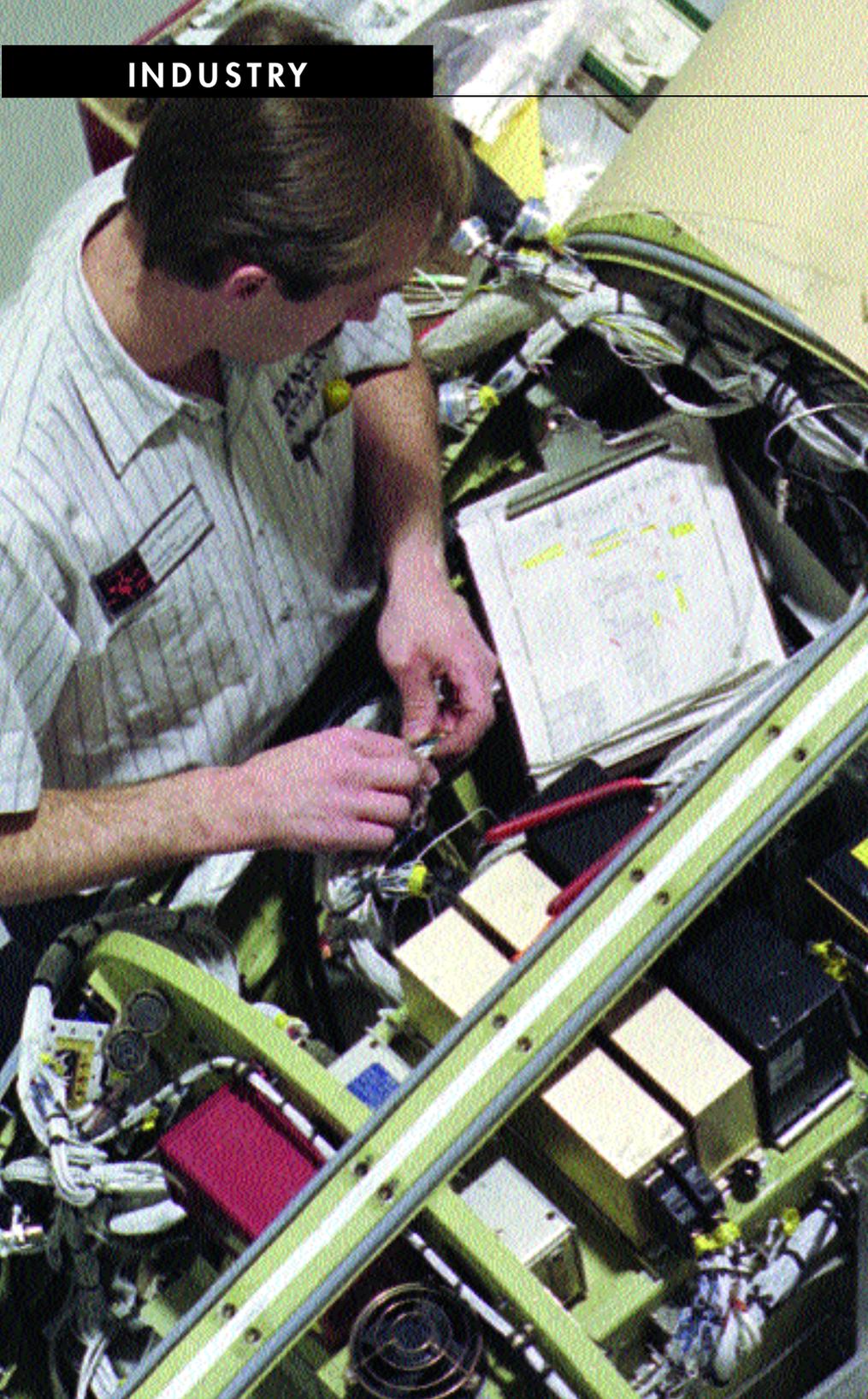


**INDUSTRY**



**While working with avionics could be considered one of the “least hazardous” jobs in aircraft maintenance, there are still plenty of opportunities to sustain serious injury if you’re not careful.**

# **AVOIDING HAZARDS IN THE HANGAR**

BY DALE SMITH  
PHOTOS COURTESY OF DUNCAN AVIATION

**A**ircraft hangars, like any other maintenance or manufacturing facilities, are inherently dangerous places. Above, below and all around are countless opportunities for the unaware technician to incur anything from a simple cut to a life-threatening injury.

“Probably the major safety hazard to a technician is whatever happened to them that day,” said Nick Onufer, R.N. and instructor for MedAire Inc. “That’s why, during our training, we try to give aviation technicians a wide awareness of everything that is around them. From chemicals, to power tools, to slip and fall dangers, our goal is to make them aware of all of the various dangers found in each part of their jobs.”

### **It’s a dangerous job, but somebody has to do it...**

Onufer also explained that because of the vast assortment of products, chemicals and tools a technician must use, one of the biggest safety and health-related mistakes we make is to not fully understand what we are working with on a daily basis. “It’s just human nature to basically become complacent with safety,” he said. “You’ve been doing it this way for years so why change? But that’s the absolute wrong way to think because we know so much more now than we did before.

