Civil Aviation Authority

Guidance Material for Organisations, Operations and Design Requirements for Aerodromes

CAP 1168

Introduction

This document is published in support of Commission Regulation (EU) No.139/2014

CAP 1168 Guidance Material for Organisations, Operations and Design Requirements for Aerodromes was produced in response to a clear need for guidance on the application of the European Aviation Safety Agency (EASA) rules contained in Decision 2014/012/R in the UK.

Purpose

The primary purpose of this publication is to provide guidance to UK Aerodrome Operators on meeting EASA requirements relating to the establishment of processes and procedures at certificated aerodromes. It supports and broadens the extent of EASA Guidance Material.

The publication also includes Alternative Means of Compliance (AltMoC) available to UK aerodrome operators should they wish to take advantage of the provision.

Amendment

This document is regularly subject to review and amendment if required.

Suggestions for improvement should be addressed to:

The Editor
CAP 1168
Safety & Airspace Regulation Group
Civil Aviation Authority
Aviation House
Gatwick Airport South
West Sussex
RH6 0YR

Revision history

Version	Date	Change
1.3	14/02/2017	Updates to UKGM3 ADR.OPS.B.035 Operations in winter conditions
1.2	18/08/2016	Changes within this amendment comprise: **Alternative Means of Compliance** Page 6: UK-AltMoC1 ADR.OPS.B.005 (c) Emergency Exercises • Modular period extended to four years. **Certification** Page 9: UKGM1 ADR.OR.B.040 (a);(b) Changes • Changes to the text to clarify scope and responsibilities. • Flow chart added to indicate the process. **The Management System** Page 12: UKGM3 ADR.OR.D.010 Contracted activities • New GM to describe the scope of contracted activities. **Aerodrome operational services, Equipment and Installations** Page 20: UKGM3 ADR.OPS.B.035 Operations in winter conditions • New GM on the introduction of runway contamination reporting. Page 27: UKGM ADR.OPS.B.045 Low Visibility Operations • Low visibility operations (LVO) content has been rearranged and new guidance material added to provide clarity on the processes involved in Low Visibility operations. **Certification Specifications** Page 63: • UKGM2 ADR-DSN.S.895 Serviceability levels • Minimum Percentage of Serviceable Light Fittings table added.

Contents

Alternative Means of Compliance

UKAltMoC4 ADR.OPS.B.010 (a) (2) Rescue and fire fighting services

Extinguishing agents

(d) the amounts of water for foam production, and of the complementary agents provided on the rescue and firefighting vehicles are in accordance with the determined aerodrome category and Table 1, except that for media substitution a maximum of 50% of complementary media or water may be replaced according to the following rates when using performance level B foam:

1. 1 kg of gaseous agent or dry powder = 0.66 litres of water.
2. 2 kg of CO2 = 0.66 litres of water.

Note 1: If a “high performance” dry powder is used the amount required may be reduced by 50%.

Note 2: High performance dry powders should be produced in accordance with the EN 615 standards. In tests 1.5 kg of powder should extinguish a 144B tray with a surface area of 4.52 Esq.

UK-AltMoC1 ADR.OPS.B.005 (c) Emergency Exercises

As an alternative to the method of testing outlined in AMC1 ADR.OPS.B.005(c) Aerodrome Operators may wish to test their emergency plan by conducting:

1. a series of modular tests commencing in the first year and concluding in a full-scale aerodrome emergency exercise at intervals not exceeding four years;
2. Periodic reviews thereafter, or after an actual emergency, so as to correct any deficiency found during such exercises or actual emergency.

Guidance Material

Certification

UKGM2 ADR.OR.B.015 (a) Application for a certificate

Application

An application for an aerodrome certificate in the name of the prospective aerodrome operator should be completed and returned to the CAA together with the appropriate fee for certificate issue. Documentation should be submitted in sufficient time to allow for consideration of the application by the CAA (recommended minimum is 60 days from the date a completed Aerodrome Manual is accepted by the CAA), and for the provision by the applicant of such further information and documentation as the CAA may require.

As with any new application, grant of an aerodrome certificate will be subject to the applicant satisfying the CAA on the requirements of Commission Regulation (EU) No139/2014. In addition to the aerodrome characteristics these requirements will include the demonstration of competence by the applicant to secure that the aerodrome and its airspace are safe for use by aircraft. In assessing an applicant's competence, matters taken into account by the CAA will include:

1. the previous conduct and experience of the applicant;
2. the organisation, staffing and equipment to be provided;
3. the arrangements for the maintenance of the aerodrome and its facilities and equipment;
4. the adequacy of the Aerodrome Manual; and
5. any other arrangements made including the adequacy of safety management systems.

UKGM2 ADR.OR.B.015 (b) (2) Application for a certificate

Aerodrome boundaries

The purpose of this UK guidance material is to provide more clarity to the Guidance Material included in the EASA rules (GM1 ADR.OR.B.015(b)(2) Application for a certificate).

The competent authority in the UK expects the aerodrome operator to provide a map(s) that indicates two aerodrome boundaries. The first boundary delineates the aerodrome operational boundary as described in AMC3 ADR.OR.E.005 Aerodrome Manual Part C Para. 4.2, which indicates the area used for the movement of aircraft. This may or may not

include operational areas leased to specific operators, for which the aerodrome operator will have third party oversight responsibilities.

