

Stress (Trouble)Shoot:

A Competitive Approach to Training Emergency Procedures

By LTC Lukas B. Berg, CW5 Michael J. Muehlendorf, and SSG Patrick M. Schustereit

Sweat stung his eyes as he kneeled over the limp body of his crew chief, fastening the retention straps on the Sked. His co-pilot, equally exhausted, lay nearby, gathering himself both for the impending drag and the mile-long run that would immediately follow. Some 10 minutes later, both pilots stumble up to their aircraft and begin to don their gear, struggling to bring labored breaths and elevated heart rates under control. By the time they climb into the cockpit, darkness has fallen and ceilings have dropped to 200 feet. A 30-second mission brief later, they are off into the clouds. First, an engine caution, and then, flight instruments start malfunctioning. Soon after, hydraulics and stability augmentation systems are failing. And just when things couldn't get any worse, a large cartoonish crack flashes across a red screen. They've crashed.

Introduction:

On 31 January 2024, the 2D Battalion, 3D Aviation Regiment, General Support Aviation Battalion (GSAB), hosted its inaugural Stress (Trouble)Shoot Competition, evaluating 12 crews on their ability to respond to Emergency Procedures (EPs) immediately after completing a grueling series of physical events.

The competition responded to the 3D Infantry Division Commanding General's guidance to integrate stress shoots into annual training, but it also reflected a battalion and company-level consensus that competition can and should be leveraged to inspire "brilliance in the basics." Ultimately, it allowed us to identify and celebrate excellence under duress, and it yielded important insights into trends related to both technical proficiency and crew coordination (Figure 1).

Event Description:

Twelve crews—each consisting of a pilot-in-command (PIC) nominated by the company and a pilot (PI) recruited by the PIC—participated in the competition. Crews reported at set times and immediately began the physical competition, consisting of timed completion for the following Army Combat Fitness Test-inspired events:

- 2000 pound Cumulative Deadlift (Repetitions x Weight)
- 70 Hand-Release Push-Ups
- 25 meter (m) Skedco Buddy Drag
- 1:35 Plank (Each)
- 1-Mile Run and 1600 m Row (Each event completed by one team member)



Battalion leaders supervise execution of the physical competition. Photo provided by the authors.

gencies (Figure 2), for which crews were graded on both accuracy and timeliness. Of note, the session took place in instrument meteorological conditions in order to prevent crews from simply landing as soon as possible in response to an EP.

Literature Review:

We were unable to locate a record of any comparable competition—either civilian or military—that assessed EP proficiency under conditions of physical duress. That said, there are many broader studies of stress in aviation, including numerous case studies that examine its impact on cockpit resource management (crew coordination). One article "investigated whether stress training introduced during the acquisition of simulator-based flight skills enhances pilot performance during subsequent stressful flight operations in an actual aircraft" (McClernon et al., 2011, p. 207).

Grading Methodology:

In 2019, the United States Army Aviation Center of Excellence fielded the new Emergency Response Method, which sought to change the culture and philosophy of EP training (Francis, 2020, p. 1). The emphasis was no longer on rote memorization and rapid response. Instead, emergency responses were to be deliberate and methodical, utilizing a checklist for all but the most urgent EPs. The twin imperatives of accuracy and timeliness presented a challenge in terms of grading methodology. We navigated

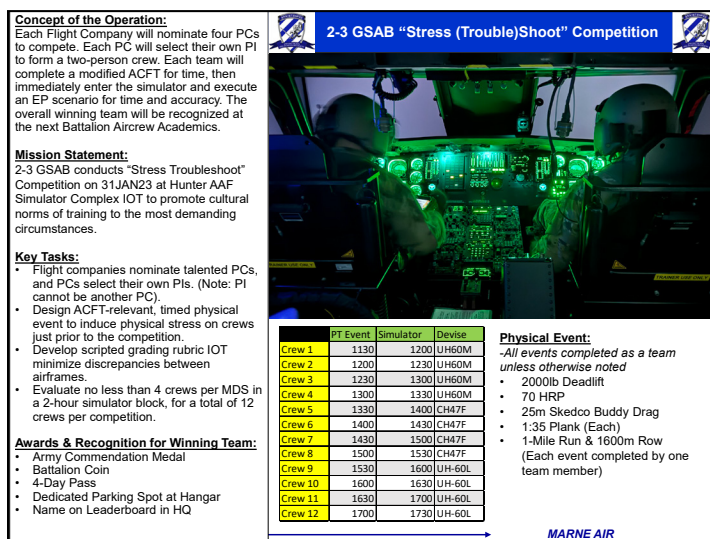
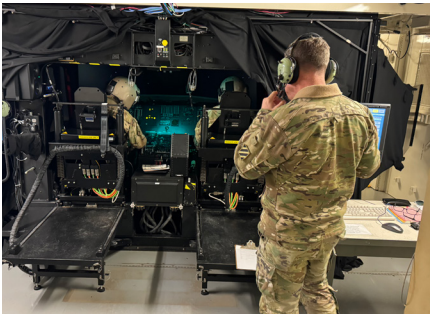


Figure 1. The 2-3 Aviation Regiment competition overview (2-3 Aviation Regiment, 2024).