“For example, people working with radar systems do have a small amount of radiation exposure and they need to be aware of just how much,” Onufer continued. “Even though you may be OK with short-term exposure, it’s the cumulative affect that you just don’t know about.” And because of that, he strongly urges technicians to take the most precautions possible whenever working with any potentially harmful equipment or products.

*Right: Note the safety harness.*

But, no sane person goes out and deliberately ignores the accepted safety precautions and procedures when working with potentially dangerous chemicals or machines—or do they? “I’m thinking of the major accidents that we’ve had over the years and most of them were because someone got complacent with procedures,” explained Kurt Sutterer, executive vice president, Midcoast Aviation. “They simply did not follow the procedures the way they had been trained and that’s when the breakdown came and someone got hurt.”

But, what can cause a trained professional to endanger themselves or other people around them? “The No. 1 thing we encounter is being hurried to

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*Note the stepstool.*



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get a job done faster,” he continued. “There’s a massive demand on cutting the amount of time that is being allowed for an airplane to go through a work inspection or repair.”

“Even though you may have the best quality control procedures in the business, you have to be extremely diligent that they are followed when you have a lot of people working around an airplane at one time,” Sutterer added. “Even in a small shop it’s critical that anytime you do anything, you take the time to let everyone else around the aircraft know what you are doing.”

Sutterer further explained that Midcoast has a crew chief or project manager assigned to each aircraft. They are responsible for everyone that’s on, around or near that airplane. If a functional check is going to be performed that could create some type of hazard, the project’s ‘chief’ is responsible for doing a survey of the exterior and interior of the airplane to make sure no one is in harm’s way. Any activities on the airplane that may interfere with the test or create an unnecessary hazard are stopped.

“We try to schedule many of our tests and functional checks during times of the day—like in the evening—when there aren’t as many people in or around the aircraft,” he said. “The fewer people around the aircraft, the less chance of an accident.”

### A shocking development.

Unlike other hazards like fuel or hydraulic fluid leaks, or the smells associated with various chemicals and cleaners, electricity doesn’t give a technician any clue that it is present in wires or cabling. Because of that, technicians have to be extra careful to double-check the aircraft’s power status before beginning to work on any avionics or electrical component.

“Powering up an airplane at the wrong time can lead to significant injuries or equipment damage,” Sutterer explained. “Let’s say there’s someone working back in the tail avionics bay and a technician ‘powers up’ the cockpit—the results can be very bad. So it’s vitally important to let everyone know what’s going to happen and when.”

An even more frequent problem he described was a technician trying to remove or install an avionics box with the power ‘on’ in the aircraft. “You always have to be powered-down before you attempt to connect or disconnect any plug,” he cautioned. “Also technicians need to inspect the Canon plugs for bent or damaged connectors. Trying to make a connection in this instance can cause a dangerous situation when the equipment is powered up for testing.”

### Hidden hazards in ‘plane’ sight.

Anytime there is an aircraft parked in a hanger for maintenance or service it creates a beehive of activity in and around it. And hidden amongst all of that activity are seemingly countless ways for a maintenance technician to get hurt.



Power and accessory cables run along hangar floors, tow bars, tool carts, fluid spills, leading and trailing edges, antennas and a laundry list of other things are all waiting to catch the unaware technician.

“We have procedures to lessen the physical dangers around our aircraft as much as possible,” explained Bob Perry, safety director for Duncan Aviation. “When a plane comes in the hangar the first thing we do is to remove the tow bar and ground the airframe. And it’s grounded the whole time it’s in the building.”

Perry and the other industry experts interviewed all agreed that keeping an airframe grounded whenever it is in the facility for maintenance can’t be over emphasized. “It may not be necessary to ground every airplane when it’s just in the hangar for storage,” explained Robert Feeler, maintenance safety consultant for the Flight Safety Foundation. “But if they’re doing any maintenance and have drop cords or electrical cords around the aircraft, proper grounding is very important. If any of those cords should somehow short into the airframe the results could be catastrophic.”

“Also, doing common maintenance like polishing the bright metal on a business aircraft can build up a significant static charge in the airframe,” he added. “I don’t think most technicians even give it a second thought. They don’t realize a lot of seemingly simple maintenance processes can create very hazardous situations.”

“Eliminating static electricity is something we work hard at all the time,” Sutterer added. “Our avionics technicians not only have static control workbenches, we also use specially grounded and bonded cages to transport the equipment from the shop to the airplane. You can build up

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a significant static charge around the airplane and it can damage the equipment and possibly injure the technician if we're not careful."

Perry also said that Duncan Aviation's hangar safety steps include protection for leading and trailing edges. "We put special foam padding around the wing edges so technicians won't get hurt when they walk in to them," he said. "Another major cause of injury are slip and fall accidents caused by power cables and extension cords running across the floor. In our new hangar all of the cable connections come up from the floor's center. That has greatly reduced the number of accidents."

