Air Warrior Aircrew Restraint Tether System

Earlier this year, the Product Manager Air Warrior (PdM AW) responded to two reports of the inadvertent detachment of the personal restraint tether (PRT) during MEDEVAC hoist operations. Based upon these reports and subsequent interviews conducted with unit crewmembers (more on this later), the PdM AW took action to develop and field a material solution.

Working closely with units that had reported incidents of inadvertent detachment, PdM AW verified the root cause of the safety issue (the inherent design of the PRT’s parachute harness quick ejector snap allows for dynamic rollout under certain conditions); designed an interim fix to prevent further inadvertent detachments; coordinated with the U.S. Army Combat Readiness Center and AMCOM Safety Center to issue an Aviation Safety Action Message (ASAM); purchased and shipped the interim fix hardware to deployed aviation units; worked with Idaho National Guard UH-72 aircrews to develop and test prototypes of the new tether system; completed the qualification of a redesigned tether system; awarded a contract to begin manufacture of the new system; and initiated fielding of the new aircrew restraint tether system (ARTS).

The ARTS is an Army adaptation of an existing Navy restraint system and consists of a new quick release extension tether (QRET) that attaches to the crewmember’s survival vest, and a modification to the currently fielded PRT that attaches to the aircraft anchor point. The modification to the current PRT is a straightforward replacement of the quick ejector snap with a parachute harness D-ring; but the QRET is a complete redesign of the current extension tether. Multiple evaluations took place to ensure suitability of the new design, including underwater emergency egress testing. Results from these tests, along with feedback from the aviation Soldiers that supported the tests, produced several functional improvements above and beyond the current tether system. One example is the addition of a qualified vest front connection configuration. During the development phase, Lakota crews communicated the importance of visual confirmation of their tether attachment and demonstrated to the PdM AW how they connected the legacy tether to the front of their vest during hoist missions.

As a result of their input, the new ARTS has a D-ring fully qualified for frontal connection to the Primary Survival Gear Carrier. Users from the Black Hawk and Chinook communities have also embraced this feature.

Other improvements the ARTS features over the current system include a cable system emergency quick release actuated using a pull tab (actuation handle) attached to the front of the survival vest, as well as the ability to insert a carabiner for multiple-use disconnects without actuating the
Aircrew Restraint Tether System

- QRET Activation Handle
- QRET Cable System
- QRET Connection to Modified PRT

Components:
- Primary Survival Gear Carrier
- Locking Carabiner
- Quick Release Extension Tether
- Emergency Release Assembly Hardware
- Modified Personal Restraint Tether
- Optional D-Ring
- Locking Carabiner
cable pull tab. In an emergency, the QRET provides a rapidly accessible means of emergency disconnect and egress from the aircraft as compared to the legacy tether. The actuation handle of the QRET was designed to be placed on the front right shoulder, similar to the LPU-40/P, to give familiarity in use and location. The QRET can also be used multiple times in contrast to the crew-specific part (CSP), which could only be cut away once in the event of an emergency. After incorporating these changes, the final configuration was successfully tested by aircrews on UH-72, HH-60, UH-60 and CH-47 platforms, and a safety confirmation was achieved.

PM Air Warrior has received the first production shipment of the new restraint system and is currently working with PM Utility Helicopters to identify units and prioritize fielding and training schedules. Follow-on quantities of the ARTS are on contract that will replace the current tether restraint systems throughout the Army aviation community, with first deliveries expected in November 2017.

Now back to the interviews with several crew chiefs mentioned in the opening paragraph. Their answers shocked us. Although our discussions were strictly anecdotal, what we uncovered was that this apparently has been a systemic problem for years. Nearly every crewmember we talked to admitted to experiencing an inadvertent detachment of their safety tether during a mission. These crewmembers ranged from Soldiers currently on active duty to crew chiefs that retired long ago.

The moral of this story is if there is a safety issue — report it!

Don’t assume because it happened to you just once, or your peers admit it’s happened to them, that there’s no need to tell your supervisor or unit safety officer. The Army can’t fix a problem unless someone identifies a problem. In this case, the units contacted the PdM AW directly and that’s OK. Please feel free to contact the Air Warrior team about any ALSE issue, but don’t forget the established safety reporting process. It includes your chain of command and unit safety officer, but it starts with you.

Ready through Safety!

MS. Karen Coleman
ALSE Technician
Product Manager Air Warrior
Redstone Arsenal, Huntsfield, Ala.
Mishap Review - OH58D Engine Failure

While conducting a route security/reconnaissance mission at 90 knots and 150 feet above ground level (AGL), the aircraft experienced an in-flight engine failure. The pilot in command (PC) was forced to execute a low-level autorotation to a level, plowed field. The aircraft was destroyed and the two crewmembers sustained serious injuries.

