

# Aviation Human Factors Industry News

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

Hello all,

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

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★And Much More

## Human Error the Greatest Threat to Aviation Safety

“Human error is now the principal threat to flight safety,” according to an article by Don Harris in the February 2014 issue of *The Psychologist*, the magazine of the British Psychological Society.



Harris, a member of the human systems integration group at Coventry University, said there's actually more to the problem than simply pointing to human weaknesses. “Although there is increasing recognition of the importance of the human component in aviation safety, further work is required. The science base and regulations still lag behind changes in the nature of modern flight operations.” Aviation psychology is, of course, designed to help reduce human error. Interestingly, Harris questions the relevance of Jim Reason's Swiss cheese model of error prevention in an era when many new airlines around the world operate without the benefit of an organizational system like the one upon which Reason's work relies. “Today more work is outsourced and contracted out,” he said. “Airlines operate into a wide range of airports (none of which they own), and maintenance is often provided by third parties.

Some low-cost carriers may not even own their aircraft, or employ their own ground and check-in personnel. In extreme cases, they don't even employ their own pilots...the person making the final error may not be one of the victims of [an impending] accident. Safety management now has to extend beyond the immediate organization.” To Harris that means realizing that aviation psychology “needs to take an integrated, long-term approach to tracking human-related costs and safety issues, significant wide-ranging benefits will accrue.”

[http://www.thepsychologist.org.uk/archive/archive\\_home.cfm?volumeID=27&editionID=236&ArticleID=2411](http://www.thepsychologist.org.uk/archive/archive_home.cfm?volumeID=27&editionID=236&ArticleID=2411)

## Pilots' Federation Calls for 'Just Culture,' Fatigue Management

Airlines can strike a balance between [safety and productivity on their flight decks](#) by instituting fatigue risk management systems (FRMS) as an overlay to flight-time regulations and company policies. Such systems require a “[just culture](#),” a working environment in which pilots can provide feedback without fear of punishment, says the president of the International Federation of Air Line Pilots’ Associations

(IFALPA). “We don’t punish for normal errors and omissions made by a reasonable person going about their daily business so long as they fess up and give us the opportunity to learn from that,” said Martin Chalk, IFALPA president. “We consider discipline only where you have deliberately or thoughtlessly created a challenge.”

An Airbus A380 captain with British Airways, Chalk was named to lead the Montreal-based umbrella organization of world pilots’ associations in April 2015. Speaking with **AIN** at the recent Farnborough Airshow outside of London, he summarized IFALPA’s current focus areas—implementing [FMRS](#), the “unholy rush” toward airline industry liberalization and the influx of remotely piloted aircraft systems (RPAS).

IFALPA describes an FRMS system as a set of scientifically based and data-driven procedures that allow for a cooperative and flexible means of [managing pilot fatigue as part of an operator’s safety management system](#). In Chalk’s words, it facilitates a “constant loop” of training, reporting and analysis into pilot scheduling.

**Benefits of a FRMS**

- Overall, a FRMS may offer a way to more safely conduct flights by offering flexibility that may not be available within regulatory limits.
- A FRMS complements prescriptive flight time, duty, and rest requirements.
- Improved operational efficiency.
- Provides for a performance-based regulatory approach that is “tailored” to an operator’s specific operation.

FRMS & FRMS Overview  
2 September 2011

Federal Aviation Administration 23 29

International Federation of Air Line Pilots' Associations 23 29

Layered over a company's fatigue management policies and the "prescriptive" flight-time limitations of regulatory authorities, FRMS provides an extra level of safety. A prerequisite of successful implementation is a just culture atmosphere of trust and confidentiality that encourages pilots to report into the system.

"Operators are often from our perspective somewhat [irrational in their resistance](#) to an open conversation as to when fatigue becomes a challenge and what impact that has on the safety margins available," Chalk said. "The most important thing to any professional pilot is to deliver their core professional promise of a safe operation. Fatigue, because it is [so insidious](#), because it affects your ability to make informed, considered decisions, is incompatible with professional piloting.

