Gen. Knowles, ADC-A

HEADQUARTERS 11TH AIR ASSAULT DIVISION
OFFICE OF THE ASSISTANT DIVISION COMMANDER
Fort Benning, Georgia, 31905

AJVAC

10 September 1964

SUBJECT: Safe Operation of Aircraft

TO: Commanding General
11th Air Assault Division
Fort Benning, Georgia

1. Reference: Letter, subject as above, Headquarters 11th Air Assault Division, dated 23 May 1964.

2. In accordance with referenced letter, I have reviewed the operating procedures for units under my supervision and wish to advise you of progress being made in the area of flying safety.

3. Specific areas listed in your 23 May letter are discussed in Inclosure 1. Other areas not listed in your letter are discussed in Inclosure 2. Inclosure 3 outlines problems requiring further emphasis.

John M. Wright Jr.

JOHN M. WRIGHT, JR.
Brigadier General, USA
Assistant Division Commander

3 Incls
1-Specific Suggested Areas
2-Other Areas Examined and Improved
3-Problems Requiring Further Emphasis

SPECIFIC SUGGESTED AREAS

1. Better Site Selection.

a. This is being improved through an intensive training program for the seventeen (17) pathfinders who are not school trained and for 18 other personnel from aviation and infantry units who will assist with pathfinder operations or will act as pathfinders when assigned pathfinders are not available. Operational procedures have been modified to permit better site locations through early reconnaissance and selection, to include installation of lights and navigational aids during daylight hours. Commanders will also visually check these sites prior to occupation by their respective units. Recently received additional navigational equipment will also improve the development and control of these areas.

b. The unimproved airfields the 10th Air Transport Brigade has selected and operated from are ideally suited for its type of operation. However, almost all of them present hazards and require techniques that are not normally found in fixed installation operation. Specifications and criteria for Pioneer airfields contained in TM 5-330 and used by the 127th Engineer Battalion in their construction procedures are impracticable when establishing an airfield where only emergency construction can be accomplished. The aviation unit can and does perform pioneer improvements in making the airfield safe for operation. This includes removing trees or fences and marking existing wires. Fields are examined by foot to determine condition of the proposed landing site or runway, to include adverse "line-of-sight" considerations, high grass, chuck holes, and concealed hazards to ground movement of aircraft or vehicles. High grass is either run down by vehicle or mowed. If "line-of-sight" is critical or change of grade is excessive, additional panels and lights are installed to insure that runways and landing sites are properly marked.

c. Check lists for both fixed and rotary wing airfields have been prepared to insure that all safety considerations are examined, corrected if possible, or made known to all who will be operating at these fields. Advance parties are dispatched, with pioneer tools, and with qualified personnel to perform all the necessary tasks outlined above. Many other considerations will be included in these check lists, all designed to effect a safer and more efficient operation. POL location, billet location for crew rest considerations, and communication facilities are all a part of this process.

2. Airfield Traffic Control.

a. Training of Tower Operators. Particular emphasis is being put on initiative of these operators in using common sense in controlling aircraft, such as landing and take off direction change when appropriate, and furnishing of information concerning hazards, if any exist. Tower operators are being trained to make weather observations so that pilots can be furnished up to date information. Altimeters are being obtained for portable towers, so that the operators can have this information for air traffic at their field.

b. Recommendations are being prepared that will establish general pattern design in an attempt to segregate fixed and rotary wing traffic and ease traffic congestion around airfields. Different altitudes will be used, and when possible, patterns will be on opposite sides of the landing area for each category.

3. Improved Hot Weather Techniques.

Development of the "GO, NO GO" criteria for UH-1 type aircraft, coupled with additional instruction, is expected to greatly improve this aspect of aircraft operations. Virtually all previous hot weather difficulty has been with this type aircraft. The new procedure is considered a practical solution to the situation of air assault operations.

4. Higher Altitudes, Safer Routes, and Slowed Tempo of Operations Whenever the Tactical Situation Permits.

These matters were taken under advisement by the Division Safety Council. It was agreed that these aspects would be integrated into future operation orders, other directives, and instructional material. Commanders of infantry and aviation units are reviewing operational methods to reduce the fatigue factor of aviators and leaders without detracting from practical mission responsiveness. All commanders have been reminded to use AR 95-17 in establishing controls to preclude crew fatigue.

Inclosure 1, Specific Suggested Areas (Cont'd)

5. Emphasis on Safety During Daily Flight Briefings and Debriefings.

This has been a command policy. Five (5) minute safety talks have been outlined well in advance to prevent monotony. These subjects cover all pertinent and timely aspects of safety and all facets of emergency aircraft procedures.

