

Safe Handling and Storage of Fuel and Dangerous Goods

Airside Operational Instruction 20

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AOI Owner – Airfield Operations



SECTION 1 – AVIATION FUEL MANAGEMENT

1 Safety Measures

1.1 Requirements

The EASA IR, ADR.OPS.B.055 requires that the aerodrome operator shall verify that organisations involved in storing and dispensing of fuel to aircraft have procedures to ensure that aircraft are provided with uncontaminated fuel and of the correct specifications.

East Midlands Airport adopts CAP 748 “Aircraft Fuelling and Fuel Installation Management” in conjunction with Explosive Atmospheres (ATEX) and Dangerous Substances Explosive Atmosphere (DSEAR) Regulations as best safety practice. Operators are to ensure they comply with the requirements of the regulations and that staff are aware of their provisions.

1.2 Fuelling Zones

a. A fuelling zone is defined under the ‘Dangerous Substances and Explosive Atmosphere Regulations’ (DSEAR) as an area that would qualify as either;

Zone 0 A place in which a potentially explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapour or mist will occur continuously, for long periods or very frequently. Anywhere where a potentially explosive atmosphere might be expected for more than 1000 hours a year.

Zone 1 A place in which a potentially explosive atmosphere consisting of a mixture with air of dangerous substances in the form of gas, vapour or mist will occur occasionally in normal operation. The hazard would not be expected to occur for more than 1000 hours a year.

Zone 2 A place in which a potentially explosive atmosphere will occur rarely, abnormally and will not persist for long. The hazard would not be expected to occur for more than 10 hours a year.

EMA adopts the larger of the industry standards for these zones (in a temperate climate), which is 3 metres. Therefore, when aircraft fuelling operations are in progress a fuelling zone is established at least 3 metres radially from the aircraft filling and venting points, and from any part of the fuelling vehicle and its equipment including hoses.

b. Non-intrinsically safe equipment including portable electronic devices (PEDs), such as mobile telephones (including use of apps / torch function), pagers, radios and any other electronic or electrically operated equipment are prohibited from any part of the refuelling zone. Particular aspects regarding fuelling zones which airside operators/personnel need to be aware of include:

- i. The use of any equipment with the potential to create or induce a source of ignition should be identified and excluded from any Fuelling Zone. Airside operators should therefore ensure that any potential source of ignition is excluded from the 3-metre fuelling zone, this includes combustion engine vehicles (hot exhaust), electric vehicles (EBT’s etc), electronic / equipment with the potential to induce a spark / source of ignition.

- ii. Equipment maintenance, repairs, and testing procedures, including the operation of switches or other devices, with the potential to create a source of ignition within the Fuelling Zone should be deferred until fuelling has finished.
- iii. During fuelling operations, air and fuel vapour are displaced from the aircraft fuel tanks. This potentially explosive vapour is expelled via vent points (these tend to be located near the aircraft wingtips on both sides of the aircraft).
- iv. Ground Power Units (GPU's) may be operated outside the fuelling zone, however the connection and disconnection of GPU'S, where the connection point is within the fuelling zone, is prohibited. On smaller aircraft i.e. Jetstream 41, the GPU connection point may be within the fuelling zone. Operators are to liaise with the fuelling supervisor to ensure that GPU connection or disconnection is not carried out during the fuelling operation.
- v. Operators must ensure that passengers do not enter the fuelling zone whilst embarking or disembarking.
- vi. Operators must be aware that where aircraft are being refuelled on adjacent stands the fuelling zone may extend between both aircraft in its entirety.
- vii. Within fuelling zones and designated fuel storage areas no person shall smoke or bring a naked light or light any naked light within these areas.

1.3 Refuelling with Passengers on board an Aircraft

- a. Provision should be made for the safe evacuation of passengers and/ or ground staff in the event of an emergency, via at least two of the main passenger doors (or the main passenger door plus one emergency exit when only one main door is available), and preferably at opposing ends of the aircraft. Throughout the fuelling operation these doors, or emergency exits, should be constantly manned by a cabin attendant.
- b. If an emergency exit with an inflatable slide is designated to meet the above requirements, the deployment area must be kept clear of external obstruction and the fuelling supervisor must be informed. The access and egress routes from areas where slides might be deployed must also be kept clear.
- c. The Operations Control Room, ext. 2973, is to be informed if it is intended to conduct aircraft fuelling operations with passengers on board. Although not required, EMA RFFS will attend if requested to do so. Requests for this service should be made through The Operations Control Room.
- d. Ground staff carrying out their duties on board an aircraft are also bound by the provisions as detailed above.
- e. If for any reason an operator is not able to comply fully with the requirements they must apply for written consent from the Head of Fire and Airfield Operations to refuel aircraft with passengers on board.
- f. Consent to refuel aircraft with passengers on board will only be given once satisfactory risk assessments and safe systems of work have been submitted to the Head of Fire and Airfield Operations by the operator.