History of Flight.
The first of two missions was to conduct aerial route reconnaissance and security of named areas of interest (NAIs). Weather conditions briefed for the mission were sky clear and winds variable at 6 knots. The accident crew began their duty day at 0600 and received their operation and intelligence (O&I) mission briefing at 0630. The accident crew was assigned as part of a scout weapons team, which conducts aerial security and reconnaissance of the objectives and NAI. At 0904, the accident aircraft, flight lead, was skids up and on station to check in for their operation. The flight returned to the forward operation base (FOB) at 1030 for refueling and departed at 1040 to resume the operation. Flight lead traveled east, followed by a northerly direction. Flight lead was configured in a low-high staggered right formation with approximately a 15–rotor-disc separation; they were flying at approximately 200 feet AGL and trail was flying approximately 300 feet AGL. Midway along their northerly route, the air mission commander (AMC) announced to trail that he had received a Chips Engine Lower message on his multifunction display at 1046:56. As flight lead turned back to the west, the crew noticed more iterations of the Chips Engine Lower message at 1047:08. The PC in flight lead decided at 1047:14 to land as soon as possible back at the FOB. Radio calls were made between flight lead and the FOB notifying them of a return to base due to maintenance. At 1049:30, flight lead was traveling over a series of dry, plowed fields at approximately 150 feet AGL and 90 knots when a puff of black smoke emanated from the exhaust collector. Flight lead immediately entered into a low-level autorotation profile with no apparent yaw. The flight lead PC, sitting in the right seat, was on the flight controls. The aircraft entered a pitch-up attitude just prior to touchdown. The trail left-seat pilot (PI) saw the accident aircraft execute the touchdown and lost visual as it was enveloped in a cloud of dust. Fallen angel was declared at 1050. The accident aircraft came to rest approximately 4 kilometers east of the FOB.

Crewmember Experience.
The PC had 3,898 total hours and 3,681 in the OH-58D(R). The PI had 766 hours total time and 684 hours in the OH-58D(R).

Commentary.
The term LAND AS SOON AS POSSIBLE is defined as executing a landing at the nearest suitable landing area (e.g., open field) without delay. (The primary consideration is to assure the survival of the occupants.) When emergency situations arise, outside considerations are sometimes weighed in the crew’s decision making process. Enemy threat may require adjustment on what is considered a suitable landing area. Negative influences may creep into the calculation - such as overconfidence in the aircraft’s ability to continue flight back to base rather than landing at a suitable location short of the desired destination. Negative habit transfers may develop based on observing others flying with ‘flickering’ chip messages so it becomes more of the default routine rather than based on the required procedure. Regardless of the situation, when an indication of a possible failure is registered, set yourself up for success. Put the aircraft in the best possible flight envelope that optimizes the ability to respond should the engine fail.
Present but not Contributing: (OH-58)
During the course of the investigation and inspection of the accident aircrew’s aviation life support equipment (ALSE), two violations of Army Regulation (AR) 95-1 were discovered. The aircrew members were using the Oregon Aero “Hush Kits” on their HGU-56/P. There was a modification to the PC’s helmet to mount a portable video recorder in contravention of a Standardization Bulletin. According to the Program Manager Air Warrior, these modifications do not have an airworthiness release (AWR) approval and therefore are not authorized for flight use.

Present and Contributing to the Severity of Injury: Human Error - Support Failure: (AH-6)
During the investigation, the radio was found to be mounted in an inappropriate location. That is, even though the #2 Airborne Communication System 231 (#2 ARC-231) radio mount was installed IAW an approved AWR, the current AWR mounting bracket was not secure enough to withstand a hard, but potentially survivable, accident. Based on the co-pilot’s injuries, the board determined the radio-mounting bracket pulled forward, which elongated the rivets, causing the bracket and radio to move forward. This resulted in the co-pilot receiving fatal injuries to the back of his head and neck. Specifically, his C1 cervical vertebra was dislocated. The board concluded the #2 ARC-231 radio bracket location allowed the failure of the mount during the accident sequence. The #2 ARC-231 radio was installed on the left side, directly behind the co-pilot’s head. However, the board observed three other aircraft within the unit and discovered that a three/four/ten rivet pattern was also utilized to install the #2 ARC-231 radio.

