

FLIGHT SURGEON GUIDE to SAFETY AND ACCIDENT INVESTIGATIONS
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SAFETY AND ACCIDENT INVESTIGATIONS

SAFETY AND ACCIDENT PREVENTION

AR 385-10, DA PAM 385-90 establishes the Army Accident Prevention function as an integral part of the Army Safety Program AR40-3 further identifies the flight surgeon's responsibilities. The flight surgeon assists and advises the command in all aviation medical matters. In remote areas where a flight surgeon is not assigned or readily available, local support will be provided by the servicing medical department activity (MEDDAC) to best accomplish these duties. The flight surgeon should:

- (1) Maintain liaison within the command to implement the aviation medicine program.
- (2) Take part in, and observe, flight operations to monitor the interactions of crewmembers, aircraft, and environment. The flight surgeon exerts maximum effort in observing the flying ability and characteristics of each assigned aviator at least annually.
- (3) Serve as a member of aircraft accident investigation boards, when directed.
- (4) Serve as a member of flight evaluation boards, when directed.
- (5) Ensure that the medical portion of the pre-accident plan is adequate.
- (6) Monitor the physical and mental health of aviation personnel, including alcohol, tobacco, dietary supplements, and self-medication problems (see AR 40-8).
- (7) Advise the commander on crew endurance issues.
- (8) Maintain aviation medical records on flight personnel, assist the unit in providing annual occupational health and safety screening for non-crewmember personnel, and ensure that DA Form 4186 (Medical Recommendation for Flying Duty) prepared on flight personnel is accurate and complete prior to being sent to the unit commander for approval.
- (9) Monitor the survival and physiological training of aviation crewmembers and provide medical support in accordance with applicable Army regulations.
- (10) Medically clear crewmembers for further flight duty after aircraft accidents in accordance with applicable Army regulations.
- (11) Make recommendations to the Commander, USACRC, for improvement of human factors compatibility, crashworthiness, aviation life-support equipment, and survival features of aircraft.
- (12) Take part in aviation safety meetings to educate aviation crewmembers on the aeromedical aspects of flight.
- (13) Monitor the aviation life support equipment (ALSE) program.
- (14) Assist in, and advise on, the hearing and occupational vision program.
- (15) Ensure command consideration of preventive and occupational medicine aspects of all plans, operations, training, and security missions.

ACCIDENT INVESTIGATION – INTRODUCTION

Accident investigations are a key component of the Army Safety Program. Accidents resulting in the damage or destruction of Army resources or personnel injury/death impair the combat readiness of the United States Army. The lessons learned from accidents provide the basis for prevention programs that help ensure we don't repeat the mistakes of the past. These investigations can be extremely difficult, time consuming and stressful. Investigations are conducted in accordance with AR385-10 and DA PAM 385-40.

Human error is a definite cause in more than 80 percent of all Army accidents. Human errors can usually be attributed to one or more of the following inadequacies: standards failure,

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training failure, leader failure, support failures, or individual failure. As a member of the accident investigation board, the flight surgeon is responsible for the team investigating the human factors aspect of the accident.

The focus of an accident investigation is to identify the system elements that permitted or caused the accident to occur. The procedure used to identify inadequate systems elements and describe the human factors, material failures, environmental factors involved in accidents is called the “3W approach”. This approach requires investigators to answer three questions:

1. What happened? Identify how the accident occurred. Identify key factors, which contributed to the accident occurrence.
2. What caused it? Identify the errors/failures that caused or permitted the accident to occur.
3. What to do about it? Identify remedial measures which will correct the system inadequacy.

DEFINITIONS (AR 385-10)

1. Army accident – An Army accident is defined as an unplanned event, or series of events, which results in one or more of the following:
 - a. Occupational illness to Army military or Army civilian personnel.
 - b. Injury to on-duty Army civilian personnel.
 - c. Injury to Army military personnel on and off duty.
 - d. Damage to Army property.
 - e. Damage to public or private property and/or injury or illness to non-Army personnel caused by Army operations (the Army had a causal or contributing role in the accident).
2. Army aircraft accident – an accident involving Army aircraft or Government aircraft operated by the Army when the intent to fly exists.
3. Intent to fly – Intent for flight begins when power is applied or brakes released to move the aircraft under its own power, for the purpose of commencing authorized flight with an authorized crew. Intent for flight ends when the aircraft is at a full stop and power is completely reduced. Intent for flight is the physical act of applying power to move the aircraft, not the thought process of the crew member as to what is going to occur in the future.
4. Aircraft accidents are subdivided into three types:
 - (1) *Flight accidents*. Those accidents in which intent for flight exists (as defined in the glossary), and there is reportable damage to the aircraft itself. (Explosives, chemical agent, or missile events that cause damage to an Army aircraft with intent for flight are categorized as flight accidents to avoid dual reporting.)
 - (2) *Flight-related accidents*. Those aircraft accidents in which there is intent for flight and no reportable damage to the aircraft itself, but the accident involves a fatality, injury to aircrew, ground crew, passengers, or other injury or property damage. These accidents are not to be used in the calculation of flight accident rates. For example, unintentional cutting of a hoist cable;

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failure or malfunction of a hoist system to include related equipment; unintentional jettisoning of cargo hook load or external stores.

(3) *Aircraft ground accidents.* Injury or property damage accidents involving Army aircraft in which no intent for flight exists and the engine(s) is in operation (an installed aircraft auxiliary power unit (APU) is not considered an aircraft engine).

ACCIDENT CLASSIFICATIONS (AR 385-10)

Accident classes are as follows:

a. Class A accident. An Army accident in which the resulting total cost of property damage is \$2 million or more; an Army aircraft is destroyed, missing, or abandoned; or an injury and/or occupational illness results in a fatality or permanent total disability. Note that unmanned aircraft system (UAS) accidents are classified based on the cost to repair or replace the UAS. A destroyed, missing, or abandoned UAS will not constitute a Class A accident unless replacement or repair cost is \$2 million or more.

b. Class B accident. An Army accident in which the resulting total cost of property damage is \$500,000 or more but less than \$2 million, an injury and/or occupational illness results in permanent partial disability, or when 3 or more personnel are hospitalized as in-patients as the result of a single occurrence.

c. Class C accident. An Army accident in which the resulting total cost of property damage is \$50,000 or more but less than \$500,000, a nonfatal injury or occupational illness that causes 1 or more days away from work or training beyond the day or shift on which it occurred or disability at any time (that does not meet the definition of Class A or Class B and is a day(s) away from work case).

d. Class D accident. An Army accident in which the resulting in total cost of property damage is \$2,000 or more but less than \$50,000, a nonfatal injury or illness resulting in restricted work, transfer to another job, medical treatment greater than first aid, needle stick injuries, and cuts from sharps that are contaminated from another person's blood or other potentially infectious material, medical removal under medical surveillance requirements of an OSHA standard, occupational hearing loss, or a work-related tuberculosis case.

e. Class E aviation accident. An Army accident in which the resulting total cost of property damage is less than \$2,000.

f. Class F aviation incident. Recordable incidents are confined to aircraft turbine engine damage because of unavoidable internal or external foreign object damage, where that is the only damage (does not include installed aircraft auxiliary power units).

