



UNITED STATES MARINE CORPS
HEADQUARTERS MARINE CORPS AIR STATION MIRAMAR
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StaO 10345.4 *W/ch 1*
SKD31
17 JUN 1998

Station Order 10345.4 *W/ch 1*

From: Commanding Officer
To: Distribution List

Subj: REGULATIONS AND OPERATING INSTRUCTIONS FOR AIRCRAFT REFUELING SYSTEMS

Ref: (a) NAVAIR 00-80T-109; Aircraft Refueling NATOPS Manual
(b) StaO 3710.1; Air Operations Manual
(c) NAVAIR 00-80R-14

Encl: (1) Safety Regulations
(2) Operating Procedures for Refueling Aircraft Engines Idling
(3) Operating Procedures for Static Refueling of Aircraft
(4) Operating Procedures for Refueling Aircraft with a Mobile Refueler
(5) Operating Procedures for Aircraft Defueling

1. Purpose. To publish information on high speed refueling of aircraft and mobile refueling/defueling vehicles.

2. Description of Facilities. The aircraft fueling system consists of two separate fixed units and mobile equipment. One lane type, located parallel to the east west taxiway (pits) consists of eight skid-mounted refuelers with sixteen outlets, one octagonal shaped system with eight independent outlets (located southwest of building 470) capable of refueling all types of aircraft, and mobile refueler/defueler vehicles.

3. Action

a. Aviation units shall maintain a copy of reference (a) in their technical library. Personnel involved in refueling operations, i.e., aircrew, plane captains, ground crew, and fuel personnel shall read reference (a) at least annually and annotate training records of the fact. Personnel sent to the Fuel Division for pit training shall have read reference (a) within the past six months.

b. Pilots, Fuel Division personnel and refueling crews shall be familiar with and comply with this instruction. Host squadrons are responsible for ensuring visiting units comply with this instruction. Understanding and compliance with provisions of enclosures (1) through (5) and references (a) through (c) are essential to safe operation.

c. Fuels Division personnel must be alert at all times and shall exercise careful attention to details. Fuel pit supervisors, Octagon supervisors and fuel vehicle operators are responsible for ensuring regulations are carried out during refueling operations.

T. A. CAUGHMAN
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Distribution: A

Copy to: 3rd MAW: A
MAG 46: A



UNITED STATES MARINE CORPS

MARINE CORPS AIR BASES WESTERN AREA MIRAMAR
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IN REPLY REFER TO:

Stao 10345.4 Ch 1
G-4

16 DEC 1998

STATION ORDER 10345.4 Ch 1

From: Commander
To: Distribution List

Subj: REGULATIONS AND OPERATING INSTRUCTION FOR AIRCRAFT
REFUELING SYSTEMS

Encl: (1) New page insert to StaO 10345.4

1. Purpose. To transmit a new page insert to the basic order.
2. Action. Remove enclosure (5) of the basic order and replace with corresponding pages in the enclosure.
3. Change Notation. Significant page inserts are denoted by an arrow (→) symbol.
4. Filing Instructions. File this Change transmittal immediately behind the page of the basic order.
5. Certification. Reviewed and approved this date.


J. A. NAUGHLAN
Chief of Staff

Distribution: MCAS: A

SAFETY REGULATIONS

1. Background Information. Three elements are necessary before fire or explosion is possible.

- a. Oxygen
- b. Flammable vapors, liquids, or materials
- c. A source of ignition

The first two are automatically present when fuel is spilled or its vapors released while refueling or defueling aircraft. Only a source of ignition is needed to cause an explosion. When refueling or defueling aircraft or when fuel is spilled, the released vapors are heavier than air and flow downward toward the ground. Fuel vapors mix with air slowly, consequently the danger area may be 30 to 50 feet from the source of the vapors. It is imperative all sources of ignition such as hot surfaces, open flames, sparks caused by metal contact, electrical equipment and static electricity be vigorously controlled within this area.

2. Smoking is not authorized in the in-line pits or Octagon. Open flames or unnecessary electrical equipment shall not be permitted within 100 feet of an aircraft prior to, during, or after refueling. Secure electrical equipment not directly used in the refueling operation. Lights will be of explosion proof design.

3. There shall be no maintenance, arming, de-arming or servicing of aircraft other than the refueling operation conducted in the aircraft fuel facilities.

