

**BY ORDER OF THE COMMANDER
301ST FIGHTER WING**

301 FIGHTER WING INSTRUCTION 21-128

1 JUNE 2015

Maintenance



**HYDRAZINE RESPONSE AND HANDLING
PROCEDURES**

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction establishes proper maintenance actions following operation of the Emergency Power Unit (EPU) or hydrazine (H-70) leak/spill mishaps involving 301st Fighter Wing (301 FW) F-16 aircraft and vehicles transporting hydrazine tanks. It applies to all personnel within the 301st Maintenance Group (301 MXG), 301st Fighter Wing Safety (301 FW/SE), 301st Bioenvironmental Engineering (301 MSG/BE), Base Civil Engineering (NAVY BCE/CEV), 301st Medical Squadron (301 MDS), Fire Department (Navy) and Department of Defense (DoD) Security Police (301 MSG/SF). It also implements AFI 21-101, AFRC Sup 1, Aircraft Equipment Maintenance Management; Air Force Manual (AFMAN) 91-201, Explosive Safety Standards; Air Force Instruction (AFI) 91-203 Air Force Consolidated Occupational Safety Instruction, General Industrial Operations; AFOSHSTD 48-137, Respiratory Protection Program; T.O. 42B1-1-18, GENERAL PROCEDURES HANDLING OF H-70 (HYDRAZINE - WATER FUEL); and Technical Orders (T.O.) 1F-16C-2-49GS-00-1, Emergency Power System; T.O.1F-16C-2-49JG-00-1, Emergency Power System; T.O.1F-16C-2-49JG-00-2, Emergency Power System; T.O. 1F-16C-2-49JG-00-3, Emergency Power System; and T.O. 6J14-4-11-2, Fuel Storage Tank. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the Air Force (AF) Form 847, Recommendation for Change of Publication; route AF Form 847s from the recommending office thru the 301FW Publications/Forms Managers (301 CF/SCBP) to Higher Headquarters is necessary. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, Management of Records, and disposed of in accordance with the Air Force Records Disposition Schedule (RDS) located in Air Force

Records Information Management System (AFRIMS) at the Air Force (AF) Portal:
<https://my.af.mil/afirms/afirms/afirms/rims.cfm>

SUMMARY OF CHANGES

Due to the safety aspects of this instruction it should be re-read in its entirety.

1. General.

1.1. 301st Maintenance Group Commander (301 MXG/CC) will ensure compliance with this directive.

1.2. Anytime an EPU has been activated in-flight or on the ground, the aircraft will be inspected for the presence of hydrazine (H-70) by the Fire Department and then by the Hydrazine Response Team. After initial inspection the aircraft will be moved to an authorized, isolated area with a clear zone of 100 feet around the aircraft. If a major spill is confirmed (more than one pint); a distance of 600 feet downwind and 100 feet upwind is required. If the spill is inside a hangar, evacuate the hangar to the required distances by using the "Giant Voice" or hangar alarms. Open all hanger doors and suspend all maintenance activities. WARNING: Maintenance personnel shall not attempt to contain or neutralize a leak/spill themselves since specialized protective equipment is required.

1.2.1. F-16 aircraft recovered with a fired EPU will be positioned in the HOT BRAKE AREA ON ECHO TAXIWAY and the End of Runway (EOR) CHECK AREA on the NORTH END OF RUNWAY. The Aircraft will be parked with the left wing into the wind if possible.

2. Hydrazine Protective Equipment Requirements:

2.1. Requirements for Use: Chemical Protective Clothing (CPC) will be evaluated against the hazards involved and the final decision on selection of CPC will rest with Bioenvironmental Engineering and the Hydrazine Team Chief. Generally, the Hydrazine Response Team will 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 will only be utilized after the team chief performs an operational risk assessment.

2.1.1. During emergency response, after Fire Department confirmation of hydrazine, Total Encapsulating suits will be required. This equipment consists of boots, gloves, Self-Contained Breathing Apparatus (SCBA), Chemical Barrier Tape and Totally Encapsulated Suit.

2.1.2. During EPU disconnects, EPU purge, spill containment, or clean-up, Level-A or B equipment will be required if hydrazine is noted.

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

2.1.4. All maintenance performed inside the hydrazine facility will require the use of level-A or B equipment if hydrazine is suspected or confirmed.

2.1.5. During hydrazine storage facility inspection, personnel will be required to wear at a minimum; gloves, Tychem coveralls and an in-line supplied air respirator or assure the ventilation is adequate by opening at least two doors for cross ventilation.