The second boundary delineates the airport boundary as described in AMC3 ADR.OR.E.005 Aerodrome Manual Part C Para. 4.3, which may include aerodrome facilities not included in the previous boundary.

Both of the boundaries described above may be shown on the location map, if practicable, as described in AMC3 ADR.OR.E.005 Aerodrome Manual Part C Para. 4.1.

UKGM3 ADR.OR.B.015 (b) (8) Application for a certificate

Aerodrome manual

The development, transmission, storage, dissemination and change control of documents is far more efficient and easier by electronic means than with paper copies.

The Aerodrome Manual, emergency orders and details of the safety management system, if contained in a separate document(s), should be submitted in electronic form. In order to facilitate assessments of aerodrome developments and the treatment of obstacles, the aerodrome plan should be provided in paper form.

Procedures

The Aerodrome Manual and other documents specified in the rule should be submitted in either Portable Document Format1 (.pdf) or a format that can be viewed using an application within the Microsoft Office software suite (e.g. Microsoft Word).

Documents must be saved to allow opening, printing, extracting (copy) and commenting without the need to enter a password. File compression utilities should not be used. Documents received in an unsuitable format will not be accepted.

Shareware software is available to convert documents into Portable Document Format.

Submitted documentation must be complete and, if an amendment, not just the amended pages. An amendment should be clearly indicated, for example, using a line in the margin adjacent to the line containing the amendment, underlining new text, and strikethrough deleted text. Substantial amounts of amended text, e.g. complete new paragraphs or chapters, may be annotated just using a margin line.

Every document should be controlled according to the version and date of issue/applicability. All files should be named according to the following convention:

(Date as YYYYMMDD)(Aerodrome name)(Document name)(Version number)

For example: 20070122ManpoolAeroManPart1V1.0.pdf

Do not insert spaces or symbols but intuitive abbreviations may be used. An amendment record and list of effective pages should be included in the document and, where

applicable, the saved filename of a previously submitted document that is to be replaced should be notified.

Documents must not contain hyperlinks to other documents or internet/intranet addresses. Large documents may, however, be split into different parts and individual files. The part number should also be indicated in the saved filename, for example:

20070122ManpoolAeroManPart1V1.0.pdf

If a required document is split into parts, a list of the parts and, where appropriate, their relationship to each other, should be provided.

Documentation should be submitted, with suitable notification of the nature of the submission, by email only to the following address:

asddocs@caa.co.uk

Notification of receipt of a submitted document, its acceptance by the AAA Aerodromes Section or any deficiencies in the document, will be provided.

Exemption from this requirement will be considered by the AAA Aerodromes Section on request.

Submission of the Aerodrome Manual and other Required Documents

Insert: ASDDOCS@caa.co.uk

UKGM1 ADR.OR.B.040 (a) (b) Changes

Changes requiring prior approval

(a) The EASA IR, ADR.**OR**.B.040(a)(2), requires that changes significantly affecting elements of the aerodrome operator's management system require prior approval by the Competent Authority. The CAA defines these changes to be:

  i. Changes significantly affecting the organisation chart, policies or culture of the aerodrome operator's management system as required by ADR.**OR**.D.005(b)(1)&(2).

(b) In addition to the "infrastructure and operational" changes required in ADR.**OR**.B.040 and its supporting AMC, the CAA requires that the additional following changes are subject to prior approval:

  (i) Constructions affecting sightlines from VCR.

  (ii) Developments on the movement area. (e.g. new aprons)

  (iii) Developments which might impact on the movement area. (e.g. New or extensions to terminals or piers)

(c) There is a requirement to include documentation to support the application of a change to infrastructure. CAP 791 'Procedure for Changes to Aerodrome Infrastructure', in particular Part 2, provides a means to meet this requirement and as such it is expected the applicant will follow the CAP 791 process when notifying such

changes. Please note however there is no 'part 3' equivalent under EASA, therefore there is no longer a requirement to complete Part 3 to conclude the process.

(d) The application form SRS2011 for changes requiring prior approval can be found at the Infrastructure, Safeguarding & Public Safety Zones web page.

(e) It will be necessary for the competent authority (CAA) to assure itself that the aerodrome works will be conducted safely; as such, it is suggested the applicant includes the aerodrome operator's Aerodrome Works Safety procedures, ADR.**OPS**.B.070, and reference the 'Part 2' documentation in the column 'Supporting documentation' (e.g. Safety Assurance Documentation). We will issue one approval, rather than a separate part 1 and part 2.

(f) ADR.**OR**.B.040(b) describes other changes requiring prior approval by the CAA, which shall be applied for by the aerodrome operator prior to implementation. The list of items is included at GM1.ADR.**OR**.B.040 (a);(b)

(g) Changes should be managed in accordance ADR.**OR**.B.040(e)&(f). Aerodrome operators should submit applications for changes at least 30 days prior to the intended implementation date to give sufficient time for the assessment and approval processes. However, engagement with the CAA at the earliest opportunity is recommended.