PRE-ACCIDENT PLAN

The formation of the medical portion of the pre-accident plan is the duty of the flight surgeon. The following areas should be evaluated:

1. Detailed Accident Response Plan – Ensure the flight surgeon is on the initial notification roster and review all responsibilities.
2. Know your unit's aircraft – Learn the basic operation of all unit aircraft and responsibilities of various crewmembers. Have unit instructor pilots (IP) explain/demonstrate aircraft operation.
3. Coordination with:

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- a. Unit Aviation Safety Officer (ASO) – Reviews accident response plan. Coordinate with ASO to monitor flight line for potential problems.
 - b. Local Coroner/Medical Examiner – Determine jurisdiction and establish agreements for waiver to military.
 - c. Air/Ground ambulance units – Ensure crews are properly trained in first aid, personnel rescue, and extraction techniques for various aircraft; have appropriate maps, radios, equipment; and are available and on-call during scheduled flying hours. (see USACRC website for crash videos and extraction guides-<https://safety.army.mil/>).
 - d. Emergency department personnel – Provide standardized protocol for the evaluation of aircrew members in the ED. To prevent unnecessary discomfort for crewmembers, ER personnel may collect toxicology and provide initial evaluation while waiting for the flight surgeon to arrive.
 - e. Pathology department – Armed Forces Medical Examiner System (AFMES) will usually provide a forensic pathologist to do the autopsy. <http://www.afmes.mil>
 - f. Crash rescue/Fire department – Ensure crews are familiar with extraction techniques for all types of aircraft, possible hazards (i.e., ejection seats, explosive canopy, etc); and toxic hazards associated with burning composite materials.
4. Investigation Kit – Customized for personal needs, compact, and portable.
5. Pre-accident plan– Periodically exercise the accident response plan to insure adequacy. Exercises are required annually IAW AR385-10 for all units and installations and quarterly per DA PAM 385-90 for Aviation units/airfields. The flight surgeon should be included in this exercise.

ACCIDENT INVESTIGATION KIT

This is not standardized, but it should be compact, lightweight, and has all items accessible. The contents of this kit are designed to aid in gathering physical data concerning the accident and to record this information photographically, verbally, or in written form.

Telephone Numbers

1. Crash Rescue
2. USACRC Surgeon/ OPs DSN 558-2763/2660, COMM (334) 255-2763/2660
3. AFMES (tox/general) DSN 366-8724/8648, COMM (302) 346-8724/8648
4. Local Coroner/Medical Examiner
5. Local Police
6. USAARL, Ft. Rucker DSN 558-6920/6960, COMM (334) 255-6920/6960
7. USASAM, Ft Rucker DSN 558-7416, COMM (334) 255-7416

References and Forms

1. AR 40-21
2. AR 385-10
3. DA PAM 385-40, DA PAM 385-90
4. Investigation guides

Recording and Plotting Devices

1. Accident worksheets (for each crewmember)

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2. Clipboard with notepad and graph paper
3. Pencils (lead and grease) and sharpener
4. Pens, magic markers
5. Scissors
6. Rulers
7. Index Cards
8. Tape measure (50/100 ft) preferably with inches and centimeters
10. Camera
11. Adhesive tape
12. Engineering tape or red ribbon for marking
13. Stakes and tags

Search and Signaling Devices

1. Flashlight with spare batteries
2. Whistle
3. Small mirror
4. GPS

Personal Items

1. Insect repellent
2. Knife with flint
3. Canteen
4. Soap
5. Paper towels
6. Handy wipes
7. Leather gloves
8. Plastic gloves
9. Ear plugs
10. Sunscreen
11. Sunglasses
12. Chapstick
13. Small first aid kit
14. Surgical masks

Items for Blood/Fluid Collection

If possible, collect all toxicology specimens at a medical facility. All specimens must be sent to AFMES(fortox) <http://www.afmes.mil>.

1. Needles, disposable
2. Syringes, disposable
3. Vacutainers
4. Tourniquet
5. Betadine swabs (avoid alcohol)
6. Labels
7. 3 red top tubes (per person)
8. 2 lavender top tubes (per person)
9. 2 grey top tubes (per person)
10. 1 urine cup (per person)
11. Toxicological exam forms (DD/AFMES 1323)

Items for Tissue Collection

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Recover all tissue specimens from accident site. Obtain body tissue samples at medical facility.

1. Surgical gloves and masks
2. Plastic bags, self-sealing (various sizes)
3. Surgical scissors
4. Forceps
5. Scalpel and blades
6. Plastic bottles
7. Tongue depressors
8. Pathological material forms (SF 543)

AIRCRAFT ACCIDENT BOARD

In accordance with AR 385-10 a flight surgeon is required to be a member of an aircraft accident investigation board for:

1. All Class A and B aircraft accidents.
2. For Class C accidents when injuries are sustained or psychological, physiological, or pathological factors are present.

If an Army Flight surgeon is not available a Navy or Air Force flight surgeon may be appointed. If a flight surgeon is not available, any DOD physician may be appointed.

The responsibilities and duties of the flight surgeon board member include (DA PAM 385-40):

1. Assisting in the medical, physiological, and psychological aspects of the human factors portion of the investigation.
2. Conducting the accident survival, emergency egress, and survival/rescue portion of the investigation.
3. Making a thorough investigation of the fatal and nonfatal injuries sustained to determine their causes and to recommend ways of preventing or minimizing recurrence.
4. Correlating the factors causing accident and injury with the safety aspect of aircraft design, restraint system design, personal equipment, and existing operational and safety regulations, practices, and conditions with other board members.
5. Evaluating life support and personal protective equipment which is in any manner implicated in the cause or prevention of injury. Insure that equipment is forwarded with all components to the U.S. Army Aeromedical Research Laboratory (see section on ALSE evaluation).
6. In case of off-post accidents or where local coroners/ medical examiners are involved, promptly recovering the remains for autopsy, specimen collections, records, etc.
7. Completing the human factors requirements for the technical report, to include DA Forms 2397-8,-9,-10 (see Report Requirements section).
8. The flight surgeon is placed on orders and assigned to the accident board for the investigation. While assigned to the board, investigation responsibilities should take precedence over all other duties.