"We are most concerned about ensuring that our [duty] rosters are produced in such a way that we can always deliver on that professional promise," he added. "Equally, we want our companies to be profitable; we don't want a nice three-hour day where nobody ever gets in any way tired. That's great, but the companies are never going to make a profit on that. We are very aware that there has to be this [balance](#) between productivity and safety."

The FRMS concept is not universally well understood, and it is important that regulators and operators be apprised of both the costs and the benefits of such a system in terms of improved safety margins, Chalk said. "One of the challenges is it has both a positive and a negative effect," he explained. "When you institute a good FMRS, the first year pilots see fatigue days disappear and management sees more productivity, but you'll come to a point [where it plateaus](#). You still need to maintain your FMRS to maintain that benefit, but there is no longer year-over-year improvement."

If an operator decides to eliminate the cost of the system, "you have to go back to a prescriptive, less nuanced system and so the cost of the fatigue risk management system is in [retaining that percentage improvement](#) whatever that happens to be, and it will differ from operator to operator," Chalk said.

Airline industry liberalization presents another dichotomy of cost and benefit, pitting system safety against healthy competition. Chalk mentioned South America specifically as a region where a growing number of large carriers are creating pressure for lax regulation.

“They’re playing regulators off against each other, they’re clearly saying to one country we can supply all of our service to your country without any airplanes licensed there, without any need for your government interference,” he said.

“They’re practicing all sorts of weird systems. They have something called ‘interchange,’ where they will have a single airplane on more than one AOC [air operator’s certificate]—it’s on multiple national AOCs. One day it will be flown by one country’s nationals, the next day it will be flown by another country’s nationals. What happens then is there no clarity as to who is responsible for the oversight.”

The issue is not confined to one region; Chalk also mentioned Ireland as causing IFALPA concern. “The Irish are quite light-handed; they’ve made their regulatory authority semi-detached from the government,” he said. “Although it’s a nonprofit organization it has to fund itself and that is having a negative effect on the basics.”

IFALPA is calling for regulatory authorities to work together to produce similar regulations governing RPAS access to unrestricted airspace. “From our perspective the modularity of regulation is really important. To have different rules in different places [just makes our lives more complicated](#) and opens up the opportunity for error and omission,” Chalk said.

The federation supports the development of regulations that will frame the commercial use of remotely piloted aircraft. It is less accommodating of recreational drones. “We would prefer the toys to be kept away from civil aviation,” Chalk said. “We don’t want there to be a string of accidents produced by drone strikes in the way that we’ve [had to deal with bird strikes](#) in the past. Common sense says something that is made of plastic and batteries and metal is likely to do you more harm than something that is made of feathers and blood.”

## Is Fatigue Factor Fiction?



*"Fatigue makes cowards of us all," said legendary Green Bay Packers coach, Vince Lombardi, as he warned his players about this insidious threat. In similar fashion, fatigue exerts an influence upon aviation operations daily. Many aviation professionals have felt its effects. Many have suffered its consequences. The NTSB 2016 "Most Wanted List" of Transportation Safety Recommendations leads with, "Reduce Fatigue-Related Accidents." It states, "Human fatigue is a serious issue affecting the safety of the traveling public in all modes of transportation."<sup>1</sup> FAA Advisory Circular 117-3, Fitness for Duty, notes that, "Fatigue is characterized by a general lack of alertness and degradation in mental and physical performance."<sup>2</sup>*

*Fatigue can manifest itself in diverse ways. Fatigue research has documented many of its effects and generally describes it as "a decrease in cognitive ability from sleep loss, circadian disruption, or sleep inertia."<sup>3</sup> Fatigue is rarely the sole or primary factor in an incident or accident, though it is often cited as a factor in ASRS reported incidents.*

*CALLBACK presents six reports from various aviation professions that either state directly or imply that fatigue was a contributing factor. You can draw your own conclusions as to the role fatigue played in these ASRS reported incidents.*

### **Target Fixation**

Preoccupation with a minor problem prevented this Regional Jet Crew from perceiving other critical events.

