

# Smoke in t

By Lt. John Gagliano

**W**e were preparing for a detachment to NAS Fallon, to continue our work-up cycle. One of our planes, Screwtop 600, had been loaned to a sister squadron for two months because they were short a bird. However, the plane was on a 72-hour recall for possible redeployment with USS *George Washington* (CVN 73) battle group. When Screwtop 600 was returned to us, it required a functional-check flight (FCF) “alpha” profile.

I recently had received my Hawkeye aircraft-commander qualification and was working on my FCF-pilot syllabus. The four crew members for 600’s check flight were experienced O-3s, and I would sit in the left seat. All four of us had made the last cruise, where 600 had been a workhorse, but it also had required a bit more TLC than our other three aircraft.

We read the aircraft-discrepancy book, which was at least as thick as Heidi Fleiss’ black book—though not nearly as tantalizing—and walked for what would be our first man-up of the day. We started engines, and, as the pilots were completing FCF-checklist items, the NFOs suspected a bleed-air leak in the combat-information-center (CIC) compartment. The smell of 14th-stage bleed air hung in the tube, along with a smoky haze, which we also smelled in the cockpit. We secured the bleed-air switches, and the leak stopped. Troubleshooters came in to fix the problem, and we shut down without ever leaving the chocks.

On the second man-up, about two hours later, we were told the computer-environmental sensor had been replaced. The gripe was signed off, and we went flying.

After takeoff, we completed the climb checks and were passing 4,000 feet off Chambers Field (home plate) when we got master-caution and oxygen lights. The O<sub>2</sub>-quantity indicator read zero liters of LOX. We went through the non-memory items in the PCL, of which the final step is, “Land as soon as practical.”

We discussed this scenario as a crew. The individual O<sub>2</sub> regulators displayed good pressure and produced good flow.



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Photo by 1ST Combat Camera Squadron (D). Modified.

We also considered it practical to complete the FCF before departing for the Fallon work-ups. At the identify-hazards step in the ORM process, we recognized that if the oxygen was malfunctioning (though we didn't think it was), we could have a problem in the event of a fire, a decompression at altitude, or a recurrence of the cabin-temperature-controller problem we had faced on deck only hours earlier. Our FCF profile, the VFR conditions, and our close proximity to home were key factors in our final decision. We had made risk decisions, implemented controls and decided to press with the FCF.

An FCF "alpha" consists of pressing every button in the aircraft, making sure every system and sub-system is checked. It is a time-consuming process, especially for the NFOs in a bird as finicky as Screwtop 600.

The cockpit checks nearly were completed; we were waiting for the NFOs to finish the FCF checklist so we could RTB. We descended to 9,000 feet to check the cabin-pressure dump. As we were reviewing the cabin-dump-FCF procedures in the cockpit, the CIC crew checked the heating-air-conditioning system. About a minute later, we heard, "Flight, CICO. We have runaway heat back here."

We turned toward home, and, because we were below 10,000 feet, we decided to dump cabin pressure, which would help with the back-end environmental issue and also complete the cockpit checks.

A minute later, I heard, "Flight, CICO. We have smoke in the tube."

Our preconditioned response to that statement is to complete the "smoke-fumes of unknown origin" emer-

gency procedure. This emergency is arguably the worst to have in a Hawkeye because of the large amounts of combustible electronics and the lack of ejection seats. We rushed for our O2 masks and checked in on the O2-mask ICS, which completed the first checklist memory item.

I heard the copilot (he signed for the plane as the qualified FCF pilot) declare an emergency with ATC. I lowered the nose and accelerated toward home plate, which I saw about 25 miles away. The second memory item in the EP states, "Isolate affected equipment by pulling circuit breakers and turning switches OFF." We turned off the air conditioning because we thought it might have been the source of the problem. The next step states, "If source cannot be immediately identified, generator switches OFF." We briefly discussed this step but didn't secure the generators because the smoke was not electrical in origin. The memory items continue, "Personnel air conditioning OFF" (completed), and "Cabin pressure—DUMP" (done before we started the EP).

As we executed the EP, a number of things happened simultaneously. The copilot talked to approach, while I flew and listened to him talk on the radios. The back-end crew continued to troubleshoot the smoke source (to see if the smoke actually had stopped when the AC was secured), while reviewing nonmemory items in the PCL and talking to Screwtop base. We were communicating well with each other, and our situational awareness was high.

We were set up for a direct entry to downwind, runway 28, and I pulled power to idle at midfield to slow for the landing. As I put down the gear, the back-end reported, "The smoke's clearing back here; we're



Photo by Michael Grove

OK.” We reviewed the landing checklist three times and rolled out without incident.

The crew debrief brought out some interesting points. We performed the EP exactly as we had briefed it, with the pilot executing memory items, backed up by the CP, and the CIC crew reviewing nonmemory items, notes, warnings, and cautions. As an experienced crew, we had good individual and crew SA. Also, the smoke was not severe, nor were there any indications of a fire; however, declaring the emergency and getting on deck ASAP was the correct action.

Finally, we discussed the oxygen-system situation. What if the indication of zero liters of LOX had been correct? What if we had put on our masks and gotten a mouthful of rubber instead of O<sub>2</sub>? Fortunately, we had applied ORM to the situation and managed the risk, though we certainly did not minimize it.

## The E-2 has a history of mishaps resulting from smoke in the aircraft.

As a crew, we did not take the most conservative approach regarding the O<sub>2</sub> light. In hindsight, considering this flight was an FCF “alpha,” the conservative approach would have been to land at Norfolk when the oxygen light illuminated. The E-2 has a history of mishaps resulting from smoke in the aircraft. Not having oxygen available creates a high level of risk.

When smoke did enter our aircraft, crew coordination and individual capabilities mitigated the severity of the emergency.

This flight reinforces why we conduct FCFs in the local area, in VMC, and close to a suitable field with arresting gear. The checklist is done under these conditions to manage the risk associated with an FCF profile. We complete system checks under these conditions so another crew doesn’t get the same emergency while on a mission, potentially hundreds of miles from a landing area.

ORM and FCF procedures are meant to manage risks, not eliminate them. By following procedures and applying ORM, we can operate with acceptable levels of risk, given our mission. 

Lt. Gagliano flies with VAW-123.

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