

**LOCATION:** F-16 Modification docks in 225, 236, 228 and 227, Flight Test Ramp east of Building 233 or any other approved outside location for F-16 aircraft maintenance or modification.

**1. Description of Workplace:** F-1 tank dimensions, approximately 3 feet in width, 5 feet long, and 3 feet deep.

**2. Tasks/Operations to be Performed:** Remove and replace F-1 bladder cells and components, rivets and fasteners, longerons, fuel pumps and lines. To inspect. Seal tank as required

Task by Potential Exposure Group (PEG) 225P1 F-16 fuel in 225, 225 Q2 F-16 Sheetmetal specialized operations in the F1 tank, Z136 fuel in 227, 228 and 236.

**Table 1.1.**

225 P1 and Z136	Task	Confined Space Entry	Potential Hazards	PPE/Control
225 P1 and Z136	Cleaning out tanks (all tanks)	Permit Required	MEK/Acetone mix, jet fuel, purge fluid, trichloroethane, and benzene. Oxygen deficiency. LEL level. Entrapment.	3M FF supplied air respirator, tri-layer coveralls for use when fuel found, nitrile gloves, (butyl rubber gloves while using MEK and trichloroethane), MA1 Blowers and MultiRAE PLUS PID Tester
225 P1 and Z136	Changing O-ring(all tanks)	Permit Required	Petrolatum, jet fuel, purge fluid, and benzene. Oxygen deficiency. LEL level. Entrapment.	Full Face or half face (HF) air purifying respirators with organic vapor (OV) cartridges, tri-layer coverall where fuel is found, cotton coveralls, nitrile gloves and MultiRAE PLUS PID Tester
225 P1 and Z136	Repair Leaks (all tanks)	Permit Required	Jet fuel, purge fluid, and benzene. Sealers Solvents (MEK/acetone mix, trichloroethane) Oxygen deficiency. LEL	Half face (HF) air purifying respirators with organic vapor (OV) cartridges, , tri-layer coverall where fuel is found cotton coveralls, nitrile gloves (when using desoclean) and butyl rubber gloves (when using MEK and trich), splash proof goggles, MA1 Blowers., and Multi RAE PLUS PID Tester.

			level. Entrapment.	
225 Q2	Surface preparation, repair and sealing in F1 tank	Permit Required	Inhalation of solvents contained in sealants and during MEK wipe down; skin contact with sealant	Half-face air-purifying respirator with organic vapor cartridges, blowers for dilution ventilation, nitrile gloves, goggles, cotton coveralls, confined space entry procedures

### 3. Chemicals Used:

#### Cleaning and Priming

Chemical: Sealant 8802/AMS-S-83318 Class A-16

Application: Brush /Gun

Quantity: 20 / 6 ounce tubes

Duration: Up to 24 hours, three 8 hour shifts

Chemical: MEK/Acetone Blend 6810P310

Application: Wipe

Quantity: 6 ounces

Duration: 30 minutes to 1 hour

Chemical: Isopropyl Alcohol 6810-00-286-5485

Applications: Brush/Wipe/Spray

Quantity: 6 ounces

Duration: 30 minutes to 1 hour

Chemical Primer 804-00-1009-1562

Applications: Brush/Wipe

Quantity: 3 ounces

Duration: 1 hour

Chemical: Petrolatum 9150002500933

Application: Hand/Brush

Quantity: 4 ounces

Duration: N/A

#### Trouble Shooting:

Chemical: Top Coating 8030-00-166-8813

Application: Brush

Quantity: 1 pint

Duration: up to 5 hours

Chemical: Trichloroethane 6810-00-0561-1487

Application: Wipe/Spray

Quantity: 1 Quart

Duration: up to 1 hour

Chemical: Leak Detection 6850-00-185-0423

Application: Spray

Quantity: 12 ounces

Duration: 4 hours

**4. Technical Data Required:** Air Force T.O. 1-1-3, AFOSH Std 91-21, LAOI 92-25, 1F-16C-2-28JG-10-1 and the current Bio Survey.

**5. Prevention of Unauthorized Entry:** Confined Space Entry Point signs will be posted at aircraft in the direction of the most common approach, indicating which space is being entered. Attendant will monitor entry point.

## **6. Potential Hazards**

**6.1. Potential Hazard Description:** Hazardous LEL and oxygen levels, entrapment. See potential hazards listed in Table 1.1. and paragraph 3.

