

**BY ORDER OF THE COMMANDER
482D FIGHTER WING**

482d FIGHTER WING INSTRUCTION 21-127

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Maintenance

**F-16 AIRCRAFT HYDRAZINE
PROCEDURES**

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This 482d Fighter Wing Instruction (482 FWI) incorporates procedures for proper maintenance actions following operation of the Emergency Power Unit (EPU) and for Hydrazine (H-70) leak/spill mishaps involving F-16 aircraft and vehicles transporting hydrazine tanks possessed by the 482d Maintenance Squadron (482 MXS). This instruction implements Air Force Policy Directive (AFPD) 21-1; *Air and Space Maintenance*, Air Force Instruction (AFI) 21-101, *Managing Aerospace Equipment Maintenance*, AFPD 91-2; *Safety Programs*, Air Force Manual (AFMAN) 91-201; *Explosives Safety Standards*, Air Force Occupational Safety Health Standard (AFOSH STD) 91-501; *Air Force Consolidated Occupational Safety Standard*, AFOSHSTD 48-137; *Respiratory Protection Program*. All Group Commanders and supervisors shall ensure provisions of this instruction are adhered to by all 482 FW personnel. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using Air Force Form 847 (AF Form 847), *Recommendation for Change of Publication*; route AF Form 847 from the field through the appropriate functional's chain of command. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with AFMAN 33-363, *Management of Records* and disposed of in accordance with the Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS) located at <https://www.my.af.mil/gcss-af61a/afirms/afirms/rims.cfm>.

SUMMARY OF CHANGES

Paragraph 3.2.1. First sentence reads "Consists of at least four individuals appointed by the 482d Maintenance Squadron Commander (482 MXS/CC)." **Paragraph 3.2.1,** now reads "The team shall include one fully qualified fuel system technician as the H-70 Response Team Chief and a minimum of three qualified response team members as augmentees."

1. Requirements:

1.1. Anytime an EPU has been activated in flight; or on the ground, the aircraft shall be inspected for the presence of Hydrazine (H-70) by 482d Mission Support Group Fire Department (482 MSG/CEF) then by the Hydrazine response team. After completion of the initial inspection, the aircraft shall be moved to an authorized and isolated area with a clear zone of 50 feet around the aircraft. If a major spill of H-70 is confirmed (more than one pint); a clear zone of 600 feet downwind and 50 feet upwind is required.

1.1.1. If the spill is inside a hangar, evacuate the hangar to the required distance (s) using Giant Voice or hangar alarms and open all hangar doors. Adjoining facilities shall be evacuated on a case-by-case basis, but all office doors must remain closed.

WARNING: Maintenance personnel should not attempt to contain or neutralize a leak or spill themselves. Specialized protective equipment is required.

2. Procedures for Personnel Contaminated with H-70.

2.1. 482d Fighter Wing Command Post (482 FW/CP), 482d Aircraft Maintenance Squadron (AMXS) Flightline Expediter or Production Supervisor or 482d Maintenance Operations Center (MOC) shall notify the (482 MSG/CEF).

2.2. Personnel who have or may have inhaled H-70 **MUST** seek **IMMEDIATE** medical attention.

2.2.1. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one way valve or other proper respiratory device.

2.3. Personnel who have had contact with Hydrazine on their skin or clothing shall be evacuated from the spill area and proceed to the nearest source of water for decontamination. Immediately flush with large amounts of water for minimum of 20 minutes. Medical attention shall be sought as soon as possible.

2.4. Remove and isolate contaminated clothing and shoes for disposal.

2.5. Eyes: Immediately flush with large amounts of water for minimum of 20 minutes. Seek medical attention as soon as possible.

3. Responsibilities:

3.1. Fuel Shop supervisor shall:

3.1.1. Ensure assigned personnel have completed a pre-placement physical examination and a briefing on the health effects of H-70 prior to working with H-70.

3.1.2. Ensure annual occupational physicals are scheduled and accomplished for fuel system technicians and documented on the AF Form 55, *Employee Safety and Health Record*.

3.1.3. Maintain at least one H-70 Kit and the necessary technical data required for spill management.

3.2. Hydrazine Response Team:

3.2.1. The team shall include one fully qualified fuel system technician as the H-70 Response Team Chief and a minimum of three qualified response team members as augmentees.