4. Personnel involved in fueling operations shall wear the full working uniform at all times (e.g., safety shoes, long sleeve shirt/coveralls, gloves, cranial helmet, sound attenuator, and flight deck goggles). Hearing protection is required for other personnel in the refueling area not directly involved in aircraft refueling. Remove fuel contaminated clothing (soaked) as soon as possible and promptly wash any part of the body affected by fuel with soap and water.

5. Take every precaution to prevent fuel spillage. In the event of a fuel spill or equipment failure, secure refueling operations immediately. Do not resume operations until the spill is cleaned up completely, equipment is checked to ascertain the cause of the spill or failure, and equipment is again in proper operating condition. Fuel spills in excess of ten feet in radius require engine shutdown. The refueling crew shall immediately clean up the fuel, and notify the Fire Department at extension 9911.

6. A portable dry chemical fire extinguisher or Halon extinguisher shall be readily accessible for use on fuel fires when the fuel pit is in operation. Personnel who work in the pit area shall be trained by the Fire Department on the proper operation of fire extinguishers. The Octagon Fuel Facility has a fixed fire suppression system loaded with ninety seconds of light water.

7. Dustpan lights will be on at night in each pit when the pit is open and ready to issue fuel. Entrances, exits, and fuel station lights will be on at night in the Octagon.

8. It shall be the responsibility of the fuels supervisor in the in-line pits and the Octagon to maintain a high state of cleanliness of all fuel handling areas. Personnel working in the fuel area shall be subject to the authority of the fuels supervisor. Squadron personnel are responsible for cleaning in-line pits assigned to them.

9. Only authorized personnel (aircrews, Fuels Division personnel, aircraft refueling crews, and their supervisors) shall normally be allowed in the refueling areas.

10. Report accidents and equipment failure or breakage to the Fuels Officer or his direct representative at extension 71391 or 71392. In accidents involving aircraft or mobile equipment, the material shall remain in place (unless an emergency exists) until photographs are taken and a preliminary investigation is conducted by the unit concerned and station representatives.
11. Personnel shall conduct themselves responsibly while in the refueling areas. Eating, lying down, reading, or skylarking is not permitted.
12. Pilots shall not taxi into the fuel pits or Octagon unless under the positive control of a taxi director.
13. Pilots shall not taxi into the fuel pit or the Octagon until the aircraft is checked for hot brakes. In the event of hot brakes, taxi the aircraft to the side and park until the Fire Department is notified (extension 76128) and the brakes cool.
14. Vehicle drivers in the vicinity of refueling equipment shall use caution to avoid running over fuel hoses.
15. Do not refuel or defuel during electrical storms. Secure refueling and defueling upon the detection of an electrical storm, which is determined by the Naval Oceanography Command Detachment (NOCD), moving towards the air station. The NOCD will notify the Operations Duty Officer (ODO) who will immediately secure all base refueling or defueling by notifying the Fuel Division and squadrons.
16. Never block open the deadman valve during any type of refueling/defueling operation.
17. **PERSONNEL WORKING AT NIGHT SHALL CARRY AT LEAST ONE ILLUMINATED WAND TYPE FLASHLIGHT WHEN WALKING ON ANY TAXIWAY TO MAKE THEMSELVES MORE VISIBLE TO AIRCRAFT AND VEHICLE OPERATORS.**

OPERATING PROCEDURES FOR REFUELING AIRCRAFT WITH ENGINES IDLING

1. In addition to the safety requirements for hot refueling at the Octagon Fuel Facility as stated in reference (a), the following apply:

a. Aircraft approaching the Octagon entrance shall do so in accordance with reference (b). Once in the Octagon, aircraft shall observe a 5mph speed limit and be under the position control of a taxi director.

NOTE: Personnel in the refueling area shall be in a complete uniform at all times (e.g., safety shoes, a cranial helmet, long sleeve shirt/coveralls, gloves, flight deck goggles).

b. Inspect aircraft as follows:

(1) A refueling crew member shall check the aircraft for hot brakes at the throat of the Octagon. Aircraft with hot brakes shall follow procedures outlined in reference (c).

(2) Aircraft with hydraulic leaks around the nose gear or main mounts shall not utilize the Octagon because of the possibility of steering and/or brake failure/fire.

(3) The aircrew and refueling crew shall perform inspections and fuel system prechecks as required by reference (a).

NOTE: If any fuel system precheck fails to operate properly, stop fueling immediately.