Note: Aerodrome Operator should be aware that significant maintenance projects may result in a secondary effect on the Certification Basis e.g. installation of new airfield ground lighting as part of a runway/taxiway rehabilitation project and may, therefore require prior approval. If the aerodrome operator is uncertain whether a maintenance project falls within the scope of prior approval, they should notify the Aerodrome Inspector who will advise them accordingly.

UKGM1 ADR.OR.B.040 (d) Changes

Changes not requiring prior approval

(a) Aerodrome Operators should develop a procedure that describes the process by which changes not requiring prior approval are managed. The procedure must be approved by the CAA prior to its use.

(b) The approved procedure should be contained within the Aerodrome Manual and cross-referenced to other formally accepted or recognised publications, and should describe the process for notifying the CAA of all changes not requiring prior approval. The timescale for frequency of notification is to be agreed by the CAA.

(c) The scope of changes to be included in the procedure should contain all changes in the aerodrome infrastructure, its operation and management that do not meet the criteria for changes requiring prior approval.

(d) Aerodrome Operators should be cognisant of ADR.**AR**.C.040 (f) when notifying the CAA of any changes. If the Aerodrome Operator is uncertain that a proposed change meets the intent of their procedure or the rules they should ensure the CAA is aware of the proposed change prior to implementation. This will allow the correct course of action to be applied.

CHANGES REQUIRING PRIOR APPROVAL

For example:

- Changes to the Safety Review Board (or equivalent) and Safety Services Office
- Changes to the Hazard Identification process
- Constructions affecting sightlines from VCR
- Developments on, or affecting, the movement area
- Safety critical aerodrome equipment
- Changes affecting the terms of the certificate
- Changes affecting the CB and/or SCs
- Changes affecting DAADs
- Use of an AltMoC

Submit to CAA using Form SRG2011

Submission should include all safety assurance documentation, including control of Works in Progress (CAP791, Parts 1 & 2 provide acceptable means of compliance).

The change should not take place until CAA approval has been provided.

CHANGES NOT REQUIRING PRIOR APPROVAL

For example:

- Changes to Accountable Manager postholder
- Changes to nominated persons
- Terminal extensions not affecting movement area
- Passenger walkways
- Land-locked developments, no impact on operational area
- New windsocks/relocation of windsock
- AGL replacement (like-for-like)
- New portacabins/extensions to portacabins
- Use of cranes
- Buildings/structures located away from aircraft operations (ie maintenance area)
- Unforeseen temporary reduction in RFFS
- Pre-planned maintenance and rubber removal

Develop a procedure with correct data and submit to CAA for approval

Q: Have you developed a procedure to manage such changes?

No

Yes

Q: Does it contain details of the notification procedure to CAA', approved by the CAA?

No

Yes

Q: Has CAA formally approved the procedure, either by email or letter?

No

The change can take place under the terms of your Procedure, following the principles of your SMS and in compliance with EASA requirements.

The Management System

UKGM ADR.OR.D.005 (b) (c) Management system

Guidance can be found in CAA Document SMS Guidance to Organisations.

UKGM3 ADR.OR.D.010 Contracted activities

Scope

(a) The scope of contracted activities and purchased services covers those requirements contained in Parts OR and OPS that are the responsibility of the aerodrome operator to perform. A range of these activities is described in **GM1 ADR.OR.D.010 Contracted activities** to the regulation.

(b) The Implementing Rule (IR) is only applicable should the aerodrome operator 'contract' or 'purchase' any activity(s) it is responsible for under the regulation to another company. Examples of contracted activities may include:

(1) grass cutting;

(2) wildlife control;

(3) pavement maintenance;

(4) electrical maintenance;

(5) apron management, etc.

Examples of purchased services may include:

(1) aerodrome design;

(2) specialist repairs to infrastructure, systems or equipment;

(3) procedure development;

(4) demonstration of compliance, etc.

(c) Regardless of whether the activities are subject to contract or purchase, it remains the aerodrome operator's responsibility to approve and maintain oversight the organisation providing the service.

UKGM1 ADR.OR.D.017 (a) Training and proficiency check programmes

Further guidance and information on training and education can be found on the Learning and Skills Improvement Service website[1].

1 http://www.excellencegateway.org.uk

Training Programmes

Introduction

AMC1 ADR.OR.D.017(a) in section 1.8 sets out the requirements of a training programme. This guidance gives more detail in developing programmes of the requirements as they relate to specific tasks.

Further guidance on training programmes is available in the documents listed below:

Aerodrome Data

- ICAO Annex 15;
- World Geodetic System (WGS) -14;
- A Quality Management System (QMS).

Aerodrome Emergency Planning

- CAP 168, Chapter 9;
- Civil Contingencies Act 2004;
- Government Guidance - Emergency Response and Recovery[2];
- National Occupational Standards (NOS) for Aviation Operations on the Ground - PPLAOG04 Maintain and implement aviation emergency procedures.

Rescue and Fire Fighting Services (RFFS)

RFFS training guidance is described in CAP 699.

Aerodrome Operations

- CAP 168;
- National Occupational Standards (NOS) for Aviation Operations on the Ground[3].

Wildlife Management

- CAP 772;
- National Occupational Standards (NOS) for Aviation Operations on the Ground - PPLAOG21 Contribute to wildlife control.

