Crew Resource Management

Situational Awareness
Assertiveness
Decision Making
Communication
Leadership
Adaptability/Flexibility
Mission Analysis

The Good, The Bad, The Ugly

By Lt. Josh Filbey

On every NATOPS check, one of the mandatory discussion items is crew-resource management (CRM). For any airborne situation, good CRM can prevent problems and help you deal with emergencies better and more efficiently. Many assume its principles are designed for multicrew aircraft; however, crew-resource management is readily applied to single-piloted aircraft. Whether it is between two airborne pilots, or a pilot and a squadron rep, good communication is essential for dealing with any emergencies. The pilot in command must realize he alone may have the best situational awareness and not to allow CRM to put him in a box.

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I recently was involved in a situation where good, bad, and too much ugly CRM played a role in the outcome.

The Good

I launched on a night mission in support of Operation Iraqi Freedom while deployed aboard USS *Theodore Roosevelt* (CVN-71) in the Gulf. Passing through 10,000 feet in my fully combat-loaded Hornet, my night took a turn for the worse.

I was greeted with, "Bleed air left, bleed air right," and two, big red warning lights.

I executed my boldface procedures and contacted the squadron rep on board the carrier; my good-deal mission was over. After communicating my situation, the rep calmly talked me through all the remaining non-boldface steps associated with the emergency. Then we discussed my options. Without bleed air, I was left without normal oxygen, no ECS pressurization or cooling, no throttle boost, and 3,400 pounds of trapped fuel in my external fuel tanks. I would have to head to our primary divert field or jettison the external fuel tanks for a CV recovery.

The decision was made on the ship to keep the external tanks and head to our primary divert field 150 miles away. The rep brought up one piece of important information to consider that had slipped my mind: usable fuel versus actual fuel. My instruments indicated 12,500 pounds total fuel, but I only had 9,100 pounds of usable gas. This first exchange of the evening with the rep was an example of how CRM was designed to work.

The divert was uneventful until I arrived at the five-mile final and tried to configure my aircraft for landing. When I lowered my landing gear, only two gear indicated down and locked. My left main-landing gear indicated unsafe. I was now alone; over an unfamiliar, foreign divert field; out of radio range with any friendly aircraft; and already in a land-as-soon-as-practical aircraft.

Tower cleared me to orbit overhead, so I could troubleshoot the landing gear. As I climbed to 3,000 feet, I got out my PCL for the second time that evening and, in a moment of clarity, asked tower to rig the arresting gear at the approach end. I followed the extensive "Landing Gear Unsafe/Fails to Extend" procedures in the Hornet PCL (pages E25-E33). I arrived at the point where I needed to jettison ordnance and hoped for the best on a min-rate-descent arrested landing. With no one around to discuss options or to get a visual inspection, I asked approach for a vector over water to adjust weight for landing.

The Bad

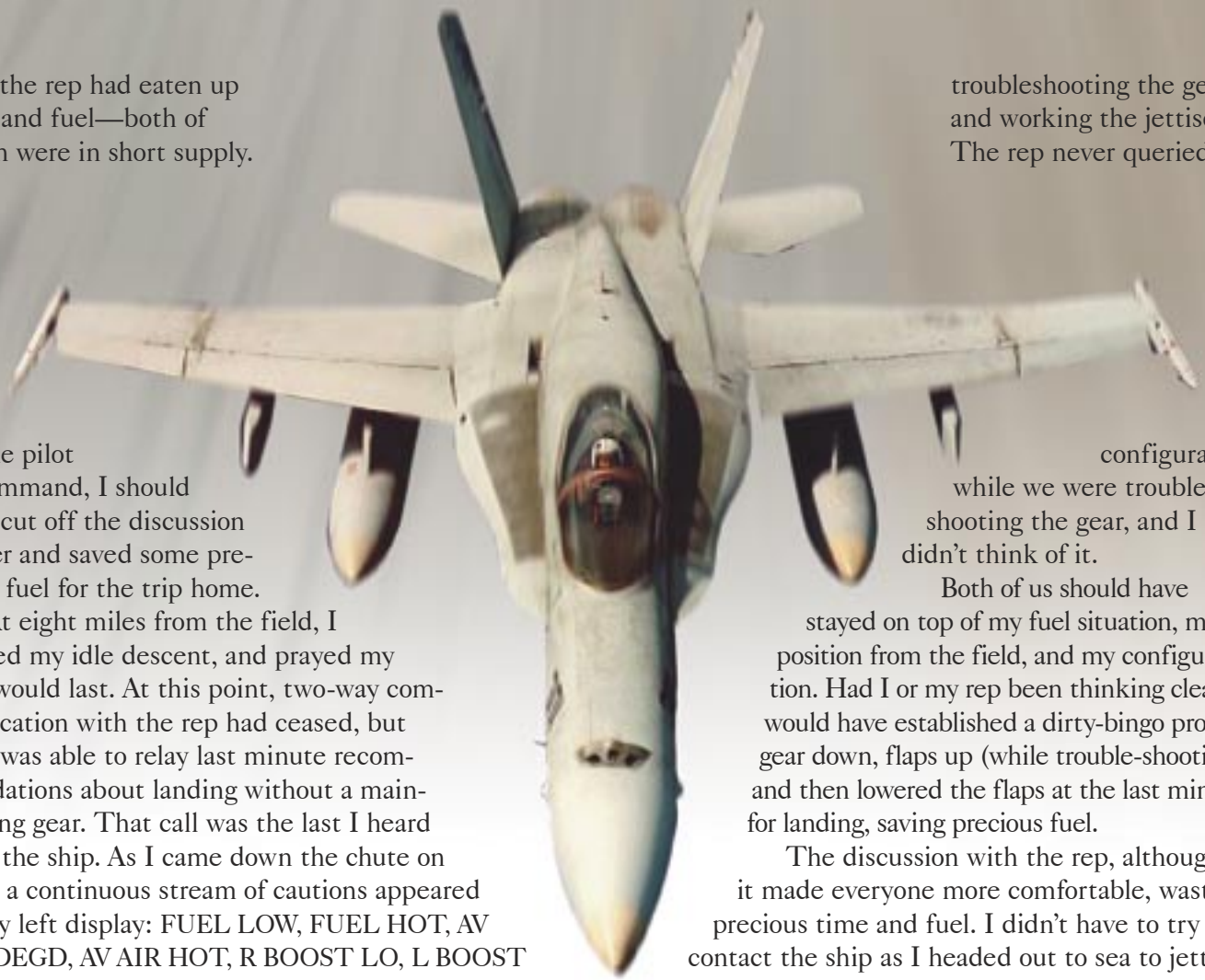
Although I was headed out to sea to jettison my stores, I felt uneasy about doing so without any guidance from outside my cockpit. On the way to the beach, I searched up and down the air-wing comm card, looking for any aircraft that could help—no luck. The only frequency I could reach anyone on was strike. I asked strike to get a squadron rep (again) ASAP to the radio. The initial two frequencies the rep came up with were unusable. The Bear Aces of VAW-124 came to the rescue; their airborne E-2 had followed me through my misery and, on their own initiative, provided a radio relay.