(4) No maintenance of any type is permitted in the fuel facility.

(5) Aircrew shall secure unnecessary electrical and electronic equipment prior to entering the Octagon.

(6) Aircraft shall taxi out of the Octagon under minimum power in a straight line to avoid directing exhaust on the fuel crew.

(7) Only single point pressure refueling is authorized for hot refueling. The nozzle shall be in the full open position only.

NOTE: Hot refueling through the in-flight refueling probe is not permitted.

(8) Chock all aircraft except E-2s.

NOTE: Prop hazard involved in chocking E-2 aircraft outweighs the necessity for chocks.

(9) Fold or sweep wings prior to entering the Octagon to lessen the chance of a taxi accident.

(10) Stop refueling if fuel spillage or leakage occurs. The aircrew shall advise ground control of the spill. Fuel spills in excess of ten feet in radius require engine shutdown. Fuel shall immediately be cleaned up by the refueling crew and the fire department shall be notified.

(11) Aircraft with external ordnance on board is not allowed in the fuel pits, including practice bombs.

(12) Any aircraft with chaff, excluding external pods, may utilize the octagon only after the system has been fully deactivated.

(13) Aircraft with 20mm TP ammunition may utilize the Octagon only after certified ordnanceman has dearmed the aircraft.

(14) Aircraft with captive (inert) missiles may utilize the Octagon.

NOTE: It is the pilot's responsibility to ensure requirements pertaining to ordnance are fulfilled.

2. Take the following actions if a fire occurs during refueling operations:

- a. The aircrew shall notify the tower.
- b. The fuel pit operator will stop refueling and secure all eight fuel pits by pushing the emergency stop. If time and conditions exist, the nozzleman will disconnect the nozzle from the aircraft.
- c. The Octagon tower operator will activate the articulating light water extinguisher and will secure it upon arrival of crash crew. CAUTION: The fire cannon operates at 135 psi through a four-inch pipe. Attempts to evacuate the aircraft while the cannon is operating may cause serious injury.
- d. All hands shall fight the fire with portable equipment available until relieved by station crash crew.

3. Take the following actions if a fire occurs in the hot brake area:

- a. The aircrew shall notify the tower.
- b. The hot brake checker shall determine if the fire is class BRAVO or class DELTA.
 - (1) If BRAVO fire, the checker shall use PKP.
 - (2) If DELTA fire (readily recognized by white, flare-like flame), the checker shall use Halon.

NOTE: Personnel assigned as hot brake checkers shall be fully trained and indoctrinated in the proper use of portable firefighting equipment. Under NO circumstances shall CO2 be used on fires in wheel assemblies.

4. In the event of any fire within 1000 feet of the Octagon, secure all refueling.

NOTE: Squadrons utilizing the Octagon shall ensure squadron personnel engaged in fueling operations are firefighting school graduates.

5. Hot refueling in pits 1 through 8 is authorized.

6. The Fuel Division person shall operate the deadman control. Fuels Division personnel and squadron personnel will man the in-line pits (1 through 8) and accomplish hot refueling in accordance with procedures in enclosures (1) and (2) of this instruction, except as modified below.

- a. Station the hot brake checker on the fast taxiway T-5, west of in-line pit 8.
- b. Notify the Operations Department and Station Fire Department. Operations Department personnel (ground control) shall coordinate aircraft refueling pits to prevent "stacking up" of aircraft.
- c. Refueling crew members shall be thoroughly familiar with the locations of fire alarms, phone boxes, and portable firefighting equipment.
- d. Aircraft will enter pits from fast taxiway T-5, traffic directions being from west to east, and shall exit fuel pits onto taxiway T-3.
- e. Hot refueling in both directions is authorized. The traffic pattern will be in a counter clockwise direction from taxiway T5, around the east end of the pits, through the east side of the selected pit, and then out on taxiway T5 in a easterly direction.

OPERATING PROCEDURES FOR STATIC REFUELING OF AIRCRAFT

1. Aircraft towed to the refueling pits or Octagon:
 - a. Refueling personnel shall:
 - (1) Check for fuel leaks.
 - (2) Perform "prior-to-refueling" checks as required by directives.
 - (3) Position nose wheel of aircraft on yellow square.
 - (4) Chock the aircraft.
 - (5) Close the fuel dump valves.
 - (6) Connect:
 - (a) External power cable(s) and energize (if applicable).
 - (b) Fuel nozzle.
 - (7) Operate fueling controls in accordance with posted instructions.
 - (8) Operate aircraft switches/controls necessary for refueling.
 - (9) Monitor fuel vents and/or gauges as required.

