If I Knew Then What I Know Now

by LCdr. Patrick Porter

Some years ago, I got an excellent lesson in the role of human factors in naval aviation. Our forward-deployed air wing had just finished an at-sea period off the Philippine coast after making the final port visit of an American aircraft carrier to Subic Bay Naval Base. In a day, the ship would pull into Hong Kong for a few more days of good WestPac liberty. Before that, the air-wing commander wanted most of the aircraft off the ship and back in Atsugi. This would allow the squadrons to prepare the aircraft for the upcoming Arabian Gulf deployment, which would create the no-fly zone over Southern Iraq and what we have come to know as Operation Southern Watch.

As a bonus, a fellow JO and I were selected to fly the last Intruder off the ship and back to Atsugi. He would get some extra time with his family before deployment. I would embark on a C-9 the next day bound for Hong Kong, where I would get my four days of WestPac liberty. An extra night off the boat, an extra 3.5 hours of flight time toward that 1,000-hour patch, and no loss of liberty to boot!

When we walked to the jet, the AMEs and other mechs had the starboard engine-bay door open and were replacing bleed-air ducts. Like most other parts on the aircraft, the ducts were practically inaccessible. We waited patiently, watching the rest of the aircraft from our event launch. Thinking that we were going to end up losing our good deal, we asked the FDC to call down to maintenance and find out if the SDO had some gouge. The benevolent air boss decided to keep the deck open until sunset for us, but we had to get the jet up in the next hour.

When the mechs finished, we manned up. By now, we were the only aircraft on the roof. All the yellowshirts, cat and arresting-gear crews, and

squadron maintenance folks were standing around, waiting for us two aviators to square away our program so they could go get chow. As we turned up the jet, we heard the all-too-familiar sound of whining hydraulic pumps, which usually meant the pumps were going bad. But since so many had worked so hard to launch this aircraft, we weren't going to disappoint them. We decided to go to the cat and check the hyds at mil power, where the engine should spin that pump at a rate sufficient to maintain system pressure within limits. The pilot did the wipeout—very slowly, I might add—to avoid cavitating the pumps. The hyds dipped slightly. Next thing we knew, we were hurtling down the cat.

We had planned to gas-and-go at Kadena Air Base, then continue to Atsugi. When we lowered the gear upon arrival at Kadena, the hydraulic gauges dipped dramatically, and it took several seconds longer than usual for the landing gear to fully extend. After a few more tense seconds, the gear-position indicators indicated three down and locked. We landed, got our gas, and walked back to the jet for the last leg of the trip. As we discussed how we would handle the hydraulics, we agreed that we surely couldn't strand the jet in Kadena. With a deployment only a few weeks away, and squadron personnel scattered between our home base 800 miles to the northeast, and our ship another 400 miles away steaming the opposite direction, we decided we had bought the problem and would have to get the jet home.

To protect our weak hydraulic system, we agreed we would raise the gear normally after takeoff, then electrically raise the flaps to reduce the load on the hydraulics. When we got airborne and raised the gear, we got a big dip on the gauges, but they eventually went up and locked. Phase one of the plan was complete. Retracting the flaps worked like a champ, and phase two was complete. We were on our way. Once the combined hydraulic system was isolated via a switch on the pilot's instrument panel, we breathed a sign of relief.

As the trip wound down, we found ourselves back in familiar surroundings. We asked for a visual straight-in to runway 01 at Atsugi. At eight miles, we went dirty. Well, we tried to go dirty. The

hydraulic gauges dipped almost to the bottom, and we got three unsafe gear. We had 4,000 pounds of fuel, so we had a little time to deal with this problem, but we knew that our last option would be to blow the gear down. We knew we would have to answer questions if we did that, but more importantly, aviators get uneasy about having to expend their only remaining option. If we shot that silver bullet and it didn't work, we were going to have serious problems.

After what seemed like an eternity, air loads drove the mains to the down-and-locked position. As we slowed, the weak hydraulic pressure overcame the drag against the nose gear, driving it down and locked as well. We discussed taking a trap if the hydraulics failed on final, and I kept a close eye on the gauges. We landed uneventfully, and the brakes worked fine.

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When we got out, we downed the aircraft for the hydraulics. No one ever asked why or how the problem originated. They just fixed it and returned the jet to the flight line.

Back then, a mindset of "I can hack it" was admired. We knew we had a job to get done, and we "knew" we could do it. But since then, with 2,000 more hours, 600 traps, and a trip to School of Aviation Safety at Monterey, I find myself looking back at that incident in a different light.

The pressure to accomplish a mission can be enormous. Today, the complexity of our missions requires hours of planning and extensive, detailed briefs. In the F-14A community, many man-hours of effort are required to get an aircraft ready for flight, and a lot of effort by a lot of people is wasted if the jet doesn't make it off the pointy end to complete the sortie.

It is easy to quote go/no-go criteria and advise aircrew to make the hard call when required. Often, the call is easy: a hydraulic system that is bleeding onto the flight deck. The subtler, gray areas are where the real pressures exist. Those pressures can produce poor decisions. A conservative crew decides that an aircraft isn't airworthy; another crew decides it is perfectly flyable. Our policies aren't that inconsistent; the variable is human factors.

In the years since this incident, a great deal of research has been done in this field, studying the role of the human in a system comprised of himself, his machine, his environment and the operating rules. Naval aviation's Human Factors Quality Management Board was chartered to reduce mishaps caused by human factors. There is still progress to be made.

By now, many of you may be familiar with the Human Factors Accident Classification System (HFACS). Perhaps you've seen LCdr. Scott Shappell's brief entitled "The Taxonomy of Unsafe Operations." If so, you know about organizational factors, unsafe supervision, preconditions for unsafe acts, and the unsafe acts themselves. The first three categories don't directly cause mishaps, but they set the stage for them. Unsafe acts are active failures. They cause mishaps because of things people did or did not do. Unsafe acts may be errors, where the aviator didn't intend to do something hazardous, or they may be violations, where he or she knowingly performs a hazardous act.

Focusing on human factors can help a squadron see if its culture conditions aircrew to commit unsafe acts. If the leadership of the command is open to honest self-assessment, squadron members will suggest solutions to serious problems before mishaps.

Battle-group commanders, CAGs and squadron COs must learn about HFACS so they can assess the organizations they lead. Department heads must familiarize themselves with it to be better at administering and guiding their departments, planning operations and rooting out potential causes of mishaps. JOs must learn it to be aware of pitfalls and be armed to combat them.

As for me, my desire to "make it happen" for the squadron and get a jet home (and secure my good deal) are easily found in the list of preconditions to unsafe acts. Another young crew, armed with a knowledge of human factors, can recognize such situations and resist the pressure to make the wrong choice.

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