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POST-ACCIDENT FLIGHT SURGEON DUTIES

1. When the call is received, find out:
 - a. Status and number of occupants
 - b. Type of aircraft.
 - c. Location of accident.
 - d. Type of mission, armaments, and weapons onboard.
2. At the crash site:
 - a. Make sure area is safe from armaments, toxins, armed ejection seats etc.
 - b. The first priority is the triage, treatment and evacuation of casualties.
 - c. The wreckage should be disturbed as little as possible in the process of removing personnel.
 - d. Keep your hands in your pockets and just observe for the first walk-through.
 - e. Confirm and declare dead victims. Bodies of deceased personnel should be covered and left where they are for the period required to take photographs or make sketches documenting their posture and relative position. Confirm jurisdiction prior to moving bodies.
 - f. Account for all body parts and personal equipment and mark their exact location.
 - g. Determine and document position of bodies when initially found by crash/rescue.
 - h. Determine and document whether life support equipment was removed or altered (i.e., flight suits cut, helmets removed, restraint harnesses cut).
 - i. Document time of day, weather conditions, and terrain.
 - j. Body fluids from fatalities should not be collected on-the-scene. The autopsy is the proper time to collect toxicology specimens.
 - k. Photograph accident site, wreckage, fatalities, restraint systems, ALSE equipment (see Photography section).
 1. Supervise recovery of bodies and accompany them to medical facility.
 - m. Do not remove personal equipment from the body before, radiographs are taken and the autopsy.
3. At the medical facility:
 - a. Evaluate survivors to include making sure toxicology specimens are collected.
 - b. Secure all flight equipment, medical and dental records for survivors and fatalities.
 - c. Assist radiologist in obtaining full body radiographs with equipment and personal gear.
 - d. Confirm notification of AFMES by USACRC.
 - e. Complete DA Form 3894 – Hospital Report of Death.
 - (1) “Time” is time of death declared by you.
 - (2) Cause of death is your best estimate; this may be changed on the death certificate after autopsy.
4. Later that day:
 - a. Meet with arriving USACRC personnel.
 - b. Meet with arriving pathologist from AFMES. Take him to accident site if possible, prior to conducting autopsy.
 - c. Attend/assist with autopsy. Make careful notes of any damage to flight helmets, boots, flight suits, gloves, and flight vest. Obtain a copy of autopsy report from pathologist.
 - d. Collect all damaged ALSE equipment (helmet, vest etc.) and contact USAARL for shipment to them for further evaluation.

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- e. Sign Death Certificate after autopsy, and ensure body is released to next-of-kin.
- f. USACRC Surgeon is always a good consultant if help is needed.

SURVIVOR – TOXIOLOGY COLLECTION

Toxicology samples will be collected for all Class A, B, and C accidents (AR385-10 Para 15-10d). Specimens should be collected at the local medical facility immediately following the accident. All toxicological examinations will be performed at the Armed Forces Medical Examiner System- Forensic Toxicology Division. Do not perform test locally. Instructions on web site: <http://www.afmes.mil>.

AFMES requests that the following specimens be collected:

SERUM:	5-10 ML (No preservative, RED TOP)
BLOOD:	14-20 ML (NaF, GREY TOP)
	14-20 ML (EDTA, PURPLE TOP)
URINE:	70 ML is optimal (No preservatives)

NOTE: Carbon Monoxide analysis requires blood to be collected in a PURPLE TOP tube.

As a practical guide, collect from each of the involved aircrew:

2 red tops	2 grey tops
2 purple tops	70-100 ml urine

Prepare skin with betadine or soap and water. Do not use alcohol.

The above specimen should be collected by chain-of-custody conditions IAW AR 600-85, from the moment they leave the crewmembers body to the time of their delivery at AFMES, they should be secured. DD Form 1323. Toxicological Exam – Request and Report will be completed and sent with specimens. <http://www.afmes.mil>

AFMES routinely screens for

Amphetamines	Antihistamines
Barbiturates	Antidepressants
Cocaine	Phencyclidine
Ethanol	Cannabinoids
Carbon Monoxide	Benzodiazepines
Nicotine	Phenothiazines
Salicylates	Narcotic Analgesics
Acetaminophen	NSAID's
Sympathomimetic Amine	Diuretics
Neuroleptics	Morphine

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Even with the large number of tests completed, substances are still missed because of their short half-life, limited tissue distribution, etc. If there is a specific drug that you would like tested for, specify that on the DD Form 1323, and call AFMES to discuss your request.

Label the tubes with the name and social security number of the individual. Wrap tubes in sufficient absorbent material to contain any leakage and place them in individual polyethylene bags. A larger, heat-sealed polyethylene bag is then used to keep all specimens from one individual together. The blood and urine are then packed, unfrozen, in a shipping container of sturdy cardboard, plastic or metal construction and sent by the fastest means possible to the AFMES, such as FEDEX, US Express/Priority Mail, or US Second-day Mail. Packages must be shipped so they arrive at AFMES Mon-Fri. Weekend deliveries are not accepted (See Appendix A for packing and shipping materials and detailed instructions). Registered mail and/or "Return Receipt Requested" are not recommended and could delay shipment. Each individual sample must include an AFMES form 1323.

The following information should be placed on the outside wrapper of all shipments:

Division of Forensic Toxicology
Armed Forces Medical Examiner System
Building 115 Purple Heart Drive
Dover AFB, DE 19902

A copy of all toxicology results are sent directly to the USACRC to be placed in the accident report. A second copy is usually sent to the facility where the specimens were collected.

AUTOPSY

AR 40-21 requires an autopsy be performed on all fatally injured Army air crewmembers. Whenever possible: AFMES will conduct the autopsy. The flight surgeon assigned to the accident board should assist the pathologist and be prepared to obtain the required aeromedical information.

The flight surgeon plays a critical role in jurisdiction issues. The Army has exclusive jurisdiction only when the accident occurs on property under exclusive federal control. In this case, the Armed Forces Medical Examiner (AFME) has the authority to order the autopsy. However, most accidents involve concurrent jurisdiction. For this reason, the flight surgeon must establish a good working relationship (prior to the accident) with the local coroner or medical examiner.

If the jurisdiction is concurrent or exclusively civilian, then the coroner or medical examiner may:

1. Retain jurisdiction and perform the autopsy;
2. Retain jurisdiction and request that a representative of the Armed Forces Medical Examiner (AFME) perform the autopsy under his jurisdiction;
3. Waive jurisdiction to the Army, in which case the AFME will order the autopsy;

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4. Retain jurisdiction and not perform the autopsy. He will release the body to the next-of-kin, who may authorize the autopsy by a military pathologist.

When a fatal aircraft accident occurs, the USACRC immediately requests assistance from AFMES. Whenever possible, AFMES will conduct autopsies on these fatalities, however, they will not launch a team until jurisdiction is determined. If possible, prior to the autopsy AFMES will visit the accident site in an effort to correlate injury patterns, aircraft surfaces, and damage. Prior to departure they will provide the flight surgeon with a written autopsy protocol that includes a statement of injuries and evidence for identification. A finalized report is sent directly to the U.S. Army USACRC to be included in the accident report.

The objectives of the autopsy are:

1. Identify the dead.
2. Identify the cause of death.
3. Identify the manner of death.
4. Identify the nature and sequence of traumatic events.
5. Identify specific interactions between the victim, the aircraft structure, or components resulting in the sustained injuries.
6. Estimate crash survivability.
7. Identify post impact injuries and attributable causes.
8. Determine who was in control.
9. Identify physiological or medical cause factors.

Based on autopsy results, the flight surgeon must determine if any modifications of the aircraft or its equipment would have improved chances of survival for those killed, or reduced the severity of injury to the survivors.

Positive identification of victims requires comparison of pre and postmortem fingerprints, footprints, dental records; or DNA typing. Presumptive identification includes visual (marks, tattoos, etc.), personal effects, I.D. tags, physical characteristics, radiography and flight manifest.