### **From the Captain's report:**

- We were maintaining 6,000 feet to join the ILS for Runway 11L. Four miles prior to the Initial Approach Fix I selected Heading Mode and inadvertently hit the transfer button causing the ILS frequency to disappear in the Communications 1 standby box. I was distracted by this and tried to fix it. I was fixated on my [ILS] frequency and did not recognize that the autopilot had disconnected. The Pilot Not Flying asked what was wrong. I [corrected] the frequency error and looked up to see that we were low for the approach and then the Ground Proximity Warning System (GPWS) "Too Low Terrain" alert went off. I applied max thrust and started to climb. ATC also said that they were getting a Low Altitude Alert and suggested the 6,000 foot minimum vectoring altitude in that sector. We climbed back through 6,000 feet, leveled off, intercepted the ILS to Runway 11L, and continued the approach.

The day was long with weather in the entire southwest. We flew five legs and were delayed...every leg. An ILS was hampered by fatigue and [selecting] the wrong button on the Communications 1 standby box, followed by fixation on that problem. Fatigue being the cause, a solution is to avoid and recognize it before it hampers safety.

### **From the First Officer's report:**

- The uncommon weather conditions, turbulence throughout every flight, and long delays most likely contributed to our being fatigued.... It appears that fatigue and fixation on a communication [switching] problem were the causes.

## **Pilot Injured After Runaway Hand-Propping**

A Pennsylvania pilot is [lucky to be alive](#) after his hand-propped vintage airplane spun out of control on the ramp Wednesday morning. WTAE reported that the 72-year-old man was hospitalized with multiple injuries, including to his head. Security cameras at the Joseph A. Hardy airport in Connellsville caught the accident on video, which showed the 1946 Aeronca Champ circling wildly on the ground before it veered off, struck a truck, then crashed into a hangar door.

The owner had just started up the taildragger, but apparently **didn't check that the throttle was closed.**

Two other men, including the owner of the truck, were on the ramp and ran towards the wayward aircraft as seen on the video, but were helpless as they had to avoid the plane until it came to a stop. "We were chasing it **and it was chasing us,**" one of the

witnesses told the station. The Champ pilot tried to grab on as it began moving, but "it caught him behind the legs and flipped him and he went down," he said. They stayed with the injured pilot until an ambulance arrived to take him to a local hospital, the station reported.



<http://www.wtae.com/news/runaway-plane-caught-on-video/40805370>

## **Internal Memo Reveals Air Canada Must Update Hundreds of Pieces of GSE In Wake of Employee Death**

Following an April 20 incident in which a ramp agent was killed at Toronto's Pearson airport, Air Canada **has been ordered to fix "hundreds"** of baggage trucks at airports across Canada by Labour Canada. According to the report by the CBC, Air Canada has until November 15 to complete the repairs.



An internal memo obtained by the CBC states that Air Canada has been directed to [install seat belts on all "ramp and baggage tractors, belt loaders and other motorized material handling equipment"](#) that do not currently have seat belts. According to the airline, the updates will 950 of Air Canada's 2,200 pieces of relevant GSE.

The updates are already underway according to the Air Canada memo, dated June 8.

Ian Henry Pervez, 24, was killed after the baggage truck he was driving flipped over, ejecting him. The CBC has obtained an earlier internal memo dated April 30 stating the mechanical inspection of the truck involved in the incident revealed ["mechanical issues."](#)

Read the full CBC report including responses from the airline, Pervez' family and his colleagues.

<http://www.cbc.ca/player/play/2687377931/>

<http://www.cbc.ca/news/business/air-canada-baggage-worker-death-1.3677291>

## **Loose Latches Caused Citation Excel Cowling Detachment**

During a descent into the UK's Farnborough Airport, the majority the right engine upper cowling on Cessna Citation 560XL broke free, damaging the leading edges of the vertical and horizontal stabilizers, according to a UK investigation report released last week on the Nov. 29, 2015 incident.



of

Safety investigators concluded that the cowling “probably detached because a number of the quick-release fasteners had **not been secured during maintenance.**” Cessna has confirmed that there have been two other similar incidents on Citation 560XLs, both in 2008. In the most recent mishap, the cowlings had been removed and refitted several times to allow engine troubleshooting. The fasteners had been removed from the cowlings as part of a periodic inspection for retention-hole wear. After all maintenance was concluded, the cowlings were reinstalled with one of the mechanics **confirming in writing, “Engine cowlings closed and attachments tightened.”**

Since the incident, the maintenance organization has changed its inspection procedures to ensure that, following installation, an independent mechanic checks the security of engine cowlings.

