she said.

"It's too soon to speculate how the incident occurred," she said, saying the Department of Aviation and the involved airlines were investigating.

She said it was unclear whether the cart or the incoming jet were in areas they should not have been.

[Nigerian plane crash report blames weather, crew](#)

ABUJA, Oct 19 (Reuters) - Bad weather, no runway lighting and a poor decision by the crew caused the December crash of a Nigerian plane that killed 106 people, more than half of them children, investigators said.

The DC9 operated by private Nigerian airline Sosoliso crashed, broke into pieces and burst into flames on Dec. 10 as it was trying to land at the international airport at Port Harcourt, Nigeria's oil capital in the southern Niger Delta.



The majority of the victims were children on their way home from boarding school for the Christmas break. It was the second major plane crash in Nigeria in seven weeks.

A report by the aviation ministry's Accident Investigation and Prevention Bureau (AIPB), published in newspapers on Thursday, described a disastrous sequence of events that led to the crash. AIPB Director Angus Ozoka confirmed the details to Reuters.



The report said a thunderstorm was raging as the plane approached Port Harcourt, impairing the pilot's visibility. **Runway lighting that would have helped was not switched on at the time.** Then, as the plane was preparing to touch down, the wind suddenly changed speed and direction dramatically.

As a result, the plane hit the ground about 500 metres (1,640 ft) from the runway and crashed into an exposed drainage culvert, breaking into pieces. Wreckage was recovered over a distance of 1,120 metres.

The report criticised the crew for deciding to land the aircraft despite the poor visibility and strong winds.

"The probable cause of the crash was the crew's decision to continue to approach below the decision altitude without having the runway in sight," Ozoka told Reuters by telephone.

The report recommended improving the training of Nigerian pilots to recognise and recover from adverse weather conditions including wind shear. It also said airports and aircraft should be equipped with instruments to detect wind shear.

The report also noted that the control tower at Port Harcourt airport was supposed to control the runway lighting but in fact the system was not working at the time. It recommended simplifying the commands for runway lighting.

Port Harcourt airport was closed down in August for rehabilitation works expected to last several months.

The Sosoliso crash came just seven weeks after another passenger jet, a Boeing operated by private Nigerian carrier Bellview, crashed in the countryside shortly after take-off from Lagos, killing all 117 people on board.

The AIPB has not released a report on the Bellview crash. Ozoka said investigations were still going on but were hampered by the absence of the black box, of any survivors or credible eye witnesses, and by insufficient evidence from the crash site.

The two crashes prompted President Olusegun Obasanjo to launch a raft of reforms in the aviation sector including a new civil aviation bill strengthening safety regulations and several airport rehabilitation projects. Several airlines, including Sosoliso, were temporarily grounded for audits of their fleets.

Tools Make the Maintainer

Good tools, and effective tool control, are essential for modern maintenance needs.



The quality of maintenance workmanship depends on the technician doing the work, to be sure, but the quality of tools used plays an important role. The guiding principles at Stahlwille Tools are that the tool should be consistently accurate in their dimensions, and robust enough to stand up in repeated use.

Accordingly, all tools are built to assure dimensional accuracy, chrome stability, foreign object damage (FOD) compliance, **and they are made from forgings, rather than stampings.** The result is longevity. "Our tools don't wear out very often," declared Bill Baum, a Stahlwille official with the North American part of the enterprise. All tools are manufactured in Germany, to aerospace specifications. Baum claims other companies manufacture to industrial or automotive specifications. Stahlwille has been distributing tools in the U.S. since 1961, primarily to the automotive, wind power and other industrial industries; they are the factory tool for Mercedes Benz, BMW, VW, Audi and Porsche. **Thirty months ago the company launched its concentrated effort in aviation and aerospace, starting with the U.S. Air Force.**

As an example of the benefits of high dimensional accuracy, a properly dimensioned wrench has much less chance of skipping, or slipping, on the fastener. Also, **Stahlwille's 12-point sockets are considered so accurate they can be used on 6-point fasteners, thus saving money by not having duplicate tools.** "The fastener can cost 10 times more than the tool, so there's a huge cost savings in not having to remove and discard a fastener whose edges have been rounded off by a tool produced to lower tolerances," Baum explained.

The Center Piece

The real stars of Stahlwille tools are the torque wrenches. The biggest issue for torque users is abuse. Torque wrenches are used, improperly, as hammers and breaker bars (used to free up a recalcitrant fastener). Torque wrenches are over torqued, dropped and generally beat up, all in a day's work. Often, the abuse is not reported, as no one wants to be admonished or responsible for a tool going out of service.

