Aviation Human Factors Industry News

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Mechanic Dies In Engine Accident on Tenerife; Ingested Into A320 Turbofan

An aircraft mechanic working on the engine of an Airbus A320 in the Canary Islands died when he was ingested into the turbofan during a run-up exercise Monday night.

News Canarias reports the mechanic, whose name has not been released pending notification of next of kin, died moments after being drawn into the airliner's engine.

The aircraft, operated by Spanish charter carrier LTE International Airways, was about to depart from Tenerife South Airport for Warsaw, Poland when the accident occurred.

The airliner was grounded following the accident, and arrangements were made to transport passengers on another plane. Police are investigating the accident, though foul play is not suspected.

Such incidents, though rare, aren't unprecedented. As ANN reported in January 2006, a contract mechanic for Continental Airlines was ingested into the engine of a Boeing 737 during a run-up test at a gate at El Paso (TX) International Airport.

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NTSB: Northwest mechanics at fault in cowl incident

US NTSB investigators say Northwest Airlines mechanics diverted their attention from engine maintenance on an Airbus A319 on 9 January, resulting in the in-flight departure of an engine cowling.

Flight attendants on Northwest Flight 853, carrying 68 passengers and five crew from LaGuardia to Detroit, alerted the pilots on climbout that a passenger had reported that "the number two engine (right side) cowling was flapping after takeoff", according to the NTSB final accident report, issued Monday.

Pilots continued the flight, while monitoring the engine for vibration, according to the report. Vibration levels for the suspect engine were twice the levels of the normal engine during climbout, the crew stated, but did not trip the aircraft's alerting system.

NTSB reports that the flight was then otherwise normal except for an event 20 minutes into cruise, when the aircraft "shuddered", pilots stated.
After an uneventful landing, flight attendants informed the pilots that "part of the right engine had come off", according to the report.

NTSB determined that half of the engine cowl had departed the aircraft when it was on a one-mile final for landing, substantially damaging the right horizontal stabilizer. The other half fell off when the aircraft touched down.
Also damaged were the fan cowl doors, right side engine pylon, thrust reverser and right wing "number one" slat.

In addition, the aircraft that landed behind Northwest 853 hit the cowling on the runway, though the NTSB does not state whether that aircraft was damaged.
Investigators found that Northwest "contract maintenance personnel" had changed an N1 engine sensor in the incident engine the previous evening and failed to latch the cowl when finished, as required by the maintenance manual.
Mechanics stated that they were called upon for help from another mechanic on a different aircraft during the final portions of the work diverting their attention. Each had thought the other had latched the cowl, according to the NTSB.
Responding to the report, Northwest in a statement says: "Northwest has a sterling safety record. Safety is our top priority and while this incident was unfortunate, at no time was the safety of our passengers compromised."

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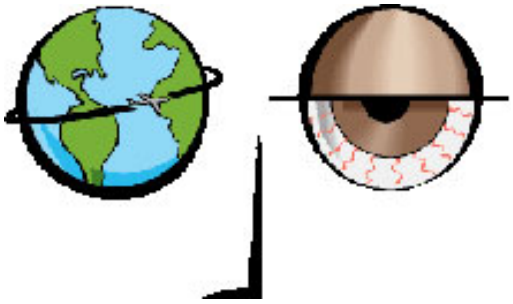
FAA Told to Address Crew Fatigue in Aviation



After the crew of a commercial aircraft apparently went to sleep at the wheel and flew right over their destination airport, the National Transportation Safety Board (NTSB) has recommended that the Federal Aviation Administration (FAA) take steps to "address" the effects of human fatigue in commercial aviation.

The NTSB urged the FAA to adopt regulations requiring airlines to establish fatigue management systems designed to increase the sleep time and quality of aircrews between flights, improve crew alertness, mitigate performance errors, and prevent incidents and accidents.

In making their recommendation, the Board cited four fatigue-related incidents occurring since 2004, one resulting in the deaths of both pilots and 11 passengers.

Perhaps the most bizarre incident took place on Feb. 13, 2008, when Go! flight 1002, operated by Mesa Airlines flew beyond its destination airport, General Lyman Field, Hilo, Hawaii. For over 18 minutes air traffic controllers at General Lyman Field tried without response to contact the Go! crew, as the plane continued over Maui, the big island of Hawaii and continued flying southeast over the Pacific Ocean. After flying 26 miles beyond the airport, the crew responded and returned to land at General Lyman Field. There were no injuries, probably just a lot of embarrassment and extensive discussion with the FAA.