1.4 Fuel Spillages (Action by Fuellers)

- a. The following procedures are to be incorporated into existing company procedures, by aircraft fuellers, in the event of a fuel spillage whilst carrying out aircraft fuelling operations:
 - i. STOP FUELLING – release dead man control, activate emergency cut off device.
 - ii. The Fuelling Overseer should notify the aircraft operator and EMA Operations Control Room if the spillage is likely to create a fire hazard, if the spillage covers an area in excess of 2 sq. metres, or if the spillage enters the drainage system.
 - iii. Alert personnel and airline staff within the vicinity and where possible, prevent ingress into the affected area by other vehicles and/or personnel.
 - iv. Keep all spark producing equipment and sources of ignition away from the area until the fuel is completely vaporised and the fuel vapour has dissipated.
 - v. If safe to do so, and the spillage is not within 6 metres of the engine compartment, disconnect all fuelling nozzles and bonding leads from the aircraft, reel in the fuelling hoses and move the fuelling equipment away from the spillage, to a safe area.
 - vi. Do not start engines or move the fuelling vehicle if the fuel spillage is within 6 metres of the vehicle engine compartment, unless instructed to do so by the attending Fire Officer.
 - vii. Ensure that all minor spillages are cleared up using the appropriate absorbent materials which should then be removed and disposed of safely.
- b. The following procedures are to be incorporated into existing company procedures by aircraft fuellers, in the event of a fire during aircraft fuelling operations:
 - i. STOP FUELLING/DEFUELLING
 - ii. Raise the alarm and inform EMA Control Room immediately
 - iii. Attempt to extinguish the fire if it is safe and practical to do so
 - iv. Alert all nearby personnel and airline staff
 - v. As soon as possible, and after hoses have been disconnected, drive the fuelling vehicle away from the aircraft to a safe area

1.5 Supervision of Fuelling

- a. Aircraft operating companies are to ensure that a competent person (Fuelling Overseer) is present during all aircraft fuelling operations, to ensure the observance of correct fuelling procedures.
- b. The Fuelling Overseer should be easily identified to the fuelling company operative before fuelling/de-fuelling commences so that there is an obvious point of contact should a problem occur.
- c. The Fuelling Overseer is to remain in the vicinity of the aircraft whilst the fuelling operation is in progress to alert the fuelling company operative of potential hazards and to ensure that emergency exits from the aircraft or the exit path of the fuelling vehicle remain unobstructed.

1.6 Additional Provisions

- a. To prevent land/water contamination, aircraft and vehicle refuelling must not take place where the venting point and/or fuelling zone is above broken ground including, but not limited to gravel and grass.
- b. Fuelling staff are to be advised when de-icing of aircraft is to take place. Subject to weather conditions, de-icing may only be carried out on the opposing wing of the aircraft to the fuelling point. The de-icing of the fuselage and remaining wing must not take place until fuelling is complete.

1.7 Training

All personnel who are involved in aircraft fuelling operations must be adequately trained in the duties they perform.

2. Storage and Delivery

2.1 All fuels to be used in aircraft require careful handling. Negligence in the receipt, storage and handling of fuel or an error in fuelling can endanger an aircraft and the lives of all on board. The EASA IR, ADR.OPS.B.055 requires that the correct grade of fuel is supplied and that it is in a condition fit for use in aircraft. CAP 748 "Aircraft Fuelling and Fuel Installation Management" is adopted by EMA as best practice. Operators are to ensure that they comply with the requirements of this publication.