<http://ea.ecn5.com/Clicks/Z2hHbTZ2d1ZrdUxiM2pVMTdmZVE0aTBzRmoyMHNhaWhDYVRpcmphMGRNTFZJZTI1Qjk5ZkZYaVZPbExKVWpaSw%3d%3d>

## **Airbus uses drones to speed up aircraft inspections**

**Drones help aircraft inspectors do a two-hour job in just ten minutes.**

Aircraft inspections are one of the best things operators can do to ensure safety in flight, but ironically, the chore can be a little unsafe for inspectors themselves. To properly review an aircraft's condition, workers often need to utilize cranes and lifts to closely examine an plane's structure and components. **It's mildly risky, slow and laborious process** -- but soon, it may not be.



Airbus has started testing drone inspections that may speed up the process by over an hour.

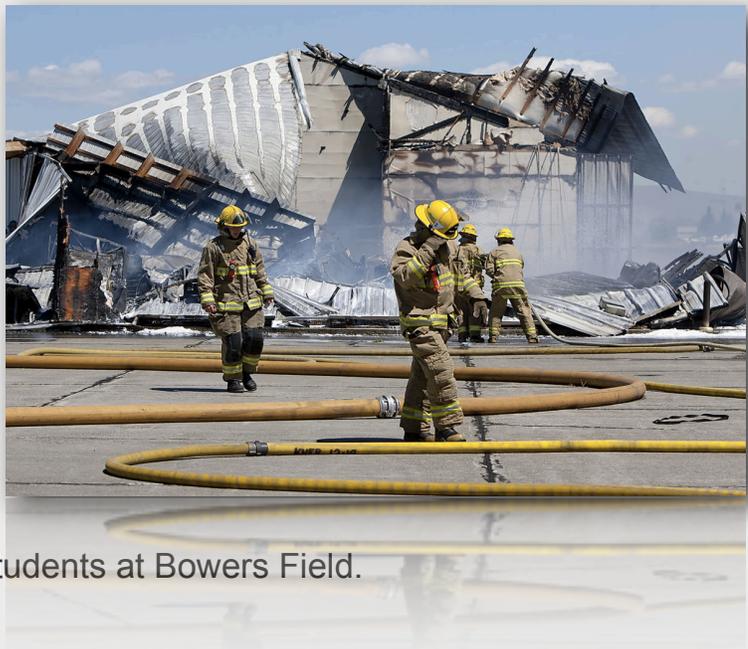
Airbus demonstrated its new inspection process at the Farnborough Airshow, where a drone equipped with an Intel RealSense camera autonomously circled an A330 while rapidly snapping photos. The images were then applied to a 3D model of the aircraft that allowed inspectors to get a close, detailed look at the subject. It still takes awhile to inspect the digital model, but in all, **it's much faster**. Gathering the inspection data by hand takes about two hours. Using a drone takes only 10 to 15 minutes.

The company expects to finish initial testing the program by the end of the year, and hopes to include a wider range of aircraft in the program soon afterwards.

<https://www.youtube.com/watch?v=KpoCf9ev0VM>

## **Fire marshal: Bowers Field hangar fire was accidental**

The cause of a fire that destroyed two hangars and aircraft at Bowers Field in Ellensburg on last Friday was accidental, according to the Kittitas County Fire Marshal's Office. Interim Kittitas County Fire Marshal Josh Hink said an IASCO employee was **removing fuel from one airplane when static electricity caught the plane's fuel on fire**, he said. IASCO provides planes and training for Central Washington University aviation students at Bowers Field.



