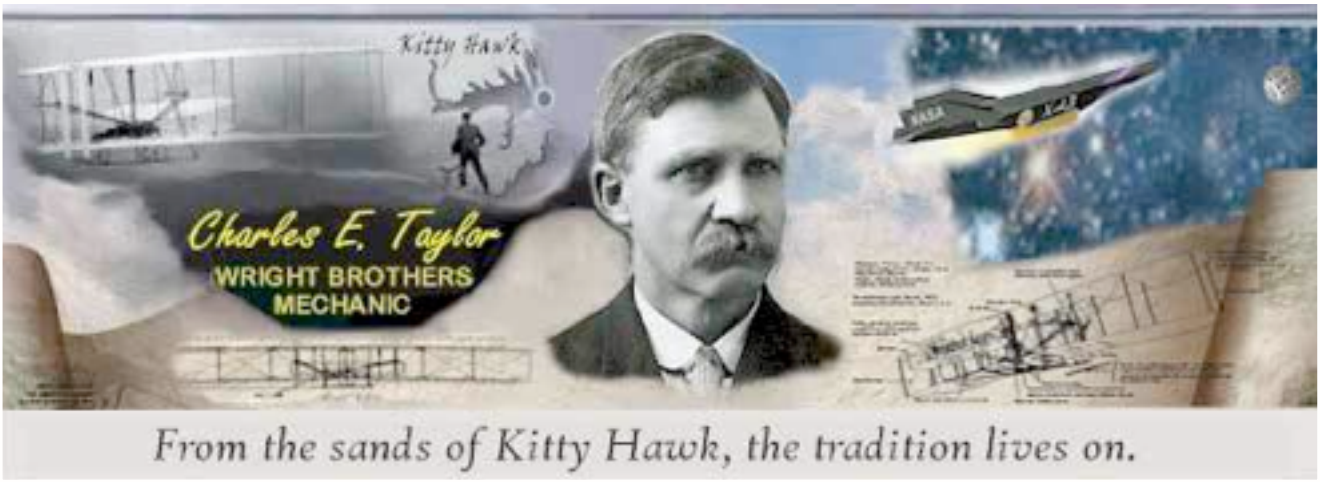
# Aviation Human Factors Industry News

Volume V. Issue 10, May 11, 2009




**Hello all,**

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

# THY 737 altimeter fault occurred several times before crash


Dutch accident investigators have determined that the radio-altimeter fault that is the focus of their probe into the fatal loss of a THY Turkish Airlines Boeing 737-800 at Amsterdam Schiphol had occurred on several of the nine previous flights by the aircraft.

On two of the flights, which were retained on the digital flight data recorder (DFDR), the fault caused the autothrottle to enter retard mode and the throttles to close as they did on the accident flight.

The investigators note that Boeing guidance is that the autopilot and autothrottle should not be used on approach, as they were on the accident flight, if the radio altimeter malfunctioned on the previous flight. It is not stated whether a malfunction was in fact identified on the previous flight.

In their preliminary report they also describe how the aircraft entered the glidepath from above rather than below, and only decelerated to the correct approach speed of 144kt at an altitude of 770ft. With the throttles at idle, the aircraft's speed subsequently fell to 110kt at 420ft and a last-ditch attempt by the crew to recover was unsuccessful.

The report relates how, in daytime and good weather on 25 February, the aircraft (TC-JGE), which was otherwise found to be fault-free, was flown from Istanbul to Amsterdam by the crew consisting of a line-training captain, a first officer performing a "line flight under supervision (LFUS)", and another first officer in the jump seat required as a safety pilot during a LFUS. All three died, as well as a flight attendant and five passengers.

The left-hand radio altimeter, which feeds the autopilot and autothrottle, recorded its maximum permissible altitude of 8,191ft until the aircraft descended to an actual altitude of about 1,950ft when the recorded value

"suddenly changed to -8ft and remained at that value up until shortly before impact".

Cockpit voice recorder data shows that "several aural landing configuration warnings" - for flaps and landing-gear - sounded at altitude and then again while on the approach, when they were triggered by the low radio-altitude reading. The warnings and the crew's reaction are still being examined.

The investigators say the standard procedure for runway 18R at Amsterdam is for air traffic control to line up aircraft at 8nm and 2,000ft altitude, but a line-up of 5-8nm may be offered. The Turkish flight lined up at 6nm and 2,000ft and descended to onto the glidepath from above, the crew selecting vertical-speed mode to attain the glidepath at 1,330ft. They reduced speed from their initial 165kt to the correct 144kt by 770ft, selecting 40° flap at 900ft.