The problem comes when a torque wrench goes in for calibration, and the laboratory calls the user, notifying that the wrench is not repairable. In other words, the tool has to be replaced. Immediately, the question is asked, **what has it been used on and how long has it been so bad?**



"Stahlwille torque wrenches address that question in a few very clever ways," declared Baum.

Of primary importance, there is no spring inside a Stahlwille torque wrench. This feature lends itself to some very important attributes. Without a spring, the user can leave a Stahlwille wrench set at a value, without any degradation in the accuracy of the setting or the wrench.

Thus, if a user operates the wrench at 1,040 inch-pounds, the wrench can be left at that setting day in and day out, until calibration, and still have total accuracy (+/- 3% or 4%, depending on model).

Not having a spring, the mechanism inside the wrench is actually a beam at rest. The beam is machined and tapered to follow a precise curve, allowing not only for the accuracy, but also allowing the entire range of the wrench to be used. Hence, a wrench with a designed range of 350 inch-pounds to 1,800 inch-pounds can be used at 350 inch-pounds and at 1,800 inch-pounds as accurately as at 700 inch-pounds. As Baum explained, "This design feature surmounts a big problem with torque wrenches; technicians, especially new ones, use whatever value they see, not thinking about the standard 'cannot use 20% of the visible range of the wrench' rule" applied to more traditional designs based on a spring.

Of importance, Stahlwille torque wrenches can be used as breaker bars with no effect on the accuracy of the wrench. When a Stahlwille torque wrench is misused, the internal mechanism is taken out of the mechanical connection, and the wrench can be employed successfully as a breaker bar with no damage to the wrench or to its internal mechanism. As Baum exclaimed, "Virtually every other torque wrench on the planet is seriously damaged, and its accuracy is in question, that is if the wrench still functions after being used as a breaker bar."

Stahlwille torque wrenches come from the factory with NIST traceable certificates. More importantly, the wrenches come ready to work. "In the last 30 months of supplying torque wrenches to aerospace companies and to the U.S. military, we have not had a single wrench returned for any reason, including initial calibration tests," Baum said proudly. According to many U.S. military and commercial OEM (original equipment manufacturer) laboratories, as much as 30% of the traditional torque wrenches supplied "out of the box" cannot be calibrated. This problem is costly and time-consuming, as the wrench must be returned to the manufacturer for recalibration and certification, then sent back to the end-user's laboratory for "proofing." In the meantime, the tool was paid for but is not being put to work.

"We do not have this issue with our torque wrenches," Baum declared. He said Stahlwille is unique in that the company designs, builds, forges, machines, assembles, tests and certifies every torque wrench in-house. "We have not sent our torque wrench operations to Taiwan or mainland China, nor do we buy components from third parties and simply assemble torque wrenches," Baum said. "All the critical components are done internally.



To be sure, handles, windows and such are sourced out, but Baum says these components are not critical to the torque mechanism.

Stahlwille wrenches are built to the ISO 6789 standard of one year or 5,000 active calibration cycles. A calibration cycle is generally established by the user's calibration laboratory based on long term monitoring of the tools. Twelve months or 5,000 activations is the allowed maximum by the ISO/NIST.

Tools that claim longer calibration cycles are not adhering to the ISO standard and thus could expose the end-user to unnecessary liabilities, Baum asserted.. Interchangeable heads allow for greater flexibility and lower overall cost than other fixed head wrenches. One wrench can accommodate multiple heads. For example, one torque wrench can be fitted with 1/4-inch, 3/8, 1/2 or 3/4-inch drive ratchets, as well as crow's feet, crow ring, square drive or ring inserts.

Moreover, specific inserts allow for specialized applications, like for the mount pins on CFM56 engines on the A319 and A320 aircraft.

Baum admitted that his company's torque wrenches sell for about 2.5 times the price of competitors spring-adjusted models. "But with the interchangeable heads, ours is only 1/3 to 1/2 times more expensive, and its got two big advantages: you have the flexibility of the interchangeable heads, and you have the longevity of our forged, machined-beam tool," Baum explained.

As Baum said, "Torque is a focal point of the company." In addition to the tools, the company manufactures and sells torque testing and calibration equipment.

The company's torque wrenches and other tools are designed to minimize the potential for foreign object damage (FOD) to the airplane, engine or components. However, the tools themselves, if inadvertently left in the airplane or engine, present a dangerous risk of FOD.

