

"I'M GOING TO LOSE IT!"

When something bad happens to good pilots, they will survive if the chain of preceding events was made of sound and useful links.

by Harry Kraemer

Accidents normally are a result of a chain of events. You may survive an unforeseen incident if you have built a solid preflight and follow orderly cockpit procedures. You can experience equipment failures and encounter hazardous weather without having an accident if you are prepared to fly the airplane.

It is interesting to look at a chain of events to see how it may have caused an accident, but it also is important to recognize the chain of events that may have helped prevent an accident.

I recently had a runaway trim in a Pilatus PC-12 that gave me a handful of airplane, but because the chain of procedures leading up to the incident was solid, the event did not result in an accident.

I departed Montgomery County Airpark (KGAI) in Montgomery County, Maryland, IFR to Martin State Airport (KMTN) in Baltimore, Maryland. The weather at KGAI was 400 feet overcast and 2 1/2 miles visibility. KMTN reported 1,400 feet overcast with seven miles visibility. The winds were 150 degrees at three knots favoring Runway 14.

The Chain Begins

Event or decision number one in the chain: I decided to use Runway 32 for departure. My clearance was direct Westminster (KEMI) direct KMTN. Direct KEMI is about a 035-degree heading from KGAI. I chose 32 for departure because it was only a 75-

degree heading change to go direct KEMI as opposed to a 105-degree heading change. I was trying to make life easier using Runway 32.

I operate the aircraft under FAR Part 91. Ninety-five percent of the flights are operated single-pilot. Event number two in the chain: For some reason I decided to ask Bob, a designated pilot examiner friend of mine, if he wanted to get some time in the PC-12, and he accepted. Bob is PC-12-qualified.

Operating single-pilot most of the time, I am not in the habit of briefing the crew before departure. But I always give myself a takeoff briefing out loud. This briefing includes wind direction, go/no go decision point, abort and/or engine-out procedures and critical speeds.

Right-Seater Briefing

When I do have another pilot in the front with me, it seems that he always is eager to assist in the duties — gear up, flaps up and setting radios. But flying single-pilot and having a strict routine that I follow means that friendly help can break my routine. It can cause me to forget to do something or do something out of sequence.

For example, when the right-seater brings the gear up for me, I lose the sequence because I have things that I do after bringing the gear up while flying solo. My whole routine is off.

Event number three in the chain: This particular morning, I briefed my friend Bob on exactly what I wanted

him to do for me. Bob would work the radios, and I would handle the rest.

I told him that I would be busy — it was only an 18-minute flight — with a departure, short cruise and approach all within a very short time and that I did not want my routine interrupted.

The aircraft is equipped with four five-inch EFIS displays, dual RMIs, approach-certified GPS, Loran, DME and dual VORs. Event number four in the chain: I set up my radios for my departure, en route and approach at KMTN before taxiing and briefed Bob on how I would execute everything.

Each electronic horizontal situation indicator (pilot and co-pilot side) had all of the navigation information displayed on it. I had the approach course for the Localizer 15 at KMTN dialed in. All course pointers were set properly. I even had all of the communication frequencies dialed in.

All that was left to do was to fly the airplane and communicate. Little did we know that just flying the airplane would be a challenge.

Normal Departure

The before takeoff checks were normal. After Bob had our clearance and I verified that all checklists were completed, Bob called for our release. The takeoff was normal. Rotate at 80 knots. Positive rate of climb verified, gear up, taxi and landing lights off, yaw damper on and flaps up passing through 100 knots.

With the weather being as low as it was, I had planned to use the autopilot for the initial climb and cruise while I tended to my climb and cruise checklist and prepared for the approach. I selected the heading bug mode on the autopilot controller, and then I turned the autopilot on.

Event number five in the chain: I always keep my hands on the control wheel for about 40 seconds after I turn on the autopilot, just to make sure that it is doing what I expect and want. With one hand still on the yoke, I

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reached for the pilot's side EFIS controller to turn the heading bug to direct a turn toward KEMI.

The autopilot started to make the turn, and as it did I could feel the aircraft pitching up. At the same time, several bells and alarms were going off in the cockpit, along with lots of red lights. The autopilot also was knocked off line.

Runaway Trim

Something was very wrong. For some reason, at first I thought that it was the flap overspeed warning, so I verified, twice, that I had brought the flaps up. I did indeed. By now the airplane was pitching up rapidly, and the rudder trim was trying to keep up with it. I could feel in the yoke and rudder pedals what was happening.

After about a two- or three-second delay, I realized that it was a runaway stabilizer trim. The PC-12 has a trim interrupt switch that stops all trim motors (rudder, stabilizer and aileron). I selected trim interrupt. It worked. It stopped all trim motors in the position

that they were in.

Now I had an airplane in the soup, in an unusual attitude 400 feet off of the ground (800 MSL) and way out of trim. By now I had been yelling at Bob for some help on the controls (this may have been the only time that I will get to yell at a pilot examiner in an airplane and get away with it).

I said to him that I didn't think that I could hold it much longer. Both my arms and legs were shaking from exerting a lot of force on the controls. I was desperately pushing forward on the yoke. I needed to pull the circuit breaker on the stabilizer trim so that I could arm the trim motors that I had working and regain control of the airplane. Again I told Bob that I thought I was going to lose it.

I asked Bob to find and pull the circuit breaker for the stabilizer trim while I held onto the controls. Both of us were on the controls, trying to keep from losing control.

Once the stabilizer trim circuit breaker was pulled, I was able to select the normal mode on the trim interrupt

switch. This gave me primary rudder and aileron trim back and also allowed me to use the alternate stabilizer trim switch to trim the airplane.

With the airplane once again under control, we were able to restore order in the cockpit and continue to KMTN.

Keeping Your Cool

Until you experience a situation like this, it is hard to imagine how distracting all of the bells and whistles can be. I had the alarm for the runaway trim, the autopilot disconnect chime and the master caution and warning bell all going off simultaneously.

I also had the master caution and warning light, trim warning light on the autopilot controller and the stabilizer trim warning light on the Central Advisory and Warning System panel going off.

It also is very easy to get vertigo while your scan is moving quickly around the cockpit, absorbing all of the information and looking for switches.

Having been an instrument instructor for many years, I have seen a lot of instrument students induce vertigo under situations like this. So I was quite aware of the possibilities of it happening to me, and I made a conscious effort to scan and properly interpret the flight instruments.

It also is important to know and understand the meaning of all of the bells, whistles and warning lights in your aircraft.

The entire episode from the first warning to regaining control lasted about 15 to 20 seconds. It seemed like hours. I had experienced this in the simulator during recurrent training, and I can say that I am glad that I saw it in the sim first. A break in any one of the chain of events could have resulted in a very different outcome.

Harry Kraemer is a 6,000-hour corporate pilot and CFII who lives near Washington, D.C.