Present but Not Contributing: (AH-64)
During the investigation, the board determined the first aid kits in the task force are not sealed with a lead seal according to TM 1-1500-204-23-1. The TM requires the use of a flat-head pin in the zipper with a breakaway safety wire sealed with a lead seal. The task force first aid kits were found to have just the breakaway safety, which made it extremely difficult to open without the use of tools. The board found this creates an unnecessary safety hazard.

Present but not Contributing: (UH-60)
The board found that the established pre-accident plan dated 10 September 08 outlines specific duties of key personnel to ensure notifications and required tasks are performed. The evening and morning of 22-23 September revealed key tasks were not accomplished to properly secure aircraft and records. The board found that the time between notification of aircraft mishap and securing of aircraft was 8.5 hours. The accident site was a five-minute flight from an airfield where at least two aircraft flights arrived on scene and numerous ground vehicles were on station.
### Manned Aircraft Class A – C Mishap Table

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<td>Class C Mishaps</td>
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</table>

**Class A Flight Accident rate per 100,000 Flight Hours**

- 5 Yr Avg: 1.27
- 3 Yr Avg: 1.32
- FY 16: 0.87
- Current FY: 0.99

### UAS Class A – C Mishap Table

<table>
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<tr>
<th>FY 16</th>
<th>FY 17</th>
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<tbody>
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<td>Total for Year</td>
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IN LATE 1966, USAAAVS (now the U.S. Army Safety Center) decided to take on the job of telling you everything you wanted to know—and probably some things you didn’t about aviation life support equipment (ALSE). With Vietnam came speedy development of new and much needed survival gear and along with it an avalanche of questions on how to get it, wear it, maintain it, and use it. Since there was no single source for the field to turn to for answers—and realizing the safety payoff from the proper use of personal equipment—we created PEARL (an acronym for Personal Equipment and Rescue/Survival Lowdown) to be our chief advisor on all ALSE matters. But in October 1977, all this changed.
Realizing the multiplicity of problems associated with survival equipment, the Army established an ALSE office at DARCOM and appointed a project officer to deal specifically with these problems and to provide information and guidance to the field. Consequently, answers to questions concerning the Army’s ALSE program, the establishment of an ALSE MOS, logistical support, and other problems must come from the DARCOM project officer. Although we will continue to report to you regularly on the effectiveness of your ALSE from a safety standpoint through FLIGHTFAX, please bear in mind that we are not the proponent agency for survival equipment. Until ALSE problems are resolved, we offer the following suggestions:

- Establish a library containing the publications for inspecting and using ALSE effectively. Presently, there are two publications available which list all current ALSE publications and which can be obtained from the DARCOM ALSE project officer.

- Train your ALSE personnel. Both the Air Force and Navy have ALSE courses for officers and enlisted personnel which are available to the Army. Although Army personnel will be exposed to some equipment unique to these sister services, the courses provide a good background in ALSE and serve as a guide for establishing an adequate unit ALSE program for Army units. Courses range in length from 2 weeks and 3 days to 10 weeks and must be locally funded. Again, DARCOM can assist you with any additional information about these courses.

- Familiarize ALSE personnel with the Army supply system. Since much of our ALSE is either Air Force or Navy equipment which has been adopted for Army use, it is imperative that supply personnel know how to properly procure the equipment. The Army Master Data File (AMDF) normally lists all items of equipment used by the Army. However, as the Army uses many items that are managed by the Air Force and Navy, some of this equipment may not be listed in the Army AMDF. But this doesn’t mean that you can’t get it or that the equipment is not available. It simply means that you must hand-process the requisition “off-line” to the Air Force or Navy managing activity of the equipment.

- Include a section in your unit SOP listing the required ALSE for your particular geographical area and how it should be used. For example, the Army’s SRU-21/P is a universal survival vest, but its contents can be tailored to suit your particular operating environment. The contents of the vest should be evaluated to determine whether they are appropriate for your environment. Since most of these items are expendable, they can be procured with locally available supply funds and added to the vest.

- Identify and project separate funds for maintaining and replacing ALSE. Failure to allocate funds for this purpose places ALSE personnel in a situation in which they cannot possibly comply with serviceability and replacement standards.