### **6.1.1. Personal Exposure Conditions for Hazardous Substances:**

Solvents, sealants, adhesives and other chemicals approved for this MEP are permitted in quantities which will not cause the generation of a hazardous atmosphere. To further protect all entrants ventilation of the space is required before and through out the entry. Failure of the ventilation system, observations by the attendant of condition changes in the space, changes or failure to communicate by the entrant, and/or detection of early symptoms by the entrant will result in the space being evacuated and if necessary the attendant calling for immediate emergency assistance.

**6.2. Control of Hazards:** All hazards are controlled with methods consistent in the current Bio Survey, MSDSs on all products approved for use in this confined space and by applicable AFOSH Standards and technical orders. Reference paragraphs 8.1 through and 8.2.3. of this MEP.

**6.2.1.** Chemical goggles will be used for eye protection. Exposure to the eyes will require immediate care at the closest eyewash station followed by medical assessment and care.

**6.2.2.** Exposure to skin will be limited by the use of tri-layer coveralls when fuel is present. Employees will use gloves and goggles as stated in the current PEG survey. Change outs of the coveralls will be before moisture breakthrough. Used coveralls will be hung between use and exchanged when soiled or soaked through. Employees will wash hands, arms, and faces after entries and before drinking or using tobacco products.

**6.2.3.** Hazards from inhalation will be controlled by the use of respirators identified in the current respirator OI for the PEG.

**6.2.4.** Fire hazards are eliminated by establishing and maintaining an LEL of 20% or less during fuel foam removal, and 5 % or less when aircraft defueling and purging are completed. This is accomplished by the elimination of any spark producing tool or equipment and the use of continuous ventilating air into the space.

**6.2.5.** Confined space entrants must be cognizant of areas of the confined space in which they could become entangled, such as protruding tank structure, lines, conduits, and converging areas of the interior of the tank

## **7. Entry Permit: Required**

**7.1. Permit:** AF Form 1024 Confined Space Entry Permit

**7.2. Permit Requirements-** Permit will not be issued until confined space meets requirements and acceptable entry conditions specified in paragraphs 8.1 through 8.2.3. are complied with.

## **8. Entry Procedures**

**8.1. Confined Space Isolation Methods/Lockout Tag out:** Aircraft power must not be applied during fuel tank confined space entry until the aircraft is fully drained, purged, depuddled, mopped out, and fuel lines drained and a LEL of 5% or 300 ppm is maintained. Then power may be applied to the aircraft. Lock out tag out requirements will be In Accordance With (IAW) T.O. 1-1-3 paragraph 2.7.10 circuit breakers, power receptacles and SPR to be tagged to indicated maintenance is on going and 2.11.3.a. and e. all aircraft batteries are disconnected or made safe in accordance with the system particular technical order, If-16() -2-28JG-10-1 and tagged as required, and the aircraft external power receptacles and fuel control panel are tagged with AF Form 979 or 1492.

**8.2. Acceptable Entry Conditions.** Lock and tag out requirements listed in paragraph 8.1 must be complied with The fuel tank must be drained, purged, depuddled, mopped out, and fuel lines drained. The confined space must be continuously fresh air ventilated. LEL will be maintained at 10% or less and oxygen content will be between 19.5 and 23.5 %. Respirators will be required. The availability of emergency rescue services must be confirmed. Call MAB Control at 7-2812 to confirm the availability of Hill AFB Emergency Rescue. If work is performed on graveyard shift in any facility other than Hangar 1, the authorizing supervisor will notify MA Customer Service, 7-3238 of the location of the aircraft and the start time of the entry. MA Customer Service will be notified at the completion or cancellation of the permit.

**8.2.1.** When working fuel equipped aircraft the LEL will be monitored continuously or checked every two minutes using a non continuous combustible meter. Readings will be taken at the entry point and progressively into the space.

**8.2.2.** Tanks will be continuously air ventilated when entered. IAW T.O. 1-1-3 paragraph 2.6.3.1. JP-8 vapor concentration must be measured using a photoionization detector (PID). A PID measures JP-8 vapor in parts per million (ppm). The concentration of JP-8 vapor must be below 600 ppm (10 % LEL) before tank entry is authorized.

**Note:** *Ventilation is the process of supplying fresh air to or exhausting air from a fuel tank once a tank is considered acceptably purged.*

**Warning:** **If mechanical ventilation is interrupted the attendant will command entrant to exit the space immediately. The entrant will respond immediately to the command.**

**8.2.3.** A respirator may still be required to prevent exposure to specific substances in accordance with other health standards , An atmosphere which could have health effects from exposure, but will not cause incapacitation or limit the ability for self-rescue is not considered a hazardous atmosphere for a confined space.