6. Skull Sessions and Refresher Courses.

A constant exchange of information, ideas, and lessons learned are part of the formal and informal instruction presented to units and individuals in garrison and in the field. The film "Know Your Iroquois" has been used in this program and has been shown to all units having UH-1 aircraft. Refresher and updating courses are also a part of this program, to include reemphasised use of all available safety equipment. This program includes all members of the aircraft crew.

7. Enforcement.

All accidents have been closely scrutinized for violations of regulations or other directives. As appropriate, on the spot corrections were made or disciplinary action was taken.

8. Safe Practices for Men and Equipment to be Carried in Aircraft.

a. Further training has been conducted in vehicular loading and off-loading of aircraft and in rappelling from tower and helicopter.

b. Greater emphasis is being placed on tailoring aircraft loads to fit specific aircraft in conjunction with existing weather conditions.

c. Wearing of all safety equipment by passengers is being stressed.

OTHER AREAS EXAMINED AND IMPROVED

1. Dissemination of Flight Information.

The implementation of a practical method of furnishing flight information in garrison and in the field was discussed at the Division Safety Council meeting. A single agency, gathering and publishing information of restricted areas, prohibited areas, changed radio frequencies, traffic patterns, and so forth, will reduce violations caused by ignorance of the current airspace situation. Prompt, accurate dissemination of flight information will make flights inherently safer and will improve tactical operations.

2. Formation Flying.

Formation flying techniques have been, and are continuing to be, reviewed and improved to reduce many of the hazards that have been recognized from experience. The few modifications already implemented will improve safety margins and reduce accident rates.

3. Aircraft Emergency Warning Systems.

Voice warning systems for UH-1, OV-1, and CH-47 aircraft are being procured by cooperative effort with USABAAR. (This project is still in the early stage, and the end product is sometime away.) Aircraft are now faster, and have more controls, switches, and dials, than aircraft of the past. At the same time, air assault operations demand increased aviator attention outside the aircraft. This warning system will permit the aviator to observe the surroundings and to monitor the emergency systems simultaneously, without having to divide his visual attention.

4. Aircraft Crews.

Increased availability of proficient and experienced aviators has improved the performance of aircraft crews. Now, emphasis is on assignment of a more experienced aviator to work and fly with the lesser experienced aviator. This is possible because of experience build-up from past field exercises and from concentrated unit training programs. Improved crew chief experience is also a significant safety aspect.

5. Mohawk Improvements.

OV-1 accidents indicated other areas for improvement. One was the gunnery pattern. The attack angles were changed, and the safety factors were increased without reducing the effectiveness of the training. Another indicated action was the procurement of extended trim tabs to assist pilots with assymmetrical loads as occur during firing. This modification is expected to be completed in the near future.

6. Standardization.

The Division Standardization Board has greatly improved the instructional programs, the availability of vital information to aviators, and the selection of instructor pilots. These improvements will have a far reaching effect in the reduction of accidents in our utility and observation helicopters.

7. Engine Surge (Compressor Stall).

a. The problem of UH-1 engine surges has been investigated. Approximately fifty (50) known engine surges have occurred. Some were never officially reported. It is felt that many of the milder ones were never recognized. Some of our UH-1 accidents were directly caused by engine surges. Other engine surges have been cited as contributing factors. However, some accident cases, not related to engine surge, may have been caused directly or indirectly by them. Engine surge investigation has indicated a multiple cause situation. These causes are at least:

(1) Axial compressor and stator blade erosion due to heavy concentration of silica sand in this environment.

(2) Engine power demands exceeding the criteria used for determining design life: (Average engine time at occurrence of engine surge is approximately 266 hours.)

(3) Increased weight and loads of UH-1D aircraft demand greater constant power requirements than UH-1B aircraft. Therefore, greater volumes of air are required, increasing the ingestion of sand and the rate of erosion.

(4) Changed inlet and fuselage design of the UH-1D which creates restrictions of airflow in certain normal maneuvers.

(5) Increased probability of engine surge due to requirements of formation flight.

(6) Aviator lack of knowledge as to engine surge causes, recognition of engine surge condition, and proper corrective procedures.

b. Since the probable causes are recongized, the following corrective actions are indicated:

(1) That maintenance experts establish valid, scheduled compressor inspections ("cold-end" inspection as opposed to "hot-end" inspections), to include the use of accurate instruments for measuring engine erosion, which will dictate thrust adjustments or engine change prior to engine surge occurrences.

(2) That immediate, unqualified, engine change be accomplished after an engine surge. The internal fatigue effect of engine surges cannot be effectively determined at A, B, or C maintenance levels. All indications are that once an engine has experienced a surge, it will ultimately do it again, more violently, until final failure.

(3) That the aid of manufacturers be requested to improve air inlet design. One UH-1D has a locally fabricated UH-1B type intake. So far, it has been successful, but it has not been operating long enough to prove the point.