"Addressing this safety related measure is long overdue," said NTSB Chairman Mark V. Rosenker in a press release. "We must and can correct this serious concern." Let's all hope Chairman Rosenker is correct.

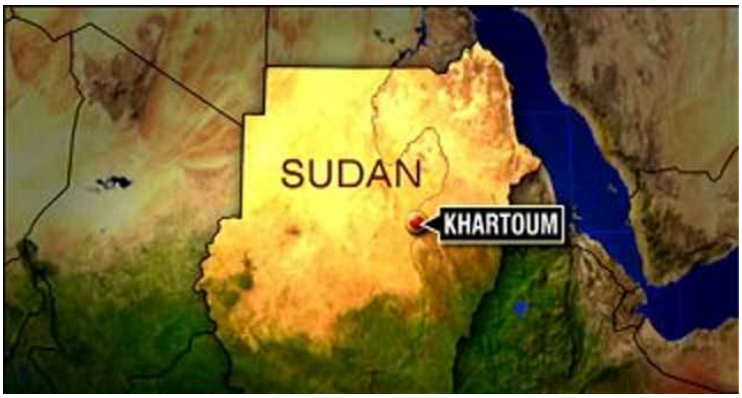
Pilot and aircraft mechanic shortage

Aircraft operators around the world, including some in business aviation, have been affected by a shortage of aircrew and aircraft mechanics during the past few years. Large numbers of retiring pilots and aircraft maintenance personnel have coincided with substantial growth in airline and business jet travel in Asia, the Middle East and other parts of the world. Because the demand for such travel continues to rise, there are more job vacancies globally than experienced pilots and aircraft mechanics to fill them.

"Business aviation operators are indeed generally finding that there is a shortage of both pilots and maintenance personnel. It is not reaching crisis stage yet but we are definitely seeing an increase in the level of concern by our operators," Spruston wrote in an e-mail.

"The extension of the retirement age for commercial airline pilots (in the U.S.) will likely help in the short term but the problem will not go away," he added. "We will be working with the Flight Safety Foundation and IATA (International Air Transport Association) to try to find solutions."

Sudan Crash Probe Underway



The crash of a Sudan Airways Airbus A310-300 at Khartoum is highlighting need for air safety improvements in Africa – a continent with a hull-loss accident rate that is six times higher than the world average, according to International Air Transport Assn. statistics.

According to preliminary accident data, Flight 109 originated at Amman, Jordan and made a scheduled stop at Damascus, Syria, before proceeding to this final destination, Khartoum, with 203 passengers and 14 crew on board. Upon landing Khartoum-Civil airport in bad weather, the A310 veered off the runway and burst into flames.

The Sudan Civil Aviation Authority is investigating what factors led to the fatal runway excursion. As of late last week, local press reports varied widely about the number of people killed in the crash – from 29 to more than 100. The crash follows another Sudan Airways fatal accident on July 8, 2003. The pilot reported an engine failure shortly after takeoff from Port Sudan. The A300 crashed killing all 115 people on board. In March 2007, a Sudan Airways A300 with 284 people on board was hijacked in route to Khartoum. The hijacker surrendered, and all on board were safe.

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U.S. Labor Department's OSHA cites United Airlines at O'Hare International Airport for numerous workplace safety violations

Federal action proposes $215,500 in penalties

The U.S. Department of Labor's Occupational Safety and Health Administration (OSHA) has proposed $215,500 in fines against United Airlines Inc. in Chicago for alleged multiple serious and repeat violations of federal workplace safety standards.

OSHA selected United Airlines for inspection after reviewing occupational injury and illness data, which included ramp services, customer service areas, air freight, aircraft and ground equipment maintenance, building/facility maintenance, business operations, strategic procurement, medical facilities and flight attendant operations. As a result of its inspection, OSHA issued 43 serious violations and four repeat violations.

The serious violations address hazards associated with fall protection, hazardous energy control procedures and training, storage of oxygen and fuel-gas cylinders, platform load ratings and electrical hazards. The four repeat violations, based on citations issued and affirmed in 2006 and 2007, cover machine guarding and electrical issues. Proposed penalties for the repeat violations alone total $57,500.