2.2. Training: Only personnel who are trained and task certified will wear CPC. All personnel who respond to hydrazine incidents and who are subject to wear level-A or B CPC are required to attend task certification training prior to job placement and must attend refresher training annually. Training will be given by 301 Maintenance Squadron (301 MXS) fuel system technicians and documented in IMDS upon completion.

2.3. Care of Protective Equipment:

2.3.1. Totally encapsulating suits will require annual checks as required and in accordance with manufacturing instructions. Suits will be decontaminated after each use. Because of the 480-minute usage time of the suit, the user will be required to document the date, time and name of wearer prior to storage. All Level-A and B suits will be serial number controlled.

2.3.2. SCBA will be checked after each use, prior to use and will have a monthly inspection. Cylinders will never be stored with less than full pressure. Re-service as required.

2.4. Eyeglasses with straps or temple bars that pass through the face piece to face seal on SCBA mask are prohibited. If eyeglasses are required, contact Medical Services.

3. Procedures for Personnel Contaminated with H-70:

3.1. Maintenance Operations Center (MOC) will notify the Fire Department IAW QRC.

3.2. Personnel who have or may have inhaled H-70 MUST seek immediate medical attention.

3.3. Personnel, who have had contact with hydrazine on their skin or clothing, will be evacuated from the spill area and proceed to the nearest source of water for decontamination. Medical attention will be sought as soon as possible.

3.4. Contaminated clothing will be removed and the affected skin area will be flushed with large amounts of water for 15 minutes. The Hydrazine Response Team Chief will ensure the clothing is neutralized in accordance with T.O. 1F-16C-2-49GS-00-1. Place contaminated clothing in an approved container for later disposition by environmental engineering.

3.5. Eyes: Immediately flush with large amounts of water for a minimum of 15 minutes. Seek medical attention as soon as possible.

4. Fuel Shop Supervisor Responsibilities:

4.1. The 301 MXS Fuel Shop Supervisor will ensure assigned personnel have completed a pre-placement occupational physical examination and a briefing on the health effects of H-70 prior to working with H-70. Ensure annual occupational physicals for fuel systems repair personnel are scheduled and accomplished. Maintain at least one H-70 kit (hydrazine response trailer) and the necessary technical data required for spill management.

5. Hydrazine Response Team:

5.1. The Hydrazine Response Team will consist of at least four individuals appointed by the Fuel System NCOIC (301 MXS/MXMCF) and certified by the maintenance squadron commander (301 MXS/CC). The team will include two fully qualified Fuel System technicians and two additional team members or trained augmentees. The most senior of the Fuel Systems technicians on the team will be the Hydrazine Response Team Chief.

5.2. A qualified Hydrazine Response Team will be on call via radio or telephone during normal duty hours. During non-duty hours the Base Fire Department (Host Navy) will 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 will be submitted by 301 MXS to the Base Fire Department (Host Navy) and MOC. This letter will be updated as changes occur and reviewed quarterly.

5.3. The Hydrazine Response Team will be responsible for detection, containment, neutralization, and clean-up of any hydrazine spills, leaks or residues caused by EPU activation, providing the incident is within the organization's capabilities.

5.3.1. The Fuel System/Hydrazine Response Team will be responsible for all Level I (less than 1 pint) hydrazine incidents unless weather conditions or spill locations cause it to be beyond their capabilities. Examples are wet weather or when leaks are near storm drains.

5.3.2. Spill containment and neutralization will be accomplished in accordance with T.O. 1F-16C-2-49GS-00-1, using the two person concept with a two person back-up team standing no closer than 100 feet upwind of the site. The two working members will wear full protective clothing and SCBA.

5.3.3. Whenever level-A or B equipment is required, two personnel (entrants) will be fully suited and an additional back-up team of two personnel will be half-suited in preparation for entry. The Base Fire Department EMS personnel will check vital signs on personnel pre and post entry of level-A or B suits. The Fire Department, Crash Recovery, and Support personnel will assist the Entry/Back-Up Team in donning CPC.

5.4. When hydrazine is present, the Hydrazine Response Team will post a sign indicating CAUTION: HYDRAZINE-WATER COMBUSTIBLE, CANCER SUSPECT AGENT. AVOID VAPORS AND SKIN CONTACT. WEAR PROTECTIVE EQUIPMENT. NO SMOKING, EATING OR DRINKING. If spill, leak, or residue is in a hangar, adjoining offices within the cordon area (100 feet) will be evacuated. All office doors, including those outside the cordon area, must remain closed. When it is determined that a hydrazine leak is not present or the leak has been contained and neutralized and the aircraft is determined safe for maintenance, the aircraft will be moved to the designated fuel system maintenance "Safe" area for refurbishment and servicing of the Hydrazine System. The Hydrazine Response Team Chief will report to the On-Scene Commander before departing.

