BIOLOGICAL, CHEMICAL, AND PHYSICAL HAZARDS

1. INTRODUCTION.

Accident investigators are potentially exposed to many hazards during the process of an investigation and its associated travel. Although the probability of exposure to health hazards during an investigation is moderate to low in most cases, a risk assessment needs to be done to mitigate known hazards. Although there are hundreds of potential exposures of concern, some of the more common hazards are:

a. Chemicals and carbon and/or aramid fiber decomposition byproducts of Chemical Agent Resistant Coating (CARC AMV paint), aircraft paint(s), and composite materials which make up vehicle components

b. Synthetic and petroleum-based hydraulic fluids, fuels, oils and lubricants from engines, transmissions and differentials

c. Acids and heavy metals from batteries (lead, acid, NiCd)

d. Metals such as beryllium, hexavalent chromium, titanium (from airframes and electronics)

e. Physical eye, neck, back and leg stress/ strain from extended travel, awkward positions and lengthy computer monitor use

f. Unexploded ordinance and chemical residue from partially exploded ordinance

g. Bacteria, micro-organisms and viruses from scavenging mammals and birds and their associated insect parasites like fleas, ticks and mites

h. travel associated airborne bacteria, microorganisms, and viruses (i.e. SARS)

Note: *References and website hyperlinks for these and other potential hazards are located at the end of this appendix.*

2. GENERAL.

Board presidents and recorders must assume they are the experts on composite materials and blood borne pathogens safety at a minimum. As such, they must ensure that all board members are adequately protected and that all other personnel involved with the accident scene are advised appropriately.

3. PURPOSE.

To ensure that exposure to airborne and contact health hazards such as composite materials and/or blood borne pathogens does not result in physical harm or illness to investigators. This appendix explains the minimum precautions investigators will take to reduce risks posed by composite materials and blood borne pathogens. Some of the hazards listed in the introduction require additional controls and/or PPE.

4. COMPOSITE MATERIAL SAFETY.

a. Accidents involving composite materials that fragment and/or burn upon impact may pose a significant health threat to investigators. The primary threats are inhalation and dermal exposure to fragmented materials. The aircraft and vehicles that contain a potentially damaging quantity of composite materials include, but are not limited to: UH-1, AH-1, AH-64, CH-47D, OH-58D, RAH-66, UH-60, V-22 HMMWV, M-1 ABRAMS, M-2/M-3 BRADLEY, M-9 ACE, M-109 HOWITZER, M-113 APC

WARNING: *Unless confirmed otherwise, assume the equipment contains composite materials and proceed IAW this Appendix. Print all warnings in red?*

b. RESPONSIBILITIES.

(1) Unit Safety Personnel. Safety personnel must assume that they are the most qualified individuals to evaluate the potential for illness that could be caused by composite materials in all accidents (both air and ground). They must ensure that composite materials will not result in illness to investigators, guards or recovery personnel. Additionally, safety personnel will ensure the following

(a) That a Composite Material Safety Kit is available to all members of an investigation team if protection from composite materials is required.

(b) That coordination is made with the activity incurring the accident so that on-site personnel can properly equip themselves to prevent injury. Guidelines for use of proper equipment are contained below.

(2) Board president. The accident investigation team board president has the overall responsibility to ensure personnel are properly attired and equipped for an investigation involving composite materials. Specifically, he will-

(a) Conduct a specific procedures briefing regarding composite materials. Remind personnel that a U.S. Army Chemical Protective Mask is not authorized PPE for composite material protection. The authorized respiratory protection is a full-face respirator with a dual high efficiency particulate air (HEPA) and organic vapor cartridge.

(b) Ensure only properly equipped board members enter the accident site area. See paragraph S-3c for proper equipment.

(c) Advise the unit regarding the hazards of composite materials to ensure that the recovery team is properly protected to prevent composite material injury or illness.

(3) Board members have the responsibility to ensure they use the appropriate protective equipment when working near fragmented or burned composite materials. See paragraph S-3e to determine the proper equipment.

c. COMPOSITE MATERIAL SAFETY KIT.