At the same time the autothrottle "entered the retard mode" normally engaged during the landing flare and the thrust levers went to idle. The speed continued to decay and the autopilot steadily commanded nose-up to try to maintain the glideslope.

Eventually the stick-shaker, warning of an imminent stall, triggered at about 460ft. The report says the thrust levers were immediately advanced but "moved back to idle" and the autothrottle disengaged, either by the crew or automatically. Speed by then was 110kt, the aircraft 11° nose-up, and the angle of attack at about 20°.

At 420ft the crew disengaged the autopilot and attempted to recover, reaching 8° nose-down at 310ft with full-power then generating a slight climb, but it eventually reached a 22° nose-up attitude with 10° left bank before crashing 1.5km from the threshold. The fuselage broke in two places and the cockpit and cabin were severely damaged. Eighty-six occupants were injured, in addition to the nine fatalities.

The report states: "The door between the cabin and the cockpit was found partly opened."

It concludes: "The Dutch Safety Board has issued a warning to Boeing in which extra attention is asked for a part of one of the manuals (737 dispatch deviations guide) of the Boeing 737. In this guide it is stated that if, [during the] preceding flight, the radio altimeters are malfunctioning, the associated automatic pilots and autothrottle systems cannot be used for

approach and landing. The board has given Boeing into consideration to investigate if these procedures should also be valid during all phases of a flight.

"Boeing has issued a multi-operator message the same day concerning malfunction of the radio altimeters."

## Proud Member of the “Dirty Dozen” - Lack of Communication

CALLBACK ASRS

From NASA's Aviation Safety Reporting System

### Narrative

ONE OF OUR 200 SERIES DASH 8'S FERRIED TO OUR BASE FOR AN ENG CHANGE, PROP CHANGE, AND SHEET METAL REPAIRS. OUR BASE HERE IN ZZZ NORMALLY ONLY WORKS ON 100 SERIES DASH 8'S. A CREW REMOVED AND REPLACED THE PW123 ENG BUT DID NOT INSTALL THE PROP NOR DID THEY RIG THE ENG CTLS. ANOTHER MECH AND I WERE TOLD BY OUR SUPVR TO INSTALL THE PROP AND TO GET THE ACFT READY FOR AN XX00 DEP.

THE PROP INSTALLATION AND ENG RIGGING WAS COMPLIED WITH AND INSPECTED IN ACCORDANCE WITH THE MAINT MANUALS. THE EVENT WAS CAUSED BY THE NACELLE MOUNTED CTL RODS BEING INSTALLED ON THE WRONG SIDE OF THE LEVERS AT THE ENG'S FUEL CTLR. THE CORRECT SIDE WAS OPPOSITE OF WHAT WAS IN THE MANUAL. THE MAIN CONTRIBUTING FACTORS WERE THAT THE MANUALS WERE INCORRECT AND NOT SPECIFIC, LACK OF TRAINING, AND A POOR TURNOVER FROM THE CREW THAT REMOVED AND REPLACED THE ENG. THE SIT WAS DISCOVERED DURING A

REVENUE FLT ON THE NEXT DAY WHEN THE CREW RPTED THAT THE PWR AND CONDITION LEVERS FOR THAT ENG BOUND UP. THE CREW WAS ABLE TO FREE THE LEVERS AND CONTINUED AND COMPLETED THEIR FLT.

## Synopsis

A DH8-200 RPTED ENG CTLS BINDING ON A RECENTLY REPLACED ENG. FOUND MAINT MANUAL FOR ENG FUEL CTL RIG FOR MODEL 200 INCORRECT.

## Safety More Than Just Rules


Human factors are a contributing element in 80 percent of aircraft accidents, said Warren Jensen, a medical doctor and UND professor who teaches a course called "Human Factors" for the aerospace school. The second highest contributing factor, weather, isn't even close, Jensen said. Information released from an investigation into the Sunday crash of Comair Flight 5191 in Lexington, Ky., that killed 49 people has focused on a pilot error that sent the plane down the wrong runway and an air traffic controller who, investigators said, only had eight hours off between shifts and was working on two hours of sleep. "Fatigue is public enemy number one here at the university and at commercial airports, too," said Dana Siewert, director of safety with the John D. Odegard School of Aerospace Sciences. Before taking off on a solo flight, Siewert said, every student pilot has to check in with at least six different people, including a flight instructor who asks the student pilot if he or she is under any stress and who examines the pilot for signs of fatigue. The pilot also fills out a checklist stating he or she has considered risk factors such as too little sleep or too little to eat. Checklists help, Siewert said, but the final line of defense against a risky situation is a culture of safety.