Upon completion, crews jogged to the nearby simulator, where they donned their pre-staged flight gear, received a short in-brief from an evaluator, and took seats. Over the course of 20 minutes, they were then challenged with the following emer-

it by selecting time as the overall grading metric, adjusted with penalties and bonuses for incorrect and commendable actions, respectively. Time started when a crewmember began to look up an EP in the flight reference cards (FRCs), and it stopped when they found the correct page. Penalties and bonuses were also assessed in terms of time, either added to or subtracted from the crew's total event time.

The physical event was also graded for time, with one caveat. We wanted the event to conclude with a 1-mile run but recognized that some crewmembers had running profiles. We consequently



The Battalion Standardization Pilot (SP) monitors a crew from Company Alpha as they prepare for take-off. Photo provided by the authors.

integrated a rowing event, which was executed by one crewmember while the other ran. In order to synchronize finish times, the rower was required to stay on his machine until the runner crossed the finish line. The difference between the distance rowed and 1600 m was converted to time and added to or subtracted from the total time.

Another challenge was weighting the events. The physical events set the conditions for a challenging EP assessment, but they were not the focal point for the competition. We consequently weighted the physical score at only 10 percent of the overall competition, but we chose not to disclose this weighting in order to prevent crews from low-balling that portion. Our instructions to them were simply, "Do your best as quickly as you can."

Grader Observations:

What struck us most at the conclusion of the competition was that we had unintentionally gathered a lot of valuable

UH-60L	CH-47F	HH-60M
CHIP R INPUT MDL	ENG1 CHIPS	CHIP R INPUT MDL
HYD PUMP 1 FAIL	#1 HYD FLT CONTR	HYD PUMP 1 FAIL
RSVR 2 LOW	UTIL HYD PRESS LO	RSVR 2 LOW
TAIL ROTOR QUADRANT	ENG1 FADEC	ENG 1 OIL BYPASS
FIRE (ENG 2)	AFC51 FAIL	EGI FAILURE
STAB UNCOM NOSE DOWN	FWD LCTA FAIL	STAB UNCOM NOSE DOWN

Figure 2. Emergency challenges for the Stress (Trouble)Shoot Competition participants (2-3 Aviation Regiment, 2024).

data, not just regarding the proficiency of individual crews, but also about broader trends in crew coordination and task prioritization. Our sample size was admittedly small, but we still considered the following observations informative and worth sharing with our respective communities.

First, we discovered that crews that had recently flown together tended to perform at a much higher level. Our unit had redeployed from Europe less than 2 months prior to the competition, and we found that crews that had been co-located during the rotation tended to communicate more and with greater effectiveness than those who had not. Additionally, we found that combinations of mature PICs and junior PIs were also effective, perhaps due to clear divisions of labor and responsibility. All told, these observations could support an argument for unit-level battle rostering, particularly when mission stakes are high.

Unsurprisingly, we also observed that the benefits of physical fitness extended beyond the physical competition and into the EP competition. Our most fit crews were able to catch their breaths faster after arriving at the simulator, setting the conditions for more effective communication and more deliberate EP response. At the other end of the spectrum, we terminated the assessment of one team because a crewmember



The Battalion SP monitors a Company Charlie crew as the Battalion Standardization Instructor (SI) scores their performance. Photo provided by the authors.

became lightheaded in the simulator. Graders observed that the physical portion of the competition appeared to have taken a significant toll on him.

Next, we noted that our best crews were deliberate about establishing and maintain-



A competitor from Company Bravo does hand-release push-ups during the physical competition. U.S. Army photo by SGT Caitlin Wilkins, 3D Combat Aviation Brigade Public Affairs Officer.

ing aircraft control (the first "Fly" of FADEC-F). Given an EP that produced an unusual attitude in the clouds, half of our crews made aircraft control their #1 priority, with both pilots on the controls and talking through the task of recovery. The crews that accelerated through this step or prioritized other actions ended up crashing.

Another dangerous trend we observed was related to engine fires in Black Hawks. When given a #2 Engine Fire, members of two different crews announced a fire in the #1 Engine. We attribute this potentially deadly error to the fact that the sole fire light is located on the left side of the Master Warning Panel, and crewmembers consequently associated it with the #1 Engine. Another factor that may be contributing to this pattern is that most pilots spend the majority of flight school in the right seat. Instructor Pilots typically occupy the left seat and almost always simulate engine fires on the same side (#1). It is possible that some flight school students graduate without ever having responded to a simulated #2 Engine Fire, and that they are conditioned to believe that the Master Warning Panel has two fire lights, one per engine.