Operation of Vehicles

- CAP 790

2 https://www.gov.uk/guidance/emergency-response-and-recovery

3 http://nos.ukces.org.uk/Pages/index.aspx

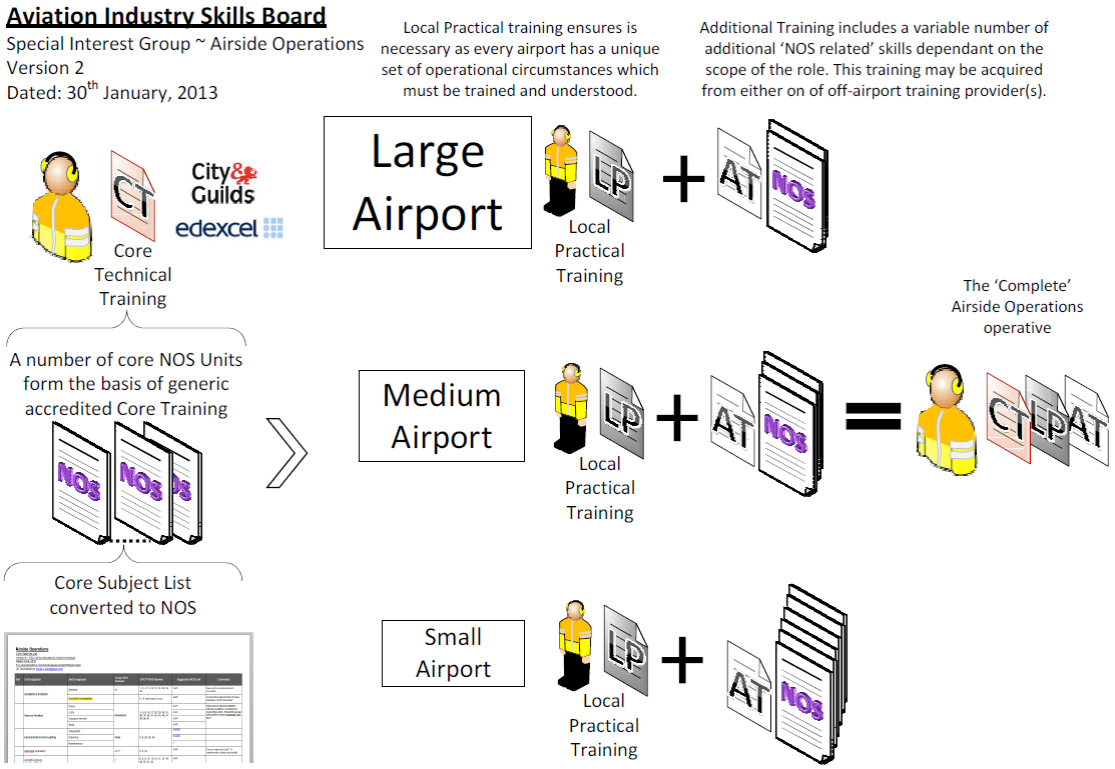
Aerodrome Works Safety

- CAP 168, Chapter 2;
- National Occupational Standards (NOS) for Aviation Operations on the Ground - PPLAOG18 Carry out airside maintenance operations.

Aerodrome Maintenance

- CAP 168 Chapter 2;
- National Occupational Standards (NOS) for Aviation Operations on the Ground:
  - PPLAOG18 Carry out airside maintenance operations;
  - PPLAOG40 Monitor airfield condition and operations;
  - PPLAOG53 Inspect and maintain aeronautical ground lighting systems;
  - PPLAOG54 Inspect and maintain ground power units;
  - PPLAOG55 Inspect and maintain ground lighting; serviceability
  - PPLAOG20 Inspect airside pavement surfaces and systems.

Application of Competence



Aerodrome Operational Services, Equipment and Installations

UKGM7 ADR.OPS.B.015 Monitoring and inspection of movement area and related facilities

Aerodrome pavements to runways, taxiways and aprons are critical to ensure that hazards to aircraft are minimised and to the safe, efficient and economic operation of an aerodrome. As such they represent a significant capital investment that must be preserved in a suitable condition for the particular demands of aircraft operations.

Aerodrome pavements are complex structural systems and their performance depends on a large number of variables relating to the unique mix of aircraft operations, pavement materials and environmental conditions at each aerodrome. As with all aerodrome assets, the most effective means of preserving these pavements in a suitable condition is to implement appropriate inspection and maintenance procedures.

Aerodrome operators should be aware of the importance of timely and disciplined core runway inspections and have suitable procedures to ensure that such inspections are undertaken effectively. Regular inspections should be planned so as to ensure that an appropriate level of vigilance is maintained at all times. These will also improve the level of understanding of the changes under local conditions and allow for maintenance activities to be proactive. The inspections should address the following related items:

- Inspection of the runway surface condition, including water drainage characteristics;
- FOD detection and removal;
- Aeronautical ground lighting fittings within the pavement including the structural integrity of the fittings;
- Signage, markings and other visual aids;
- Cleared and graded areas;
- Wildlife control and the removal of remains.

A runway inspection involves the deliberate entry of an active runway. It is therefore essential that any hazards associated with this activity are identified and addressed so that each agency with an inspection duty has a clear understanding of what is involved and how the task is carried out safely.