A U.S. Air Force Air Combat Command briefing in 2003 indicated that hardware and tools comprised a major source of damage to aircraft. "Poor hardware control" was a major driver, according to the briefing, and tools left in aircraft or engines represent a significant source of the problem.

Controlling Tools

Stahlwille has teamed with Coplan Ltd. of the United Kingdom to provide what is called **intelligent tool control**. The object primarily is to eliminate FOD related incidents, but also to avoid tool loss, track the usage of tools, manage tool inventory and purchasing, and to control tool calibration.

These goals are accomplished by a secure tool chest that is connected, via wireless telemetering technology, to a computer network.

The tool chest can be fixed or mounted on mobile casters, but it takes the right keypad entry or swipe-card from the user to gain access to the locked drawers.

Once open, **the tools are arrayed in specially cut out foam inserts**, which enables one to see at a glance which tools are out. This is known as **visual tool control**. The use of the foam to store the tools in shaped-receptacles is not unique. What is unique is the use of digital optical sensors, adapted from the robotics assembly industry, in each tool receptacle.

The optical sensor is connected to a wired or a wireless network. Thus, management knows which tools are in use and for how long. And should the tool chest be returned with missing tools, that information is also known.

There are numerous virtues to this accountability. For one thing, tools appropriate to the job at hand should be the ones in use. **Second, should any tools mistakenly be left on the aircraft or engine, the empty foam receptacle is a sure sign to the mechanic, and the absence of the correct signal to management is a back-up indication.** This accountability can be a lifesaver, as aircraft can be held if a tool is indicated to be out of the box by the monitoring system.

A "standard" tool trolley, able to store 180-220 tools, costs around \$7,000. This is more than the price of a standard toolbox, but includes the precision-cut foam, the sensors, the control board and the software to control multiple trolleys or cabinets. "Remember that there is another cost to consider here," said Baum. "There is the cost of FOD damage, or lost sorties, and/or revenue, when a tool cannot be located, as well as the cost of searching for a tool." These costs can easily trump the cost of the tool control system by a considerable margin.

Thus, in the grand scheme of things, the extra cost of Stahlwille torque wrenches and Coplan's tool control system, may actually be outweighed by the costs avoided. **Not having an effective and flexible tool, or not being able to locate it, may cost far more.**

Boeing has put situational awareness on the center stage in designing the cockpit and avionics systems for the 787s.

Two well-known sayings immediately spring to mind when summing up the 787 cockpit and its avionics systems: "A picture is worth a thousand words," and "information is power."





While Boeing's newest airplane will bristle with all the latest avionics bells and whistles, for Chief Systems Engineer Mike Sinnett its major feature is its greatly enhanced **situational awareness** package for pilots.

"With the dual head-up displays and the greatly enhanced tactical situation displays, flightcrews will have unprecedented information available to them when they want it and in a form they want," he explains.

That information will be displayed on five large screens measuring 15.1 in. diagonally twice the size of those on the 777 that will give pilots not only a new level of the view ahead but also of what is behind. "If pilots need to make an emergency go-around, they instantly know what the terrain is all around them," Sinnett says. During that emergency turn, when flightcrews normally would be blind momentarily to the weather toward which the aircraft was turning, the Rockwell Collins WXR-2100 MultiScan Radar solves this problem by using SmartScan to scan just in the direction of the turn, thus ensuring quick re-visit times.

The real beauty, says Sinnett, **is that pilots will have all the information they want on one screen without having to scroll to get the total picture.** The screens are capable of displaying large-format maps with a range of 1,280 mi. (2,370 km.) and flightcrews also can bring up complete airport taxiway maps without having to scroll. The additional screen space allows for overlaying weather data without obscuring vital navigation information and there will be screens for displaying ATC communications and advisories to remind crew to comply with those instructions.

All 787 pilots will have these and countless other state-of-the-art safety systems because Boeing has taken safety options away from airline accountants.

"Everything is standard. We had a battle to start with as airlines balked at paying for features they thought unnecessary, wanting credits, but we convinced them that it was more cost-effective to make everything standard rather than try to tailor the cockpit," notes Sinnett. "We don't get arguments any more," he adds with a smile.

