

# Aviation Human Factors Industry News

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*From the sands of Kitty Hawk, the tradition lives on.*

Hello all,

To subscribe send an email to: [rhughes@humanfactorsedu.com](mailto:rhughes@humanfactorsedu.com)

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

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## A Deadly Human Factor “The Loss of Situational Awareness”

A cursory reading of news the day after the 4<sup>th</sup> of July once again shines the spotlight on **human error** in our industry. In an opinion article entitled “Why Do Planes Still Crash? The author highlights the Air France flight 447 crash which killed all 228 people on board on June 1<sup>st</sup> 2009. “The crash happened at around **2:00 a.m.** on a dark night when the error messages suddenly appeared and the autopilot tripped out.” He said the crew, possibly at their **deepest circadian low** at this point, suddenly have this problem and they “fixate” on it. “This is a syndrome,” he said. “There have been lots of accidents where pilots have fixated on correcting a relatively minor problem and lose sight of the macro problem. Now we don't know that, but we do know the aircraft acted as if it was not being controlled purposefully.



"Whether it was out of control -- and I doubt this -- it was not being controlled. Imagine it is 2 am and two sleepy pilots encounter a problem. They don't have much to do so they decide to troubleshoot this problem. They **fixate on** it and forget the autopilot has tripped.

"The airplane meanwhile goes into a lazy spiral descent -- the pilots don't notice as it is all very gentle. And when they look up they don't believe what their instruments tell them and they get disorientated and can't recover." CNN Paul Armstrong

The pilots of Flight 447 were **at a loss for situational awareness**. Unaware the aircraft was in a stall position when the autopilot tripped out, the pilots pointed the nose of the aircraft up exacerbating the problem. This loss of situational awareness is reminiscent of Eastern Air Lines Flight 401 that went down in the everglades when the pilots lost situational awareness while trying to determine if the landing gear indicator (light bulb) was actually working or not. Accidentally tripping the autopilot out the pilots, crew and passengers slowly descended to their deaths.

Loss of Situational Awareness can be compared to letting your mind fly on autopilot. Just when you need a correction in behavior or action the “pilot” is at a loss, ill-equipped to respond. In a new book called "Erreurs de Pilotage" (Pilot Error) by aeronautics expert Jean Pierre Otelli, writes about the last two minutes of Air France flight 447. The cockpit voice recorder reveals the panic-stricken conversations of the confused pilots. The plane plunged 38,000 feet in just three minutes and 30 seconds. Being lost in the immensity of a modern large airliner that is no longer flying its self the pilots were at a loss to regain control.

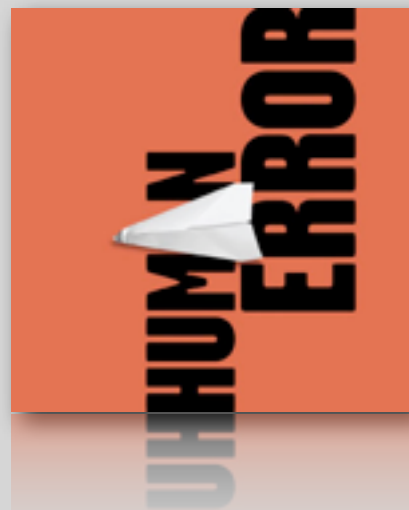
As our industry pushes to make flying safer our crew and maintenance personnel are confronted with the [human equation](#) in the loop. [Human Factors training](#) calls all of us to a renewed sense of purpose and vigilance as we face one of our biggest adversaries – the Self.

<http://www.bluetunadocs.com/index.html>

## [Opinion: Why do planes still crash?](#)

### [How human error turned Air France's minor technical problem into tragedy](#)

The grim reality emerging from the Air France Flight 447 disaster is that the Airbus A330 jetting from Rio to Paris slammed into the dark sea – killing all 228 passengers and crew – [after pilot-induced loss of control](#) when there was nothing significantly wrong with the plane. The disaster was unprecedented. Never before has a modern airliner been wrenched by its pilots into such position that it – literally – stopped flying, leaving its doomed passengers in a free-fall to their deaths while the confounded flight crew debated what they had done and needed to do.



There was no terrorist bomb, nor a lightning strike that destroyed the plane's electronics, although wild media speculation suggested the latter two in the early days after Air France 447 mysteriously disappeared without a trace.

The flight controls all worked, the engines were delivering full power and the instruments were accurately telling the pilots that the aircraft was pointed nose-high at an angle three times what is normal at takeoff and falling at nearly 200 kilometers an hour straight down, wings level.

