

“What Do You Mean, the Engines Won’t Shut Down?”



by Lt. Bill Selk and Lt. John DiGiovacchino

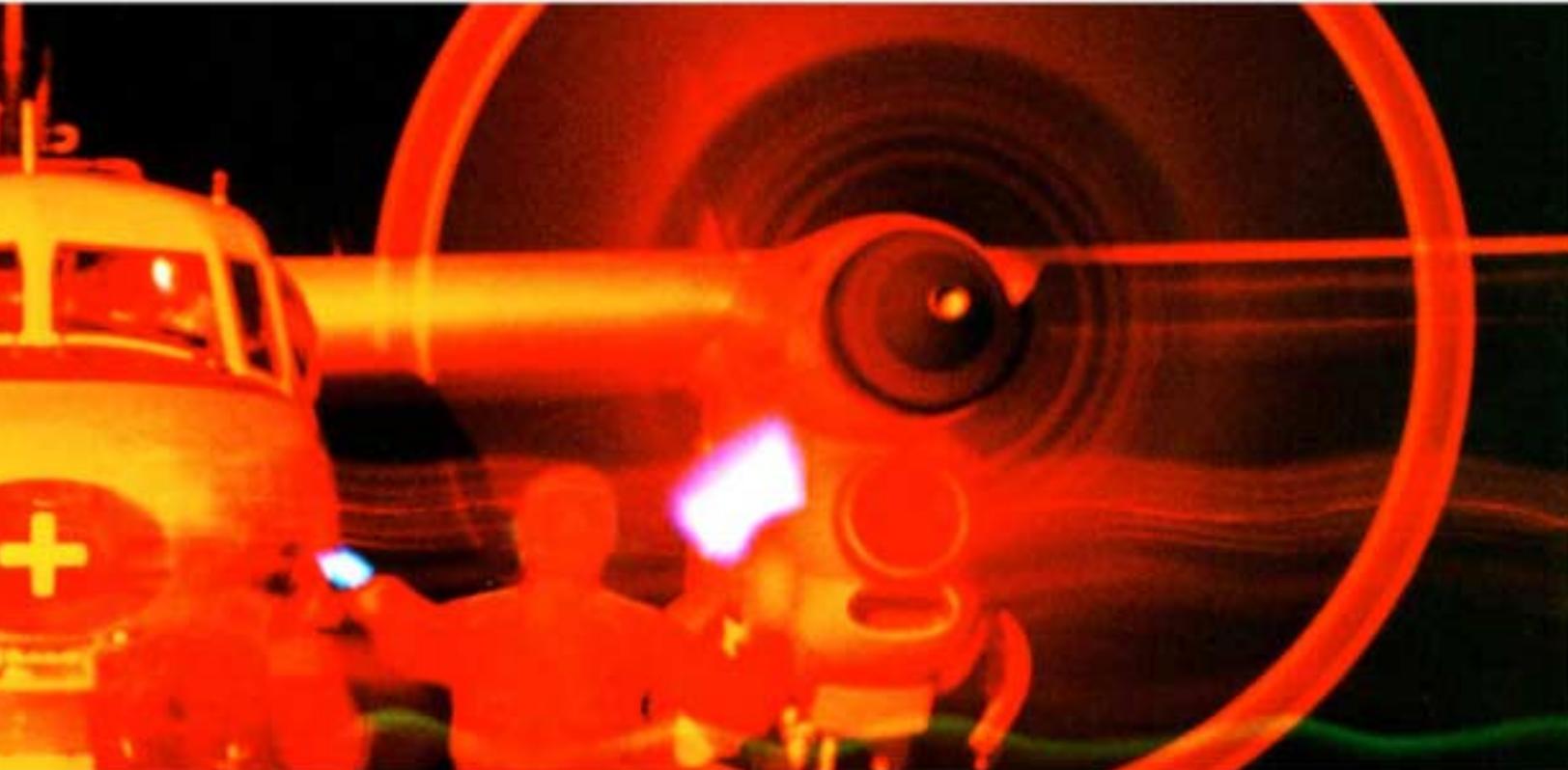
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After a successful weapons det at NAS Fallon, Black Eagle 603 was returning on an evening flight to NAS Point Mugu. Everyone had worked hard at Fallon, and everyone was eager to return home for a few weeks before RIMPAC. This aircraft had been one of our primary players at Fallon, a good plane with a great system.