## **9. Authorization**

### **9.1. Confined Space Entry Team:**

**9.1.1.** Entry Authorizing Supervisor: The work center employee, identified as the Entry Authorizing and Alternates in this MAB-003 MEP, will:

**9.1.1.1.** Maintain the organizational MEP.

**9.1.1.2.** Issue entry permits consistent with the MEP.

**9.1.1.3.** Revoke the permit and contact MAB Safety when any entry conditions are not consistent with the MEP.

**9.1.1.4.** Determine that acceptable conditions are present at a permit space when entry is planned.

**9.1.1.5.** Ensures confined space team members are trained in the operation of atmospheric testing and monitoring equipment to evaluate the confined space for safe entry conditions.

**9.1.1.6.** Ensures confined space team members are properly trained and qualified in safe operating and emergency procedures, use of PPE and how to egress the confined space.

**9.1.1.7.** Ensures Confined space team members who are ill or are on medication that may affect their ability to safely perform assigned tasks, are excused from the operation and replaced.

**9.1.1.8.** Briefs workers on the hazards of the entry.

**9.1.1.9.** Insure the work area, tools and equipment to identify and correct hazards.

**9.1.1.10.** Selects the PPE consistent with the current PEG survey.

**9.1.1.11.** Insure all lockout tag out and acceptable entry conditions listed in paragraph 8.1 through 8.2.3. are complied with.

**9.1.1.12.** Ensures that any equipment necessary to perform the entry task or to aid in an emergency rescue is readily available.

**9.1.1.13.** Determines the availability of the Fire Department Rescue team by calling MAB Control, 7-2812.

**9.1.1.14.** Authorize the confined space entry permit, making sure the entry permit is complete, dated and signed prior to entry.

**9.1.1.15.** Cancels the permit if conditions are no longer acceptable

**9.1.1.16.** Never permit entry into an Immediate Danger to Life or Health (IDLH) atmosphere.

**9.1.1.17.** Establish a system for controlling entries.

**9.1.1.18.** Coordinates and briefs contractors on permit-required confined space entry.

**9.1.2.** Attendant:

**9.1.2.1.** Is responsible for monitoring the entry area and maintaining effective communication with entrant(s) and can easily summon help in the case of an emergency. Do not attempt rescue involving entry. Provide all possible support without entering the fuel cell until the rescue team arrives. Attendants will have authority to order entrants to exit the space at the first indication of an unexpected hazard.

**9.1.2.2.** Comply with all requirements of the entry permit.

**9.1.2.3.** Limit entry to those authorized.

**9.1.2.4.** In the event of an emergency the attendant will order the evacuation of the space by all entrants and direct the runner to notify emergency response personnel. Emergency calls will be made by the runner by calling 911, using the dock phone. If the aircraft is located on the ramp the runner will be equipped with a hand held radio, maintained at the distance required by the fuel safety zone and will call MAB Control or MA Alert and instruct the Control Centers to make the 911 call.

**9.1.2.5.** Remain at the attendant's post and not leave for any reason except self-preservation unless replaced by an equally qualified person.

**9.1.2.6.** If an attendant is monitoring more than one entry all entrants must be ordered to evacuate the spaces in the event of any emergency in any of the spaces.

**9.1.2.7.** The attendant is authorized to assist the entrant in self-rescue if the assistance can be rendered without the attendant breaking the plane of the confined space.

**9.1.3.** Entrant:

**9.1.3.1.** Must understand all procedures, safeguards and emergency egress/rescue procedures associated with the entry.

**9.1.3.2.** Alert the attendant to any changes or conditions and responds immediately to the attendant's evacuation orders.