When everything else is stripped away, three highly paid, supposedly highly trained pilots, flying a modern, well-maintained aircraft for a major Western carrier on a routine transatlantic night flight completely [overreacted to a minor instrument failure](#), and then for a nightmarishly long three minutes thirty seconds failed to cope with the upset they had created.

"The crew [never grasped](#) that they had stalled," Alain Bouillard, the lead investigator for France's Bureau d'Enquêtes et d'Analyses, said at Thursday's briefing before the long-awaited release of the probe's final report. "[They failed to understand the stall and they failed to recover](#)

To be sure, it was a dark and stormy night. Heavy turbulence and a line of massive thunderstorms lay across the plane's path. Ice crystals coated the thin Pitot tubes protruding from the Airbus that measure air speed. [When they iced up](#), the speed data to the flight computers became unreliable. That triggered the autopilot to disconnect, putting the plane back into the hands of the pilots to fly manually.

It wasn't a new or especially tough problem. Investigators [uncovered at least 36 other similar instances](#) that triggered the autopilot to disconnect, although the Air France crew probably hadn't heard of them on the fateful flight. In none of the other cases had pilots lost control and crashed.

But on June 1, 2009, the Air France pilots turned the aviation equivalent of an automobile driver losing cruise control and then steering the car over a cliff. Flight 447 is the worst disaster ever for Air France and the first loss ever of a modern airliner from oceanic cruise that wasn't caused by terrorist bomb or suicidal pilots.

There's an old, grim flying truism, dating back nearly to the Wright brothers: "[Pull back to go up, pull further back to go down.](#)"

What it means is that gently pulling back on the stick (either a game-controller-like sidestick that Airbus uses or the bigger between-the-legs control yoke favored by Boeing) lifts the nose and the plane, as long as the engines' thrust is sufficient to keep climbing, goes up. But pull back too far, get the nose too high and the aircraft ceases to fly.

Seconds before the final impact, one of the pilots, still befuddled, says: "Damn, we're going to crash, this can't be happening."

A debate rages among pilots – and has apparently been played out on airline simulators – as to how late into the Flight 447 accident sequence the pilots could have engineered a recovery. In the final official report, French investigators make clear that early corrective actions – pushing the nose down, building back flying speed in a dive and then resuming normal flight – would have worked.

**But the window to save the aircraft was small.** “Only an extremely purposeful crew with good comprehension of the situation could have carried out a maneuver that would have made it possible to perhaps recover control of the airplane,” they concluded. Instead, “the crew had almost completely lost control of the airplane.”

For the last 10,000 metres of free-fall, the last two minutes, **only test pilots might have pulled off the sort of dramatic, aggressive effort** needed to save the plane. That might have involved throttling back one engine to force a wing drop, to drag the nose out of its 40-degree up angle into a dive.

Unprecedented as the Air France Flight 447 disaster may be, the investigation made scores of recommendations to avoid a repeat.

No one can mandate whether pilots will do the right – or wrong – things in a crisis, even a self-inflicting one. But better training, a better understanding of the different and more difficult flight handling in the thin air of high altitude, clearer warnings and better crew communication all **might have broken the accident chain and averted disaster.**

In hindsight, plenty went wrong. The senior captain, who was on mandated rest break, failed to properly brief the more junior pilots. The most junior of the three was flying, but his colleague, who had more experience, seemed more aware of the crisis yet never really took over. Nor did the captain on his return to an alarm-filled cockpit.

Air France defends its pilots and training, praising their doggedness. “The captain and two co-pilots remained fully engaged in flying the plane until the last moments,” the airline said.

For the passengers, an awareness of what was happening from the pilots at the front, would have been more useful.

A judicial inquiry into whether manslaughter charges can be laid and a myriad of civil suits filed is still pending.

# Final Report

On the accident on 1<sup>st</sup> June 2009  
to the **Airbus A330-203**  
registered **F-GZCP**  
operated by **Air France**  
flight **AF 447 Rio de Janeiro - Paris**

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<http://www.bea.aero/docspa/2009/f-cp090601.en/pdf/f-cp090601.en.pdf>

## Sleep Deprivation Blamed for JetBlue Pilot's March Meltdown

The Jetblue airline pilot who went on a frightening in-flight tirade in March, forcing the flight to be diverted, was having a "because of sleep deprivation" brief psychotic disorder, a psychologist testified at a hearing. The psychologist's testimony, given last week, was revealed in court documents released today. According to witnesses, Clayton Osbon, 49, was flying a New York-to-Las Vegas jetliner March 27 when he went on a rampage in the cabin, ranting about Sept. 11, 2001, making allusions to terrorists and yelling, "Guys, push it to full throttle."



