SOUTH AFRICAN CIVIL AVIATION AUTHORITY

Technical Guidance Material for Aircraft Ground Handling and Servicing

Subject: AIRCRAFT GROUND HANDLING AND SERVICING: CA AOC-AC-004

Date: 05 October 2018

1. PURPOSE

This Technical Guidance Material (TGM) contains information and guidance for the servicing and ground handling of aircraft.

2. GENERAL

The aviation industry has found through experience that firm safety practices deter accidents. This TGM contains generally accepted information and safety practices that may help prevent injuries to personnel and damage to aircraft.

3. ORGANISATION AND MANAGEMENT

The Operator should have an organization and management system, including definition of responsibilities and authority, for the management of all ground handling functions associated with ramp operations, passenger services, baggage services, cabin services, weight and balance control, ground support equipment and fuel services.

The Operator should have a system for the management of personnel assigned to its ground handling operations, to include assurance of appropriate competence, training, education, skills, and experience.

4. TRAINING REQUIREMENTS

The Operator shall have training programmes that include initial and recurrent training to ensure that employees engaged in ground handling operations establish and retain their effectiveness in carrying out assigned duties. Such training programmes of the Operator should have:

a) Operator and Regulatory approval, as applicable;
b) recurrent training;

The Operator should have procedures for the handling of on-ground emergencies, including aircraft evacuation, bomb threats, facility evacuation and natural disasters.

The Operator should have a procedure for ground handling personnel to provide the Pilot-in-Command with written information of special loads, including dangerous goods, as soon as possible before the departure of the flight.

The Operator should have a preventive maintenance programme for ground support equipment and established a system for recording maintenance completed on ground support equipment.

3. DIRECTING MOVEMENT OF AIRCRAFT

The person directing an aircraft that is being taxied should stay far enough ahead and to the left of the aircraft for the pilot to have an unobstructed view of him.

a. Use the standard hand signals illustrated in SA CATS 91.06.13.

b. When directing aircraft during darkness or inclement weather, the signalman should use illuminated or reflective wands.

c. Movement of aircraft in congested areas should be avoided. However, when necessary, additional signalmen should be stationed near the aircraft wingtips to assure that adequate clearance is maintained.

4. PARKED AIRCRAFT

The Operator should have a process for securing the aircraft at the completion of ground handling and servicing functions on overnight/lay-over aircraft.

When an aircraft is parked, the main gear wheels should be chocked fore and aft. If the aircraft is to remain overnight or if winds are expected, flight control locks should be used.

a. While turbine powered aircraft are not in service or being worked on, engine plugs should be installed to prevent damage from dust, debris, nesting birds, etc.

b. Ground personnel should develop a habit of making a visual check of the aircraft as soon as it is parked and secured. Before the flight crew departs, advise them of any unsafe condition that may have been observed and determine the nature of services that will be required for the next flight. This procedure may prevent unwarranted delays of the next departure or possible in-flight failures. Examples of conditions that may be observed are: low or flat tires; cracked windows; nicked propeller blades; loose propeller spinners; oil and fuel leaks; damaged flight surfaces; etc.

   ***CAUTION**: Propellers have injured many people in a moment of carelessness. When it becomes necessary to position propellers, they should be handled as if the engine is going to start. Before moving a*

g. Clearance must be obtained from the airport control tower, either by appropriate radio frequency or by prior arrangement through other means, before moving aircraft across runways or taxiways.

7. TAXIING OF AIRCRAFT

Only rated pilots or other qualified persons should be authorised to taxi aircraft. Persons authorised to taxi aircraft shall be familiar with the airport control communications procedures and radio frequencies.

8. AIRCRAFT FUELLING

Improper fuelling procedures may cause aircraft accidents and in-flight incidents. If operators of fuelling facilities establish procedures for safe and proper fuelling of aircraft and fuelling personnel follow these procedures, many aircraft accidents or incidents will be prevented. Fuelling personnel should be familiar with the fuel requirements for the models and types of aircraft that they are servicing. The following paragraphs contain a description of problems that may be encountered in fuelling aircraft and recommended procedures for combating these problems.

a. Water in the Fuel.

(1) Water occurs in aviation fuels in three forms:

(a) Dissolved water occurs similar to the humidity in the atmosphere that converts to droplets and settles out as the fuel temperature decreases during flight.
(b) Suspended water appears in the form of droplets that reflect light. High concentration of droplets will cause fuel to have a cloudy or hazy appearance.
(c) Solid bodies of water may be caused by leakage of storage tanks, leaking filler neck seals, or the settling out of suspended water droplets.

(2) Accumulation of water. There is no way of preventing the accumulation of water formed through condensation in fuel tanks. The accumulation is certain, and the rate of accumulation will vary; so it is recommended that storage tanks, fuel truck tanks and aircraft fuel tanks be checked DAILY for the presence of water. Any water discovered should be REMOVED immediately. In addition to the daily water check, fuel tanks should be CHECKED AFTER EACH DELIVERY as insurance against inadvertent water contamination.
(3) The minimum settling time. Adequate settling time is NECESSARY for accurate testing. The minimum settling time for aviation gas is 15 minutes per foot-depth of fuel and 60 minutes per foot-depth of turbine fuel.
(4) Water checks of storage tanks and fuel trucks may be made by attaching water detecting paste, or litmus paper, to the bottom of the tank dip stick.