- Designate an ALSE officer and an ALSE NCO who will be responsible for your ALSE program guidelines and equipment utilization and maintenance.
Mishap Briefs

**Attack Helicopters**

**AH-64**

D Model- Aircraft experienced NP overspeed during autorotational RPM check by maintenance personnel. (Class E)

D Model- During post flight of an AH-64D, aircraft structural damage was found on the bottom of the tail boom along with damaged antennas. (Class E)

E Model- Aircraft conducted alternate autorotational RPM check that resulted in an NP overspeed. (Class C)

**Utility Helicopters**

**CH-47**

F Model- Crew reportedly experienced aircraft attitude anomalies during take-off, during which the aft wheels made repeated contact with the runway. Crew conducted emergency shut-down procedures. (Class C)

**UH-60**

M Model- Soldier/Medic fell approximately 20-30 feet into a wooded area while being hoisted during MEDEVAC training. (Class A)

M Model- Aircraft sustained damage to the FLIR and FLIR mount upon landing to an unimproved area. (Class E)

L Mode - Maintenance personnel experienced an engine TGT exceedance on ground-run start-up with the engine inlet plug still in place. (Class C)

M Model- Lead aircraft, in flight of two, sustained in-flight foreign-object damage to the tail rotor as crew was returning from a local-area orientation mission. Post-landing inspection revealed debris imbedded in the aircraft identified as a DJI Phantom 4 quadcopter. (Class C)

L Model- The tail rotor of the aircraft made contact with concertina wire/fence during landing. (Class B)

**Fixed Wing**

**UC-35**

A Model- Post-flight maintenance exceeded an instrumentation reading during an in-flight climb. (Class C)

**C-12**

U Model- Birdstrike damage was discovered on leading edge of right inboard wing section near #2 engine nacelle during post-flight maintenance inspection by contract maintenance personnel. (Class E)

**Unmanned Aircraft Systems**

**RQ-7**

B Model- UAS experienced a Generator Fail, Ignition Fail and ECU Communications Fail during ascension. Aircraft was steered to an open field where the flight termination system (FTS) was deployed at approximately 275 feet AGL. (Class B)

B Model- Crew experienced engine overtemp during flight and initiated the FTS. Recovery chute was deployed and the system was recovered with damage. (Class C)

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**UAS Commanders are you familiar with these requirements?**

a. Commanders monitor the implementation of the U.S. Army Aviation Standardization Program. They provide the command with a continuing assessment of the program.

b. The UAS unit commanders will coordinate with the aviation brigade standardization committee. In the absence of an aviation brigade, the UAS unit commander will coordinate with the nearest aviation unit (for example, flight detachment).

c. Aviation standardization committees will be organized to
   1) Recommend and review directives, provide guidance, and respond to specific inquiries and requests.
   2) Coordinate requests for support from subordinate aviation units.
   3) Prepare and review recommended changes to aviation standardization literature and forward to proponents.
   4) Develop ARMS checklists for command approval.
   5) Write and publish supplements to this regulation.
   6) Meet at the call of the chairman.

Check out AR 95-23 and get refreshed on UAS flight regulations and aircrew training requirements.
ALSE...

OK, JONES! YOU GET FIVE SKRAM BAGS WITH THE INSERT FOR THE CHINOOK!

AND SMITTY, YOU GET THE GO-BAG WITH THE AMMO POUCHES SINCE YOU'RE A CREWMEMBER!

Need Help With the SKRAM?

Dear Sergeant Blade,

We noticed that Air Warrior is issuing the survival kit ready access modular (SKRAM), PN 1005991-1, to deploying aviation units. Does SKRAM replace the aircraft modular survival system (AMSS) and how do we take care of the SKRAM?

SGT J.P.J.

Dear Sergeant J.P.J.,

Those are good questions. I'm sure every ALSE tech wants the scoop on SKRAM, so here it is.

The SKRAM is designed to give your aviation units an additional means to secure survival equipment. It is composed of two bags with shoulder harnesses. The SKRAM for the aircraft has the insert for the mandatory minimum survival items. Each aircraft gets a certain number of bags. UH-60 gets 4, OH-58D gets 2, CH-47F gets 5, AH-64D gets 2 and the LUH gets 2. The inserts include:

- Survival food packets, 3600 calories each - 1
- Chemical lights, green - 2 each
- Chemical lights, IR - 2 each
- Water storage bag, any size - 1
- Survival blanket - 1
- Survival manual - 1
- Muslin bandage - 1
- 550 cord, 50 ft. - 1
- Water purification tablets - 1
- Emergency water packets, 4 oz. - 10 each

SKRAM for aircraft gets mandatory minimum survival insert
If you have comments, input, or contributions to *Flightfax*, feel free to contact the Aviation Division, U.S. Army Combat Readiness Center at com (334) 255-3530, DSN 558-3530.

Review archived issues of *Flightfax*:
https://safety.army.mil/ON-DUTY/Aviation/Flightfax/Archives.aspx

*Flightfax*

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