5.5. Hydrazine Response Team Chief:

5.5.1. The primary responsibility of the Hydrazine Response 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. The team chief ensures all proper equipment is on hand and all personal items are removed, tagged, and secured. He or she performs quality checks on SCBA and CPC between uses and records the serial

numbers, time consumed and date of usage of the level-A and level-B hazard suits in a logbook.

5.5.2. The H-70 Team Chief will notify MOC upon confirmation of any hydrazine leaks.

5.5.3. The H-70 Team Chief will establish a minimum safety area of 100 feet in all directions around the aircraft, with one entry point. Only persons authorized by the Team Chief will be allowed in this area.

5.5.4. 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 to or delete procedures using approved local checklists.

6. Base Fire Department (Host Navy):

6.1. The Fire Department will:

6.1.1. Be the on-scene-commander, anytime EPU activation has occurred or is suspected.

6.1.2. Perform decontamination duties as required.

6.1.3. Establish communications with pilot; verify EPU selector switch is off. Chock left main tire only if hot brakes are not a factor.

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

6.1.4.1. If visual inspection indicates a leak, inform pilot to: notify control tower, go on 100 percent oxygen, and shut engine down. Assist pilot in cockpit egress, using portable oxygen bottle.

6.1.4.2. If visual inspection indicates no leak, direct pilot to shut engine down, assist in normal pilot egress.

6.1.5. Assist Hydrazine Response Team Entry/Back-Up Team in donning CPC.

6.1.6. Determine if and when the initial Security Forces cordon will be adjusted.

6.2. The on-scene-commander shall standby at the entry control point to facilitate communication with the Hydrazine Response Team Chief on aircraft status.

6.3. After the Fire Department has rendered the aircraft safe; the aircraft will be turned over to the Hydrazine Response Team.

7. 301st Aircraft Maintenance Squadron (301 AMXS):

7.1. Upon notification or discovery of an H-70 discharge, leak, or spill, the 301 AMXS Expediter will declare a ground emergency and notify the MOC of any EPU activations or suspected hydrazine spills. The expeditor will be the on-scene-commander until relieved by the fire department or a senior maintenance supervisor.

7.2. Personnel suspecting or discovering H-70 leaks on aircraft/vehicles will immediately evacuate the area to a distance of 100 feet up-wind and notify 301 AMXS Expediter. **WARNING:** Any leakage of a clear oily liquid or presence of ammonia odor will be treated as a hydrazine leak. Personnel shall never touch, smell, or taste liquid leaks.

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

7.4. For suspected ground activations of the EPU with engine running, the aircraft will remain running until told to shut-down by emergency personnel.

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

7.4.2. Crew chiefs on all remaining running aircraft will ensure that the EPU safety pin is installed and immediately shut down engines. The crew chiefs and pilots will then evacuate the ramp to a minimum of 100 feet upwind from the affected aircraft.

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

7.5. If an activation or hydrazine spill occurs at EOR the crew chief will notify the pilot of activation and inform him or her to go on 100% oxygen. The crew chief will then evacuate all additional personnel at least 100 feet upwind.

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

8. Aircraft Pilot:

8.1. The aircraft with the activated EPU will follow the -1 procedure for an activated EPU.

8.2. For unaffected aircraft, pilots will be notified by UHF radio when a 301 FW aircraft has activated its EPU. Pilot will notify the crew chief that there is an activated EPU and direct him to install the EPU safety pin. After the safety pin is installed, the pilot will shut down the aircraft engine and crew chief and pilot will evacuate to a minimum of 100 feet upwind or 300 feet downwind from the affected aircraft. However, if the aircraft is ready to launch (i.e. crew chief is off headset and aircraft is ready to taxi), the pilot will immediately taxi to appropriate end-of-runway area or as directed by ground control.

8.3. Aircraft returning from flight with an activated EPU will follow the appropriate -1 procedure and recover in the designated aircraft recovery area. HOT BRAKE AREA on ECHO TAXIWAY and the End of Runway (EOR) CHECK AREA on the NORTH END OF RUNWAY.

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

9. 301 Maintenance Operations Control (MOC) will:

9.1. Upon notification of an in-flight, ground firing, or "Possible Hydrazine Leak" of the EPU, MOC will perform Functional Checklist 04; F-16 Hydrazine Leak / EPU Activation (H-70) and dispatch the Fuel Shop, Hydrazine Response Team to the appropriate recovery area for possible EPU activation. The team will maintain radio contact with MOC for wind

direction. Notify the Quality Assurance Branch (301 MXG/MXQ) and the Command Post (301 FW/CP) that an inadvertent firing has occurred.