All personnel with a task that involves entering a runway should clearly understand their responsibilities and the identified hazards. This training should be recorded and a system of review should be established so that new hazards can be identified and new training needs satisfied.

The aerodrome operator should ensure that the development and use of runway inspection procedures are addressed in the safety management system employed at the aerodrome.

Documentation

All aerodrome inspections, maintenance activities and matters arising from such should be formally documented by the aerodrome operator and records maintained for future reference.

Each inspection should include a reporting mechanism to ensure that appropriate action is taken. Reports should include details of the task(s); any remedial action(s) necessary or taken; should identify the person/agency responsible for undertaking the task and/or further action; and should identify the timescale by which it should be completed.

Daily Inspections

The movement area should be inspected by aerodrome operations staff at least twice a day, although this may be increased dependent upon the movement rate and duration of operations, but the inspections should be spread over the main times of operational activity.

Inspections planned to take place during the hours of darkness may need to be done in a different manner from those undertaken during the daytime, with consideration being given to the presence of vehicles, people, lighting etc. The inspection should check the current suitability for aerodrome operations and the presence of FOD. Inspections may be undertaken from a vehicle travelling at a speed suitable to the task.

Weekly Inspections

All aerodrome pavements within the movement area should be inspected in more detail at least once a week.

The inspection should check the integrity of the aerodrome pavements and should give particular attention to those areas subject to high loads such as departure taxiways, thresholds and high speed operations. High levels of jet blast are known to be a cause for concern. Inspections should be undertaken preferably on foot but may be made from a slow moving vehicle.

Annual Inspections

All pavements within the movement area should be subject to inspection by a professional qualified engineer at least once a year. Inspections should be undertaken on foot and should cover the whole of the movement area or a statistically significant sample.

Optional Inspections

Specific additional on-runway inspections, for example, wildlife hazard control or FOD detection, might be undertaken by a single vehicle and should be carried out at an appropriate speed for effective monitoring.

Off-runway observations may be taken from various vantage points, such as the edge of the clear and graded area, holding points, taxiways or tracks. Observations should be carried out from a stationary vehicle, with binoculars. These types of inspections may only be possible during daylight hours and, if utilised, should be integrated with the core 'on-runway' inspections.

Daily runway lighting checks are normally undertaken in order to identify unserviceable lamps and possible failures of light fittings. It might be possible to incorporate inspections of particular areas of the runway at the same time. These inspections will need to integrate with the other on-runway inspections and be flexible in timing to cater for the variability of the onset of night.

Runway walking inspections can provide a more thorough examination of the runway. The number of full walking inspections planned for each year will depend upon the age and use of the runway surface, and the level of operations undertaken at each aerodrome. Suitable opportunities for this type of inspection may include during and after periods of maintenance, when engineering staff are working on the runway.

A runway inspection should be conducted in the vicinity of the working area after completion of the works to ensure that tools, machinery and other forms of FOD are not present. This is particularly important after works at night where there is a greater risk of the misplacement of work items.

Detailed Pavement Inspection and Evaluation

The inspection procedures described in paragraphs 3-6 above address the functional condition of the surface of the aerodrome pavement but do not consider the structural condition of the pavement construction as a whole. In order to monitor the change in the condition of aerodrome pavements over time, it is recommended that aerodrome authorities establish a formal index to define pavement condition.

The pavement structure has a limited operational life that will be related in part to the declared Pavement Classification Number (PCN). The aerodrome should review declared PCN values in the light of the functional condition.

A detailed pavement inspection of functional condition should normally be undertaken every 2-4 years and a detailed pavement structural evaluation every 5-10 years. However, the frequency will depend on the age, condition and usage of each area.

The regular inspection and evaluation of aerodrome pavements can be the first step in establishing a formal management system that will provide significant advantages to aerodromes by improving the ability to predict, plan and budget for future maintenance work. A number of computerised systems are available.

UKGM1 ADR.OPS.B.020 Wildlife strike hazard reduction

See CAP 772 for further guidance.

UKGM3 ADR.OPS.B.025 Operation of vehicles

See CAP 790 for further guidance.

UKGM2 ADR.OPS.B.030 Surface movement guidance and control system

The Siting of Aids to Navigation within Runway Strips

Any aids to air navigation to be sited within a runway strip should be made as light and as frangible as design and function will permit. In this context a frangible object is one which retains its structural integrity and stiffness up to a desired maximum load, but when subjected to a greater load than desired will break, distort or yield in such a manner as to present the minimum hazard to an aeroplane.

The height of any object which is permitted within a runway strip should be kept to the minimum for the particular site and function of the equipment.

UKGM2 ADR.OPS.B.035 Operations in winter conditions

To allow aircraft movements to take place, snow, slush and ice should be removed from as much of the movement area as is required for safe operations. When snow banks remain at the edge of a cleared section of the movement area they should not exceed the profiles given in Figures 3.8 and 3.9 below.

Aerodromes and airports listed as either a ‘Regular’ or an ‘Alternate’ in the current edition of ICAO Air Navigation Plan – European Region are required to draw up a snow plan in accordance with the national Snow Plan. Other aerodromes can be included in the National Snow Plan on request to the CAA.