- a. It is the responsibility of the fuel supplier to ensure that fuel is fit for purpose on delivery. The aerodrome fuel installation manager should therefore, on acceptance of deliveries of fuel, insist that the supplier provides satisfactory evidence that the fuel has been sampled and found by tests to be fit for use in aircraft with supporting documentation to this effect. After fuel has been delivered, the responsibility for its safekeeping, quality control and proper delivery to aircraft lies with the manager of the fuel installation. The installation manager should also provide satisfactory evidence that the fuel has been sampled and found by tests to be fit for use in aircraft, with supporting documentation to this effect. Any fuel failing to meet this criteria or required quality tests must not be delivered into the installation or into an aircraft.
- b. All fuel installations and equipment should be marked in a manner appropriate to the grade of fuel stored or distributed therein.
- c. Written records shall be kept for each installation, including vehicles (browsers or tankers), which show dates, quantities and grades of fuel received and delivered to and from the installation. Details of all samples taken, the results of tests, maintenance and cleaning for each installation shall be recorded. All records should be signed and dated by the person responsible for the completion of such work. They shall be preserved for a minimum of twelve months or for a longer period as required by the CAA. On request such records shall be produced to an Authorised person within a reasonable time.
- d. EMA will on an annual basis, commission a suitably qualified person to carry out an audit of all fuel facilities. Results of the audits will be made available to the facility providers. Any action points raised by the audit will be followed up by the Ops Planning and Compliance Department.

3. Contamination of jet fuel by Fatty Acid Methyl Ester (FAME)

3.1 Jet Kerosene has been successfully transported in multi-product pipelines for many years. Strict procedures exist to ensure cross-contamination is minimised. Bio diesel has been used

in the UK since 2002, however significant amounts are now being transported since the Renewable Transport Fuel Obligation (2008) came into force.

- 3.2 The introduction of bio diesel into a pipeline has the potential to impact upon other forms of fuel being transported. The main issue is that the bio-component in bio-diesel Fatty Acid Methyl Ester (FAME) is a surface active material and there is a potential for Jet Kerosene, when transported in pipelines following a batch of bio diesel, to be degraded if FAME desorbs off the pipeline wall, referred to as FAME carryover.
- 3.3 Fuel suppliers at EMA have procedures in place to address the potential for FAME carryover and to ensure that the fuel is fit for use in aircraft. Should contamination occur, the relevant fuel supplier will immediately inform the Control Room (ext. 2973) then cascade the information to each of their airline customers.
- 3.4 Where a FAME incident has been identified details must be reported to the CAA through the Mandatory Occurrence Reporting (MOR) Scheme.

SECTION 2 - PARKING ARRANGEMENTS – FLIGHTS CARRYING EXPLOSIVES

- 1.1 Dangerous Goods are assigned to one or more of nine UN hazard classes, with explosives falling within Class 1, which is further divided into six divisions and several compatibility groups. A few types of explosives are permitted on passenger aircraft, while some may only be carried on cargo aircraft. Many types of explosives are not permitted to be carried unless a specific exemption has been granted by the Civil Aviation Authority.
- 1.2 Loading/Unloading Areas
 - a. Where explosives are permitted to be carried on either passenger or cargo aircraft without the need for an exemption, there is no restriction on where the aircraft must be parked during loading or unloading of the explosives. Where an exemption has been granted by the CAA (Dangerous Goods Office) to permit the carriage of normally forbidden explosives, the aircraft must be parked at one of the 'six' specified surveyed sites during loading or unloading of the explosives.
 - b. At each site no other aircraft are permitted within 75m (stand 111) and 50m (stand 70).
 - c. At each site the minimum distance, which should be maintained by persons in the open not involved in the loading/unloading operation is 50 metres.
 - d. The six surveyed loading/unloading sites are:

Conditions During Loading / Unloading	Division 1.1	Division 1.2	Division 1.3	Division 1.4
Stand 111	100 kg	100 kg	130 kg	Unlimited
Stand 70	140 kg	125 kg	200 kg	Unlimited
Taxiway J – 220m south of Hold J	350 kg	350 kg	1600 kg	Unlimited
Taxiway J – 37m south of Hold J	650 kg	650 kg	5000 kg	Unlimited
Taxiway F – at start of West Apron	920 kg	920 kg	10,000 kg	Unlimited

- e. Each site allows for a maximum quantity of Class 1 Dangerous Goods to be loaded/unloaded. This quantity varies and is dependent upon division.

- f. The maximum quantity shown is that for any one of the above figures; it is not intended that each apply when there is more than one division on the same occasion, in such circumstances the most restrictive single quantity applies. For example, at stand 111, there may be a total of 100Kg of explosives in Division 1.1 or Division 1.2, or a combination of the two divisions. If the explosive is in Division 1.3, the quantity may be up to 130Kg but if there are also explosives in Division 1.1 and/or Division 1.2, the maximum quantity will be 100Kg.
- g. Should the 'dangerous goods' cargo remain on board and be neither added to or removed at EMA then restrictions detailed in 1.2 (d) do not apply.
- h. The net explosive quantities described in paragraph (d) relate to carriage by civilian aircraft. Military aircraft do not fall under the jurisdiction of the CAA. Should a request arise to handle military aircraft carrying quantities greater than prescribed in paragraph (d) a specific risk assessment should be undertaken, this should be signed off by the EMA Accountable Manager (Operations Director).