10. Bio-Environmental Engineering (301 MSG/SGPB) will:

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 301FW Occupational Health Working Group (OHWG) or other means.

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

11. Base Environmental (NAVY BCE/CEV) will:

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

11.2. Provide instructions for the disposal of hydrazine fuel, rinse water, cleanup materials, and defective components

12. Safety Officer (301 FW/SE) will:

12.1. 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.

13. Medical Services (301 MDS/PES) will:

13.1. Ensure all personnel assigned to hydrazine maintenance duties have pre-placement, annual and termination occupational health physicals. From these physicals, 301 MSG/SGPB will assess any occupational exposures of maintenance personnel to hydrazine. Medical Services will review all incidents/accidents involving hydrazine to evaluate any needed follow-ups for exposed personnel.

14. EPU maintenance requirements:

14.1. Building 1656 is the designated controlled area for EPU maintenance and servicing. Selection of this area was made with the coordination and approval of the Base Bioenvironmental Engineer. The following tasks shall be performed only in this area: EPU maintenance actions that include catalyst bed depth check/line purge (After EPU has been fired) and tank de-pressurization or removal and replacement.

14.2. Routine EPU maintenance to include pre-phase EPU and monopropellant checks may be performed in a hangar or shelter. If the EPU has been fired, the monopropellant checks may be accomplished in a hangar or shelter, after the EPU tank de-pressurization and line purge is accomplished and when no hydrazine vapors are detectable. Ref: T.O. 1F-16C-2-49GS-00-1.

14.3. All EPU disconnects and purges will be performed inside Building 1656 whenever any of the following conditions exists:

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

14.3.2. Wet or rainy conditions exist which would make liquid hydrazine difficult to detect or clean up.

14.3.3. Weather conditions are below 32 degrees Fahrenheit.

14.4. All disconnects performed inside the facility will require maintenance personnel to perform the following:

14.4.1. Notify MOC or the flight line expediter of the maintenance in progress.

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

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

15. Crash Damaged or Disabled Aircraft Recovery (CDDAR):

15.1. Upon arrival to a crashed or disabled aircraft the Hydrazine Response Team Leader (HRTL) will coordinate with the CDDAR team leader and the On-Scene Commander (OSC). The OSC will determine when to send in the Hydrazine Response Team.

16. Hydrazine Procedures for Aircraft Deployment:

16.1. A qualified H-70 response team with a complete spill kit will be sent with every F-16 deployment going to any other location than an established F-16 base, or as determined by 301 MXG/CC.

16.2. Immediately upon arrival at the deployment location, the senior 301 FW Maintenance Officer or NCO will 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 Maintenance Officer, MOC, Quality Assurance Branch, Hospital, Base Fire Department, Base Disaster Preparedness, Base Safety, Bioenvironmental Engineering, and Security Police.

JOHN M. BREAZEALE, Col, USAFR
Commander

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

AFI 21-101, AFRC Sup 1, Aircraft Equipment Maintenance Management

AFI 91-203 Air Force Consolidated Occupational Safety Instruction, General Industrial Operations;

AFMAN 33-363, Management of Records,

AFMAN 91-201, Explosive Safety Standards

AFOSHSTD 48-137, Respiratory Protection Program;

AFRIMS <https://my.af.mil/afrims/afrims/afrims/rims.cfm>

T.O. 42B1-1-18, GENERAL PROCEDURES HANDLING OF H-70 (HYDRAZINE - WATER FUEL);

T.O. 1F-16C-2-49GS-00-1, Emergency Power System;

T.O. 1F-16C-2-49JG-00-1, Emergency Power System;

T.O. 1F-16C-2-49JG-00-2, Emergency Power System;

T.O. 1F-16C-2-49JG-00-3, Emergency Power System;

T.O. 6J14-4-11-2, Fuel Storage Tank

Adopted Forms

AF Form 847, *Recommendation for Change of Publication*, 22 September 2009

Abbreviations and Acronyms

AF—Air Force

AFMAN—Air Force Manual

AFRIMS—Air Force Records Information Management System

CDDAR—Crash Damaged or Disabled Aircraft Recovery

CPC—Chemical Protective Clothing

EPU—Emergency Power Unit

HRTL—Hydrazine Response Team Leader

MOC—Maintenance Operations Center

OHWG—Occupational Health Working Group

OSC—On-Scene Commander

RDS—Records Disposition Schedule

SCBA—Self-Contained Breathing Apparatus

T.O.—Technical Orders