"Falls, electrical hazards and machine guarding issues, as well as energy lockout/tagout procedures, which are intended to prevent accidental start-up of machinery during maintenance, are problems that should not exist at any worksite,"

said Diane Turek, director of OSHA's Chicago North Area Office in Des Plaines, Ill. "They are problems that can be avoided if an employer is dedicated to protecting employees. Employers must remain dedicated to keeping the workplace safe and healthful, or face close scrutiny by this agency."

Since 2004, OSHA has inspected United Airlines 22 times at various locations nationwide. United Airlines operations at O'Hare International Airport have been inspected eight times since 2000 with only three of those inspections resulting in citations.

Fact Check

2,600

Number of workers injured in fires and explosions in 2005.

Source: National Safety Council, "Injury Facts", 2008

Why Mechanics Make Mistakes

During the century since the Wright Brothers first flew, the predominant perpetrator in aircraft accidents has shifted dramatically from machine to human. Today, human error is responsible for 90 percent of aircraft accidents and incidents. It's not that people have become more careless, forgetful, inattentive or reckless. It's that aircraft and aircraft components have become much more reliable. As component failures become fewer and fewer, human failures represent an ever-increasing percentage.

Most of the efforts of the aviation research community have focused on errors committed by pilots. This is appropriate, since about 75 percent of serious aviation accidents are due to pilot error. However, there have been a significant number of serious, even fatal, accidents caused primarily by maintenance errors. While there has been increased focus on maintenance errors by the airlines, particularly in the wake of the Aloha and ValuJet crashes, not nearly enough attention has been given to maintenance errors in General Aviation (GA).

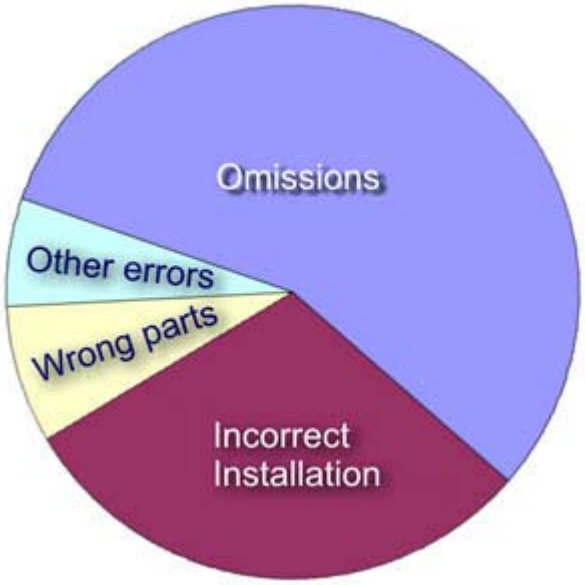
Kinds of Maintenance Errors

Less-than-adequate maintenance can be divided into two broad classes:

- **Introduction of a problem that was not there before the maintenance began; and**
- **Failure to detect a pre-existing problem during maintenance inspections.**

Errors of omission seem to be the most prevalent kind of maintenance errors. An analysis of 122 maintenance errors detected by a major airline over a three-year period revealed the following breakdown:

- **Omissions: 56 percent**
- **Incorrect installation: 30 percent**
- **Wrong parts installed: 8 percent**
- **Other errors: 6 percent**



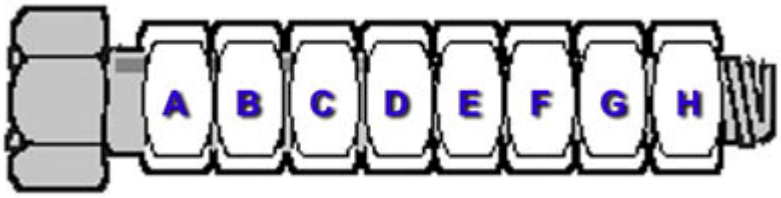
Most maintenance errors are errors of omission.