The employee was **using a rag** to wipe up fuel on the side of the plane, Hink said, when he dropped the rag. He reached down to pick the rag up when **static electricity from his movement caught the fuel on fire**.

The plane was properly grounded at the time of incident, Hink said. Another IASCO employee in a different hangar responded to the scene with a fire extinguisher, but it was too late, he said.

The investigation determined the cause was accidental, he said.

### **Damage**

Two private hangars were destroyed and a third one sustained structural damage in the fire. Four planes, two gyrocopters and a boat also were destroyed in the fire, Hink said.

Damage is estimated at \$500,000 to \$750,000. No one was injured.

### **Planes also lost**

Hink said two of the planes that were lost were owned by IASCO. The planes were stored in hangars leased from Carrera Hangars. The other two planes, the gyrocopters and the boat, were owned by a private citizen in another hanger.

CWU's aviation program has 60 students enrolled in summer school. IASCO has eight other planes at Bowers Field, so student programs this summer will not be affected, the university has said.

## **Oil starvation brings down Cessna 188**

The pilot reported that he was maneuvering the Cessna 188 with a banner attached when he noticed a loss of oil pressure.

He notified an air traffic controller of the emergency and indicated that he could not reach an airport.

The engine then experienced a total loss of power, and the pilot made an emergency landing to a grassy area near a highway interchange in Arlington, Texas.

During the landing, the airplane collided with a vehicle, and then another vehicle struck the airplane. A post-accident examination of the engine revealed that the [oil filter adapter was loose](#), and no oil was observed inside the engine. The threads on the adapter were worn and damaged. [The lock nut on the adapter was not properly torqued](#), and oil residue was observed on the engine near the adapter and on the underside of the airframe.

A large amount of metallic debris was found throughout the entire oil filter element, which is consistent with engine oil starvation.

Maintenance personnel replaced the oil and oil filter four days before the accident. However, [they did not comply with FAA Airworthiness Directive 96-12-22](#), which required, in part, inspecting the oil filter and adapter assembly for oil leakage and proper installation of the adapter retaining nut and replacing any oil filter adapter assembly with security problems to prevent loss of engine oil caused by loose or separated oil filter adapters because the loss of oil could result in engine stoppage while in flight and loss of airplane control.

The NTSB determined the probable cause as the total loss of engine power due to a loose oil filter adapter, which resulted in oil starvation. Contributing to the accident was maintenance personnel's [failure to comply with](#) a Federal Aviation Administration airworthiness directive.



NTSB Identification: [CEN14LA331](#)

This June 2014 accident report is provided by the [National Transportation Safety Board](#). Published as an educational tool, it is intended to help pilots learn from the misfortunes of others.

## **FAA Scales Back Proposed Airport SMS Rule**

The FAA last week issued a [supplemental notice of proposed rulemaking](#) pertaining to the adoption of [safety management systems](#) (SMS) by airports. Based on comments the agency has received, it has amended its originally proposed rule submitted in October 2010, which would have required all Part 139 airports in the U.S., numbering more than 500, to implement a SMS. Under the new proposal, which nearly halves that number, the agency will require an SMS at any airport that is classified as a small, medium or large hub airport in the National Plan of Integrated Airport Systems (NPIAS), and identified by the U.S. Customs and Border Protection agency as a port of entry, designated international airport, landing rights airport or user fee airport, or is identified as having more than 100,000 total annual operations. For those qualifying airports, the agency is also proposing to extend the SMS implementation period from 18 to 24 months.



[The 60-day comment period on the new rule will end on September 12.](#)

<http://ea.ecn5.com/Clicks/Z2hHbTZ2d1ZrdUxiM2pVMTdmZVE0aTBzRmoyMHNhaWhDYVRpcmphMGRN SjrRuYkVKQXQzUkN4Z05rU2NXWFFtbA%3d%3d>

## **Boeing: 679,000 maintenance technicians needed by 2035**

The commercial aviation industry will need 679,000 maintenance technicians by 2035 in order to service industry demand, according to Boeing.