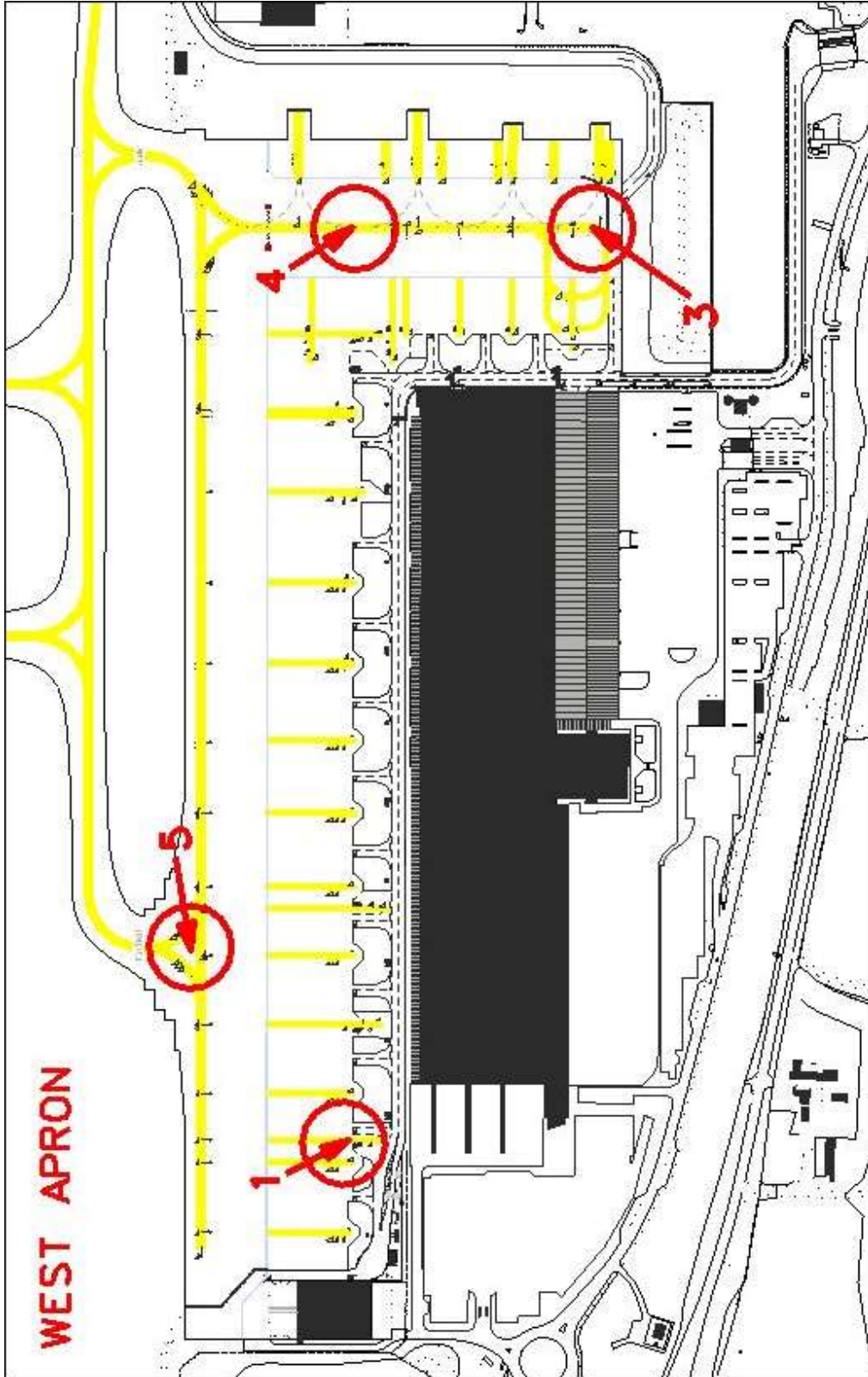
1.3 Notification

- a. Airlines/Handling Agents are to ensure that if they are operating, or receive notification of, dangerous goods flights which require an exemption, and therefore use of specific loading/unloading sites, they are to inform the Operations Control Room as soon as possible, to arrange aircraft parking in accordance with the above. They must also take into account any conditions/restrictions specified above.
- b. The Civil Aviation Authority may also impose additional conditions, which may affect the loading/unloading site.