When the 56 percent of errors attributed to omissions was further examined, the breakdown was:

- **Fasteners left undone or incomplete: 22 percent**
- **Items left locked or pins not removed: 13 percent**
- **Filter/breather caps loose or missing: 11 percent**
- **Items left loose or disconnected: 10 percent**
- **Spacers, washers, etc., missing: 10 percent**
- **Tools, spare fasteners, etc., not removed: 10 percent**
- **Lack of lubrication: 7 percent**
- **Access panels left off: 3 percent**
- **Miscellaneous: 11 percent**

The Reassembly Problem

Clearly, most maintenance errors occur not when taking something apart, but rather when putting that something back together. There's a good reason for this. Consider a bolt (figure below) onto which eight nuts have been assembled, each one labeled with a unique letter A through H.



There is only one way to take this assembly apart, but more than 40,000 ways to put it back together -- all but one of them wrong.

Assume that the mechanic's task is to disassemble the nuts from the bolt, clean them, and then reassemble them in the original order. There is really only one way to take this assembly apart, but there are 40,320 different ways in which it could be put back together -- and 40,319 of them are wrong!

This simplistic example illustrates the fact that the task of disassembly usually constrains the mechanic to one particular sequence, with each succeeding step being prompted by the last. The mechanic doesn't require much guidance, because the disassembly procedure is usually obvious. In contrast, correct reassembly usually requires knowledge -- either in the mechanic's memory or in written form.

Human memory being as imperfect as it is, reassembly based on memory is error-prone. Reassembly based on written guidance (such as a checklist or service-manual instructions) is far more reliable, but people doing a hands-on job tend to be reluctant to consult written instructions. (Watch your A&P work on your airplane, and note how rarely he consults the service manual or any other form of written guidance.) Reassembly-by-memory is probably adequate for a task that the mechanic does every day. Most maintenance tasks aren't like this, however, and we all know how easily we can forget the details of a task after even a short period of time.

To make matters worse, a wrongly-assembled component is not always obvious on later inspection. The absence of washers, bushings, fasteners, seals, O-rings, caps, lubrication, etc., are often concealed once the component has been reassembled. Thus, reassembly errors often create the opportunity for double jeopardy: a high probability of forgetting something important during reassembly, and a low probability of detecting the error once the job is completed.

Slips, Mistakes, and Violations

Failures by a mechanic to perform a task as planned are commonly termed slips, lapses, trips or fumbles. A slip occurs when the mechanic is trying to do the right thing, but screws it up somehow. Slips can be caused by:

- **Omitting some necessary action;**
- **Performing some necessary action in a clumsy fashion;**
- **Performing some unwanted action; and**
- **Carrying out the right actions in the wrong order.**

Inspection

Such slips most often occur when doing tasks by memory -- often well-practiced tasks that are done frequently in an automatic fashion.

Mistakes are higher-level failures caused by an error in the plan itself. These are usually caused by lack of knowledge, and occur most commonly when performing tasks that are not done very often. Often, mistakes are caused by trying to do something by memory that should have been looked up on the service manual. Forgetting to torque a cylinder hold-down nut is a slip; torquing it to the wrong torque value is a mistake.

Violations are deviations from standard practices, rules, regulations, or standards. While slips and mistakes are unintentional, violations are usually deliberate. They often involve cutting corners in order to take the path of least resistance, and often become part of a mechanic's habit pattern.

In an incident in which the pilot of a Cessna 340A launched into IMC on the first flight after maintenance, only to discover that his airspeed indicator, altimeter and VSI stopped working as the aircraft climbed through 3000 feet. The cause of the problem turned out to be a mechanic's failure to reconnect a static line that had been disconnected during maintenance to facilitate access. The mechanic's failure to reconnect the line was an inadvertent slip -- he forgot. On the other hand, the mechanic's failure to perform a static-system leak check (required by FAR any time the static system is opened) was a deliberate violation. Because of the violation, the slip went undetected and jeopardized safety of flight.

Distractions

Distractions play a big part in many errors of omission. A common scenario is that a mechanic installs some nuts or bolts finger-tight, then gets a phone call or goes on lunch break and forgets to finish the job by torquing the fasteners. I have personally seen some of the best, most experienced mechanics I know fall victim to such seemingly rookie mistakes. I know of several fatal accidents and countless less-serious incidents caused by such omissions.

Just as pilots need a "sterile cockpit" during high-workload phases of flight, mechanics need a distraction-free workplace when performing safety-critical maintenance tasks. Unfortunately, the typical piston GA shop is a distraction-rich environment. Phone calls come in. Customers drop by unexpectedly. UPS and FedEx drivers deliver anxiously-awaited parts. The Snap-On tool truck stops by. The shop's FAA principal maintenance inspector pays a surprise visit. The roach coach arrives with lunch.