In its 2016 Pilot and Technician Outlook unveiled on Monday (July 25) at EAA AirVenture Oshkosh, the OEM said demand for maintenance engineers had [grown 11.3 per cent](#) since its last study in 2015 and around 35,000 are required annually. Boeing also forecast 617,000 commercial airline pilots will be needed until 2035, along with 814,000 cabin crew.



For all of the roles combined, Asia-Pacific region comprises 40 per cent of the global need due to the growth in the narrow-body aircraft market driven by low-cost carriers.

This is followed by North America which is expected to be buoyed by new markets opening in Cuba and Mexico, and then in Europe, where demand has increased due to a strengthened intra-European Union market.

## **FAA develops new standards to improve runway safety at US airports**

"The TALPA standards will help reduce the risk of runway overrun accidents and fatal incidents caused by weather-related runway contamination."

The Federal Aviation Administration (FAA), in collaboration with other members of the aviation community, has developed new standards to improve runway safety at all US airports during [harsh weather conditions](#).

US airports, airline flight crews, dispatchers, general aviation pilots, and air traffic controllers will start using the new Takeoff and Landing Performance Assessment (TALPA) safety standards from 1 October.

The TALPA standards will help reduce the risk of runway overrun accidents and fatal incidents caused by weather-related runway contamination. The US FAA has developed the safety standards based on the work of the TALPA Aviation Rulemaking Committee (ARC).



Based on the work of the committee, the FAA [has created a new way](#) for airports and air traffic controllers to inform pilots about runway conditions, with regards to the particular aircraft they are flying.

TALPA standards help the aviation community to assess runway conditions based on contaminant type and depth.

This provides aircraft operators with the essential information required to anticipate aircraft braking performance.

Operators will use the runway condition assessment matrix (RCAM) to report the status of runways to pilots.

Presented in a standardized format, the RCAM is based on airplane performance data for stated contaminant types and depths.

Pilots or dispatchers will consult the data to identify the expected stopping performance for the particular airplane they are operating.

Based on the RCAM, the airport operator will assess surfaces, report contaminants and determine numerical runway condition codes (RwyCC).

## 17 facts about sleep that you may not know yet!

What is the world record for hours spent “awake”? How many hours of sleep do parents lose during their child’s first year of life? Do animals dream like us? Can you ever be sleep “drunk”?



1. The record for the longest period without sleep is 18 days, 21 hours and 40 minutes achieved during a marathon.
2. If it takes you less than 5 minutes to fall asleep at night that means you’re too tired and won’t rest well! Falling asleep should take between 10 to 15 minutes!
3. After a child’s birth, parents lose between 400 and 750 hours of sleep only in the first year!
4. REM sleep lasts about 2 hours and begins more or less 90 minutes after falling asleep.
5. We dream during both REM and non-REM sleep.
6. The dreams we have during REM sleep are usually more bizarre than the ones we have during non-REM sleep, which instead tend to be repetitive.
7. We still don’t know for sure if animals have the ability to dream too.
8. After 17 hours spent awake we would feel as if we had a blood-alcohol degree of 0.05%.
9. After 3 days of little sleep, 3 alcoholic drinks would have the same effect on our body of 6 alcoholic drinks had during a period of regular sleep!
10. The natural sleep-wake cycle is regulated by the hormone of stress: cortisol.
11. We snore only during non-REM sleep.
12. Women need about an hour more of sleep.
13. Before the invention of electricity, people slept an average of 9-10 hours per night.