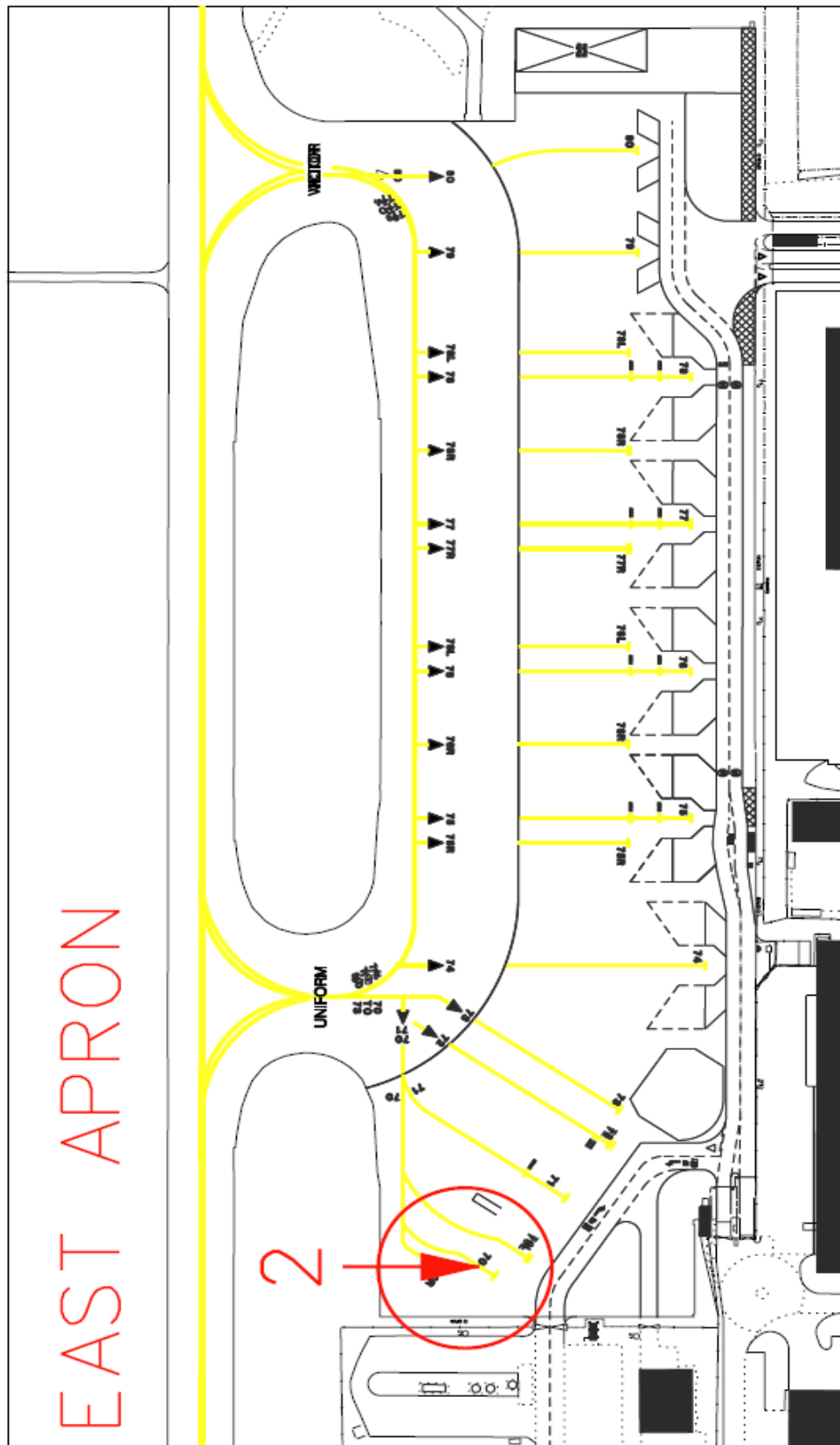
SECTION 3 - CARRIAGE OF ELECTRIC MOBILITY AIDS

1. The procedure for the carriage of electric mobility aids is contained within AOI 26 'Persons with Reduced Mobility'.

Appendix 1 - Dangerous Goods Loading Sites West Apron



Appendix 2 - Dangerous Goods Loading Sites East Apron



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