Upon the determination that a composite material hazard exists, a Composite Material Safety Kit will be issued. CAI personnel will maintain this equipment on hand to minimize time required for deployment. The minimum essential equipment includes the following:

(1) Two NIOSH approved respirators (full-face, dual filter cartridge) to be used when fire has consumed composite materials or fragmentation exists. The investigator must be fitted-tested for the respirator in accordance with AR 11-34, The Army Respiratory Protection Program, and 29 CFR 1910.134, Respiratory Protection. (As an interim measure safety goggles with side shields will be worn if the investigator was issued a half-face respirator.)

(2) Tyvek® disposable coveralls with hood and booties (two sets for each investigator). These will be used when a fire has involved composite materials or fragmentation exists.

(3) Four sets of leather gloves to be used whenever fire has occurred or fragmentation exists.

(4) Four sets of nitrile gloves to be used as inserts to the leather gloves.

NOTE: *With the exception of the respirators, all equipment must be properly discarded after use to prevent potential subsequent injury.*

d. USE OF COMPOSITE MATERIAL SAFETY KIT.

(1) In evaluating an accident where composite material is involved, consider fire and fragmentation.

(2) If either fire or fragmentation has occurred on any airframe or vehicle known or suspected to contain composite materials, then a Composite Material Safety Kit must be issued.

e. EQUIPMENT USE.

To ensure that all personnel are adequately protected, the following guidelines must be followed:

(1) Burning aircraft or ground vehicles/equipment. Only emergency rescue personnel or fire fighters should be in the immediate vicinity of the accident site during the burning and smoldering phases.

(2) Previously burned composite materials (fire extinguished (no smoldering) or fragmented composite materials). All protective equipment, to include respirators, coveralls, and leather gloves with inserts, will be worn at the accident site.

f. ON-SITE PROCEDURES.

These are procedures designed to minimize the dangers of composite material fragmentation to personnel in the vicinity of the accident site.

(1) Security: The accident site must be cordoned off with a single entry and exit point. All unauthorized personnel must be restricted from the accident site.

(2) Personnel should avoid downwind locations. Remain upwind when approaching and, when possible, while working at the site.

(3) No eating, smoking or drinking at the site.

(4) Fixant. Once the fire has been extinguished, the wreckage cooled, and smoldering has stopped, the composite materials must be sprayed with a fixant. A fixant is similar to an acrylic floor wax, which can be locally purchased or commercially procured. Alternatively, polyacrylic acid (B. F. Goodrich XL-II) can be used. Either product is satisfactory and must be sprayed on the entire area consumed by fire. By doing this, the composite material fragments are held in place.

(5) Prior to shipping composite materials, ensure they are heavily wrapped in plastic, marked as such and cannot present a hazard to others handling the items.

(6) All personnel must shower in cool water as soon as possible after working with burned composite materials.

(7) All equipment (except the respirators) can be discarded as non-hazardous waste material after use (see installation industrial hygienist for correct method of destruction). Respirators will be serviced upon completion of the safety investigation.

5. BLOOD BORNE PATHOGEN SAFETY.

a. PURPOSE.

To provide guidance to personnel investigating accidents which involve the possible exposure to human blood or body fluids. Care must be taken to minimize exposure to blood borne pathogens (BBP).

b. BACKGROUND.

During an accident sequence, blood and body parts may contaminate the equipment and immediate area of the accident scene. Personnel who assist in the recovery of parts or components may unknowingly come into contact with blood soaked items and become infected. Exposure of rescue and investigative personnel to bloodborne diseases have the potential to cause health problems.

c. PROCEDURES.

(1) Complete information regarding OSHA regulations regarding blood borne pathogens are found in OSHA Standard 29 CFR 1910.1030.

(2) Immunizations: All military personnel regardless of MOS should have received Hepatitis A immunization. Any personnel not so immunized should be directed to a military treatment facility (MTF) to receive this immunization. All military personnel with a medical or law enforcement MOS (as well as those deployed to designated areas) should have received Hepatitis B vaccine. OSHA Standard 29 CFR

1910.1030 states that Hepatitis B vaccination will be made available to anyone who may be exposed to BBP; this includes all safety personnel.

(3) Every accident site should initially be treated as a contaminated area. After the immediate stabilization and evacuation of survivors, no one should be allowed into the accident site until it has been cleared of contamination or until personnel are provided the appropriate protection. Removal of bodies or body parts should only be done by qualified and properly equipped medical personnel.