The HUD Battle

One of the biggest battles involved the HUD: "Some airline executives thought it was just a toy and it was difficult to make the business case." **He was adamant that the HUD is a critical element of greatly improved situational awareness.** Ironically, Boeing's task of selling safety features like the HUD was made harder because of the perfect safety record of aircraft such as the 777, which does not have many of the 787's cockpit features. **However, the smaller 787 will be performing missions into airports that never see a 777 destinations where locals steal and sell copper wire from navigation beacons to feed their starving families.** The company ultimately was able to build the cost savings case for the HUD; for instance, the 787 will be able to take off with only 200-ft. minimums instead of the usual 300 ft.



While accountants may have needed some persuasion, pilot groups have praised Boeing for harnessing avionics and systems advances and making them standard. According to Air Line Pilots Assn. [President Duane Woerth, the 787 flight deck "serves as an extraordinary example of collaboration between pilots, the aircraft manufacturer and its suppliers to design the safest and most efficient aircraft possible."](#) He lauds the company for involving the union's safety experts from the outset, while ALPA Executive Air Safety Chairman Terry McVenes says that "because pilots were so involved in the design development, the 787 gives them the information they need, exactly how and when they want it. Pilots have asked for this type of flight deck innovation for years."

At the heart of delivering that innovation is an innovation in its own right: The Smiths Common Core System, the Dreamliner's central nervous system. The CCS has made the most of advances in rugged, powerful computing technology to create a single platform that will take the place of up to 100 different line replaceable units.

In comparison to the 777's Aircraft Information Management System, which collects, formats and distributes onboard avionic information for the bulk of the aircraft's major systems, Smiths has tacked on more systems and connected the dual hearts of the CCS with 21 Remote Data Concentrators spread throughout the 787, eliminating miles of wiring. The RDCs serve as "digital gateways to the CCS," says Sinnott. The CCS will see a reduction from the 80 separate computing functions on the 777 to just 30 on the 787, and in the cockpit the Dreamliner has just eight LRUs, down from 15. In total, Boeing expects the 787's avionics suite to be 2,000 lb. lighter than earlier-generation systems.

To keep the various functions separated within the main CCS processors, the system was designed around an ARINC 653 partitioned software operating environment a series of artificial barriers that isolate the various software sets. By using that industry standard operating system, the open architecture of the 787's avionics suite is ensured and Boeing is able to upgrade the cockpit easily, giving it the freedom to select the best providers of subsystems.

[Connecting the CCS with the RDCs, avionics and utilities is the avionics full-duplex switched Ethernet, also known as an ARINC 664 Deterministic Ethernet, which operates at speeds up to 1,000 times faster than its predecessor ARINC 429 used in earlier generations of airliners.](#) The decision to use Ethernet-based technology instead of more arcane and aviation-specific data communication protocols also means the system benefits from the massive amount of commercial investment poured into Ethernet since its invention in 1972. Additionally, it is inherently more flexible and therefore capable of growing with the 787 and its future systems development.

Philosophical Shift

The Dreamliner's avionics represent a major shift in philosophy for Boeing, with suppliers being responsible for development and systems integration while ensuring they maintain the theme of open architecture. Sinnett dismisses out of hand reports that there is friction among avionics suppliers. "When that story came out, I had our avionics suppliers ring me up saying what on earth is that all about?" He says the opposite is the case: "We have weekly avionics meetings with each supplier present, and if there are any problems everyone helps to resolve the issue. In fact, our suppliers have morphed into 787 people."

One of the major "787 people" is Rockwell Collins, which is responsible for the primary 787 safety functions being grouped into the Integrated Surveillance System. Acting as the ears and eyes of the aircraft, the ISS incorporates into a single unit dual TCAS, Honeywell-supplied TAWS, weather radar and Mode S transponders. By integrating them, Rockwell has saved weight, volume, power consumption and cost. Compared to a suite of equivalent federated systems, the ISS saves around 36% in weight, 26% in power consumption and an impressive 60% in size. Having dual systems means the 787 has a "hot spare," Sinnett notes.

Boeing is bullish on the fact that the 787's futuristic flight deck will incorporate the latest technology. Program Manager Mike Bair makes no apologies for the lack of commonality with earlier models. "You have to be careful not to limit yourself to the same cockpit airplane," he says. "We are striving, however, to limit the transition time from a 777 to just five days of differences training."