While not a trend, we also noted that one particularly efficient crewmember

Statement	Agree	Ambivalent	Disagree
1. The competition motivated me to study and prepare more than normal.	9	1	6
2. I learned something valuable about myself during the competition.	7	3	6
3. I learned something valuable about my teammate during the competition.	9	1	6
4. The competition challenged me as a professional aviator.	9	1	6
5. It would be valuable to execute additional competitions with different focus areas (e.g., mission planning, etc.).	10	1	5

Figure 3. Stress (Trouble)Shoot Competition online survey results (2-3 Aviation Regiment, 2024).

kept his FRCs opened to the Caution Section. He noted that the EPs in the Warning Section are required to be memorized, and simply opening the FRC to the Cautions allowed him to reduce the time spent searching for the appropriate EP.

After-Action Review:

During our in-person after-action review (AAR), we identified the following areas for improvement:

- *Balance the needs for secrecy and rehearsal.* In an effort to protect the integrity of the competition, we did not conduct a full dress rehearsal of the EP portion with a test audience. Our script was consequently unvetted, and we discovered during the competition that we had failed to articulate and/or emphasize expectations in several circum-



The Battalion SP initiates an EP as the Battalion SI monitors a Company Alpha crew's response. Photo provided by the authors.

stances, leading to confusion and/or delay. Additionally, we were reminded during the competition that the simulator software initiates some uncommanded EPs when programmed EPs are not addressed quickly enough. For example, some UH-60L crews had to contend with an unscheduled transmis-

sion failure when they didn't respond to the CHIP R INPUT MDL quickly enough. A more thorough rehearsal might have identified this and allowed us to anticipate the implications for both time management and scoring.

- *Build in more time for simulator reset and unanticipated delays.* New crews arrived every 30 minutes, and we only built in 10 minutes for reset and delays. In practice, we were hard-pressed to stay on time, and some crews benefited from having a few extra minutes to catch their breath as we reset the cockpit.
- *Incorporate crew chiefs.* In real life, we rely on crew chiefs for countless functions, including emergency response validation. For this competition, we did not include crew chiefs, largely due to the limited number of headsets available in each simulator (four total, with two allocated for the crew and two for graders). In future iterations, we may dispense with helmets/headsets in order to facilitate the inclusion of crew chiefs.

Recognizing that some participants might not have been fully transparent during the in-person AAR, we also administered a short, anonymous online survey to gauge the effectiveness of the competition in achieving our principal objectives. Sixteen of our 24 competitors completed the survey, and we found the responses to be positive enough to warrant further development of the concept (Figure 3).

Conclusion:

In designing and executing the Stress (Trouble)Shoot Competition, we at-

tempted to change the narrative surrounding a foundational skill in Army Aviation. In our experience, few pilots choose to undertake EP training beyond command-directed semiannual simulator sessions, in large

part because it's viewed as a high-risk, low-reward endeavor (high risk of embarrassment in front of a peer or evaluator, and low prospects of reward because EPs are themselves low-probability events). By hosting a competition that promised handsome rewards for excellence and no penalties (reputational or other) for failure, we sought to reframe associated training as low risk and high reward, and most competitors seemed to adopt this perspective. Moving forward, we intend to host quarterly EP competitions and apply the same methodology to other aviation proficiencies in an effort to achieve "brilliance in the basics."

Biographies:

LTC Lukas Berg is the Commander of 2-3 Aviation Regiment. He is rated in the UH-60A/L/M and HH-60M and previously served in the 101st Airborne, 1st Cavalry, and 25th Infantry Divisions. He also taught in West Point's Department of Social Sciences and held administrative leadership positions at U.S. Special Operations Command's Joint Special Operations University.

CW5 Michael Muehlendorf is the Senior Aviation Advisor to the III Armored Corps G3. He previously served as Senior WO Advisor and Battalion SP for 2-3 Aviation Regiment, flying UH-60L/M and HH-60 Black Hawks. He also served in the 1st Cavalry Division and the 12th Aviation Battalion, as well as at the U.S. Army Aviation Center of Excellence as an SP and in D/1-160th SOAR(A) as a Fully Mission Qualified Pilot.

SSG Patrick Schustereit is the SI for 2-3 Aviation Regiment. He holds the distinction of being a qualified non-rated crewmember in both the CH-47F Chinook and HH-60M Black Hawk. His previous assignments include serving as a Flight Engineer in the 1st Armored Division, Flight Instructor in the 110th Aviation Brigade, and Platoon Sergeant in the 3D Infantry Division.

References:

- Francis, D. J. (2020, April). Introduction of the emergency response methodology. *Flightfax* (Special Edition #2). https://safety.army.mil/Portals/0/Documents/ON-DUTY/AVIATION/FLIGHTFAX/Standard/2020/FF_Special-Edition-2.pdf
- McClernon, C. K., McCauley, M. E., O'Connor, P. E., & Warm, J. S. (2011, June). Stress training improves performance during a stressful flight. *Human Factors*, 53(3), 207-218. <https://doi.org/10.1177/0018720811405317>