The flight home was uneventful, and 603 was the last plane to return, arriving an hour or so after dark. The NAS Point Mugu air show was being held that weekend, so after an uneventful approach and landing, we taxied off the runway and headed for the Air National Guard side of base, where our aircraft would be parked for the weekend. The

crew completed the shutdown checklist and put the engines into low-speed ground idle (E-2C+ engines must run for two minutes at that speed to prevent problems with the fuel nozzles and consequent turbine damage). After those two minutes, you move the condition levers to a ground stop position, which, via a weight-on-wheels switch, shuts the fuel-control-shutoff valve electrically,

There is no emergency procedure for a failed air-ground safety switch. NATOPS says moving the condition lever toward the feather position mechanically and electrically closes the engine fuel-control-shutoff valve and feathers the prop once the feather position is reached. We didn't want to feather the prop if we didn't have to, assuming it would stress the engine and



cutting fuel flow to the engine without feathering the propellers.

That's what is supposed to happen, anyway. In our case, the pilot and the copilot were staring at each other, each with a hand on a condition lever in the ground stop position, and both engines still humming away. After a couple of blank stares, a few exchanges between the front and back end ("Did you cut the engines?"), and cycling the condition levers between run and ground stop, we quickly surmised that we had a bad air-ground safety switch. "Not a big deal," I thought from the RO's seat. "They'll just pull the T-handles, and we'll be good to go." We were home and wanted out of the aircraft.

gearbox. We decided to "fuel chop" the engine by moving the condition lever to the point where the fuel shutoff valve closed, yet didn't fully feather the prop; in other words, an improvised ground stop.

This is where it gets even trickier. We couldn't do this to both engines because a mechanical interlock prevents moving both condition levers to feather. The other option was to use the T-handles that secured the fuel-supply and control-shutoff valves, as well as the hydraulic gate valve. However, our hydraulic emergency generator would immediately cease to provide power once the T-handles were pulled. We'd lose our ICS and have no way of

talking between the front and back end if anything happened during shutdown. The aircraft's fire-extinguishing system also would not be available after we lost electrical power.

We discussed our options and decided to fuel chop the left engine, letting it wind down (and more importantly, keeping the emergency generator online), and then use the T-handle on the right. Unbeknownst to us, when we fuel chopped the left engine, the fuel-control-shutoff valve on the left engine never fully closed, thereby letting a slow trickle of fuel pour into the hot turbine.

The plane captain gave the pilots the lazy-eight signal almost immediately after shutting down the right engine. There was no way for the pilots to tell the NFOs, still in the back of the aircraft, what was going on, because of the loss of emergency-generator electrical power and ICS. The NFOs began a normal exit of the aircraft; the ACO moved into the aft equipment compartment to begin untying the crew's luggage. I went forward to the main-entrance hatch, which was opened by the ground crew almost as soon as I reached it. It was unusual, but I didn't think anything of it. I figured the ground crew probably was anxious to go home as well. As I exited the aircraft, I noticed a PC manning the fire bottle by the tailpipe of the

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left engine. He already had extinguished a small fire with a quick douse from the Halon bottle. Now there was a small flash, which he quickly put out. I figured a little residual fuel had flashed, and it wasn't a big deal. I'd seen tailpipe fires before, and it looked like everything was under control. What I didn't know was that a steady stream of fuel still was leaking into the hot turbine.

The tailpipe fire flashed again as the CICO exited the aircraft. He was followed quickly by the pilot and the copilot. The fire was put out

again but continued to re-flash. At this point, I realized the severity of the situation. The ground crew went to get another fire bottle, so the copilot and I stood clear of the aircraft, while the CICO manned the fire bottle. The plane commander went back into the aircraft and cycled the fluid-cutoff handles and moved the left condition lever to full feather. His actions caused the mechanical link finally to close the fuel-control-shutoff valve, stopping the flow of fuel. The CICO banged on the side of the aircraft, trying to get the attention of the ACO, who was still in the aft equipment compartment. The crash crew arrived a few minutes later. They manned the re-flash watch, and everything was once again under control.

We learned some big lessons. Lacking a NATOPS emergency procedure, we had to rely on our systems knowledge to remedy the situation—one more reason to stay in the books. We chose not to feather the left engine because we didn't want to put unnecessary stress on the engine and gearbox. In retrospect, we shouldn't have worried about that (the stress is minimal at best). We should have put the condition lever all the way to feather.

We spend a lot of time briefing crew coordination for emergencies and missions. Most of the

time, we assume that ICS will be available, or that the other crew members will be expecting and looking for our

non-verbal signals. In a case like this, there were no prebriefed signals, and no one was expecting or looking for them. The ACO didn't know about the fire until the crash crew arrived, which could have been disastrous in other circumstances. Something as simple as a lazy figure eight from the ground crew when I exited the plane, or from the pilots as they headed aft to the main-entrance hatch, could have alerted the entire crew as to what was going on. 

Lt. Selk and Lt. DiGiovacchino fly with VAW-113.