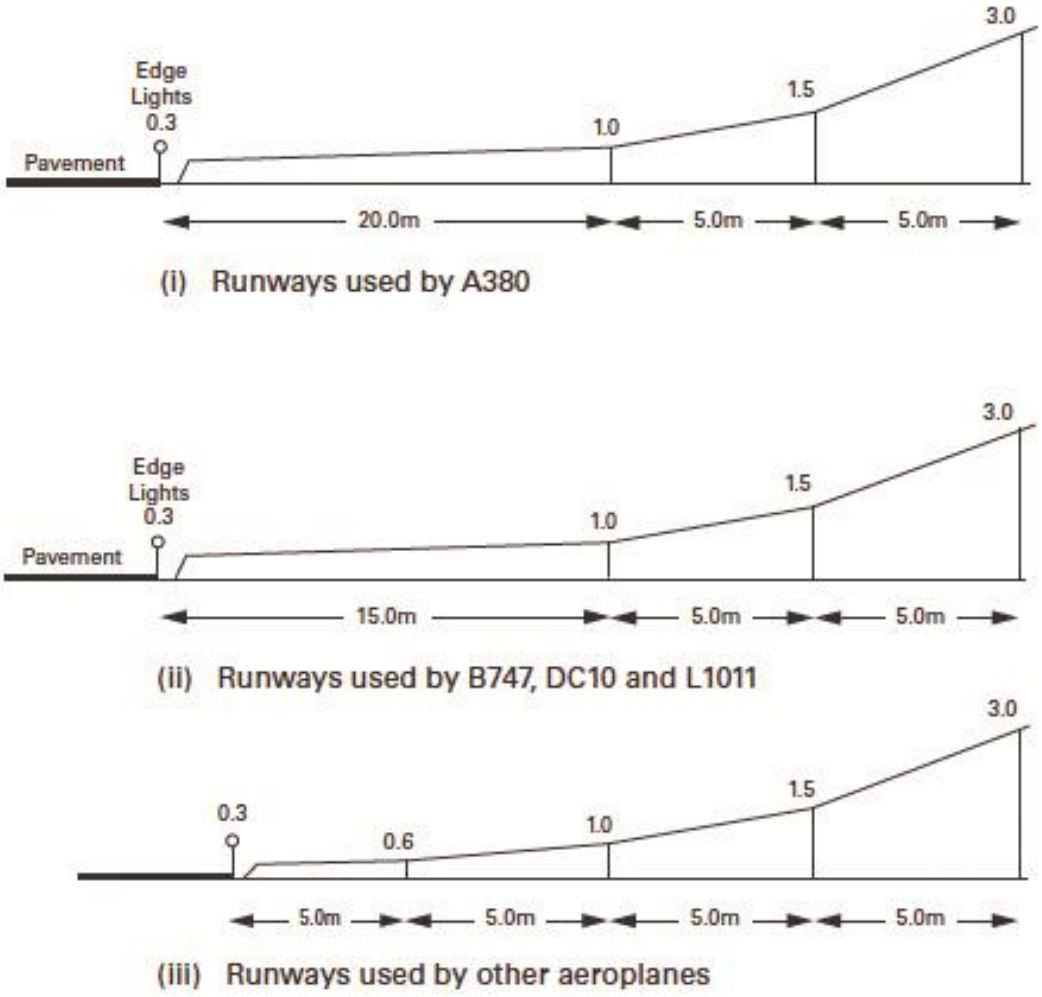


Figure 3.8 Acceptable profiles of snowbanks showing maximum height in metres

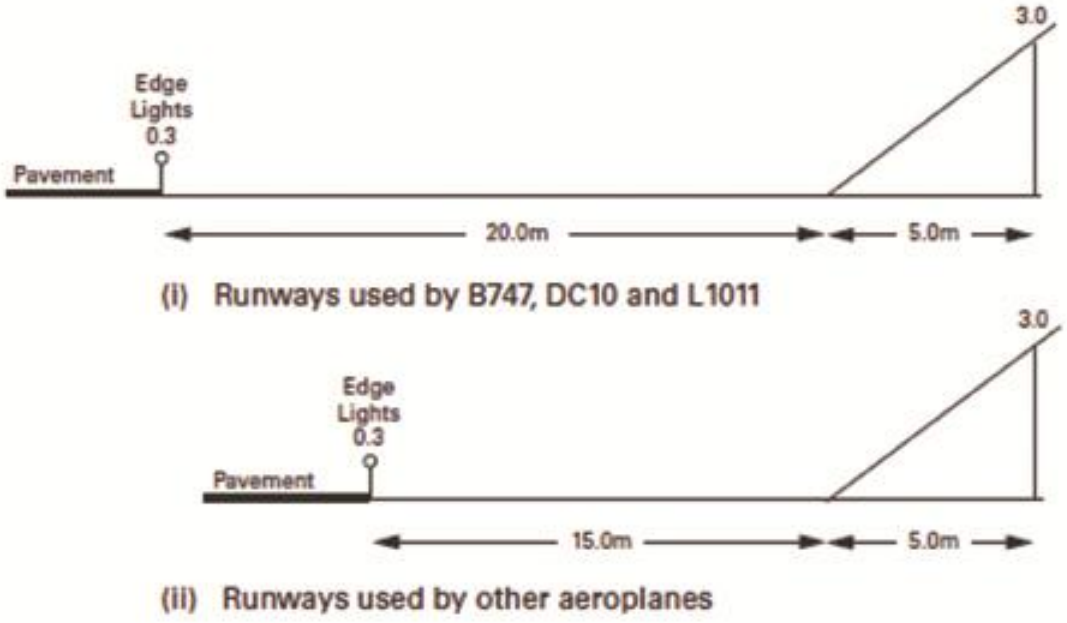


Figure 3.9 Acceptable profiles of fully cleared snowbanks showing maximum height in metres