**9.1.3.3.** Review the entry permit prior to entry ensuring acceptable entry conditions are valid.

**9.1.3.4.** Obey instruction from attendant, responding immediately to the attendant's evacuation order.

**9.1.3.5.** Notify the supervisor if any hazards are found that were not identified in the MEP.

**9.1.3.6.** Notify the supervisor if they are ill or on medication of any type.

**9.1.4.** Runner:

**9.1.4.1.** Respond to the attendants request to notify Hill AFB Emergency Rescue for assistance.

**9.1.4.2.** Direct emergency rescue team to the location of the entrant.

## **10. TRAINING:**

**10.1.** All members of the Confined Space Entry Team, Entry Authorizing Supervisor, Entrant, and Attendant will receive the following training:

MAW Course 0523 Confined Space Generic	Frequency: Initial Trainer: MAW	Trainer: MAW	Document AF Form 55
MAB F-16 Aircraft Confined Space Specific Course	Frequency: Annual	Trainer: MABW	Document AF Form 55
* Respirator Fit Test and Training if Fuel work is performed or authorized.	Annual	75 AMDS/SGB and Supervisor	Document AF Form 55
Confined Space Awareness AF Form 55 Brief Item 20.	Initial and at least Annual	Trainer: Supervisor	Document AF Form 55
MAB Atmospheric Tester Course	Annual	Trainer: MABW	Document AF Form 55

**Note: If non-fuels personnel enter these confined spaces they must have fuel system/tank familiarization training as well as the training listed in this MEP.**

**10.2.** All MAB employees will receive Confined Space Awareness training as part of the AF Form initial and annual briefing. This briefing will be documented in block IV on the AF Form 55.

## **11. Entry Equipment and location:**

**11.1.** Atmospheric monitoring equipment, in Special Equipment Crib .

**11.2.** MA-1 Blower with required filter to prevent the blower from picking up sand, dust and dirt and blowing it into the space. Filters in the assembly should be cleaned and replaced as required. .  
Blowers to be delivered at the work site by the AGE contractor.

**11.2.1.** The blower will be placed, and bonded to aircraft as required by T.O. 1-1-3 paragraph, 2-12.2. and t. 8-7.3. A complete approved equipment listing is found in T.O. 1-1-3 Table 8-1.

**11.3.** Coveralls, white with no pockets and no spark-producing buttons and tri layer are issued from the tool crib in building 225.

**11.4.** Nitrile gloves are issued at the SSC.

**11.5.** Goggles, face shields and plano safety glasses are issued at the SSC in building 225.

**11.6.** Confined Space signs are located at the docks and will be in place at the aircraft during the entry indicating the space being entered.

**Note:** PPE required is listed in the current PEG survey

## **12. Testing:**

**12.1.** Atmospheres will be tested and documented by the F-16 Confined Space Entry member using the listed LEL and Oxygen tester following manufacturer instructions and in accordance with training on the use of the equipment. Testing results, times, make and model of the testing equipment, and last date of calibration will be annotated on the AF Form 1024.

MULTIRAE Plus	RAE Systems	Photo Ionization Detector (PID)
Eagle	RKI Instruments Inc	Portable Multi-Gas Detector to be used until replaced by MultiRAE

**12.1.1.** All personnel who perform tests must be certified by training on each type of testing equipment Training will be documented in the employees AF Form 55.

**12.2.** Testing must be accomplished for oxygen testing first then LEL.

**12.3.** Concentrations of toxic materials will be evaluated during annual surveys by Bio Environmental Engineering and before new processes are established for the space.

**12.4.** Testing will be accomplished prior to starting the ventilating air and after the air has been turned on, and as required throughout the entry. Each time the space is tested the results and times will

be recorded on the AF Form 1024. Testing will also be accomplished any time the ventilation air has been shut down and before reentry every time the confined space is vacated for any reason.

**12.5.** Aircraft which use JP-8 may not ,under certain circumstances, require purging and can have the LEL maintained at acceptable levels by ventilating the tanks. Entry-safe condition is 10 % LEL or 600 ppm or less. Tank shall be continuously ventilated during all entries.

**13. Communication and Observation:** The attendant will communicate with the entrant verbally. In the event of an emergency the attendant will notify the runner to call the Hill AFB Fire Department Emergency Rescue. See Rescue paragraph 14.

**14. Rescue:** The primary rescue plan for this MEP is self-rescue. The entrant and attendant will be aware of early symptoms that may include, but are not limited to headache, dizziness, weakness, loss of coordination or inability to respond to verbal communication or exit orders. Any of these or other symptoms will require the attendant to order the entrant to exit the space or will require the entrant to initiate self rescue. The entrant will respond to exit commands given by the attendant at any time during the entry.

**14.1.** OO-ALC/MAB has no organizational rescue teams. Consistent with the requirements of AFOSH 91-25 and AF TO 1-1-3, the 75 ABW /CEF is the primary rescue service for all MAB confined space entries.

