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Maintenance

FUEL SYSTEMS REPAIR AREA

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This instruction implements Air Force Policy Directive (AFPD) 21-1. It establishes responsibilities and procedures for safe and efficient joint operations. It applies to all personnel assigned within the 15th Aircraft Maintenance Squadron (AMXS), Maintenance Flight (MXF), and assigned to Hickam AFB under PACAF operational control. This instruction applies to all organizations requiring support from the Maintenance Flight (MXF) Fuel Systems Repair Element.

1. REFERENCES:

- AFOSH STD 91-25, Confined Space Entry
- AFOSH STD 91-501, Personnel Protection Equipment
- AFOSH STD 91-38, Hydrocarbon Fuels General
- AFOSH STD 91-501, General Industrial Operations
- AFOSH STD 48-137, Respiratory Protection Program
- T.O. 00-25-172, Ground Servicing of Aircraft and Static Bonding/Grounding
- T.O. 1-1-3, Inspection and Repair of Aircraft Integral Tanks and Fuel Cells

2. TERMS.

- 2.1. Entrant: Any employee who is trained and authorized to enter a confined space.
- 2.2. Entry: Any act which results in any part of the employee's body breaking the plane of the opening of a confined space or enclosed area. Includes any ensuing work in the confined space or enclosed area.

- 2.3. Immediately Dangerous to Life and Health (IDLH): Any condition that poses immediate threat to life or which is likely to result in acute or immediate severe health effects.
- 2.4. Integral Fuel Tank: Any cavity designed to hold fuel or other liquids (confined space).
- 2.5. Organizational Rescue Team: A group of two or more specially trained employees, preferably fuel system repair specialists 2A6X4 or equal, designated to rescue entrants from confined spaces.
- 2.6. Attendant: A trained individual outside the confined space who acts as an observer for the entrant and a member of the rescue team who may be required to enter the tank/cell for emergency rescue.
- 2.7. Equipment Monitor/Runner: A trained individual who monitors all support equipment, initiates the emergency response plan, and is a member of the organizational rescue team who may be required to enter a tank/cell for emergency rescue.
- 2.8. Emergency Communications: Any type of communications link (radio, telephone, etc.) which is available for requesting emergency assistance.
- 2.9. Fuel Systems Repair Dock: An approved facility configured to house aircraft undergoing fuel system maintenance/repairs.
- 2.10. Open Fuel Systems Repair Area: Any open/outside area approved by the AMXS/CC with coordination from the Fuel Systems Element Chief, Wing Safety, Bio-environmental, Fire Protection, and the Airfield Manager.
- 2.11. Grounding: The removal of static electricity from the surface of an object by connecting that object to an approved ground.
- 2.12. Lower Explosive Limit (LEL): The lowest concentration of flammable or combustible vapors which can be ignited by spark or flame.
- 2.13. Purge: A process which removes flammable or combustible fluids and vapors.

3. RESPONSIBILITIES.

- 3.1. Fuel systems repair supervisor will:
- 3.1.1. Ensure personnel are trained to implement the Emergency Response Plan (ERP).
 - 3.1.2. Ensure personnel designated as rescue members are trained to remove individuals incapable of self-rescue.
 - 3.1.3. Ensure personnel designated as rescue members are trained in Cardiopulmonary Resuscitation (CPR) and self-aid/buddy care.
 - 3.1.4. Ensure personnel have received both initial and annual fuel tank rescue training.
 - 3.1.5. Ensure personnel have received both initial and annual fuel tank entry qualification training.
 - 3.1.6. Initiate the ERP as outlined in [Attachment 1](#), if necessary.
 - 3.1.7. Ensure the ERP is exercised annually. Actual or simulated fuel tanks and dummies/mannequins may be used.

3.1.8. Suspend operations and implement as applicable, severe weather shutdown procedures outlined below, upon notification from Maintenance Operating Control Center (MOCC) of high winds (30 kts or higher) or lightning/thunderstorms within five nautical miles of the repair area.

3.1.8.1. Ensure all aircraft access openings are temporarily closed (i.e. filler caps, fuel tank access doors, etc.).

3.1.8.2. Ensure all debris capable of being blown around is secured/stored (i.e. panels, TOs, respirators, etc.).

3.1.8.3. Ensure all support equipment is shut down, repositioned, returned as required.

3.1.8.4. Notify MOCC that the above actions have been completed.

3.2. Aircraft-owning organizations will:

3.2.1. Provide a core number of trained maintenance personnel designated as equipment monitor/runners.

3.2.2. Appoint a core number of personnel from any work center that may have a requirement to enter a fuel tank for maintenance (sheet metal, non-destructive inspection, etc.) for tank entry qualification training.