UKGM3 ADR.OPS.B.035 Operations in winter conditions

RUNWAY CONTAMINATION REPORT

During adverse weather, any significant change in runway state should be observed, assessed and promulgated without delay.

The runway surface condition should be assessed and reported, giving details of the type, depth and extent of contamination for each third of the runway. Using the following reporting format (see Table 1), which is intended to promote consistent reporting will assist operators assimilate important information.

Format:

Touchdown Zone - % coverage, type, depth

Mid Point - % coverage, type, depth

Stop End - % coverage, type, depth

Descriptor if required (e.g. snow banks, restricted runway, width etc.)

	Touchdown Zone			Mid Point			Stop End		
Runway	% cover	Type	Depth	% cover	Type	Depth	% cover	Type	Depth
Xx									
Yy									

Table 1

Having assessed the runway state, consideration should be given to the most effective means of passing accurate and relevant information to operators intending to use the runway. This can be achieved in several ways:

a) ATIS;

b) SNOWTAM (Form CA1272);

c) Runway State Groups appended to METAR, and;

d) Plain language broadcast by ATC.

Where provided, the ATIS broadcast should be populated with additional descriptors gathered from the runway condition assessment.

It is only the complete picture as described above that can inform operators intending to use a runway as to its condition. It is therefore imperative that Aerodrome Licence/Certificate Holders make every effort, during severe winter weather, to ensure that the fullest report possible is made available, promulgated by all the available means, and kept up to date.

ESTIMATED BRAKING ACTION

The Estimated Braking Action Assessment procedures should be read in conjunction with the Runway Assessment Matrix, which can be found at the end of this section.

Use of a Matrix during periods of precipitation has been shown to help aerodrome authorities remain operational beyond the time where traditionally the runway has been closed for sweeping. By paying close attention to the type and depth of contamination estimated braking action can be given using words familiar to crews and in context.

ESTIMATED BRAKING ACTION ASSESSMENT PROCEDURES

Introduction

These procedures are for aerodromes operators intending to continue operations in winter weather where conditions on the runway are termed contaminated.

The main benefit of adoption to both aerodrome and aircraft operators is a methodology whereby greater clarity and accuracy should lead to improved safety through a reduction in the excursion risk and in weather diversions due to inestimable contamination on the runway.

Scope

These procedures are for use by any licensed or certificated aerodrome intending to operate in periods of winter runway contamination by reference to the runway condition assessment tools described herein. Any aerodrome wishing to start using the assessment table may contact the CAA via their nominated Aerodrome Inspector, for a detailed briefing.

Assessment Methodologies

A task data sheet has been produced to help aerodrome operations staff carry out a runway inspection and obtain all the necessary data to pass on to ATC.

The runway assessment matrix is provided for use in contaminated runway conditions to help enable aerodrome operations staff assess conditions and derive an estimate of runway braking action. Aerodrome operators should also be aware of the two caution notes when using the matrix:

> **Note**: The words (GOOD, MEDIUM or POOR) are the same as those used in reports of braking action on compacted snow and ice detailed in the UK AIP GEN 3.10 paragraph 10.12.1 but it must be emphasised that the meanings of these words are not directly related to any numerical values of friction.

Should one or more thirds of the runway not be affected by contamination, the standard phraseology for runway state should be used, e.g. Dry, Damp, Wet or Wet with De-icer Fluid.

> **Note:** the surface condition may be passed as (GOOD) when wet with de-icing fluid, as there should be no difference in braking action to that when the runway is wet with water.

In the case of a pilot report (PIREP) being communicated from an aircraft during periods of runway contamination, a hierarchy of validity is to be employed. Any PIREP that reports the runway as worse than the current Estimated Braking Action will prompt a downgrading to that state and require a reassessment of the runway condition. Any PIREP suggesting better than reported conditions will not upgrade the Estimated Braking Action but will trigger a reassessment of the runway state.

SNOWTAMs should be issued and updated, for significant changes, in accordance with AIC Yellow 86/2009. Notwithstanding the AIC, if sleet or snow is falling, or clearing is in progress, reports are usually provided every 30 minutes, but must be provided hourly.

Runway State Groups appended to the METAR should be issued in accordance with CAP 782 Regulation of Aeronautical Meteorological Services. When different states are

reported for the three portions of the runway, the one that equates to the worst condition should be reported.

ATC will pass Estimated Braking Action information to any aircraft when aerodrome operations personnel make a report available. ATC may request a verbal report from landed aircraft on the braking action perceived by the flight crew.

This will comprise the following: "(Callsign), *were the estimated braking actions as reported?*" and should be reported as: "the previous landing aircraft (insert aircraft type) reported an **estimated** braking action of…".