And while we're on the subject of slips and falls, there's another potential hazard that few companies or technicians ever consider—the very 'air stair' doors found on many of today's aircraft. "We had a technician working on a jet out on the ramp this winter," Perry said, "and it had been snowing lightly. The technician was carrying a box out of the airplane and when he stepped on the stair he slipped and fell on the ramp. He wasn't hurt badly but you couldn't say the same for the box he was carrying."

### The human side of hazard protection.

Grounding airframes, padding edges and hiding extension cords are all great steps companies can take to protect technicians from injury, but they are just the "tip of the iceberg" when it comes to creating a safer environment. "Most times it's the simple things that get you," Perry added. "Our workforce is getting older—our average technician is over 40 so we try to pay attention to the basics to avoid injury." At Duncan those 'basics' include how their technicians lift and carry the 'black'boxes.

"We work hard with our line guys to stress the proper way to lift," he said. "Some avionics bays in today's aircraft can be pretty cramped and it forces you to work in uncomfortable positions. It's easy to strain your back." One new tool that Duncan has made available to reduce the problem are kneepads. That's right, kneepads.

"A couple of our guys are over six [foot], six [inches] and by just making it easy for them to get down on their knees instead of bending down inside the airplane takes most of the stress off of their backs," Perry explained. "The pads are right there in the tool room and they get checked-out a bunch by our technicians. It's a simple thing but it shows our technicians that we care about them."

Perry also said that Duncan has recently brought Kevlar gloves into the shops—they're a lot more resistant to knife and metal cuts than regular work gloves. "A pair of Kevlar gloves probably cost \$4, while a visit to the doctor to fix a cut will cost \$70—not to mention the pain and suffering of the technician," he said.

Cut protection isn't the only benefit the right pair of gloves can offer a technician. More and more facilities are requiring technicians who work with cleaners or chemicals to wear approved nitrile or latex gloves. "People are now learning how many chemicals can be absorbed through the skin," Onufer explained. "You can work with a chemical for years and not understand its long-term affect on you. Almost every chemical has what we call a 'target organ'—the part of the body it attacks more than others. You may never see the damage on your skin, but what's happening inside is a different story."

Onufer said it's the same way with many toxic fumes. "For example, some chemicals you breathe will affect the liver while another may damage the lungs," he added. "Again, even

small amount of exposure on a daily basis can accumulate to create a serious situation. Take the new solders for example, while they are a lot safer than the old lead products, you still need to wear an approved breathing mask or hood when ever you use them."

### Hangar, 911.

Unfortunately, even with all the precautions and safety warnings bad things happen to good technicians and that's when all the safety and emergency response reminders and drills really pay off. "We have two full-time, in-house safety trainers on staff at our facility," Sutterer said. "We develop all of our own safety training programs that begin with the employee's orientation and run through the entire time they are employed with us."

Sutterer said their programs cover everything from hazardous chemical handling, to environmental law, to DOT safety awareness training, to basic first aid and CPR. The last two being particular 'skills' that everyone *Avionics News* interviewed stressed as critically important. Electrical shocks and falls can easily put a person in need of these life-saving services.

"Knowing CPR and how to use a defibrillator are very important," Onufer stressed. "Those first few minutes that you're waiting for an ambulance to arrive can make all the difference in whether or not someone lives or dies—you can actually save a life in that time."

Duncan's Perry added, "We have what we call our 'First Responders'—people who are specially trained to do what's right in those situations. Most of the time they're responding to cuts or falls, but about a year and a half ago they actually brought someone back to life who had suffered a heart attack. While they get specialized training, we provide CPR and basic first aid

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training to all of our employees.”

Perry also said that Duncan’s policy is to take safety training out of the workplace and into the home. The company holds monthly training safety sessions on a Saturday and employees are encouraged to bring the entire family. “We’ll get 70 or 80 people at these sessions,” he said. “We cover everything from handling pesticides, to second-hand smoke, to home fire safety. It helps the employee and it helps the company on the bottom-line because of the high cost of medical insurance these days.”

“Safety begins with each individual and how they perceive their responsibilities,” Onufer concluded. “A lot of people will say it’s the employer’s responsibility to keep people safe, but when you get down to it, it’s up to the individual to take care of themselves. Every employer can provide all the gloves, hearing protection, eye protection or training they want, but if the individual doesn’t use it the right way at the right time, it’s no good to anyone.”

## **A bolt from the blue.**

One final hazard that we uncovered while researching this story is one that is ever-present, yet hardly ever gets any consideration—until it’s too late—and that’s lightning strikes. “I did some research a while back and found that typically two aircraft technicians are killed somewhere in the United States each year by lightning strikes,” Feeler explained. “It’s usually when they’re doing a push-back or servicing the aircraft on the ramp. But avionics and electronics technicians are certainly not immune to the danger. Lightning could hit the ground somewhere else on the airport and the charge could travel up into the airframe. The best rule of thumb is if there’s lightning anywhere within five miles of your facility, don’t go out and work on the airplane.” q