This is less of a problem in the big turbine shops, where there's usually a Parts Manager to deal with deliveries, a Customer Service Manager to handle customer visits and phone calls, and a Compliance Manager to interface with the FAA.

But in the smaller shops that owners of piston GA usually use, employees usually wear multiple hats and must deal with these distractions as they come. That leads to mistakes.

Big shops have their own issues. Shift changes cause lots of problems, when the first-shift technician assumes the second-shift technician will handle something, but the second-shift guy fails to do it because he assumes the first-shift guy handled it.

Quality Assurance

At different GA aircraft and engine factories, it's important to watch them build our flying machines. One of the fundamental work rules at these plants is that there must always be at least two sets of eyes that look at every step of the process: the technician that performs the work, and an inspector who verifies that the work has been done properly. Often, there are three sets of eyes: two technicians who work as a team and check one another's work, and then an inspector who re-checks the work.

Maintenance Hangar

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Large repair stations that work on turbine aircraft often have similar rules, where designated inspectors are required to check the work of each mechanic and sign it off. But the smaller shops where most piston GA maintenance is done seldom can afford the luxury of having dedicated inspectors on staff. One A&P will sometimes ask another to check a particularly critical or complex task, but most maintenance is checked by just one set of eyes belonging to the mechanic who did the work, and most scheduled inspections are done by just one IA. Fewer sets of eyes inevitably means that more slips, mistakes, violations and discrepancies escape detection.

Safety Board Determines Pilot Fatigue Caused Skid

The National Transportation Safety Board on Tuesday identified sleepy pilots as a reason that a regional jet slid off a snowy runway in Traverse City, Mich., in April 2007, and the agency again called on the Federal Aviation Administration to take steps to manage fatigue.

The Bombardier jet, operated by Pinnacle Airlines as a feeder for Northwest, was landing after midnight, after the tower had closed, on a flight from Minneapolis. The nose gear was torn off during the landing, but there were no injuries among the 3 crew members or 46 passengers, including 3 infants.

Investigators said at a meeting on Tuesday that the captain and first officer were not paying enough attention to the deteriorating weather conditions. Because the runway was snowy, they should have performed a "landing distance assessment," and that calculation would have told them not to try the landing, according to the board. The crew showed "poor decision-making" and this "likely reflected the effects of fatigue," the board found.

The crew had flown more than eight hours, and made five landings, in "challenging conditions," the board found, and had been on duty more than 14 hours. The pilots had been awake more than 16 hours. The captain was experienced but his first officer was new at the airline, probably adding to the captain's workload, investigators said. And the crew members could be heard referring to their own tiredness on the cockpit voice recorder.

Fatigue is often suspected but less often identified as a cause of crashes. And it is hard to identify in daily operations, experts said.

"It's an insidious condition," Mark V. Rosenker, chairman of the five-member N.T.S.B., said. "People don't recognize that they are fatigued, just as they might not recognize that they are driving under the influence."

Fatigue, he said, probably gave the captain more confidence than was justified.

The board, a purely advisory agency, has been asking the Federal Aviation Administration for years to pay more attention to pilot fatigue. In 1995 the F.A.A. published a proposed set of rules on flight and duty times, but it did not put them in place. Airlines have resisted because it would raise their costs. Some pilots like being able to squeeze their monthly number of flight hours into as few days as possible.

Other pilots, though, have complained that changes instituted by the airlines since 2001 have made them fly more hours and left them tired more often.

The board also recommended that the F.A.A. require aircraft operators to set up "fatigue management systems."

But Deborah A. P. Hersman, another member of the board, said, "This recommendation is a bit of a Band-Aid because we can't get the flight and duty time fixes."

The Federal Aviation Administration conducted a three-day symposium last week on fatigue, including scientists and representatives of airlines and unions.

And the safety board is investigating an incident in February in which a Go airlines flight from Honolulu to Hilo, Hawaii, overshot the airport by 15 miles, at which point the crew was alerted by an air traffic controller. The pilots, suspected of falling asleep, were fired.

The safety board cited fatigue in a crash in Missouri in October 2004 that killed 13.