"Osbon also yelled jumbled comments about Jesus, September 11, Iraq, Iran, and terrorists," according to a criminal complaint. The plane was carrying 131 passengers and six crew members.

"The captain of the plane just went berserk," passenger Wayne Holmes told ABC News. "He came out of the other end of the plane -- came running back to the cockpit and he was shouting out these numbers -- 500 something. He started banging on the cockpit door."

A passenger subdued Osbon, a veteran captain, and the flight was diverted safely to Amarillo, Texas. Osbon was later suspended from his duties and charged with interfering with flight crew instructions

The U.S. Attorney's Office [did not dispute the psychologist's testimony](#) on July 3 and a federal judge in Texas found Osbon not guilty by reason of insanity.

"The defendant appeared to suffer from a [severe mental disease](#) or defect that impaired his ability to appreciate the nature, quality or wrongfulness of his behavior," U.S. District Judge Mary Lous Robinson said last week.

Osbon was sent to a mental health facility in Fort Worth for additional treatment.

Despite denials from the airline industry, ABC News has found that large numbers of pilots have reported for duty every day after getting only a few hours of what fatigue experts call "[destructive sleep](#)" in crowded crew lounges and so-called "crash pads."

Critics say that widespread pilot fatigue is putting airline passengers at risk, and may already have cost lives.

JetBlue told ABC News recently, however, that Osbon had the weekend off before that Tuesday flight and that Monday he'd only flown two trips before having an additional 17 hours off.

The airline said that it continued to comply with new rules instituted by the Federal Aviation Administration in December that require a 10-hour rest period for pilots between flights and 30 consecutive hours off during the week.

Ten passengers from the flight filed the first of what is expected to be many lawsuits demanding unspecified damages from Osbon and JetBlue.

Alison Croyle, an airline spokeswoman, told The Associated Press that Osbon was still employed by JetBlue and on "inactive status."

Osbon could be released as early as August, when he is expected to have another hearing. A judge may determine whether he can be permanently released or committed to a facility.

<http://abcnews.go.com/Blotter/pilot-fatigue-crash-pads-threaten-safety-airline-passengers/story?id=12874949>

## Sleep Deprivation Effect on the Immune System Mirrors Physical Stress

Severe sleep loss jolts the immune system into action, reflecting the same type of immediate response shown during [exposure to stress](#), a new study reports.

Researchers in the Netherlands and United Kingdom compared the white blood cell counts of 15 healthy young men under normal and severely sleep-deprived conditions. The greatest changes were seen in the white blood cells known as granulocytes, which showed a loss of day-night rhythmicity, along with increased numbers, particularly at night. "Future research will reveal the molecular mechanisms behind this immediate stress response and elucidate its role in the development of diseases associated with [chronic sleep loss](#)," said Katrin Ackermann, PhD, the study's lead author. "If confirmed with more data, this will have implications for clinical practice and for professions associated with long-term sleep loss, such as [rotating shift work](#)."



For this study, white blood cells were categorized and measured from 15 young men following a strict schedule of 8 hours of sleep every day for a week. The participants were exposed to at least 15 minutes of outdoor light within the first 90 minutes of waking and prohibited from using caffeine, alcohol, or medication during the final 3 days. All of this was designed to [stabilize their circadian clocks](#) and minimize sleep deprivation before the intensive laboratory study.

White blood cell counts in a normal sleep/wake cycle were compared to the numbers produced during the second part of the experiment, in which blood samples were collected during [29 hours of continual wakefulness](#).

"The granulocytes reacted immediately to the physical stress of sleep loss and directly mirrored the body's stress response," said Ackermann, a postdoctoral researcher at the Erasmus MC University Medical Center Rotterdam in the Netherlands.

<http://www.journalsleep.org/ViewAbstract.aspx?pid=28578>



## Help Advance Threat and Error Management Video

This Training video was originally produced in 1999 by an airline that no longer exists. It has been modified and updated to provide a useful training tool.

The video begins an explanation of Threat & Error Management. A storyline follows that begins with a series of unrecognized threats. These, in turn, lead to an error that ultimately leads to an undesirable consequence or accident. The viewer is challenged to identify the threats, errors and undesired state that ultimately leads to the accident. The lack of a functioning Emergency Response Plan adds to the negative outcome.