If body parts are found late in the investigation, the flight surgeon should take possession of them and call AFMES to determine if they are of use in the investigation. If they are, AFMES will direct what to do. If they are not, it is the flight surgeons responsibility to insure that they are disposed of properly at the nearest military medical facility pathology department. Following completion of the autopsy, the prompt release of remains to the next-of-kin is extremely important.

HANDLING OF FATALITIES WITHOUT AFMES

It is unlikely but possible that AFMES will be unavailable to provide on-site assistance for a fatal accident. Should this occur, the flight surgeon should use the following guide in coordination with the local medical examiner or pathologist to collect as much useful data as possible to send to AFMES. If possible, phone AFMES for further guidance (302) 346-8648.

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Collection: Prompt collection of body tissue is essential so that it may be protected from contamination, physical and chemical change, and preserved in a fresh state as possible. Before collecting the specimens, however, the flight surgeon must insure that the body, or fragments thereof, are properly identified and must rule out commingling of tissues if more than one fatality is involved. If this cannot be insured, specimens must be submitted as commingled remains. Body fluids should not be collected on site by percutaneous puncture. You can't tell what you are hitting. You may contaminate blood with gastric contents or urine with blood, and the specimens are much easier to obtain at autopsy. If no fluids or organs can be recovered, several hundred grams each of muscle, fat, and red bone marrow can be submitted for most determinations, including carbon monoxide. In severe crash injuries, the gallbladder will often remain intact, permitting bile collection. Remember that even in the most severely fragmented cases, valuable information can often be obtained from only a few milligrams of blood or tissue. If in doubt, submit as much tissue as practical. The following tissue and fluid samples are recommended.

Blood	50-100 ml
Urine	100 ml (no preservatives)
Bile:	All available
Vitreous	All available
Liver:	100gm
Brain:	100-200 gm
Kidney	50 gm
Lung	50 gm
Stomach Contents	50 ml
Skeletal Muscle	200-300 gm
Fat	200 gm

Package and Preservation: Each specimen should be individually packaged and heat-sealed in sturdy polyethylene bags. Cellophane laminated plastic bags must not be used for frozen specimens as they will become brittle, crack, and come apart when placed in dry ice for 24 hours or longer. Fluids should be placed in tightly closed, preferably screw cap polyethylene containers. All of these primary containers are to be labeled with the name and social security number of the individual, the type of specimen, date, name of submitting facility, and flight surgeons' name. Avoid contamination of the specimens with solvents, which may be found in some inks, formalin or formalinized tissue, alcohol, disinfectants, or deodorants. Make sure that each tissue is individually packaged, since drug distribution studies of different organs are often useful in determining time of ingestion of any drugs. Chemical preservation, such as with formalin, embalming fluids, etc., causes interference to such an extent as to render the tissue nearly useless and the interpretation of results sent to impossible. FREEZING is the method of choice in preserving the tissue; dry ice being extremely effective in the endeavor. It is important that a properly filled out AFMES Form 1323 (Toxicological Examination – Request and Report) is submitted with each accident fatality. In addition, DD Form 1322 (Aircraft Accident Autopsy Report) or SF 503 (Autopsy Protocol) should be sent. Information on the victim's health status, and brief summary of the accident to include a site description and the condition of the body when recovered, should be enclosed. Forward this along with any other relevant paperwork (in its own polyethylene bag) to AFMES.

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Shipment: All primary containers should be wrapped with sufficient absorbent material to contain any leakage and then placed in a secondary container (a polyethylene plastic bag) and again heat-sealed. A third, large polyethylene bag may now be used to keep all the specimens from one individual together. (See Appendix A for packing/shipping materials). The frozen tissue and body fluids must now be packed in an insulated shipping container large enough to hold the specimens plus a quantity of dry ice approximately 3 times the weight of the specimens. A more precise guide may be found in Appendix. The frozen specimens and dry ice should not be packed in containers that seal to the extent that gas is not permitted to escape; gas pressure within a sealed container presents a potential hazard and could cause the container to burst. Dry ice must not be placed in thermos bottle. The shipment **MUST** be made by overnight mail. This is the only method rapid enough to deliver the specimen to AFMES as quickly as is necessary to preserve them in their frozen state. It is extremely important to pack the specimens with the utmost care in sturdy containers, properly labeled, to include the proper paperwork. Addressing the Shipment: The following information should be placed on the outside wrapper of all shipments

Contributor's Address

Division of Forensic Toxicology
Armed Forces Medical Examiner System
Building 115 Purple Heart Drive
Dover AFB, DE 19902
RUSH – FRAGILE
Aircraft Accident
Clinical/Diagnostic Specimens Enclosed
Shipment Complies with US Domestic and IATA international packaging regulation
Dry Ice will last until (Date)

AFMES Notification:

Telephone Numbers: Tox Div (302) 346-8724 DSN 366-8724
Main Desk (302) 346-8648 DSN 366-8648

Notifying AFMES that specimens are about to be shipped contributes immeasurably to expeditious handling of the shipment. The message and/or telephone call should include the following information:

1. Aircraft Accident Material
2. Patient's name, rank, social security number
3. Method of shipment (Air Express/Air Freight)
4. Name of area airport to receive shipment
5. Name of airline
6. Flight number
7. GBL/Airbill number
8. Contributor's name
9. Departure Time and date

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10. Arrival Time and date
11. Brief description of contents
12. Chain of Custody, if required
13. Other information

CRASH SURVIVAL (CREEP FACTORS)

1. Tolerable deceleration forces;
2. Maintaining sufficient volume of occupiable space;
3. Non-lethal post crash environment;
4. Time to definitive medical care

Using known velocities, stopping distances, ground and airframe deformation, etc., the deceleration forces on an aircraft can be calculated. These figures should then be viewed from the perspective of aircrew survival. However, the G-forces imposed on the airframe may have only limited similarity to the forces imposed on crewmembers. The CREEP concept provides an easy way to organize all the aspects that go into crash survival.

C – Container

R – Restraint

E – Environment

E – Energy Absorption

P – Post-crash Factors

Container – In order for a crash to be survivable the aircraft structure must maintain integrity and preserve an adequate volume of living space and prevent penetration by objects throughout the crash sequence. Modern helicopter design provides reasonably good protection when the helicopter remains upright. However, due to the lightness of the cockpit/cabin overhead structure, the helicopter generally provides little protection during rollover accidents.

Restraint – It is critical for impact survival that occupants and contents be securely restrained. Failure of the restraint system results in a much higher probability of injury. Loose items may become missiles on impact causing injuries; and possibly hampering rapid egress.

Environment – Even when properly restrained, injuries may result through contact with various surfaces/objects in the aircraft.

Energy Absorption – To prevent injury during a crash, the airframe and seat must attenuate the crash forces transmitted to the occupants. This may be accomplished through the use of energy absorbing materials and designs located between the occupants and the point of impact.

Post Crash Factors – Post crash fire, toxic fumes, poor communications, remote location, and inadequate training can adversely affect survival. A delay in rescue and time to definitive medical care can result in major injuries becoming fatal injuries.