3.2.3. Comply with paragraph 6. as applicable.

3.3. MOCC will:

3.3.1. Notify the appropriate agencies outlined in **Attachment 1** upon notification of an emergency.

3.3.2. Ensure paragraphs **6.1.2.1.** through 6.1.2.8. are completed.

3.4. Hickam AFB Fire Department will:

3.4.1. Provide emergency response to Building 3004 (fuel systems repair dock), or alternate open fuel systems repair area (Fuel Cell Charlie).

3.4.2. Assume fire fighting/rescue operations upon arriving on scene.

3.5. The Medical Operations Squadron Ambulance Services (15 MDOS/SGOME) will:

3.5.1. Provide emergency medical response personnel to bldg. 3004 (fuel systems repair dock), or alternate open fuel systems repair area (Fuel Cell Charlie) as required.

4. REQUIREMENTS.

4.1. Equipment monitor/runner (Non 2A6X4 or equivalent):

4.1.1. All personnel selected as equipment monitor/runner must be CPR and self-aid buddy care qualified.

4.1.2. A letter of appointment for all designated equipment monitor/runners will be signed by their respective flight chief, and as a minimum contain the following:

4.1.2.1. Name and wage grade/rank of all appointed personnel.

4.1.2.2. Phone number, work center, and office symbol.

4.1.2.3. Date received most recent CPR and self-aid buddy care

4.1.3. After initiating the ERP, the equipment monitor/runner shall assume the position of the attendant.

5. QUALIFICATION.

5.1. Fuel Tank Familiarization (FTF):

5.1.1. All personnel must be trained and certified in respiratory protection training and have a current occupational exam prior to tank entry.

5.1.2. A letter of appointment for all personnel qualified in FTF will be signed by their respective flight chief, and as a minimum contain the following:

5.1.2.1. Name and wage grade/rank of all appointed personnel.

5.1.2.2. Phone number, work center, and office symbol.

5.1.2.3. Date received most recent respirator training.

6. PROCEDURES.

6.1. Fuel systems repair dock/open fuel systems repair area:

6.1.1. When an aircraft requires in tank entry, the owning organization will:

6.1.1.1. Coordinate with fuel systems repair personnel for the appropriate aircraft configurations (i.e. aircraft defueled, fuel transferred, flaps down, batteries disconnected, antenna wiring disconnected, etc.) prior to positioning aircraft within the repair area.

6.1.1.2. Ensure all munitions 30mm and smaller, including Target Practice (TP) ammo is download in accordance with T.O. 11A-1-33, Handling and Maintenance of Explosive Loaded Aircraft (not applicable to removal/replacement, inspection, and testing of externally mounted components). Cartridge Actuated Devices (CADS) utilized in egress systems will be disarmed but need not be removed from the aircraft.

6.1.1.3. Coordinate/schedule with MOCC prior to towing aircraft into fuel systems repair dock or open fuel systems repair area. Aircraft shall not taxi into or out of the fuel systems repair dock.

6.1.1.4. Ensure aircraft are positioned into the fuel systems repair dock/open fuel systems repair area under supervision of the on site supervisor. The tow team will comply with the following at either the fuel systems repair dock/open fuel systems repair area:

6.1.1.4.1. Chock aircraft in accordance with applicable aircraft technical order.

6.1.1.4.2. Ground aircraft in accordance with applicable aircraft technical order.

6.1.1.4.3. Disconnect and bag aircraft battery terminals in accordance with applicable aircraft technical order.

6.1.1.4.4. Position engine drip pans respectively.

6.1.1.4.5. Ensure aircraft tow bar remain attached for quick evacuation.

6.1.1.4.6. Prior to aircraft removal from repair dock:

6.1.1.4.6.1. Ensure all drip pans are picked up and wiped clean.

- 6.1.1.4.6.2. Ensure any fluids/solvents which may be spilled have been wiped up.
- 6.1.1.4.6.3. Ensure maintenance stand handrails are reinstalled, returned to their original parking spot and grounded to the hangar beam.
- 6.1.1.5. Provide a qualified equipment monitor/runner, if required.
- 6.1.1.6. Ensure all aircraft doors, hatches, and canopies, except crew entrance door are closed.
- 6.1.2. When an aircraft requires in tank entry, MOCC will:
 - 6.1.2.1. Coordinate and direct all aircraft movement into and out of the repair dock or open fuel systems repair area.
 - 6.1.2.2. Notify fuel systems repair personnel (15 AMXS/MXFF, 449-1233) of aircraft scheduled for maintenance and provide an aircraft estimated time of arrival (ETA).
 - 6.1.2.3. Notify fuel systems repair personnel when high winds (30 kts or higher) or when thunderstorms/lightning are within a five miles radius of the repair area.
 - 6.1.2.4. Ensure aircraft are towed only to authorized fuel systems repair areas.
 - 6.1.2.5. Notify the proper agencies in the event of an emergency by using the Fuel Systems Emergency Notification Checklist (see [Attachment 2](#)).
 - 6.1.2.6. Ensure aircraft RADAR is not operating within 300 feet (100 feet when using a dummy load) of the repair area.
 - 6.1.2.7. Ensure aircraft are not operating under their own power within 100 feet of the open fuel systems repair area.
- 6.1.3. Due to the volatile nature during fuel systems maintenance, all visiting/non-authorized fuel systems repair personnel (i.e. crew chief, specialist, etc.) will:
 - 6.1.3.1. Request approval to enter the fuel systems repair area only through the designated Entry Control Point (ECP).
 - 6.1.3.2. Park all motorized vehicles (GOVs and POVs) adjacent to the water channel only. The entire roadside directly in front of the fuel systems repair dock (Bldg. 3004) will be kept clear at all times for responding emergency vehicles (i.e. ambulance, fire department, tow team, etc.).
 - 6.1.3.3. Enter the repair area under escort only after fuel systems personnel have conducted a personal inspection for unauthorized items not allowed within the area (i.e. inadequate footwear, matches/lighters, watches, rings, etc.).
 - 6.1.3.4. Ensure tools carried into the repair area are within a canvas bag or ensure metal toolboxes are placed onto rubber matting.

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Attachment 1

EMERGENCY RESPONSE PLAN

1. This plan establishes responsibilities and procedures for emergency extraction from an aircraft fuel tank/cell within the fuel systems repair dock (Bldg. 3004) or open repair systems repair area.
2. In the event a person becomes trapped or incapacitated inside a fuel tank/cell, the following sequence of events will be followed.
 - 2.1. The *Attendant* will:
 - 2.1.1. Alert the equipment monitor/runner.
 - 2.1.2. Ensure the tank is being properly ventilated.
 - 2.1.3. Determine the nature of the emergency.
 - 2.1.4. Attempt rescue only from outside the tank.
 - 2.2. The *Equipment Monitor/Runner* will:
 - 2.2.1. Initiate the Emergency Response Plan (ERP) by notifying the Fire Department by using the direct phone line located in the Fuel Systems Repair Dock, Building 3004, and MOCC who will in-turn contact the appropriate agencies required as outlined in [Attachment 2](#).
 - 2.2.2. After sounding the alarm and initiating the ERP the equipment monitor/runner will immediately return and assume the duties of the attendant.
 - 2.3. The *Attendant* will:
 - 2.3.1. Continue to make contact with the entrant and determine the nature of emergency.
 - 2.3.2. Determine whether the tank/cell is Immediately Dangerous to Life and Health (IDLH) by using the MultiRae combustible gas alarm.
 - 2.3.3. Attempt rescue from outside the tank if the tank is IDLH.

2.4. The *Rescuer (Attendant)* will:

2.4.1. Don a full-face air supplied respirator.

2.4.2. Enter the tank/cell with a spare full-face respirator and attempt rescue after determining the tank is non-IDLH and the equipment monitor/runner has assumed duties of the attendant.

2.4.3. Attempt to get an air-supplied respirator to a conscious entrant if rescue from outside the tank is impossible.

2.4.4. Upon reaching the victim, check for vital signs and immediately don the spare full-face air supplied respirator.

2.4.5. Assist an conscious victim out of the tank/cell by the most direct route.

2.4.6. Assist an unconscious victim out of the tank/cell by any feasible means and by the most direct route.

2.4.7. Remove braces, plumbing, etc. which will aid in removing a stuck or jammed victim.

2.5. The *Attendant (Equipment Monitor/Runner)* will:

2.5.1. Provide the appropriate first-aid (CPR, self-aid buddy care) until relieved by medical personnel.

2.5.2. Provide status of the victim to responding fire department and medical personnel.

2.6. The *Rescuer* will:

2.6.1. Assist the attendant providing first-aid.

2.6.2. Direct all emergency response personnel to the victim.

2.6.3. The *Fire Department* will:

2.6.4. Assume extraction/rescue operations from fuel systems repair personnel if initial attempts have failed.

2.7. The *Military Medical Personnel* will:

2.7.1. Assist fuel systems/fire department personnel in their area of responsibility.

3. The following equipment and facility items are required to remove an incapacitated entrant:

3.1. Intrinsically safe hand held radios

3.2. Operational Hotline

3.3. MultiRae Combustible Gas Sniffer

3.4. Evacuation stand/scaffold

3.5. Operational Climate Control Units (CCU)

Attachment 2

EMERGENCY RESPONSE NOTIFICATION CHECKLIST

Upon receiving notification and status from the equipment monitor/runner of an on going emergency, MOC will contact the appropriate agency below.

Fire Department (15 CES/CEF) "911"

Military Medical Personnel (15 MDOS/SGOME) "911"