3.2.2. A qualified H-70 response team shall be on call, via radio or telephone during normal duty hours. During non-duty hours the 482 MSG/CEF shall be responsible for evacuation and containment of spills until a qualified team can be reached by telephone. A letter containing a list of personnel and their home telephone numbers to be contacted during off duty hours shall be submitted to the **FIRE DEPT, MOC AND THE COMMAND POST BY THE FUEL SYSTEM SHOP SUPERVISOR**. This letter shall be updated as changes occur.

3.2.3. The H-70 Response Team shall be responsible for detection, containment, neutralization, and clean up of any Hydrazine leaks or residues caused by EPU system.

3.2.3.1. The H-70 team shall be responsible for all Level I (less than 1 pint) Hydrazine incidents unless weather conditions or spill locations cause it to be beyond their capability. Examples are wet weather or when leaks are near storm drains.

3.2.3.2. Spill Containment and neutralization shall be accomplished in accordance with applicable tech data and LCL 482 MXS 10-6, *Hydrazine Response Checklist* using the two person concept with a two person back-up team standing no closer than 50 ft upwind of the site. The two working members shall wear full protective clothing and Self Contained Breathing Apparatus (SCBA).

3.2.3.3. Whenever Level A-equipment is required, three team members, two entrants and one back-up, shall be suited with all required equipment. Team Chief shall have his equipment available for use, if needed.

3.2.3.4. When Hydrazine is present, the Hydrazine Response Team shall post signs indicating "KEEP OUT" Hydrazine Work in Progress".

3.2.3.5. When it's determined that a Hydrazine leak is not present or has been contained and neutralized and the aircraft is determined safe for maintenance, the aircraft shall be moved to the designated H-70 system maintenance "Safe" area for refurbishment and servicing of the Hydrazine system. The H-70 Team supervisor shall report to the on-site commander before departing.

3.3. Hydrazine Response Team Chief.

3.3.1. The primary responsibility of the Hydrazine Team Chief is to take the Hydrazine Team into a hazardous environment, take appropriate action, and ensure the team is safely removed from the hazardous environment.

3.3.2. Notify 482 MXG/MOC upon confirmation of any hydrazine leaks.

3.3.3. Ensures all the proper equipment is on hand and all personal items are removed, tagged, and secured.

3.3.4. Performs quality checks on SCBA and Chemical Protective Clothing, (CPC) being worn. Records the serial numbers, time consumed and date of usage of the Level-A suit in a logbook.

3.3.5. Establish a safety area of 50 ft. in all directions around the aircraft, with one entry point. Only persons authorized by the Team Chief shall be allowed in this area.

3.3.6. Because of the multiplicity of aircraft spill and leak situations which could occur, it is not possible to develop definite procedures for each possible situation. The Hydrazine Response Team Chief must assess each situation and add or delete procedures using approved local checklists.

3.4. 482 MSG/CEF shall:

3.4.1. Be the on-scene-commander anytime an EPU activation has occurred or is suspected.

3.4.2. Establish communications with pilot; verify EPU selector switch is "OFF". Chock left tire only if hot brakes are not a factor.

3.4.3. Visually inspect for evidence of a leak from the EPU compartment drain and surrounding EPU area.

3.4.4. If visual inspection indicates a leak, inform pilot to:

3.4.4.1. Notify control tower.

3.4.4.2. Go to 100 percent oxygen and shut down the engine.

3.4.4.3. Assist pilot in cockpit egress using portable oxygen bottle.

3.4.5. If visual inspection does not indicate a leak, inform pilot to shut down the engine and assist pilot in normal pilot egress.

3.4.6. Assist Hydrazine Response Team Entry/Back-up Team with donning of CPC.

3.4.7. Perform decontamination duties as required.

3.4.8. The on-scene commander shall standby at the Entry Control Point to facilitate communication with the Hydrazine Response team Chief on aircraft status.

3.4.9. After 482 MSG/CEF has rendered the aircraft safe; the aircraft shall be turned over to the Hydrazine Response team.

4. 482 AMXS shall. Anytime the EPU system is activated or suspected of activation, aircraft will go from the recovery area to the Hydrazine (mono) pad as soon as the Hydrazine Response Team clears the aircraft and deems it safe to tow. The only maintenance performed by shops shall be the installation of safety pins for weapons/flight lines, if not previously installed by 482 MSG/CEF or 482 MXS/MXMCF(Fuel Shop/Hydrazine Team). **WARNING: Personnel not immediately involved with securing aircraft or towing, shall stay clear of aircraft as directed by the Hydrazine Response Team.**

4.1. Upon notification or discovery of an actual or suspected H-70 discharge, leak or spill, the 482 AMXS Expediter shall declare a ground emergency and notify 482 MXG/MOC.