IMPACT TOLERANCE LIMITS

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1. Survivable Accident – An accident in which the impact conditions are within human tolerances, and crew and passenger occupiable space remains reasonably uncompromised. In addition, post crash factors must be such that successful egress is possible.

2. Human tolerance to abrupt acceleration depends mainly on:

- a. Magnitude of the accelerating force;
- b. Duration of the accelerating force;
- c. Rate of onset of the accelerating force;
- d. Direction in which the acceleration force is applied to the body;
- e. Manner in which the occupant's body is supported during the acceleration.

3. The following estimates can be used to determine the probability of survival:

- a. Human tolerance limits exceeded by a factor of 2 or more, survival unlikely.
- b. Human tolerance limits exceeded by a factor of 1.5, survival is doubtful.
- c. Human tolerance limits exceeded by a factor of 1.25 or less, survival depends on specific CREEP factors.
- d. If limits are not exceeded, survival expected.

When the crash forces are not clearly in X, Y, or Z axis, extrapolate.

4. Whole body impact tolerance limits (based on 250G/sec. onset rate; using restraint system)

- | | |
|--------------------------------|---------------------------|
| a. -Gx (eyeballs out) | 45 G over 0.1 sec |
| | 25 G over 0.2 sec |
| b. +Gx (eyeballs in) | 45 G over 0.1 sec |
| | 83 G over 0.04 sec |
| c. -Gz (eyeballs up) | 15 G over 0.1 sec |
| d. +Gz (eyeballs down) | 25 G over 0.1 sec |
| e. Gy (eyeballs left or right) | 11.5 to 20 G over 0.1 sec |

5. Deceleration Injuries

- | | |
|----------------------------------|----------------------|
| a. Pulmonary Contusion | 25 G |
| b. Nose fracture | 30 G |
| c. Vertebral body compression | 20-30 G |
| d. Fracture/dislocation of C1/C2 | 20-40 G |
| e. Mandible fracture | 40 G |
| f. Maxilla fracture | 50 G |
| g. Aorta tear | 50 G |
| h. Aorta transection | 80-100 G |
| i. Pelvic fracture | 100-200 G |
| j. Vertebral body transection | 200-300 G |
| k. Total body transection | >350 G |
| l. Concussion | 60 G over 0.02 sec |
| | 100 G over 0.005 sec |

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180 G over 0.002 sec

ALSE EVALUATION

The flight surgeon, IAW AR 40-21 is required to correlate the factors causing the accident and injuries with system design, personal equipment and regulations. This includes evaluation of life support and personal protective equipment which is in any manner implicated in the cause or the prevention of injuries. Any suspect equipment should be sent to the U.S. Army Aeromedical Research Laboratory (USAARL) for further analysis. The U.S. Army Aeromedical Research Laboratory manages the Aviation Life Support Retrieval Program (ALSERP). The purpose of this program is to evaluate and record the efficiency of Aviation Life Support Equipment (ALSE) in the aircraft accident environment. Personal injury data are correlated with the item of ALSE provided for protection, along with information on the accident kinematics and dynamics. These ALSE items are assessed for damage to determine if the design was adequate, if it was manufactured to design, and/or if it was properly worn by the crewmember. The data is further used to identify design deficiencies and to substantiate the need for system improvements. The ALSE which may be sent to USAARL includes: helmets, seats, restraint systems, inertia reels, survival vests and flight suits. The unit will be provided a receipt for property book upon arrival at USAARL. (DA PAM 385-40).

Send all equipment requiring further evaluation to:

U.S. Army Aeromedical Research Laboratory
ATTN: ALSERP
BLDG 6901 Farrell Road
Fort Rucker, AL 36362

Notify USAARL prior to shipping (DSN 558-6920/6960; COMM (334) 255-6920/6960) or to answer any questions regarding ALSE damage and assistance with restraint/seats and survivability issues..

WITNESS INTERVIEWS (DA PAM385-40)

The board president will usually conduct all witness interviews. Unless the individual objects, all interviews are recorded. It is important for the flight surgeon to be present during the interviews in order to obtain all possible information regarding the accident. When the board president completes his interview, other board members will be given the opportunity to ask specific questions of the witness.

In all accidents, witnesses will be advised that the sole purpose of the investigation is accident prevention. This means that, within the Army, their statement may not be used as evidence to obtain evidence in connection with any legal, disciplinary or adverse administrative action. Their statements cannot be used by the Army against them or anyone else.

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The flight surgeon will conduct/assist with interviews of witnesses injured and hospitalized because of their involvement in the accident. Under these circumstances, there are several items to consider:

1. The medical facility admitting and treating the injured survivors is responsible for their well being. Therefore, interviews of inpatients will be coordinated with the medical facility and attending physician so as not to conflict with medical needs.
2. Timeliness, though desired, is not an overriding requirement. The nature and degree of injuries may require subsequent evacuation of a key witness to another medical facility far removed from where the board is conducting its investigation. If this occurs prior to the interview, it may be necessary for the flight surgeon board member to conduct the interview at the other facility later. If this is not feasible, then it may be necessary to contact a flight surgeon or other DOD physician near the other medical facility to act as a proxy interviewer for the board.
3. In a hospital setting, it is better to prepare questions in advance. They should be tailored to obtain responses essential to the investigation. In cases where the person being interviewed is giving testimony while under the influence of medications, it is the flight surgeon's responsibility to qualify the credibility of information obtained under these circumstances. Two or three short interviews may be more beneficial and have less negative emotional effect than one lengthy session. In all cases, the well being of the witness is paramount at all times and will govern the conduct of the interview.

It is not unusual for a survivor of an accident to be unable to recall details of the accident that would be useful to the board. This condition is often temporary and should never be interpreted as a lack of cooperation. Patience and empathy on the part of the interviewer may eventually result in obtaining the desired information, whereas persistence and impatience may not.

PHOTOGRAPHY

1. General Comments:

- a. The main reason for taking photos is to illustrate, record, and verify evidence, especially perishable evidence.
- b. Whenever possible, use an experienced photographer and supervise him.
- c. Chronologically number and identify all pictures as they are taken, noting the location where they were taken from.
- d. You can never take too many pictures.
- e. The board president should own and maintain all photos.
- f. Always take a flash unit to the site for fill-in flash and night photography.
- g. If night photography is used, repeat shots the following day if possible.
- h. Use known objects in the scene as size references whenever possible. In overall scenes, the presence of a person may be sufficient, in close-up photos a hand or portion of a ruler may work best.