Note: See reference (a) for mandatory manning requirements.

- (10) Upon completion of refueling:
 - (a) Disconnect fuel nozzle and stow the hose.
 - (b) De-energize, disconnect, and stow the external power cable.
 - (c) Connect tow bar.
 - (d) Man the aircraft cockpit as the brake rider.
 - (e) Remove wheel chocks.
2. Conduct an inspection of the aircraft, hose assembly and refueler for fuel leakage, both prior to and during the refueling operation. In the event of fuel leakage or spilled fuel, stop the operation immediately until the leak is repaired, the spilled fuel is cleaned up, and the Fire Department notified. It is the responsibility of the pit supervisor to determine if and when it is safe to resume refueling.
3. The nozzle operator shall ascertain that refueling nozzles are clean and mechanically inspected before each delivery.
4. Upon completion of refueling, evacuate hoses before the pressure nozzle is disconnected.
5. At no time will an aircraft be towed more than five miles per hour, or personnel allowed on the aircraft other than in the cockpit.

OPERATING PROCEDURES FOR REFUELING AIRCRAFT WITH A MOBILE REFUELER

1. Comply with the following mandatory procedures when refueling aircraft. These procedures assume that the mobile refueler operator will be designated as an operator and the plane captain or his assistant as a loader. The safety observer shall stand by with a portable fire extinguisher (not the fire extinguisher from the mobile refueling unit). Note: Additional personnel may be required for certain type aircraft. These procedures also assume that gravity, or over-the-wing refueling methods are employed. If pressure or under-the-wing method of refueling is employed, the procedure shall be modified as listed in paragraph 2 below.

a. Before beginning any refueling operation, complete the appropriate aircraft check list.

b. The refueler operator shall ensure the aircraft is properly located away from all possible sources of ignition. If not, delay refueling until the aircraft is moved or the source of ignition is eliminated.

c. Park the refueler as far from the aircraft as the length of hose will reasonably permit, and park the vehicle in a position so it may be quickly driven away in the event of a fire. This means, park the refueler parallel to or headed away from the aircraft wing. There must be no obstruction in front of the refueler to prevent it from being driven away in an emergency. Do not back the refueler in, except in extenuating circumstances and then only with an outside observer at the back of the refueler to direct the operator.

d. After the refueler is parked, the handbrake shall be set, gear shift placed in the neutral position, and parking lights turned on.

e. Consult the plane captain to ensure fuel in the refueler is the type required for the aircraft being refueled.

f. Before beginning the refueling operation, consult the plane captain to ensure aircraft electrical and electronic equipment is turned off, no maintenance work or loading/unloading is being done on the aircraft, and nonessential personnel have disembarked from the aircraft.

g. The aircraft and refueler shall be properly bonded by connecting the refueler static cable to the aircraft.

h. The loader shall bond the nozzle bonding wire to the aircraft and shall open the fill cap of only one aircraft fuel tank. Replace cap immediately after the tank is filled and before removing the cap of any other tank.

i. The refueler operator shall check to ensure no ignition sources are within 100 feet of the aircraft and then prepare the refueler for the dispensing operation.

j. The operator shall first record the totalizer meter readings and then open the refueling valves as necessary.

k. At the signal from the loader on the aircraft, start the fuel pump. The operator shall stand by the refueler controls during the entire fueling operation.

l. Never lock open the fuel nozzle. Control the nozzle by hand so the flow of the fuel may be stopped instantly when the hand pressure is released.

m. It is important to replace tank fill caps before removing any of the grounding or bonding wires. After completing the filling operation and evacuation of the hose, lower the hose and nozzle to the operator on the ground, and secure on to the refueler as required.

n. Secure the refueler equipment by replacing the hose, closing or operating the necessary valves, replacing the static ground and bonding wires, closing cabinet doors, etc.

CAUTION

If during the refueling operation the automatic water drain valve opens and ejects water, and the fuel control valve closes, immediately stop refueling operations. Return the refueler to the parking area, and notify the fuel supervisor. An investigation shall be made to determine the source of the water and deficiency corrected.