(4) If the accident scene is determined to be contaminated, biohazard signs and placards will be placed, and the area must be roped off with a single entry/exit point and secured to control and prevent unauthorized access. The extent of the contaminated area will be designated by the medical officer and safety officer.

(5) All personnel entering the contaminated area will wear appropriate personal protective equipment (PPE). The safety officer, in conjunction with the medical officer, will determine what PPE will be used. Examples of typical PPE are listed below. Ensure enough protective equipment is available for multiple entries into the area. Once the individual leaves the contaminated area, all equipment, except the respirator (if used) will be properly bagged and disposed of as biological hazard waste. The medical personnel will normally accomplish this; however, means of disposal of biohazard material should be specified in the pre-accident plan.

(6) Only designated personnel will enter the contaminated area, the board president or safety officer will determine who will enter. If manufacturer's representatives are needed, they must receive BBP composite risk briefings, and sign a statement acknowledging and accepting the composite risk.

(7) If ALSE clothing or equipment is to be shipped to a medical laboratory (U.S. Army Aeromedical Research Laboratory {USAARL}) for analysis, do not clean or alter it in any manner. Ensure the articles are properly wrapped in a biohazard bag. If biohazard bags are unavailable, plastic bags (multiple wrap) may be used and must be marked as a biological hazard.

(8) All of the victim's equipment and personal clothing, etc., which is contaminated must be identified and disposed of as a biological hazard waste. Do not dispose of clothing/ equipment until the board has had an opportunity to examine the materials. Personal belongings (rings, watches, etc.) can be returned to family members if and when they can be decontaminated. Military equipment (flight helmets, CTA 50 items) may be returned to the unit if they can be decontaminated. Military equipment will not be released to family members.

(9) Any contaminated wreckage or parts to be shipped for analysis must be decontaminated with a ten percent bleach solution, then wrapped and labeled specifying how decontamination was accomplished. DO NOT use bleach on any parts suspected of having fatigue fractures. These parts will be bagged and labeled as biohazard.

(10) In the event someone believes contamination has occurred, the affected area should be washed for 20 minutes with running water and soap. The person must then report to a military

treatment facility (MTF) or other facility for examination and required testing or treatment. In the case of reserve component (RC) units or personnel, arrangements should be made with supporting active Army (AC) medical facilities, RC medical units, or civilian hospitals, and the appropriate facility named in the pre-accident plan. If the person was cut, the item that caused the injury should be saved and tested for contamination.

d. BLOODBORNE PATHOGEN SAFETY KIT.

The following is a guide to equipment that may be necessary for personnel potentially exposed to biological hazards. Once used, the equipment, except respirators, must be bagged and treated as biological waste hazards. The local MTF will handle the waste disposal. In the case of RC units, arrangements should be made with supporting AC medical facilities, RC medical units, or civilian hospitals, and the appropriate facility named in the pre-accident plan.

(1) NIOSH-approved respirators with biological filters. One respirator with several filters per individual.

(2) Surgical masks.

(3) Tyvek® Disposable coveralls (at least two sets per individual in contaminated area).

(4) Rubber gloves (latex or . Recommend medical personnel have a box (100+) on hand at the site. Anyone handling parts, clothing, etc., must wear gloves if so directed.

(5) Leather gloves as appropriate for the recovery of metal or fragmented machine parts.

(6) Antiseptic Towelettes/alcohol pads.

(7) Goggles/face shields

(8) Boot covers

6. PPE REMOVAL CHECKLIST.

a. Establish a designated area for PPE exchange.

b. Disinfect & remove work gloves.

c. Remove Coveralls.

d. Disinfect latex gloves.

e. Remove & disinfect boot covers.

f. Re-glove.

g. Remove & disinfect goggles.

h. Remove mask.

i. Remove latex gloves.

j. Close & seal waste bag.

k. Clean hands & face with disinfectant wipes.

l. Exit via controlled entry point.

m. Wash with soap & water.

NOTE: *Should the personal uniforms (especially boots) of the investigation team become contaminated by hazardous materials such as blood and/or fuels or POL's, provisions must be made to change into uncontaminated clothing as soon as possible. If there is skin contact, thorough washing with soap and water and appropriate follow-up action as in Paragraph 5, C (10) above.*