Sinnett adds, "The airplanes [787 and 777] were designed nearly 15 years apart and it would be shortsighted not to take advantage of new technologies. However, with advanced systems we can make those differences nearly invisible to the flightcrew. **We have digitally recreated the feel and functionality of the 777 but we use more efficient and more modern approaches.**"

For example, he notes that the systems team has added new functionality, such as gust suppression to help create a smoother ride, "without changing the way the pilot interfaces with the airplane." This careful approach "allows us to achieve breakthrough improvements in efficiency with minimal impact on flight deck procedures, reducing crew training costs in transitioning from other models of the Boeing fleet." The transition time for pilots of non-fly-by-wire types such as the 757/767 and 737NG will be just eight days while 747-400 transition training will be a more extensive 10 days.



Pilots' Delight

Though pilots will delight in navigating their way around the 787 cockpit, responsibility for the navigation package was awarded to Honeywell.

To guarantee absolute accuracy and multiple redundancies, the "nav suite" will include both the tried-and-tested inertial reference system and the latest version of the more recently developed satellite-based navigation system. Also part of the base package are an associated air data system measuring aircraft speed and altitude along with two micro-IRS units that are available as backups. Additional backup comes from two attitude heading reference systems based on the off-the-shelf units supplied to Regional airliners.

The satnav capability gives the 787's Global Navigation Satellite Landing System the capacity to allow pilots to land using the ILS in Cat IIIB weather conditions or the newly established satnav-based Cat 1 GLS approaches to airports covered by differential GPS ground stations. Other elements of the nav package include dual DME transmitters, two radio altimeters, optional dual ADF radios and the emergency locator transmitter.

Honeywell also won the contract for the Crew Information System/Maintenance System, which is built on the central maintenance computing and airplane condition monitoring functions provided by the company for the 777. The CIS is linked to a secure crew wireless LAN that will be used with wireless LANs in airports to upload flight plan data, cabin manifests and passenger information. The airport LANs will be powerful enough to reach the aircraft at distances of up to 400 ft., allowing information to begin loading before the 787 has docked. The system also will let maintenance engineers with wireless laptops access data without having to board the jet.

Aside from the huge display screens, the most striking features of the 787 cockpit are the dual Rockwell Collins Flight Dynamics HUDs. Unlike earlier units, such as those in the 737NG, the 787 HUD is based on a pin-sharp LCD image source rather than CRT technology. This is an important step not only for improved overall image quality but because it provides the platform for a wider range of uses in the future. Sinnett suggests these could include enhanced vision systems and runway and taxiway outlines. Dual Electronic Flight Bags also come standard. Again, airline accountants bucked the additional "toy" but Boeing held fast.

In the last century, there was a plaque over the door to the navigator's position on the famous ocean liner Queen Mary that read: **"It is better to be unsure of where you are and know it than to be certain of where you are not."** Given Boeing's uncompromising stance on the 787's cockpit safety features, combined with huge advances in avionics, perhaps a plaque should be installed over the 787 cockpit door that states, **"You will always be certain where you are in a 787 you can be sure of that."**

British Concorde 'Left To Rot On The Runway'

Group Wants To Save One Of 'Britain's Greatest Engineering Achievement'

Almost every pilot will tell you that seeing a grounded airplane deteriorate over time is a sad sight. When that plane is the magnificent supersonic Concorde, it seems even more heart-wrenching.



Scotland's Sunday Herald reports that three out of the four Concorde left in the United Kingdom are being left to corrode on lonely stretches of tarmac. Only the Scottish Museum of Flight has brought its Concorde in from the elements.

Ben Lord, of the Save Concorde Group, told the paper "Our national heritage is being left to rot on a forgotten runway. These iconic aircraft represent the single most stunning achievement in Britain's post-war history, yet they are being allowed to slowly turn to rust," said

He continued, "We are extremely concerned that Concorde is about to experience another winter without shelter. **What's more alarming is that we see no concern being shown by British Airways, which still owns the British airframes. By retaining ownership of the aircraft, this denies any of the museums where Concorde is now resting to apply for a lottery grant to ensure that at least preservation of the airframes is maintained under permanent cover.**"

The Concorde was first flown in 1969 and retired in 2003 and remains the only civilian passenger aircraft to regularly exceed the speed of sound on scheduled flights.

When the airline ordered its ground crew to disable many of the plane's critical systems last year to prevent the possibility of the plane being resurrected, one former chief pilot described the decision as "an act of vandalism".

BA has dismissed claims that it is allowing the fleet to decay, stating that it is "incredibly proud" of Concorde, according to the Herald.

But Lord insists, "BA has absolutely no interest in Concorde and seems determined to let the last planes crumble into rust... It is as if they were trying to un-invent one of Britain's greatest engineering achievements."