2. Scene coverage (Ground):

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- a. Show enough of the scene to provide good orientation. Several pictures while moving 360° around the aircraft should be taken.
 - b. If there is a fire, pictures taken during the event are often useful.
 - c. Trees, obstacles, ground strikes prior to final impact.
 - d. Bodies, ALSE (multiple views) in position prior to moving.
 - e. Photograph large body part specimens both close-up and in relation to the majority of the wreckage or accident scene.
 - f. Close-up of tissue/blood found on aircraft structures or at accident scene prior to removal.
 - g. Detailed views of specific components: cockpit, switches, gauges, circuit breakers, flight controls, equipment with curious damage, seats, restraint systems, inertia reels.
 - h. The most charred or burned area.
3. Scene coverage (Aerial):
- a. Overall area
 - b. Views of flight path – consider using video camera at same time of day
 - c. Note the altitude of the aircraft and type of lens for each photo.
4. Survivor coverage:
- a. Multiple views of flight equipment with close-up damage.
 - b. Appropriate views of injuries.
6. Autopsy coverage:
- a. Photos will be done by AFMES or medical photographer
 - b. Total body photographs from all direction prior to removing flight equipment.
 - c. Close-up views of damage to flight equipment and associated injuries (with and without a ruler).
 - d. Total nude body photographs from all directions.
 - e. Close-ups of all wounds, anomalies and other findings.
 - f. Other views as indicated.
 - g. Photocopies of each exposed radiograph.
 - h. Autopsy photographs are considered privileged and will be maintained by the flight surgeon board member until returned to the USACRC for review by the USACRC Surgeon and destruction of pictures.

REPORT REQUIREMENTS (FORMS)

As a member of the accident investigation board, the flight surgeon is responsible for providing substantiating data and/or completing several of the DA Forms 2397 series technical reports. This report provides guidance in conducting the investigation, assures minimal collected information, and the standard format improves ease of analysis. Detailed information regarding completion of each of these forms can be found in DA Pam 385-40. The Aircraft Accident Worksheet (Appendix D) should be utilized to ensure all necessary information is collected.

1. DA Form 2397-3 (Narrative) – For each of the following section the flight surgeon with the board recorder will write a brief human factors narrative:

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- a. Personnel background information (for each crew member) – describe:
 - (1) Currency of flight physical
 - (2) Waivers and other irregularities in medical history that may be relevant.
 - (3) Professional reputation in unit, opinions of peers, subordinates, and others who have flown with them.
 - (4) Social habits, financial and marital well-being, sleep and dietary habits, use of nicotine and alcohol.
 - (5) Use of medication (prescribed or self-medication) and supplements, to include type, dose, and possible effect on performance.
 - (6) Unit crew rest policy and compliance.
 - (6) Summary of the post accident medical examination to include a brief description of injuries and how they occurred.
 - b. Aircraft suitability. Describe suitability to perform mission (IP usually responsible).
 - c. Communications/Air Traffic Services- Describe evidence relating to
 - (1) Communication equipment
 - (2) Communication that occurred or failed to occur among the crew, between crew and passengers, and between crew and outside services.
 - (3) Consider, language difficulty, clarity of spoken words and precision of instruction.
 - d. Meteorological information. Describe weather conditions that existed at the time of accident.
 - e. Navigation Aids. Describe adequacy of navigation aids. (usually IP).
 - f. Ground support services.
 - g. Crash survival – describe:
 - (1) Crashworthiness of the aircraft in terms of crash sequence, impact conditions, kinematics, and crash impact forces.
 - (2) Performance of the restraint system and the adequacy of the aircraft structure to maintain occupiable space extenuate crash forces.
 - (3) Occupant injury in relation to crashworthiness.
 - (4) If injuries occurred during or after the crash sequence, explain.
 - (5) The performance of personal protective equipment (helmet, visor, clothing, etc.).
 - c. Emergency Egress, Survival, and Rescue – describe:
 - (1) Details of egress, survival and rescue investigation.
 - (2) Where individuals were located in aircraft, how and where they exited aircraft, difficulties encountered, and position of aircraft at time of egress.
 - (3) Factors that may have enhanced or inhibited the success of the survival/rescue situation.
 - (4) When and how rescue personnel were notified, how long it took rescue personnel to respond to the initial notification, arrive at the accident site, and evacuate the survivors.
 - (5) Problems associated with delays in rescue.
2. **DA Form 2397-8** – The flight surgeon is responsible for obtaining the following information for all crewmembers involved in the accident:
- a. Hours slept over last 24, 48, 72 hours
 - b. Hours awake prior to the accident

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- c. Duration of last sleep period
- d. Hours worked over last 24, 48, 72 hours
- e. Height, weight and age
- f. Date of last physical and waivers, if any
- g. Date of post accident medical examination
- h. Whether or not required lab tests were completed (results will be annotated by the USACRC)

3. **DA Form 2397-9** (Injury Data) - This form will be completed by the flight surgeon for all individuals involved in the accident who sustain an injury. The following information will be recorded:

- a. All injuries ranked by severity, from most too least severe.
- b. The suspected cause of each injury.
- c. Injury cost.
- d. Cause of death based on autopsy report for fatalities.

4. **DA Form 2397-10** (Protective Equipment/Escape/Survival/ Rescue Data) – This form will be completed by the flight surgeon for all individuals on board the accident aircraft. The following information will be recorded:

- a. Use of protective/restraint/survival equipment, relationship to injuries and damage codes.
- b. Methods and difficulties of egress.
- c. Detailed time sequence for response of rescue personnel.
- d. Problems associated with survival and rescue.
- e. Factors that helped survival and rescue.

INVESTIGATION TIPS

1. Review and update your pre-accident plan periodically.
2. Most of the evidence as to the cause of the accident is available on the first day and deteriorate with time. Do not delay the start of an investigation due to poor weather conditions.
3. Avoid taking a scrap of information and attaching a theory to it.
4. Learn as much as possible from the wreckage at the crash site before moving anything.
5. Don't rely on your memory. Make notes and use a tape recorder.
6. Don't take shortcuts; you may unknowingly destroy evidence.
7. Obtain rescue response and ambulance run sheets from EMS/TOC logs if available.
8. Inquire about documentation of any medication, OTC, supplements or medical devices at the deceased place of residence. (CID, Mortuary affairs).

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9. Avoid preconceived ideas. This results in a search for evidence to support the preconceived assumption and overlooking other evidence that may lead in a different direction. Keep an open mind.
10. Don't look for just one cause; there are usually several.
11. Do not wash, clean or brush off dirty items before examination.
12. Do not touch settings on control dials, switches or anything that can be changed. Record and photograph them. You can never take too many pictures.
13. Don't hesitate to call the USACRC Surgeon with questions.

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APPENDIX A
PATHOLOGY SHIPMENT CONTAINERS

FEDERAL STOCK ITEMS SUGGESTED FOR USE

Bag, Polyethylene, Flat Heat Seal Closure

8105-00-579-9286	3 x 5 inches
8105-00-680-0503	4 x 6 inches
8105-00-702-7177	5 x 12 inches
8105-00-579-9285	6 x 7 inches
8105-00-702-7178	18 x 48 inches
8105-00-299-8532	20 x 40 inches
8105-00-200-0195	24 x 24 inches

Box, Plastic, Insulated, Meat, Dairy Products and Laboratory Samples

8115-00-682-6525

Corrugated Mailing Carton for Above Box (8115-00-682-6525)

8115-00-183-9490

Box, Pathological, Shipping, Insulated

8115-00-226-1199	2 cu. Ft.
8115-00-965-2300	5 cu. Ft.

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TIMETABLE FOR FROZEN SPECIMENS

This table has been prepared to provide guidance for personnel in preparing fresh tissue specimens being shipped for use in toxicological studies. This table is, however, just a guideline; it is not meant to be absolute. It is the responsibility of the shipper to pack the specimens in such a manner so as to maintain their frozen state until arrival at AFMES.