(4) Reduce the foreign matter (especially sand) ingestion. At present, two aircraft have been modified with intake filters. Other ways to reduce this problem are to use dust pallatives in garrison and possibly in the field, wash rack construction in garrison and scheduled aircraft washing in the field, and loosening of formations and/or staggering of elements in PZ's and LZ's and during operations at the base sites. The latter action will avoid "stacking up" of aircraft, reducing nose high, decelleration maneuvers and associated "pumping" of the collective, which are conditions most conducive to engine surges.

(5) Reduce aircraft loads. In this respect, action is by the Commanders and through the use of the "GO, NO GO" criteria previously mentioned.

(6) Further aircraft crew instruction on engine surge causes, recognition, and corrective procedures for all units operating UH-1 type aircraft. Portions of 7.a.(1), (2), (3), and (4), listed above, are cited in Inclosure 3.

8. Team Training.

Changes in training procedures have been instituted to improve team/unit integrity. One method employed is to consolidate available aircraft, then to use aircraft crews from only one unit to perform missions. This action keeps crews and units working together, as they were organized to do, rather than personnel of one unit being attached to another unit for mission performance.

PROBLEMS REQUIRING FURTHER EMPHASIS

1. Maintenance.

a. Engine Surge: For discussion, see paragraph 7, Inclosure 2.

(1) Maintenance experts should establish valid, scheduled compressor inspections ("cold-end" inspection) which would include the use of accurate instruments for measuring engine erosion to permit thrust adjustments or engine change prior to engine surge condition.

(2) Immediate, unqualified engine change when any engine surge has been experienced.

(3) Request the aid of manufacturers to improve air inlet design .

(4) Reduce the foreign matter (especially sand) ingestion, by:

(a) Modifying all UH-1 aircraft with filters.

(b) Further use of quick, temporary, economical dust pallatives.

(c) Construction of aircraft wash racks at garrison air installations.

(d) Establishing aircraft wash sites in the field, similiar to the plan used for water points.

b. A review of Established Time Schedule Maintenance: UH-1 aircraft were designed originally as transport aircraft. They were programmed to operate from sophisticated aircraft environments, for at least a part of their design life. They are being subjected to conditions different from those for which they were designed, by air assault requirements. Gun ships, for instance, are subjected to increased vibrational loads from firing, higher speeds and tighter turns, than normal transport operations. Also, these gun kits were "added [illegible] thoughts" once the aircraft had already been designed. If the design life criteria of the UH-1 is being exceeded by 20%, scheduled maintenance should be increased in frequency by an equal proportion.

2. Aircraft Refueling.

The army has never had such difficult aircraft refueling operations as those presented by air assault operations. Specialists in this field have much to learn from the sister services. But, even that knowledge requires modification if we are to have practical, but safe, POL operations in the air assault situation. POL problems involve the entire fleet. Our past accident experience in this area indicated increased emphasis is required. Organization of a full time team of POL experts, whose purpose would be to improve every facet of POL operations, is indicated.

3. Standardization.

The lack of standardization continues to be one of the army's largest flying problems. As aircraft become more numerous and more complicated, this problem increases Instructor pilot qualifications are decreased as the number of rated aviators grows larger because truly experienced aviators are fewer, proportionately. Being an instructor pilot is difficult and exacting work. We do not utilize professional, full time instructors except at the aviation school. Even those instructors are often "turn-around" students without benefit of actual field experience. The problems of maintaining and increasing aviator proficiency can be compared to the problems of maintaining and increasing equipment readiness. To assist commanders with maintaining the readiness state of equipment, Command Maintenance Inspection (CMI) teams have been employed. This method has contributed significantly to the state of equipment readiness in the army. Flight Proficiency Inspection (FPI) teams should be organized utilizing full time, professional instructors to assist and advise commanders on the state of readiness of the flight aspects of the commander's aviation elements. A roving FPI team, inspecting units at random on a courtesy basis, could advise commanders on ways to improve their flight instruction programs, insure that command policies are being complied with, that lessons learned from past experience are being utilized, train instructor pilots that are not fully qualified, and, provide a system for comparison of aviation unit capabilities.

Inclosure 3, Problems Requiring Further Emphasis (Cont'd)

4. Crash-Rescue/Fire-Fighting Services.

This area requires a thorough plan to obtain the best results from existing facilities. First, a central planning agency is required to determine who will respond, with what equipment, in any given area. The nearest agencies should respond to the crash. The next nearest agency should be placed on standby to respond to the accident scene and to cover the area vacated by the unit that was nearest to the crash site. Most of these details can be handled by one well planned crash-rescue plan. Ideally, this should incorporate a post-crash rescue map, so that all action agencies are working with the same information. A further requirement is a central communications agency, so that these efforts can be a controlled and coordinated effort. Notification of the proper back-up and support personnel to respond to that particular situation and keeping commanders informed are some of the other benefits this service will provide. This system, with slight modification, can also be used in the field.