But the issue is not limited to pilots. When the crew of a regional jet took off from the wrong runway in Lexington, Ky., early one morning in August 2006, the circumstances suggested that fatigue in the control tower might have been a factor. And it is hardly limited to aviation; in trucking, railroads and maritime operations, standards for the number of hours a worker can be on duty are often an issue.

The Transportation Department published rules for truck drivers in 2003 that took effect in early 2004, but a court threw them out in July of that year. The department put a new rule in place in August 2005, but parts of that rule were tossed out by a court last year.

ATSB urges review of accident procedures

Emergency services need to review procedures for dealing with crashes of aircraft made from the new generation of composites, Australia's national transport safety watchdog has warned.

In a report released on Monday, the Australian Transport Safety Bureau (ATSB) said these materials could pose long-term and even fatal health hazards if not handled correctly.

It said fire, ambulance and other emergency services needed to have the correct equipment and their members had to be trained in the proper response methods and be aware of the risks unique to accidents involving aircraft with composite materials.

"It would be timely for first responders to review their aircraft emergency and hazardous material handling guidelines, and training in handling fiber composite debris for a number of reasons," it said.

"Fiber composite materials are heavily used in general aviation and amateur-built aircraft, which are the most common aircraft accidents that state emergency services respond to.

"Fiber composite usage in airliners will continue to increase in the next decade, especially with the introduction of the Boeing 787 Dreamliner."

Composite materials have been used for aircraft components since the 1950s.

Materials such as glass fiber and carbon fiber are lighter and stronger than traditional materials such as aluminum and less prone to fatigue damage. They will form an increasingly higher portion of modern aircraft.

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The new Boeing 787 will comprise about 50 per cent by weight of composites, making it some five tons lighter and 20 per cent more fuel efficient than a comparable aluminum aircraft.

ATSB said in an accident, glass fiber had good fire resistance but carbon fiber would ignite easily, producing toxic gases. In an impact both materials could release fibers which posed a respiratory hazard much like asbestos.

As well, carbon fibers were highly conductive and could damage electronic equipment.

ATSB said defense, airport and metropolitan emergency services, who would likely respond to an aircraft accident at a major airport, were all equipped and trained to deal with the hazards of composite materials.

"When an aircraft accident occurs, it is often not conveniently in the bounds of an airport. In Australia, typical first responders to accident sites are the emergency services, such as state police, ambulance, metropolitan and country fire services," it said.

ATSB said a survey of emergency services showed significant regional variations in procedures.

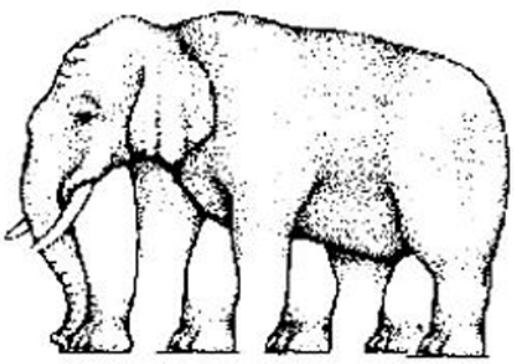
It said as a first step in dealing with such an incident, passengers needed to be evacuated quickly to an area upwind of the accident site.

All personnel not directly involved in rescue operations needed to be kept well clear and a no-fly zone established to prevent media or other helicopters further dispersing fiber composite dust.

Those working at the accident scene needed to wear full protective equipment similar to that used when handling asbestos.

Improve your memory with a good night's sleep

Sleep is essential for memory consolidation as well as overall health. Research suggests that six to eight hours of sleep a night is ideal for most people. Perhaps even more important than the amount of sleep is the quality of sleep. For better sleep *and* memory, try the following:



- **Establish and maintain a consistent sleep schedule and routine. Go to bed at the same time each night and wake up at the same time each morning.**
- **Plan to do your most vigorous exercise early in the day. Exercising in the hours immediately before bedtime causes physiological changes that interfere with sleep.**
- **Avoid coffee and other sources of caffeine (e.g., chocolate, many soft drinks, some brands of aspirin, many types of tea) after midmorning, because caffeine is a stimulant that can keep you awake for hours afterward.**
- **Avoid napping during the daytime. Napping can disrupt your natural sleep cycle and prevent you from feeling tired enough to fall asleep at night.**
- **Don't take sleeping pills unless nothing else works. If you do take a prescription sleep medicine, work with your doctor to use it effectively but only on a short-term basis.**
- **Don't try to sleep if you're not tired; otherwise you'll set yourself up for tossing and turning. If you're still awake after about 20 minutes in bed, get up and read awhile to relax.**