When pilots understand the dangers of flying while tired or stressed out, he said, they are less likely to take risks. "Our pilots are trained from day one to make good decisions," Siewert said. "We call it ADM -- aeronautical

decision making. We teach them not to fly when they're ill, or have stress, or are on medications, to have a knowledge of the plane and of the environment." Jensen said he teaches students that simply following rules and regulations won't keep an airplane safe. After United Airlines Flight 173 crashed in Portland, Ore., in 1978, Jensen said, people in the airline training community began to look beyond regulations. The National Transportation Safety Board determined the probable cause was the captain's failure to properly monitor and respond to a low fuel situation while preoccupied with other matters was the probable cause of that crash, according to AirDisaster.com. Eleven people were killed and 23 were seriously injured. Following the United crash, Jensen said, the industry developed the first Crew Resource Management program, a training program now mandated by the FAA that teaches situational awareness, problem solving and teamwork. "They decided we need people with good skills so their natural inclination is to do the right thing," he said. "It's like drivers. Some people know all the rules but just because they're legal doesn't mean they're safe."

## Aircraft Mechanics Compete in 2009 AMTSociety Maintenance Skills Competition

Continental Airlines' CLE team took first in the commercial airlines division and finished with the best overall time. AMTSociety hosted its second annual Maintenance Skills Competition (MSC) at this year's Aviation Industry Expo in Las Vegas from March 10-12. Fifteen teams of aircraft maintenance technicians pitted their skills against each others' in 12 different skills categories.

Categories included the Charles E. Taylor written test, G IV main wheel removal/installation, hardware identification, regulatory research, composite damage inspection, safety wiring, two electrical troubleshooting

categories, avionics troubleshooting, APU combustor chamber inspection, aileron rigging, and N1 tach generator removal/installation.

"The MSC allows the public to see first- hand exactly what today's and tomorrow's AMTs do in order to provide safe, airworthy aircraft," says AMTSociety Director and MSC Chairman Ken McTiernan.

Teams were split into four divisions: military, schools, commercial airlines, and general aviation. The top three teams in each group won a plaque.

In the military group, USAF McGuire AFB won first place. USAF McChord AFB won second place, followed by US Navy Fleet Readiness Center Southwest in third place.

The Aviation Institute of Maintenance (AIM) Atlanta campus won first place in the schools division. AIM "Team USA"— made up of students from other AIM campuses – took second place, and Crimson Technical College came in third.

In the commercial aviation bracket, Continental Airlines CLE garnered first place. Continental Airlines IAH/Hobby took second place).

American Airlines' "Team American" – made up of AMTs from LGA, JFK, and BOS – finished in third place.

"Team Colorado" from the Colorado Aeronautics Division was the only team to compete in the general aviation division.

"All 15 teams that competed were the epitome of what today's professional AMT is," says McTiernan. "As the Chairman for the 2009 MSC, I am proud of the way both professional and student AMTs performed and portrayed our proud craft and profession."

AMTSociety also honored Continental Airlines' CLE team with the "William F. O'Brien Award for Excellence in Aircraft Maintenance" for having the fastest finish time overall. Marie O'Brien, widow of the late Bill O'Brien, and Carol Giles, manager of the FAA's Aircraft Maintenance Division, presented the award.

Sponsors for the 12 skills categories included Aircraft Maintenance Technicians Association (AMTA), Alberth Aviation, American Airlines, ATP, CAE, Continental Airlines, Dallas Airmotive, Embry-Riddle Aeronautical University, Nida Corporation, Spirit Aviation, and Tarrant County College.

## Safety Videos On-the Go


**"Plugged In" for Safety Videos On-the-Go The safety-related "Videos On Demand" produced and broadcast from the FAA Production Studios at the FAASTeam National Resource Center in Lakeland, FL, are now available for viewing directly on iPhones and iPod Touch devices. Video topics include icing for general aviation pilots, safe weather practices, and "Plane Time," the Production Studios' talk-show style aviation seminar. Icons have been added to the FAA Production Studio's Web site on the "Videos On Demand" page to indicate iPhone and iPod Touch compatible videos.**

**The icons link to files that can be viewed directly on these devices without additional software. These initial files do require high-speed internet access for viewing. Future plans call for the videos to be made available through iTunes, where they can be stored locally on an iPod device and downloaded without high-speed internet.**

**To see the latest videos, go to http://www.faasafety.gov/ and click on "Videos On Demand" in the top right corner.**

**You can also access the videos at http://www.faaproductionstudios.com/.**

## FAA Requests Comments On Standards For Airport Sign Systems

**FAA has requested comments on draft Advisory Circular (AC) 150/5340-18F. The AC provides standards for the siting and installation of signs on runways and taxiways. These changes are in coordination with revisions to AC 150/5300-13, Airport Design, altering the Precision Object Free Area (POFA) to the**

Precision Obstacle Free Zone (POFZ) and also incorporate new separation standards for taxiways that parallel runways used for certain low visibility operations.