I just was reaching the beach line as workable communications were established, and I reported a usable fuel state of 2,900 pounds. Mistakenly, my rep and I immediately focused on the gear problem, neglecting the big picture: my configuration, fuel state, fuel burn to get back to the field, and several other issues. The rep, having just learned of my landing-gear dilemma, was hesitant to jump right into the jettison procedures without exhausting all possible troubleshooting options.

After my rep and I calmly went through all the procedures for unsafe-gear indications, he again talked me through jettisoning my external stores. I followed the steps, cleared the sea-space beneath me, and pushed the select-jettison button—nothing happened. There had been a recent hazrep about select jettison not working with the gear down, but neither my rep nor I recalled it until after our attempt failed. The rep calmly then asked me to again clear below and initiate emergency jettison. I distinctly remember hearing the "fuel low" caution as I pushed the emergency-jettison button. I felt the jet shudder as it now was free of more than 5,300 pounds of stores.

The Ugly

Following the jettison, I immediately turned back toward our divert field. As I crossed the beach line, my airplane-generated, fuel-on-deck estimation shrank from 500 pounds to 200 pounds and then to XXXX—the computers' nice way of showing the unthinkable zero. I then realized that all the extra troubleshooting



with the rep had eaten up time and fuel—both of which were in short supply.

As the pilot in command, I should have cut off the discussion earlier and saved some precious fuel for the trip home.

At eight miles from the field, I started my idle descent, and prayed my fuel would last. At this point, two-way communication with the rep had ceased, but Bear was able to relay last minute recommendations about landing without a main-landing gear. That call was the last I heard from the ship. As I came down the chute on final, a continuous stream of cautions appeared on my left display: FUEL LOW, FUEL HOT, AV AIR DEGD, AV AIR HOT, R BOOST LO, L BOOST LO—all indicating an impending flameout.

I tried my best to execute a min-sink-rate landing on the right side of the runway with my two good landing gear. I held the left wing off the ground as long as possible. Touching down about 500 feet before the arresting gear, my fortunes finally changed: My left main was down and locked. As my jet slowed to a stop in the arresting gear, I looked down at my fuel indicator and saw the fuel remaining—200 pounds. The jet was safely on deck, and I was alive.

Although the event had a good ending, I most likely was within 30 seconds of ejecting and losing the aircraft. What happened, or did not happen, to lead me to a low-fuel state? Multiple factors played a role—some preventable and some unavoidable. In dealing with the dual-bleed warning, good CRM (situational awareness, communication, decision-making) helped us to successfully work through the emergency and get the jet headed in the right direction. However, once I had the second emergency, our CRM started to break down. I failed to raise the flaps while troubleshooting the gear and working the jettison. The rep never queried my configuration while we were troubleshooting the gear, and I didn't think of it.

Both of us should have stayed on top of my fuel situation, my position from the field, and my configuration. Had I or my rep been thinking clearly, I would have established a dirty-bingo profile: gear down, flaps up (while trouble-shooting), and then lowered the flaps at the last minute for landing, saving precious fuel.

The discussion with the rep, although it made everyone more comfortable, wasted precious time and fuel. I didn't have to try and contact the ship as I headed out to sea to jettison. I was nervous about pressing that button, in my configuration, over foreign waters, without permission from higher authority. My desire to get permission and the reps desire to exhaust all possible solutions drove me to a lower fuel state than I should have had that far away from the field.

CRM is a great tool for dealing with extremis situations. I saw many goods that night, such as my first discussion with the rep, the E-2 providing a radio relay, and the calm voice over the radio when I was getting frantic. But, at some point, you have to just rely on your personal knowledge of aircraft systems and procedures and do what is required.

Maintain the big picture and avoid working procedures that detract from awareness of basics, such as fuel state and fuel required. Although it is nice to have someone else confirm what you are doing, or to give you permission, you must be ready to cut off discussions and execute, even if it involves doing something—in my case, jettisoning stores—that you're not comfortable with.

Lt. Filbey flies with VFA-87.