2. Special Operating Precautions for Pressure, or Under-the-Wing Refueling. The operational procedures previously listed for refueling operations are also applicable to pressure refueling. Certain precautions are necessary because of the special design of the pressure refueling equipment as follows:

a. Follow safety instructions regarding checking for ignition sources and bonding all equipment, etc.

b. Before refueling operations begin, check the hose, nozzle and other equipment for leaks. If a leak is found, stop refueling immediately and do not resume operations until the source of the leak is determined and repaired.

c. Check the Automatic Fuel Shutoff Valve in the aircraft before pressure refueling. Valve failure could result in ruptured fuel cells from overfilling, possible personnel injuries, and very large fuel spills. The aircrew and refueling crew will perform prechecks as required by the appropriate NATOPS manual. If any system fails to operate properly, stop fueling immediately.

d. When a leak is detected on the aircraft, refueling shall be secured immediately. After repairs are made the aircraft shall be moved to a spill contained fuel area, i.e., inline fuel pits or octagon, to test the aircraft fuel systems for leaks. No aircraft fuel system tests will be conducted anywhere other than a fuel spill contained area.

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Operating Procedures for Aircraft Defueling

1. Background. Defueling aircraft is historically the most dangerous operation on any station. Fires may occur from defuel equipment emitting vapors caused by agitation of the fuel, and at the same time the equipment generating static charges by ingestion of air along with the fuel. The most common problems with defuelers is that adequate clearances between the defueler and a source of ignition are not maintained on the crowded flightline.

2. Defueling safety procedures

a. The squadron shall certify that the fuel is suitable for use in the aircraft. Fuel that is suspected of being contaminated will be de-certified unless tested to prove suitable. A list of personnel authorized to certify the fuel shall be delivered to the Fuel Division quarterly.

b. The aircraft shall be located on the north most parking spot on each parking line, or in the inline fuel pits. The inline pit area is the preferred area due to installed spill containment.

c. The defueling area shall be a circle 100 feet across centered on the vent of the defuel truck. There shall be no sources of ignition inside the circle. Only the following required personnel and equipment necessary to carry out the defuel operation shall be within the circle during refueling: (1) Truck driver, at the controls of the truck pumping system, (2) Nozzle person at the fuel panel of the aircraft, (3) Safety observer, on the opposite side of the aircraft from the nozzle person with a fire extinguisher.

d. The operator of the defuel truck is in absolute command of the safety circle and is by this station order, ordered to immediately cease the operation if any action of any person is judged by the operator to be a danger to personnel or equipment. Only the Fuel Division Director or his designated representative can relieve the operator.

3. Defueling the aircraft

a. The truck and aircraft shall be ground-wire bonded together to prevent static sparks.

b. Hook up the hose from the truck to the aircraft.

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c. Determine how much fuel is going to be removed from the aircraft. Insure the truck has adequate room to accommodate the fuel without overflowing.

d. The truck operator, nozzle person, and safety observer shall take up their positions and then begin removing the fuel from the aircraft.

e. While the operation is in progress all three personnel shall remain observant for violations of the safety circle. There will be no sitting down or laying down while the operation is in progress. Personnel shall remain alert during the entire defueling operation.

f. When the aircraft crew declares that the required fuel has been removed, shut off the truck and secure all hoses and bonding wires.

4. Disposition of fuel and credit to the customer

a. The defuel truck shall be brought to the fuel laboratory for testing.

b. Sample's of fuel from the truck tank shall be given to the fuel division for testing.

c. Disposition of the fuel shall be as directed by the Fuel Division Director or designated representative. The policy shall be, all practical steps will need be taken to recover defueled product for reuse as aviation grade fuel, which will be returned to the customer as a credit. If not possible to recover the material in a way which the maximum value to the station is achieved.

5. Fuel removed from the bottom of aircraft fuel tanks

a. Fuel drained from the aircraft fuel tank low points will be drained directly into the red bowser.

b. Nothing else will be placed into the red bowser.

c. Buckets of fuel or fuel samples will be dumped in the appropriate drum in the hazardous waste collection area. The fuel division shall not pick up hazardous waste.

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d. The station recovers funds by selling the drained fuel from the red bowzers as surplus jet fuel. If the process is not controlled the ability to sell the product and the fuel will be lost and given away.

e. Squadrons requiring the use of a bowser shall call the fuel dispatcher at ext. 7-1393. When the fuel has been put into the bowser, the bowser shall be brought back to the dispatch office located at building 9744.