The Air and Space Museum in Paris, meanwhile, is trying to return one of Air France's Concorde to flying condition, though that attempt is widely regarded as impractical.

It seems even more unlikely that despite the earnest efforts of the Save Concorde Group, there will ever be a British Concorde in the skies again.

Stressed Out? Take a Hint From the British

Many British people couldn't live without their "cuppa" (tea). A new study shows why they may be onto something good.

Researchers at University College London say they have evidence that black tea speeds recovery from stressful situations. Seventy-five young men who drink tea regularly were split into two groups. One group was given a fruit-flavored caffeine brew containing the ingredients of an average cup of black tea, while the other was given a placebo that tasted the same, but didn't contain black tea ingredients.

Regular black tea was not used because the scientists wanted to eliminate the psychological calming effect that many people associate with drinking a cup of tea. Men in both groups were given challenging and stressful tasks to perform while scientists measured their blood pressures, levels of cortisol (a stress hormone), blood platelet levels and stress levels as self-described by the participants.

Cortisol levels were measured after participants in both groups had completed stressful tasks. Subjects given the beverage containing black tea ingredients had cortisol levels that were 20 percent lower than those of their counterparts who drank "fake" tea.

The "real tea" drinkers also had lower blood platelet activation than the non-tea-drinking group. That means they were at lower risk for having heart attacks. The tea drinkers also reported feeling less stressed after completing the tasks.

If work and other issues are stressing you out, maybe it's time to cut back on coffee and discover black tea.



THIS DAY IN HISTORY **The Donora Death Fog of 1948**

October 26, 1948

It was like something out of a horror movie. But it really happened.



On this day, 58 years ago, a fog descended upon the small industrial town of Donora, Pennsylvania. The fog would cover the town over the next four days, killing 20 residents and hospitalizing 7,000 – half the town's population.

In 1948, the residents of Donora were used to smoke and smell from the US Steel Corp's zinc works and steel plants. They accepted the pollution as a fact of life and the cost of regular employment. But when an inversion set in, trapping the town's air in the narrow river valley, the residents became trapped in a poisonous mixture of sulfur dioxide, carbon monoxide and metal dust.

At first, the townspeople weren't alarmed. They carried on with their regular activities, with many even attending a football game, although they couldn't identify the players or even see the ball through the smog. But within a day, senior residents were unable to breathe, delivery drivers were wearing respirators and the yellow air was starting to burn eyes. Firemen were called to deliver oxygen to residents and a room in the community center was soon the town morgue.

Four days into the siege, the zinc works mill was at last ordered to shut down. The same day, it finally rained and the trapped polluted air was released. The zinc works mill was back in operation the next day.

The Donora Death Fog – or killer smog, as it was also known – triggered the first public calls for protection from industrial air pollution and was the catalyst for the creation of the Pennsylvania Clean Air Act in 1955.

HALLOWEEN SAFETY

More Tips for the Season

I love Halloween. But as a mother and a safety professional, I can't help but worry about all the hazards. Pumpkin carving, candles, kids running around at night with their bodies cloaked and their faces masked — it has all the makings of a disaster.



So, while Glenn is always pestering me to keep SafetyXChange fresh, I'm going to do the exact same thing I did last year at this time: I'm going to provide Halloween safety tips for kids.

As a sop to Glenn, I'll provide a different set of safety tips this year than I did last year. But if you want to get access to the original, [here's the link](#). So Happy and Safe Halloween, everybody!

- Use battery-powered jack o'lantern candles instead of real candles;
- Keep flammable decorations, such as dried flowers and cornstalks, well away from heat sources and open flames, including candles, light bulbs and portable heaters;
- Keep your escape routes clear. Don't block exits with decorations;
- If your kids are going to a friend's house for a Halloween party, teach them how to locate exits and plan to get out in case of emergency.

Teach Children Safety Smarts

- Trick-or-treat only at homes that are well-lit;
- Don't enter homes or apartments. When trick-or-treating, the front door is as far as they need to go;
- Walk, don't run. Unseen objects on lawns or uneven terrain are tripping hazards;
- Don't eat any treats until you've inspected it;

Keep Halloween Healthy

For the little ones who come knocking on your door, here are 10 suggestions for non-food treats or healthy food alternatives:

1. Coloring book
2. Pencil
3. Stickers
4. Eraser
5. Coins
6. Package of cheese and crackers
7. Single-serving box of cereal
8. Single-serving package of low-fat popcorn (for microwaving later)
9. Small box of raisins
10. Packaged fruit rolls

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