This AC incorporates mandatory hold signs that reflect changed standards for the POFZ and Category (CAT II/III) operations. FAA also has revised low visibility operation procedures; and Terminal Instrument Procedures (TERPS) standards for the separation distance between a runway equipped for CAT II/III operations and the parallel taxiway that requires aircraft to hold in certain circumstances, at a location other than the runway holding position.

In addition, FAA also has developed sign standards to assist airport operators in designating (1) the POFZ holding position in those instances where a taxiway, holding apron, or other movement area would result in an aircraft fuselage or tail penetrating, and (2) the alternative holding position on a taxiway during CAT II/III operations necessary to maintain adequate aircraft separation.

AAAE will be collecting comments to deliver to FAA on behalf of airports. Submit comments by May 20, 2009, to Leslie Riegle at leslie.riegle@aaae.org. FAA is asking for justification for all comments regarding oppositions and recommended modifications.

http://www.aviationnews.net/?do=headline&news_ID=166023

## Streamlight Introduces PolyTac® and PolyTac® LED Flashlights

Streamlight®, Inc..., a leading flashlight manufacturer for law enforcement and tactical uses, has introduced two super-bright, polymer personal, the Streamlight PolyTac®, featuring a high-performance Xenon incandescent bulb, and the Streamlight PolyTac® LED with the latest in C4™ power LED technology. Their compact size, combined with their strong, tough polymer casing and high light output, make both lights perfect for a wide variety of law

enforcement and tactical uses.

"These lithium-powered polymer lights are lightweight, while offering exceptional durability and brightness," said Streamlight Chief Operating Officer Ray Sharrah. "The LED version uses a power LED which provides two to three times the output of Super High Flux LEDs, and the Xenon model offers super-bright light as well. Whether used on night-time patrols, investigations, or just carried in a back pocket or holster, these small but tough lights are ideal for police and other tactical personnel to carry."

The incandescent Xenon PolyTac offers a light output of 6,000 candela peak beam intensity and 72 lumens measured system output, while the LED model offers 4,800 candela peak beam intensity and 120 lumens measured system output. The PolyTac model uses a 6-volt xenon bulb, and the LED version features a C4 LED bulb that is impervious to shock with a 50,000 hour lifetime. The xenon model also offers an adjustable head which allows for variable spot-to-flood focus.

The Xenon version provides 80 minutes of continuous runtime to the 10 % output level, and the LED version offers 3 hours of continuous runtime to the 10% output level. Both lights weigh only 3.9 oz. and measure 5.22 in. in length and 1.25 in. in diameter.

Both the PolyTac and PolyTac LED feature bodies made of high impact, super tough nylon polymer for exceptional durability and a sure grip. Each light features a tailcap push button switch for easy, one-handed operation. The tailcap also can be rotated to a "Safe" position. Both lights use two 3-volt lithium batteries, which have a shelf life of 10 years.

Available in black, coyote or OD green, the PolyTac retails for $52.00, and the PolyTac LED for $65.00. The light comes with Streamlight's Limited Lifetime warranty.

Based in Eagleville, PA, Streamlight, Inc. is a leading manufacturer of high-performance lighting equipment for professional fire fighting, law enforcement, military, industrial, automotive, and outdoor applications. Streamlight is an ISO 9001:2000 registered company. For additional information please call 800-523-7488 or visit streamlight.com.

## Mac Tools Introduces a New Lighted Inspection Mirror

**Mac Tools introduces a new Lighted Inspection Mirror – MHTLM2. This new LED lighted inspection mirror illuminates darkened areas. The stainless steel antenna telescopes from 6-3/4 inches to 37 inches enabling fast accurate inspection.**

