ORM Corner

COMBAT ORM

By LCdr. Jim Hawkins

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The sea state and swells had been large and unpredictable the previous few days in the North Arabian Sea. The ship's navigator continued to search for calmer seas, but, with up to 20 feet of vertical-deck movement and an impressive Dutch roll, the recoveries continued to be challenging during the day and extremely colorful at night.

I was scheduled as the air-control officer for a 4.8-hour day mission in support of Operation Enduring Freedom (OEF). This flight was a nice change of pace for me because I was scheduled as a crew member, instead of the mission commander.

The skipper was the pilot and aircraft commander. He decided a departure from our standard, single-engine-emergency plan was warranted because of the 10 to 12 feet of deck movement and the hot, humid weather. For the three months we had been on station, we always planned to bring back a single-engine E-2C to the carrier; we already had done it numerous times.

Today was different. With the unpredictable seas, pitching deck, and limited single-engine climb, we briefed to divert a single-engine aircraft if it occurred before feet wet on our return to the carrier. Once we were feet wet on our return, and, because of our finite amount of fuel and no airborne-refuel capability, our options were to trap on the carrier or bail out.

We noticed an odd odor immediately after launch. The smell, similar to a burnt marshmallow, was not overpowering but definitely was noticeable throughout the aircraft. As we continued the climb, we checked all indications and quickly, yet thoroughly, checked the crew cabin for any source of smoke—nothing abnormal was found. We decided to don oxygen masks, leaving selected members connected to only one fitting to act as the smell checker. Meanwhile we tried to locate the source.

We narrowed our search to the air-conditioning system, specifically, the left bleed air feeding the system. When we had secured the left bleed-air switch, the odor dissipated. Confident

we had isolated the problem, we kept the switch secured.

Approximately two minutes later, we got to the caution in the "Smoke or Fume From Air Conditioning System" procedure that states odors from the air conditioning can indicate a propeller or engine problem. Coincidently, the master-caution and port main-prop-pump lights suddenly illuminated. The largest concern with these indications is the possibility of degrading to a pitchlocked propeller. Because the E-2C uses variable-pitch propellers, with constant-engine rpm, a pitchlock limits power adjustments to rpm changes only, which is not how the system was designed.

The skipper advanced the power lever to max power, in accordance with NATOPS. The port engine rpm was steady at 105 percent. The port main-prop-pump light remained illuminated, and then, suddenly, the port engine produced a massive surge of power. The increase in rpm, followed by a surge, is the final sign of an inevitable pitchlock. The skipper feathered the prop and shut down the engine. After shutdown and confirmation, the propeller feathered with no pitchlock, and the pilots completed the emergency procedures.

Once established in a stable, single-engine profile, we tried to contact CAG, but he was flying. We eventually spoke with the captain and the battle-group commander, and both initially approved the briefed divert plan. We had plenty of gas and started to the divert on a heading of 120 degrees.

We had been established on the 120-degree heading for a few minutes when the radar officer, a first cruise JO and the crew's junior member, pointed out, "We're going the wrong way."

The mission commander and I stopped what we were doing and looked at him as if he was wearing his helmet backward.

He said, "We are going the wrong way. The divert is 240, we are heading 120."

We all double-checked our scopes and navigation and found he was correct; we were going the wrong way. The mission commander told the pilots, then gave an updated position and divert heading. We had an incorrect point on our standard TACADMIN card; the divert field—which no one in the squadron had been to—was entered incorrectly. We had been heading to the correct waypoint, but it was at the wrong location.

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As we turned to the correct heading, we heard CAG's familiar voice on the radio asking for the details of our problem. CAG still was airborne but had returned overhead when he heard about our situation. The skipper described the issue and told him of our divert plan. CAG listened, asked a few questions, and, after some thought, asked us to consider a single pass at the ship. He wanted us to evaluate the current state of the pitching deck and, if able, to land on the carrier.

We all paused for a moment and thought about the request. The skipper, knowing we all had a vested interest in the outcome, asked for our "no kidding" thoughts on a single attempt at the ship. We began to discuss and to evaluate the main issues:

• Crew: experienced. The pilot at the controls is the most experienced pilot in the squadron.

• Fuel: enough. We have enough fuel to make a single pass and still make it to the divert.

• Pitching deck: unpredictable, but it has been stable for long periods.

• Single-engine approach: current. The skipper had a single engine at the ship earlier in the deployment. He was, for lack of a better term, current.

• Benefit versus risk: assessed. Even though we had briefed a divert plan for this situation, our direct chain of command was willing to accept a greater risk than we had calculated initially. We were in combat operations, and a higher level of risk was appropriate and acceptable. The maintenance support to change the propeller and maintain a full complement of E-2s to support OEF was an important benefit.

After discussing and analyzing the risks, we agreed a single pass was reasonable, as long as we all were clear on the controls and limits we set for ourselves, and we did not exceed them. Here are the controls and limits we included:

• Be max trap at the ramp; nothing less is acceptable.

• Coordinate with the LSOs early and throughout the entire approach for deck movement. If we got to three-quarters of a mile and the deck movement still was unpredictable, wave off and head to the divert.

• Fly a "touch" fast for the approach to keep extra energy on the aircraft for single-engine climb. Do not get slow.

• Brief the CAG, the captain, and the LSOs on our plan, including the limits and controls in place.

When the landing area was ready, we pushed out of 10,000 feet for a straight-in. We checked off our "go" criteria until the critical LSO deck update on the ball. The LSOs held the deck predictable and steady, so we continued. The pass from inside and outside the aircraft looked good. The skipper flew the ball to the deck and the trap; it was a challenging pass.

In the crew debrief, we reviewed ORM. We answered various risk-related questions that focused on the decisions we had made:

Why did we change what was briefed? We considered changing what was briefed because we had been given more guidance on what an acceptable level of risk was for our situation.

Did CAG convince us to make a bad decision? No. We evaluated the risks and never relinquished the opportunity to go to the divert. We were clear if the single pass did not look good, we were diverting.

Did we take an unreasonable risk? No. The chain of command trusted the skill of the pilots and the judgment of the entire crew. We agreed to a greater but calculated and acceptable level of risk. We evaluated our limits and set greater controls. We were not going to get painted into a corner with nowhere to go.

Did the end justify the means? We accepted a challenging situation, but we also knew how we were handling it. We initially briefed a conservative plan. Once airborne, we received more information and reevaluated the situation, hazards, and risks. Then we set controls and briefed contingencies. We made the right decision, the right way.

Did we exercise ORM? Yes. Evaluating risk in combat operations is no different than in peacetime, but the level of acceptable risk may be different. If we had not been in a combat situation, or if we had had a less experienced pilot, poor visibility, darkness, or any other mitigating factors, I know we would have diverted. We all should remember that the O in ORM is for operational, and the M is for management.

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