4.2. Personnel suspecting or discovering H-70 leaks on aircraft/vehicles shall immediately evacuate the area to a distance of 100 feet up wind and notify 482 AMXS Expediter or 482 MXG/MOC. **WARNING: Any leakage of a clear oily liquid or presence of ammonia odor shall be treated as a hydrazine leak. Personnel should never touch, smell or taste liquid leaks.**

4.3. If suspected leak, spill occurred in a hangar, evacuate all personnel from the hangar and secure the area. Hangar doors shall remain open but all office doors should be closed.

4.4. For suspected ground activations of the EPU with the engine running, the aircraft shall remain running until the pilot is told to shut down by emergency personnel.

4.4.1. The crew chief on the affected aircraft shall notify the pilot to go to 100 percent oxygen. Crew chief shall then evacuate to 100 feet upwind and wait for emergency personnel to determine if exposure has occurred and provide decontamination and transportation to the hospital, if required.

4.4.2. If the -6 launch procedures are complete (i.e. crew chief is off headset and aircraft is ready to taxi), unaffected aircraft shall immediately taxi. When aircraft have taxied, maintenance personnel in the area shall evacuate to at least 100 feet upwind or 300 feet downwind from the affected aircraft, whichever they can reach without crossing the affected area.

4.4.3. F-16 aircraft with a fired EPU shall be positioned in the **HOT BRAKE AREA ON B/D TAXIWAY AND THE EOR CHECK AREA ON THE END OF RUNWAY WITH THE LEFT WING INTO THE WIND.**

4.4.4. If an activation or hydrazine spill occurs at EOR, the crew chief shall notify the pilot to go to 100 percent oxygen. Crew chief shall then evacuate all personnel to 100 feet upwind and wait for emergency personnel.

4.5. Ensure that pilots fill out the pilot's portion of the EPU Activation Checklist during debrief.

5. Aircraft Pilot.

5.1. The affected aircraft with the activated EPU will follow -1 procedure for activated EPU.

5.2. Any pilot experiencing EPU activation shall fill out the pilots' portion of the EPU Activation Checklist during debrief.

6. 482 MXG/MOC shall.

6.1. Upon notification of an in-flight, ground firing or "Possible Hydrazine Leak" of the EPU, notify the Fuel Shop of a possible EPU activation and dispatch the Fuel Shop, Hydrazine Response Team to the appropriate recovery area. The team shall maintain radio contact with MOC for wind direction.

6.2. Accomplish the Hydrazine Emergency Response checklist E-05 and notify the 482d Maintenance Group Quality Assurance (482 MXG/MXQ) and the 482 FW Command Post (482 FW/CP) that an inadvertent firing has occurred.

7. EPU maintenance requirements.

7.1. EPU disconnects and purges shall be performed inside Building 193 or any other approved facility whenever any of the following conditions exists:

7.1.1. Wind conditions are such as to cause any loss of liquid to be rapidly spread over a large area.

7.1.2. Wet or rainy conditions exist which would make liquid Hydrazine difficult to detect or clean up.

7.1.3. Weather conditions are below 32 degrees Fahrenheit.

7.2. All disconnects performed inside the facility shall require maintenance personnel to perform the following:

7.2.1. Notify 482 MXG/MOC or the flight line expediter of the maintenance in progress.

7.2.2. Clear all non-essential personnel from the building.

7.2.3. Post warning signs and partially open doors to ensure adequate ventilation.

8. Hydrazine Protective Equipment Requirements.

8.1. **Requirements for Use:** CPC shall be evaluated against the hazards involved and the final decision on selection of CPC shall rest with Bioenvironmental Engineering and the Hydrazine Team Chief. Generally, the Hydrazine Response Team shall utilize the highest protection (Level-A equipment) available when initially mitigating an incident. Level B equipment does not provide the same level of personnel protection and shall only be utilized after the team chief performs an operational risk assessment.

8.1.1. During emergency response, after 482 MSG/CEF confirmation of Hydrazine, Level-A equipment shall be required. This equipment consists of boots, gloves, SCBA and totally encapsulated vapor tight suit.

8.1.2. During EPU disconnects, EPU purge, spill containment, or clean-up, Level-A or B equipment shall be required if Hydrazine is noted.

8.1.3. During disconnect of a fired EPU, SCBA respiratory protection is required.

8.2. **Training:** Only personnel who are trained and task certified shall wear CPC. All personnel who respond to hydrazine incidents and who are subject to wear level-A or level-B CPC are required to attend task certification training prior to job placement and must attend refresher training annually. Training shall be given by 482 MXS fuel system technicians and documented in Integrated Maintenance Data Systems upon completion.

