

Crew Resource Management

Situational Awareness

Assertiveness

Decision Making

Communication

Leadership

Adaptability/Flexibility

Mission Analysis



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Was That Oil or Electrical Fumes?

By Lt. Molly Boron

Newly qualified as a PPC, I took my crew to the AUTEK range near Nassau for a TorpEx event. We headed down the Florida coast and eastward to the range.

As we descended to on-station, our No. 2 engine-driven compressor (EDC) dropped to less than five inches differential—without giving us a press-low annunciator light. A complete loss of differential could have indicated a sheared quill shaft, but the compressor still provided air for our AC-pressurization system.

The EDC problem wasn't a huge issue at the time, and we pressed on, focused on our mission. After a successful TorpEx, we departed the range. The flight engineers (FE) and I monitored the cabin pressure as we climbed toward FL200. In the P-3, cabin pressure is set with a formula, and, normally, the pressurization rate is an automatic function. As fate would have it, our No. 3 EDC proved also to be weak. Unable to hold cabin altitude—which initially rose to 6,700 feet, then fluctuated between 4,300 and 5,700 feet—we requested a descent. We tried manually to control our pressurization, but we couldn't.

Nearing Vero Beach, Fla., my 2P asked if anyone smelled something like burning oil; no one on the crew did. My TACCO and I decided to go ahead and run the fire-of-unknown-origin (FOUO) checklist anyway. The crew jumped into action and carried out their assigned duties of opening equipment-bay doors and pulling away soft panels, searching for a source of smoke and/or fumes. It wasn't long before they confirmed both smoke and fumes, with an apparently electrical source.

The flight engineer left the flight station to check the malfunctioning outflow valve in the back of the aircraft, and the off-duty FE took his place. Upon returning, the senior FE said the outflow valve was hot, and the No. 3 engine nacelle was covered in oil. Could we have smoke and fumes coming from two different sources?

Normal procedure for a P-3 aircrew, when looking for the source of



Little did I realize at the time, but our pressurization-problem troubleshooting actually had helped us: We were in a position to depressurize immediately and to make an expeditious approach. After three hours of troubleshooting on deck, we discovered the HF No. 1 radio-coupler fan was the source of our FOUO. It hadn't malfunctioned in flight, but the fan was hot enough to scorch a flight glove. We did have an oil leak on the No. 3 engine, but it was small enough not to register a loss in quantity. It turned out the oil leak, outflow valve, and EDC problems all were unrelated to the smoke and fumes.

This time was the first I had come across such a compound malfunction, and it certainly challenged our crew. This scenario reinforced several important lessons. It's better to be on deck wishing you were flying, than flying and wishing you were on deck. Also, the importance of CRM can't be stressed enough. There certainly were barriers to our communication and understanding: Conflicting information as to an oil versus electrical FOUO, misunderstanding the TACCO's statement about how he felt, trying to communicate while wearing smoke masks, and limiting initial mental troubleshooting to the EDCs, outflow valve, and No. 3 engine.

I defer to the very first thing I learned in flight school: Aviate, navigate and communicate. Knowing our divert fields through every phase of our flight, getting out all our checklists, and telling ATC of our intentions, kept us safe and quickly got us on deck. Overall, I was pleased with the way our crew performed, and every one of us learned valuable lessons on the complexity and dynamics of multi-crew aircraft malfunctions. 🏆

Lt. Boron flies with VP-45.

smoke and/or fumes, is to make two complete sweeps of their area before the flight-station crew secures electrical buses. I already had directed flight-station personnel to don their smoke masks, and the TACCO made sure the rest of the crew also had on their masks. The source was estimated to be somewhere between the flight station and the radar-operator station, and we secured our main AC bus A. The TACCO did a great job of informing me of the crew's progress and status. Unfortunately, the crew still could not pinpoint the source.

The TACCO asked for the smoke-and-fume elimination checklist to reduce the build up of smoke throughout the tube. While running the checklist, I tried to identify what could be on fire. The TACCO then told me he didn't feel good about the situation, which I misinterpreted as his feeling sick.

With ram air clearing the smoke and fumes, I declared an emergency with Daytona approach. We received vectors to Patrick AFB, which was 10 miles behind us, and prepared the cabin for landing. We landed with our smoke masks on. Once clear of the runway, we executed our procedures for ground evacuation.