Fortunately, this video is totally fictitious but is very much within the realm of possibility.

To obtain a copy of this video, the case study, the training booklet that accompanies it or other Safety training videos in the series, contact

**System Safety Services**  
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Richmond, BC Canada  
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Web: [www.system-safety.com](http://www.system-safety.com)

Threat & Error Management or the Lack of  
**Flight To Tuk**  
Series #8

**Threat & Error Management (TEM)  
or the Lack of**

**Series #8**

**Flight To Tuk**

**Total Running Time: 36 minutes**

**Produced and Distributed by**

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System Safety Services is seeking [industry support](#) to assist in the cost of the production of the Safety training video entitled “Flight to Tuk”. This video is 32 minutes long and will illustrate the principal of Threat and Error Management (TEM). It will explain the model and provide a case study.

[Each sponsor will receive](#) a complimentary copy of the video on DVD and have their logo placed on the front video cover as well as on the front page of the participants handout under the line: “This video was sponsored by the following companies in an ongoing effort to advance Aviation Safety.”

The cost to sponsor the production of this video is \$500.00. Any extra funds will be used to toward the production of the next video in the planned series.

Through these videos our industry [can learn from the mistakes of others without having to make the mistake themselves](#). Please help make this possible with your contribution.

If I can be of any further assistance please feel free to call or email me.

Thank you, for your consideration.  
Gordon Dupont (Father of the Dirty Dozen)

Please go to <http://www.youtube.com/watch?v=Cq85r8X-AIQ&feature=youtu.be> to see a trailer of our video.

[dupontg@system-safety.com](mailto:dupontg@system-safety.com)  
604 526-3993

## Tales of Mishaps Beyond Aviation

### Japanese Government: Fukushima Nuclear Crisis Was a Manmade Disaster

Read this and realize how very important SMS with it's risk analysis is if persons will just report their Safety concerns.

The failures, explosions, leaks, and subsequent radioactive dead zone that will stain Japan for decades all started with an earthquake. Nobody can stop earthquakes. But after a thorough review, the Japanese government admits **humans are responsible for the entire mess**. The official report of The Fukushima Nuclear Accident Independent Investigation Commission, produced by the Japanese National Diet, doesn't blame nature. It doesn't blame the tsunami, or the splitting of the atom, or all of the poisonous isotopes wafting across Fukushima's previously bucolic farmlands. **Instead, people are the villains**. The report blames TEPCO, the nuclear power company that botched its own botched response to the disaster. **It blames** "the ingrained conventions of Japanese culture: our reflexive obedience; our reluctance to question authority; our devotion to 'sticking with the program'; our groupism; and our insularity." It blames government bureaucracy (of course). But in aggregate, it still emphasizes that this was a **human catastrophe**, going so far as to title a portion of the report A "**manmade**" disaster.



The findings damn our species for its insolence in the face of incredibly destructive power:

*The TEPCO Fukushima Nuclear Power Plant accident was the result of collusion between the government, the regulators and TEPCO, and the lack of governance by said parties. They effectively betrayed the nation's right to be safe from nuclear accidents. Therefore, we conclude that the accident was clearly "manmade." We believe that the root causes were the organizational and regulatory systems that supported faulty rationales for decisions and actions, rather than issues relating to the competency of any specific individual.*

This is a chilling reminder, but more chilling that it required a reminder.

[http://naiic.go.jp/wp-content/uploads/2012/07/NAIIC\\_report\\_lo\\_res.pdf](http://naiic.go.jp/wp-content/uploads/2012/07/NAIIC_report_lo_res.pdf)

## **FAA Proposes Fines Against Delta, Kingfisher**

FAA on Wednesday proposed civil penalties against Delta Air Lines and Puerto Rico-based Kingfisher Air Services.

Delta faces a proposed penalty of \$687,500 for allegedly operating a Boeing 737-800 in early 2010 while the aircraft was not in compliance with FAA because of failure to repair a chip in the nose radome. The Atlanta-based carrier faces an additional penalty of \$300,000 for allegedly flying nearly 900 flights from May 2010 through January 2011 with an Airbus A320 with a broken cockpit floodlight socket at the first officer's position.

Kingfisher faces a \$187,750 civil penalty for allegedly operating a Cessna 208B in June 2010 while it was not in compliance with FAA regulations. According to FAA, Kingfisher failed to repair an the 208B engine after three pilots reported that the engine temperature exceeded the maximum allowed during take-off.