8.3. Care of Protective Equipment:

8.3.1. Totally encapsulating suits shall require annual visual and pressure checks in accordance with manufacturing instructions. Because of the 480-minute usage time of the suit, the user shall be required to document the date, time and name of wearer prior to storage. All Level-A suits shall be serial number controlled.

8.4. If eyeglasses are required, contact 482 Medical Squadron (MDS).

9. Hydrazine Procedures for Aircraft Deployment.

9.1. A qualified H-70 response team with a complete spill kit shall be sent with every F-16 deployment going to any other than an established F-16 base, or as determined by 482 MXG/CC.

9.2. Immediately upon arrival at the deployment location, the senior 482 MXG Maintenance Officer or Noncommissioned Officer (NCO) shall make arrangements with the host base commander for a briefing of host base personnel on Hydrazine and procedures for spills and

leaks. Host Base Agencies that should be represented for the briefing include, as a minimum: Host Base Maintenance Officer, 482 MXG/MOC, 482 MXG Quality Assurance (482 MXG/MXQ) branch, 482 MDS, 482 MSG/CEF, 482 MSG Emergency Management (482 MSG/CEX), 482 FW/SE, 482 MSG Environmental Engineering (482 MSG/CEV), and 482d Security Forces Squadron (482 SFS).

10. 482 MSG/SGPB shall:

10.1. Provide assistance in the selection of appropriate personal protective equipment.

10.2. Assess any occupational exposures to Hydrazine and brief Medical Services on incidents/accidents involving Hydrazine, via the 482 FW Occupational Health Working Group (OHWG) or other means.

10.3. Provide technical assistance in the neutralization and disposal of neutralized Hydrazine.

10.4. Be responsible for ensuring that all Hydrazine has been completely neutralized and properly disposed of after clean-up operations.

11. 482 FW/SE shall: Observe from outside the cordon area and assist as necessary to ensure that safe and accepted practices are adhered to throughout the course of the emergency.

12. 482 MDS/PES shall: Ensure all personnel assigned to Hydrazine maintenance duties have pre-placement, annual and termination occupational health physicals. From these physicals, 482 MSG/SGPB shall assess any occupational exposures to Hydrazine maintenance personnel. Medical Services shall review all incidents/accidents involving Hydrazine to evaluate any needed follow-ups for exposed personnel.

13. 482 MSG/CEV: 482 MSG/CEV is responsible for proper disposal of fully neutralized Hydrazine after clean-up operations.

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Commander, 482d Fighter Wing

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

AFPD 21-1, *Managing Aerospace Equipment Maintenance*, 25 February 2003
AFI21-101, *Aircraft and Equipment Maintenance Management, AFRC Sup 1*, 13 January 2011
AFPD 91-2, *Safety Programs*, 28 September 1993
AFMAN 91-201, *Explosives Safety Standards*, 12 January 2011
AFOSH STD. 91-501, *Air Force Consolidated Occupational Safety Standard*, 7 July 2004
AFOSHSTD 48-137, *Respiratory Protection Program*, 10 February 2005
LCL 482 MXS 10-6, *Hydrazine Response Checklist*, 21 July 2011

<https://www.my.af.mil/gcss-af61a/afirms/afirms/rims.cfm>

Adopted Forms

AF Form 55, *Employee Safety and Health Record*
AF Form 673, *Air Force Publication/Form Action Request*
AF Form 847, *Recommendation for Change of Publication*
AFTO Form 781A, *Maintenance Discrepancy and Work Document*

Abbreviations and Acronyms

AF—Air Force
AFI—Air Force Instruction
AFMAN—Air Force Manual
AFRC—Air Force Reserve Command
AFRIMS—Air Force Records Information Management System
CC—Commander
CPC—Chemical Protective Clothing
ECP—Entry Control Point
EPU—Emergency Power Unit
e-Publishing—the e-publishing website (www.e-publishing.af.mil)
FO—Foreign Object
FW—Fighter Wing
IAW—In Accordance With
IMDS—Integrated Maintenance Data System
MDS—Medical Squadron

MIS—Maintenance Information System

MOC—Maintenance Operations Center

MXG—Maintenance Group

NCO—Non-Commissioned Officer

OPR—Office of Primary Responsibility

PPE—Personal Protective Equipment

RDS—Records Disposition Schedule

SCBA—Self-contained breathing apparatus

USAF—United States Air Force