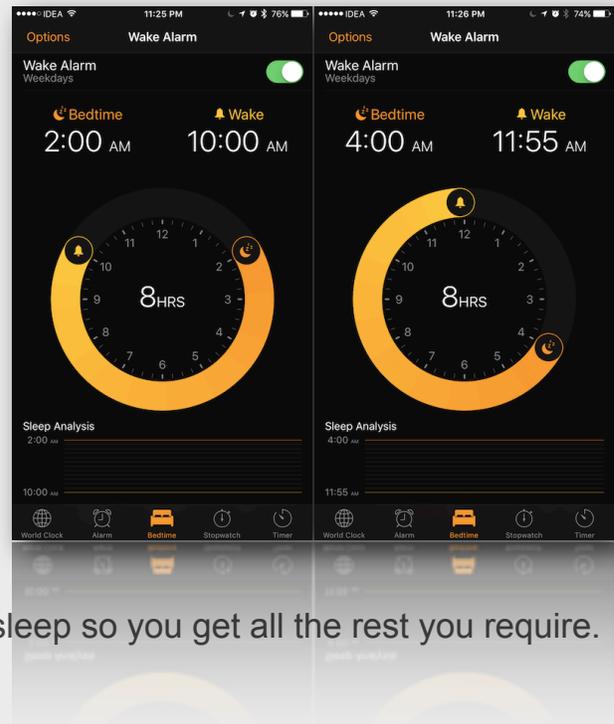
14. Internet is one of the main causes of insomnia!
15. Divorced and separated people tend to suffer more from insomnia.
16. The two moments of the day during which our body tends to nod off more easily are at 2 am and 2 pm.
17. People who don't sleep neither well nor enough, tend to eat more due to a decrease in the level of leptin in the blood.

## A new Clock App on iOS 10 will help you sleep better

Last month the world's biggest tech company Apple announced its iOS 10 update which is supposed to come on Apple devices **this month**, however, if you can't sleep properly or do not get time to have a better sleep then there is a special new clock app coming with the iOS 10 update which doesn't simply have another dim subject but it additionally has an area **called Bedtime**, another interpretation of the repeating wake up timer that goes the additional mile by reminding you to go to sleep so you get all the rest you require.

### **How you can set it up:**

It is very basic to set it up, you need to tap on the Bedtime icon and have to inform the app what time you need to awaken every day and how long of a rest you require every night. You can likewise change it so it just chips away at certain days, as weekdays or weekends, to suit your timetable.



Furthermore, in case you're truly fixated on your rest, you can likewise connect the Bedtime highlight to the Health application and get details on how well you rest. Unlike wearable trackers from FitBit or Jawbone, the element can't tell whether you get up amidst the night or thrash around in a fretful rest. It just gives you a [general picture](#) of to what extent you were resting in view of your Bedtime clock settings.

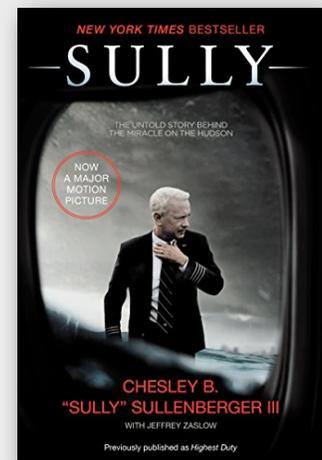
However, if you are in the habit of staying up late night watching TV shows or doing extra office work at home which takes your sleep away, then Bedtime will obviously keep you on track to assist you to have great sleep.

<http://thetechnews.com/2016/06/15/how-to-test-apples-upcoming-macos-sierra-and-ios-10/>

## **BOOK: Sully: My Search for What Really Matters**

On January 15, 2009, the world witnessed a remarkable emergency landing when Captain "Sully" Sullenberger skillfully glided US Airways Flight 1549 onto the Hudson River, saving the lives of all 155 passengers and crew. His cool actions not only averted tragedy, but made him a hero and an inspiration worldwide. His story is now a major motion picture from director-producer Clint Eastwood, starring Tom Hanks, Aaron Eckhart, and Laura Linney. Sully's story is one of dedication, hope, and preparedness, revealing the important lessons he learned through his life, in his military service, and in his work as an airline pilot.

It reminds us all that, even in these days of conflict, tragedy, and uncertainty, there are values still worth fighting for—that [life's challenges can be met if we're ready for them.](#)



# CBS Sunday Morning

## Sunlight powers a globetrotting flight

A remarkable aircraft is winging its way across the Middle East this morning bound for Abu Dhabi, completing a round-the-world flight. As our David Pogue of Yahoo Tech will explain, it's a light aircraft in more ways than one - its impossible mission fueled by not a single drop of gas.



<http://www.cbsnews.com/videos/sunlight-powers-a-globetrotting-flight/>