(a) Push the dipstick to the bottom of the tank and hold for 30 seconds. When the stick is removed, the detecting paste or litmus paper will have changed colour if water is present.
(b) The source of excessive amounts of water must be determined and corrected before further use of fuel from the tank.

b. Rust and scale dislodged from the inside of fuel storage tanks may enter the aircraft fuel tanks and clog systems. Turbine fuel tends to dislodge rust and scale and carry the particles in suspension. Because of

operation is completed, the fuelling vehicle should be parked at least fifty feet from aircraft or buildings and positioned in a manner to permit removal from the area without delay.

h. Fuelling procedures. Fuelling personnel should first check with the flight crew to determine the type and grade of fuel required, including additives for the aircraft. It is a good practice to have the pilot sign a request for service, identifying the grade and quantity of fuel desired. In the absence of the flight crew, fuelling personnel should check the placard located near the aircraft fuel tank filler port, or the aircraft owner's manual that is usually carried in the aircraft, to determine the type and grade of fuel required.

(1) Check to ensure that:

(a) No electrical or radio equipment in the aircraft is energised or being maintained while fuel is being dispensed into the aircraft, except those switches that may require energising to operate fuel selector valves and quantity gauge systems.
(b) Qualified personnel should be stationed at the aircraft fuel control panel during pressure fuelling operations.
(c) Fuelling personnel should not carry objects in the breast pockets of their clothing when servicing aircraft or filling fuel service vehicles because loose objects may fall into fuel tanks.
(d) Matches or lighters should never be carried during fuelling operations.
(e) Because of the high lead content, direct fuel contact with skin or the wearing of fuel saturated clothing should be avoided. Skin irritation or blisters may result from direct contact with fuel.
(f) Immediate medical attention should be sought if fuel enters the eyes.
(g) In the event of fuel spillage, discontinue fuelling operations until the spill can be removed, using proper safety precautions.

(2) Fuelling from mobile equipment. The fuelling crew should follow the following sequence:

(a) Connect a grounding cable from the fuelling vehicle to a satisfactory ground. Grounding posts usually consist of pipes or rods driven far enough into the ground to result in a zero potential.
(b) Connect a ground cable from ground to the aircraft (on landing gear axle or other unpainted surface). Do not attach ground cables to the propeller or radio antenna.
(c) Connect a grounding cable from the fuelling vehicle to the aircraft. The fuelling vehicle may be equipped with a "T" or "Y" cable permitting ground attachment first and grounding of the aircraft with the other end.
(d) Connect a grounding cable from the fuel nozzle to the aircraft before removing the aircraft tank cap. This bond is most essential and needs to be maintained throughout the fuelling operation and until the fuel cap is replaced.

***CAUTION**: Conductive-type fuel hose does not provide a satisfactory method of bonding.*

(e) The fuel dispensing equipment-grounding cables should be removed in the reverse order of the sequence outlined above.

(3) Fuelling from hydrants, pits, and cabinets.

(a) Connect the grounding cable from the dispenser to the aircraft.
(b) Connect the grounding cable from the hose nozzle to the aircraft before removing the fuel cap.

j. Refuelling with one engine running

Procedure for refuelling with one engine running is given in FCOM "LOADING" chapter.
This procedure may be used only if:
- no external ground pneumatic is available while APU is unserviceable.
- airport authorisation is obtained for this operation.
- airport fire department stands by at the aircraft during the entire refuelling procedure.
- one flight crew member can manage the operation and monitor all systems and the engine running from the cockpit.
- a qualified ground crew member is present at the fuelling station.
- the refuelling system is fully operational (overwing filling is not permitted).

k. Refuelling and defuelling (fuelling) when passengers are embarking, on board or disembarking

Fuelling is not permitted with passengers boarding, on board or disembarking with wide cut gasoline type fuel (Jet B, JP4, JP8 or equivalent) or when a mixture with these types of fuel might occur.

Fuelling with Jet A or Jet A1, when passengers are embarking, on board, or disembarking is allowed. However, when passengers are involved, precautions must be taken to ensure that they can be evacuated in the unlikely event that fire does occur. These precautions involve the ramp agent, the engineer (qualified ground crew member), the cabin crew and the pilot(s).

The ramp agent must ensure that, pilot(s), cabin crew and engineer are at their stations that the area around emergency exits is kept clear, that the fire service is alerted and that passenger boarding / disembarkation is carried out in a controlled manner.

The pilot(s) must establish communication with the engineer, inform the cabin crew of the beginning and ending of fuelling, listen for fire warning from the engineer and be prepared to initiate passenger evacuation if necessary.

The engineer must establish communications with the pilot(s), inform the pilot(s) of the beginning and ending of fuelling, and alert Pilot(s) if fire occurs. He must stop fuelling upon pilot request.

The cabin crew must establish communication with the pilots, warn passengers not to smoke ("no smoking" sign must be "ON"), instruct them to unfasten their seat belts ("Fasten seat belt" sign must be "OFF"), ensure that emergency exits are unobstructed and that "EXIT" sign is "ON" and that ground servicing such as catering or cleaning don't risk creating hazard or hindering an emergency evacuation .
If presence of fuel vapour is detected inside the airplane or any other hazard arises, re/defuelling must be stopped immediately.

l. Precautions with mixed fuels

More stringent precautions must be observed when refuelling an aircraft with JET B or JP4 fuel where the fuel tanks already contain JET B or JP4 or a mixture of JET B / JP4 and JET A or JET A1.

JET A and JET A1 are kerosene type fuel.

	Simon Segwabe Executive: Aviation Safety Operations Civil Aviation Authority	2018 -11- 0 8
SIGNATURE OF EXECUTIVE: ASO	**NAME IN BLOCK LETTERS**	**DATE**

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