Outside Temperature	# Hours in Transit	Weight of Specimen	Amount of Dry Ice
Below 50° F	72	2 lbs	5 lbs
	48	3 lbs	4 lbs
	24	4 lbs	3 lbs
50° - 80° F	72	2 lbs	5 lbs
	48	3 lbs	4 lbs
	24	3 lbs	4 lbs
80° - 100° F	72	1 lb	6 lbs
	48	2 lbs	5 lbs
	24	3 lbs	4 lbs
Outside Temperature	# Hours in Transit	Weight of Specimen	Amount of Dry Ice
Over 100° F	(Note recommended for shipments requiring more than 48 hours)		
	48	1 lb	6 lbs
	24	2 lbs	5 lbs

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APPENDIX C **POSITIVE TOXICOLOGY RESULTS – INTERPRETATION**

Carbon Monoxide

Tobacco smoking causes increased exposure to carbon monoxide (CO). Carboxyhemoglobin (COHb) levels in nonsmokers range from 0 to 1%. A two-pack-a-day smoker will have an 8% to 9% COHb level. Increased COHb due to smoking reduces inspired oxygen tension. The adverse impact of carboxyhemoglobinemia increases with altitude. Prior to the flight, the one-pack-a-day smoker is already functioning at an altitude of 4,000 feet.

For purposes of aviation pathology, CO levels in the blood are considered normal if <3% for non smokers and <10% for smokers. Levels above these values indicate that the individual was exposed to the products of combustion, either before or after the mishap. If CO is elevated and the crewmember sustained instantaneous fatal injury, most likely there was an in-flight fire or other source of CO prior to impact. For survivors, exposure to a post crash fire will increase CO levels; if no post crash fire, then elevated levels are usually due to in-flight exposure.

Lactic Acid

Values over 200 mg/100 gm are considered to be indicative of central nervous system hypoxia. This may be due to high altitude exposure, to low oxygen tension, reduced oxygen supply, prolonged shock, or traumatic injuries, which impair adequate oxygenation or blood circulation in the CNS. However, non-elevated levels do not rule out hypoxia as a cause of the mishap.

Ethanol

The significance of detectable levels of alcohol (ethanol) in the blood or urine of survivors is usually clear. However, post-mortem specimens raise the question: Is it real or post mortem artifact due to decomposition. Alcohol is analyzed at AFMES by gas chromatography which is the standard for volatile analysis. Due to the frequent lack of residual blood and urine. AFMES uses tissue homogenate extracts from various organs. Frequently the tissues are in an advanced stage of decomposition, resulting in the presence of volatiles, including ethanol.

The assessment of ethanol in putrefactive tissues depends on many factors:

1. The condition of the tissues;
2. The presence of several tissues;
3. The distribution in several tissues;
4. The 72 hours history and witness statements;
5. The Flight Surgeon's direct input.

Alcohol concentrations due to bacteria have been reported up to 200 mg/dl or 0.2. The presence of other alcohols such as propanol is a good indicator for decomposition. Also, the presence of

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acetaldehyde with ethanol is considered good evidence of postmortem alcohol production. If alcohol is found in urine or vitreous obtained postmortem, the ingestion of alcohol before death is strongly suggested.

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APPENDIX D
AIRCRAFT ACCIDENT WORKSHEET

NAME: _____ GRADE: _____ SSN _____
DUTY DURING MISHAP: _____ UNIT _____
LOCAL ADDRESS: _____ UNIT PHONE: _____
_____ HOME PHONE _____
DATE OF MOST RECENT FLIGHT THIS SERIES (PRIOR TO MISHAP) _____
DURATION OF MOST RECENT FLIGHT: _____
IF RATED AVIATOR, GIVE DATE OF LAST STANDARDIZATION FLIGHT, THIS
SERIES: _____ AND DATE GRADUATED FOR IERW: _____
IF IERW STUDENT, GIVE CURRENT LEVEL OF TRAINING: _____
AND ANTICIPATED GRADUATION DATE FROM IERW: _____

<u>HOURS FLOWN ON:</u>	<u>CUM HOURS</u>
DAY OF MISHAP: _____	_____
DAY PROR TO MISHAP: _____	_____
2 DAYS PRIOR TO MISHAP: _____	_____
3 DAYS PRIOR TO MISHAP: _____	_____

<u>HOURS WORKED ON:</u>	<u>CUM HOURS</u>
(HOURS WORKED FROM ARRIVAL TO DEPARTURE FOR DUTY SECTION)	
DAY OF MISHAP: _____	_____
DAY PROR TO MISHAP: _____	_____
2 DAYS PRIOR TO MISHAP: _____	_____
3 DAYS PRIOR TO MISHAP: _____	_____

<u>HOURS SLEPT (DURING 24 HOUR PERIOD OF):</u>	<u>CUM HOURS</u>
DAY OF MISHAP: _____	_____
DAY PROR TO MISHAP: _____	_____
2 DAYS PRIOR TO MISHAP: _____	_____
3 DAYS PRIOR TO MISHAP: _____	_____

HOURS CONTINUOUSLY AWAKE PRIOR TO MISHAP: _____
TOTAL TIME IN COCKPIT PRIOR TO MISHAP: _____
DUTY HOURS REMAINING, HAD MISHAP NOT OCCURRED: _____
YOUR CREWMEMBER LOCATION AT TIME OF MISHAP: _____
DID YUR SHOULDER HARNESS INERTIAL REEL LOCK
AUTOMATICALLY: _____
YOUR ORDER OF EGRESS/EXIT AFTER THE MISHAP: _____
TOTAL FLYING HOURS: _____ COMBAT FLYING HOURS _____
INSTRUMENT QUALIFICATION: YES/NO WHEN QUALIFIED: _____

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DATE LAST LEAVE ENDED: _____ TYPE OF LEAVE: _____
 NUMBER OF DAYS OF LEAVE TAKEN _____
 DATE OF LAST FLIGHT PHYSICAL: _____ HT _____ WT _____
 BIRTH DATE: _____ AGE, SEX: MALE/FEMALE _____ RACE: _____
 SMOKING HISTORY (HOW MANY PACKS PER DAY FOR HOW MANY YEARS): _____
 LIST OF MEDICAL WAIVERS: _____
 HIGHEST DEGREE ACHIEVED ACADEMICALLY: _____

GIVE DATE, CLASS OF MISHAP, AND TYPE OF AIRCRAFT IF YOU HAVE BEEN PREVIOUSLY INVOLVED IN AN AIRCRAFT MISHAP:

DATE	CLASS OF MISHAP	TYPE OF AIRCRAFT
_____	_____	_____
_____	_____	_____
_____	_____	_____

THE FOLLOWING QUESTIONS PERTAIN TO THE EQUIPMENT WORN AT THE TIME OF THIS MISHAP:

TYPE OF HELMET: _____ VISOR: UP/DOWN VISOR: TINTED/UNTINTED
 GLASSES: REQUIRED/NOT REQUIRED GLASSES: TINTED/UNTINTED
 EAR PLUGS WORN: YES/NO

FOR EACH OF THE FOLLOWING ITEMS OF EQUIPMENT, PLEASE ANNOTATE “Y” FOR YES, “N” FOR NO, OR “N/A” FOR NOT APPLICABLE IN EACH OF THREE COLUMNS BELOW WHICH INDICATE: (1) WAS THE ITEM “REQUIRED” FOR THIS MISSION, (2) WAS THE ITEM “AVAILABLE” DURING THE MISSION, AND (3) WAS THE ITEM “USED” DURING THE MISSION.