**14.2.** If a command to exit the confined space is given and there is no response, or if a verbal communication is not answered by the entrant the attendant will immediately summon emergency rescue assistance by directing the runner to notify Hill AFB Emergency Rescue by dock phone, cell phone or radio transmitter. Cell phones and radio transmitters must not be used within the fuel safety zone.. Call 911 on base phones or 777-1911 from a cell phone to summon the Hill AFB Fire Department Emergency Rescue The attendant will continue to attempt to communicate and assist the entrant without entering the confined space. When the emergency rescue team arrives, the runner will direct emergency rescue team to the location of the entrant. Communication equipment design and Hazard Class will be IAW T.O. 1-1-3 Section III.

**Warning: Cell Phones and radio transmitters must not be used in the fuel safety zone.**

**Note:** *If a radio transmitter is used confirm its operating strength from the work area of the confined space. The radio will be maintained at the distance required by the fuel safety zone from the open fuel cells until they are purged and maintained at an entry safe LEL IAW T.O. 1-1-3 2-7.6.2.*

**14.3.** Any Personnel in the area will begin to move support equipment out of the way and place a stand or JLG for the rescue team to access the entry point. Hangar doors will be open to allow unobstructed entry by the Fire Department.

**14.4.** The entry permit will be posted at the aircraft, will be provided to the Fire Department when they arrive on scene.

**14.5.** The attendant will not leave the entry point until instructed by the Fire Department Rescue team.

**14.6.** This MEP authorizes the cutting of openings by rescue personnel for access to spaces if that is the only means to reach an entrant.

**14.7.** 75 ABW/ CEF will be provided current copies of all MAB MEPs to facilitate training and rescue plans.

## **15. CONTRACTORS:**

**15.1.** When a contractor is contracted to perform work that required permit-required confined space entry, MAB fuels Management will insure the contractor is:

**15.1.1.** Notified in a statement of work that work will be performed in a permit-required confined space.

**15.1.2.** Briefed on emergency rescue responsibilities and the need to determine whether the contractor or Base Fire Department is expected to supply a rescue function.

**15.1.3.** Briefed on the contents of the space and what makes the space permit-required and any potentially hazardous conditions associated in the area of the confined space. They must also be notified that they must contact the entry authorizing supervisor or alternate listed in this MEP to review all existing permits for the space to be entered.

**15.1.4.** Briefed on precautions and procedures that have been implemented to protect Air Force workers.

**15.2.** MAB Fuel Management will coordinate entry operations and procedures with the contractor and agree upon the permit entry system to be used when both MAB organizational and contractor personnel will be working in a permit-required confined space.

**15.3.** Contractors will be required to complete and post a job specific confined space entry permits for all entries.

**15.4.** Contractors will brief MAB Fuels Management of any previously unknown hazards encountered or hazard that may have been introduced into the space as a result of the contract work.

## **16. Permit Routing and Control:**

**16.1.** Copies of all canceled and/or completed permits must be provided by authorizing authority to the MAB Safety Office on the last working day of each month MAB Safety will maintain the permits for one year from date of entry.

**17. Amendment to the MEP:** The MEP must be reviewed at least once a year. Changes and amendments to the MEP other than spelling and grammar must be coordinated with the Entry Authority, OO- ALC/ MAB/Safety, Bio Environmental Engineering/75 AMDS/SGPB, Fire Department/75 ABW/CEF and Center Safety Office/ OO-ALC/SEG.

**18.Coordination:**

OO-ALC/MABF /Second Level	Date
OO -ALC/MAB Branch Chief	Date
OO-ALC Safety	Date
OO -ALC /SEG	Date
Bio Environmental/SGP	Date
Fire Department 75 ABW/CEFT	Date

**CONFINED SPACE MASTER ENTRY PLAN  
ATTACHMENT 1**

**MEP MAB-003  
18June 2003**

**Confined Space Entry Authorization**

The following personnel in MABF and MABC are authorized to approve and sign confined space entry permits for work to be performed in F-16 Fuel Tanks.

Name	Office Symbol	Primary/Alternate
	F-16 FUELS	
Gene Kourtei	MABFPSB	Primary
Scott Keiflin	MABFPFB	Primary
Mark Wager	MABFPFB	Primary
Richard Freer	MABFPC	Primary
Stanley Kano	MABFPC	Primary
Charles Nabor	MABFPC	Primary
Darryl Stewart	MABFPFB	Primary
Dan Carrasco	MABFPSB	Primary
Rameldo Archuleta	MABFPFB	Primary
Ronald Mcbee	MABFPFB	Primary
Marshall Knuth	MABFPFB	Primary