**The new Lighted Inspection Mirror – MHTLM2 features the following: * 2-3/8" LED case illuminates darkened areas.**

*** Textured cushion grip will not slip in wet or oily hands.**

*** All angle ball joint holds the lighted mirror head firmly at any angle for perfect viewing.**

*** Comes with two easily replaceable watch batteries.**

*** Comes packaged in a four-piece display with two Velcro strips on the back for easy placement on the truck.**

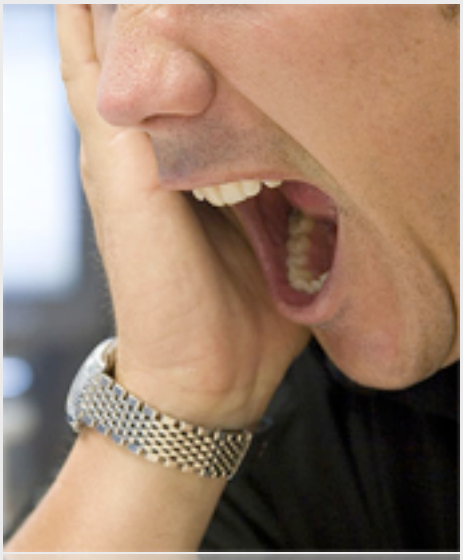
**For information on other products offered by Mac Tools, visit www.mactools.com.**

## Run.com

**Run.com is a new site that functions as a search engine for running route maps worldwide. *However,* you need not be a runner to find benefits of this ingenious idea. Walkers can also enjoy this resource and everyone who a route then enjoy can add ti to this data base. The site contains a custom route-mapping tool that is easy and fun to use and will provide you with an easy-to-read map, accurate distance information, an elevating profile for each**

route, scenic views, rest stops and much more. Use this website to change up your exercise routes and keep yourself moving this spring and summer.

## Real Life Tips for Improving Alertness on the Night Shift



"Whoops!" Slip-ups are a fact of life during the overnight hours, when most people are at greater risk of lapses in concentration compared with day-time hours. An alertness lapse may simply cause you to trip over your own feet or spill a cup of coffee. On the other hand fatigue can lead to bad decisions, sloppy work and accidents. Studies have found that accidents on the night shift tend to be more serious-and the resulting injuries more severe-than those that occur during the daytime.

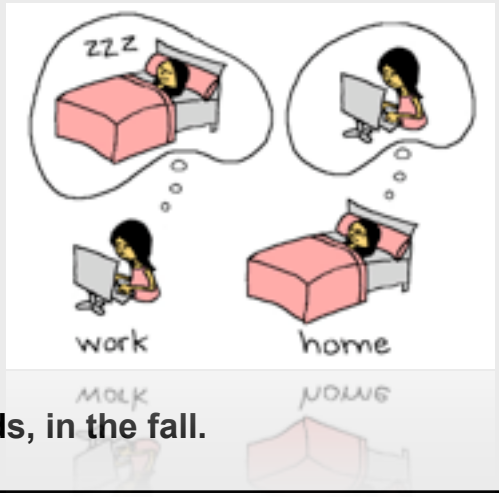
It's vital to take extra precautions on the night shift. The 'danger zone' for most people occurs around 4 to 5 a.m. when alertness dips to its daily low point. At this time it can be difficult to concentrate on the task at hand, you may feel chilly, and all you can think about is finding someplace to lie down.

Shiftworkers, physiologists and researchers, have collected a list of 'fatigue countermeasures' that can help you stay alert during the night shift:

- anticipate points of low alertness. If you know when you usually hit a low-point in your shift, you can take steps to minimize your alertness dip.
- Take naps before work and/or during break (if allowed). Naps are a great and healthy way to boost energy for hours.
- Use caffeine effectively. A cup of coffee or tea at the right time can be a great energy boost – just don't consume caffeine too close to your bedtime.
- Exercise or take a walk around the site – exercise gives you energy.

- Talk to co-worker or make a phone call. Nothing stimulates the mind like talking to another person.
- Listen to music or a talk show.
- Vary your normal routine when possible.
- Change posture frequently – alternate sitting, standing, and walking.
- Play metal games. Keep your mind alert, your body will follow.
- Read interesting material (if allowed).
- Wear layer of clothing that can be added or shed depending on your core body temperature.
- Increase workplace environment lighting. Watch out for too much glare, which can tire your eyes.
- Develop healthier eating habits. Some snack food, like candy bars, can make you more tired.
- Keep healthy snacks nearby like pretzels, fruit or vegetables (if allowed).
- Chew peppermint gum (if allowed)
- Ask fellow shift workers what they do when they get tired.

## Fact Check




Americans are getting an average of 6.7 hours of sleep on weekdays. down from seven hours in 2001.

The incidence of heart attack rises 5 percent during the first week of daylight saving time. Some experts suspect that losing an hour's sleep may make people more susceptible to an attack. Heart attacks decline slightly when daylight saving time ends, in the fall.

## Best Practices