	<u>REQUIRED</u>	<u>NEEDED</u>	<u>AVAILABLE</u>	<u>USED</u>
1. HELMET	_____	_____	_____	_____
2. VISOR	_____	_____	_____	_____
3. GLASSES	_____	_____	_____	_____
4. FLIGHT SUIT	_____	_____	_____	_____
5. FLIGHT GLOVES	_____	_____	_____	_____
6. FLIGHT JACKET	_____	_____	_____	_____
7. COMBAT BOOTS	_____	_____	_____	_____
8. LAP BELT	_____	_____	_____	_____
9. SHOULDER HARNESS	_____	_____	_____	_____
10. INERTIAL REEL	_____	_____	_____	_____
11. SURVIVAL REEL	_____	_____	_____	_____
12. ELM	_____	_____	_____	_____

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FOR ANY OF THE ITEMS #1 THROUGH #12 LISTED ABOVE, DID YOU THINK THAT IT FAILED TO PREVENT THE INJURY FOR IT WAS DESIGNED? IN ANSWERING THIS QUESTION, PLEASE INDICATE THE ITEM NUMBER AND HOW IT FAILED TO PERFORM TO YOUR EXPECTED STANDARDS: (CONTINUE ON BACK IF NEEDED)

DESCRIBE THE SIGNIFICANT EVENTS WHICH IN YOUR OPINION LED TO THE MISHAP, DESCRIBE THE ACTUAL MISHAP, AND DESCRIBE THE EGRESS AND EVENTS AFTER THE MISHAP: (CONTINUE ON BACK IF NECESSARY):

PRE-MISHAP EVENTS: _____

MISHAP EVENTS: _____

POST-MISHAP EVENTS: _____

CHRONOLOGICAL ACCOUNT OF YOUR ACTIVITIES DURING THE 72 HOURS TIME FRAME PRIOR TO THE MISHAP, IN AS MUCH DETAIL AS POSSIBLE LIST ALL ACTIVITIES TO INCLUDE: TIME OF WAKE-UP, TIME OF MEALS, CONTENT OF MEALS, TIME OF DAILY ACTIVITIES (WORK/RELAXATION). IF YOUR WERE AT A LOCATION OUTSIDE OF FT. RUCKER (i.e., PANAMA CITY, FLORIDA) PLEASE INDICATE.

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AN EXAMPLE OF A DAY (24 HOUR PERIOD) WOULD BE AS FOLLOWS:

10 MAY 1991: 0500: WAKUP; 0600: PT; 0700 BREAKFAST CONSISTING OF OATMEAL, CEREAL, ORANGE JUICE, TOAST, AND BACON; 0745 DUTY DAY BEGAN WITH PLANNING OF AM FLIGHT; 0900-1130: DAY VFR FLIGHT; 1200-1300 DEBRIEF; 1300-1400: LUNCH CONSISTING OF CHICKEN NODDLE SOUP, CRACKERS, AND SALAD; 1400-1630; ACADEMICS; 1630: DUTY DAY ENDS; 1700-2000: STUDIED SYLLABUS FOR NEXT DAY; 2000-2100: DINNER CONSISTING OF PIZZA, COCA-COLA, AND ICE CREAM; 2100-2200: WATCHED TV; 2200-0500: ASLEEP.

DAY OF MISHAP

DAY PRIOR TO MISHAP

2 DAYS PRIOR TO MISHAP

3 DAYS PRIOR TO MISHAP

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ADDITIONAL NOTES:

1. PERCEIVED STRESSES: (CAREER, FINANCIAL, MARITAL, ETC.)

2. MEAL PATTERN (EATS 3-4 MEALS A DAY, THE HOURS ARE REGULAR/IRREGULAR, PREFERS FAST FOODS/PREPARED FOODS, ETC)

3. MARITAL STATUS (SINGLE/MARRIED/DIVORCED) (CHILDREN)

4. PT PROGRAM (DESCRIBE IN TERMS OF TYPE, DURATION, AND FREQUENCY OF EXERCISE).

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5. PERSONNEL EVACUATION/ESCAPE

- a. Method of escape:
- b. Your location in aircraft:
- c. Exit attempted:
- d. Exit used:
- e. Aircraft attitude:
- f. Cockpit/Cabin conditions:
- g. Escape difficulties:

6. LAPSED TIME FOR RESCUE

ACTION	HOURS OF DAY	LAPSED TIME
a. Notification of Rescue Personnel:	_____	_____
b. Individual Physically Reached:	_____	_____
c. Individual Placed Aboard Rescue Veh:	_____	_____
d. Rescue Completed/Abandoned:	_____	_____

7. DISTANCE FROM ACCIDENT TO ACTUAL RESCUE AT TIME OF ACCIDENT

- a. To aircraft in nautical miles:
- b. To ground vehicle in statue miles:

8. PERSONNEL SURVIVAL/RESCUE

- a. Survival problems encountered
- b. Means used to locate individual
- c. Rescue equipment used
- d. Factors that helped rescue
- e. Factors complicating rescue
- f. Individual physical condition
- g. Vehicles actually performing evacuation
- h. Other vehicles assisting in rescue

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CREWMEMBER SECTION

1. **AEROMEDICAL**

Any grounding in last 30 days?
Any illness/injury in last 30 days?
Any profiles?
Corrective Lenses (reg/worn)?
Any previous head injury?
Any medications last 30 days?
Any dental work last 30 days?

2. **SOCIAL HISTORY**

Are you married or single?
Any marital problems?
Do you live with your wife?
Where do you live?
Time at present post?
Name of best friend?
How much do you smoke?
How much do you drink?
Do you use chewing tobacco/snuff?

3. **NUTRITION**

Time of last meal?
Adequate fluid intake?
Are you presently dieting?
Recent weight loss?
Recent weight gain?
Recent loss of appetite?

4. **FATIGUE**

Have you been subjected to any stress recently, such as death or illness in the family?
Do you feel that fatigue was a possible factor in this accident?
Do you feel the Command is addressing the problem of fatigue adequately?

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KEY TELEPHONE NUMBERS

AFMES: <http://www.afmes.mil>

Forensic Pathologist	DSN 366-8724	COMM (302) 346-8742
Toxicology	DSN 366-8724	COMM (302) 346-8742

US Army Combat Readiness/USACRC: <https://safety.army.mil>

Emergency Only	DSN 558-3410/2660	COM 334-255-3410-2660
Routine	DSN 558-4510/3490	COM 334-255-4510/3490
Surgeon	DSN 558-2763	COM 334-255-2763

USARRL: <http://www.usaarl.army.mil>

ALSERP POC	DSN 558-6920	COM 334-255-6920
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