***** Get your copy of* Improving Memory: Understanding and preventing age-related memory loss**

As many as two-thirds of people age 50 and older notice greater difficulty remembering names, appointments, and other details. Fortunately, the small memory lapses that occur with age are usually the result of normal changes in the structure and function of the brain. *Improving Memory: Understanding and preventing age-related memory loss* describes age-related changes and other causes of memory impairment—and how to distinguish between them. It also discusses research on how to prevent memory loss and improve memory. Click here to read more or buy online.

To order online, click one of the following links:

- Purchase printed version ($18.00)
- Purchase electronic download (PDF) ($18.00)
- Purchase print + electronic download (PDF) ($26.00)

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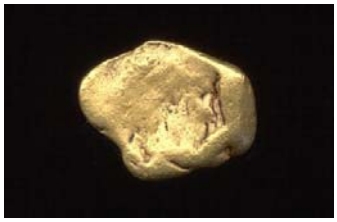
Midnight Shift Nugget

Sleep Inertia



Sleep inertia is the temporary grogginess and disorientation people often experience upon waking. It's most severe and long-lasting when you awaken from deep sleep (stage 3 and 4), but you may also feel it when you awaken from the lighter sleep stages (1 & 2, REM). Upon awakening, it's important to give yourself 5 to 10 minutes to clear your head before driving or doing anything potentially dangerous when you have sleep inertia. You might use this time to splash some water on your face, walk around or have a caffeinated beverage.

AUDIO SAFETY TALKS!

Safety When You're All Alone

In these automated times, occupations and situations in which a person might be required to work alone are increasing. A single worker might handle the night shift production for a factory that once employed eight workers to handle the same volume. However in most cases, as the number of workers on the ground dwindles, the potential for real trouble increases sharply. If your workers ever have to face the job alone, make sure they hear this safety talk.

To listen to the talk, click this link

STAT OF THE DAY

Distracted Drivers

80%

That's how many traffic accidents are caused by distracted drivers according to the National Highway Traffic Safety Administration. Top distractions, according to a survey:

That's how many traffic accidents are caused by distracted drivers according to the National Highway Traffic Safety Administration. Top distractions, according to a survey:

- **Adjusting radio station/CD: 82%**
- **Drinking a beverage: 80%**
- **Talking on a cell phone: 73%**
- **Eating a snack: 68%**
- **Eating a meal: 41%**
- **Daydreaming: 31%**
- **Experiencing road rage: 21%**
- **Smoking: 19%**
- **Fixing one's hair: 19%**
- **Talking with one's hands: 19%**
- **Texting/instant messaging: 19%**
- **Disciplining/Comforting kids: 14%**
- **Putting on makeup: 12%**
- **Using a GPS: 9%**

Source: Data on drivers' distractions comes from
http://www.nationwide.com/pdf/dwd-2007-survey-results.pdf

BAD DESIGN

Ok, which code do I write down?

Imagine this scenario. You get to the airport only half an hour before your flight. You park your car in long term parking and see the shuttle bus coming. As you grab your bags, you remember that you should write down where your car is parked otherwise you won't be able to find it when your return from your trip. You look around and see "F7" on the ground. Then you look over and see "15" on a light pole! Then you look over at the shuttle bus stop and it says "E". Ok, so what code do I write down? "F7", "15" or "E"?

Design suggestion

A person doesn't know which of the codes is important so a single simple coding scheme should be devised. You don't want people thinking "Is F7 specific enough or are there multiple F7s? Do I need to know both E and F7?"

Picture This!

- **We all know our limitations. Well, let's qualify that statement: those of us with experience have learned our limitations. Young people haven't; it's one of the reasons that young workers need extra attention to their safety, both from themselves and from their supervisors. In case you doubt that young people sometimes overdo things, take a look at this picture. Overloading, taking on more than you can handle and biting off more than you can chew are proud traditions among young folk. Keep that in mind when training your young workers.**