Aircrew responses should be recorded by ATC and fed back to the aerodrome operations staff to help them finesse their assessment procedures.

Advisory Landing Distance Data

Advisory landing distance data has been made available by some aircraft manufacturers to help monitor pilot feedback.

The additional performance data is based on normal operational landing techniques and runway surface conditions, enabling flight crew to derive a Representative Landing Distance Required (LDR). An additional 15% margin will normally be applied to the derived distance at the aircraft commander's discretion.

This has the potential to have an impact on the revised runway surface conditions assessment, which UK aerodromes trialled using a matrix derived from the TALPA-ARC matrix, to report an estimated braking action based on the surface conditions. CAA advice is that aerodromes need to be cognisant of this change and suggests aerodrome operators be aware that an optimistic report of the runway state by one category (e.g. from 'medium' to 'good to medium') could eliminate most of the safety margin and in some conditions could significantly exceed it and thus be of concern in the landing distance limited case.

Additionally, aerodrome operators should use this knowledge to inform their decision-making to suspend runway operations.

'3-Kelvin-Spread Rule'

The Norwegian Accident Investigation Board has published a report entitled 'Winter Operations, Friction Measurements and Conditions for Friction Predictions'. The report is based on findings from 30 incidents that have occurred on contaminated runways over the ten years in Norway. The report highlights a number of safety indicators from its findings, one of these is the '3-Kelvin-Spread Rule'.

The rule states that at air temperatures of +3°C and below, with a dew point spread of 3ºC or less, the runway surface condition may be more slippery than anticipated on snow and ice. The narrow dew point spread indicates that the air mass is relatively close to saturation which is often associated with actual precipitation, intermittent precipitation, nearby precipitation or fog. How these atmospheric conditions affect braking action is not considered by the rule; however, many of the incidents highlighted in the Norwegian report

which relate to insufficient grip were linked to precipitation or deposition of water, either liquid or frozen.

The validity of the rule may depend on its correlation with precipitation but it may also, at least in part, depend on the exchange of water at the air-ice interface. The rule was observed in 21 out of the 30 incidents related to braking action on ice and snow investigated by Norway. Due to the other variables involved such as surface temperature, solar heating and ground cooling or heating, a small temperature spread does not always mean that the braking action will be poor. Aerodrome operators should be aware of the rule as an indicator of slippery conditions but not as an absolute, and may consider informing aircraft operators so that they can assess the impact of these conditions.

Definitions

Dry runway - a runway can be considered dry when no more than 25% of the runway surface area within the reported length and the width being used is covered by visible moisture or dampness.

Damp runway - a runway is considered damp when the runway surface area within the reported length and the width being used shows a change of colour due to moisture.

Wet runway - a runway is considered wet when more than 25% of the runway surface area within the reported length and the width being used is covered by any visible dampness or any water up to 3 mm deep.

Contaminated runway - a runway is considered to be contaminated when more than 25% of the runway surface area (whether in isolated areas or not) within the required length and width being used is covered by the following:

i) surface water more than 3 mm deep, or by slush, or loose snow, equivalent to more than 3 mm of water;

ii) snow which has been compressed into a solid mass which resists further compression and will hold together or break into lumps if picked up (compacted snow); or

iii) ice, including wet ice.

Dry snow - snow that can be blown if loose, or that will not stick together to form a snowball using gloved hands.

Wet snow - snow that contains enough water content to be able to make a well-compacted, solid snowball, but water will not squeeze out.

Slush - snow that is so water-saturated that water will drain from it when a handful is picked up. Slush will splatter if stepped on forcefully.

Compacted snow - snow that has been compressed into a solid mass such that the airplane tyres, at operating pressures and loadings, will run on the surface without significant further compaction or rutting of the surface. Compacted snow may include a mixture of snow and embedded ice; if it is more ice than compacted snow, then it should

be reported as either ice or wet ice, as applicable. A layer of compacted snow over ice should be reported as compacted snow.

Water - water in a liquid state.

Frost - frost consists of ice crystals formed from airborne moisture that condenses on a surface whose temperature is below freezing. Frost differs from ice in that the frost crystals grow independently and therefore have a more granular texture. Heavy frost that has noticeable depth may have friction qualities similar to ice and downgrading the runway condition code accordingly should be considered. If driving a vehicle over the frost does not result in tyre tracks down to bare pavement, the frost should be considered to have sufficient depth to consider a downgrade of the runway condition code.

Rime - deposit of ice generally formed by the freezing of super cooled fog or cloud droplets on objects whose surface temperature is below or slightly above 0°C.

Ice - frozen water.

Wet ice - ice with a layer of water on top of it or ice that is melting.

> **Note:** Hail - the ICAO Friction Task Force does not provide guidance regarding hail. Informal advice from aircraft manufacturers is don't operate. It is perceived as an ingestion hazard rather than a slippery contaminant that should be cleared or allowed to thaw.

RUNWAY STATE ASSESSMENT TASK CHECKLIST

The objective of this sample task checklist is to set out those actions aerodrome operations personnel may find necessary to carry out during an inspection of a potentially contaminated runway during winter, and pass data gathered during such an assessment to Air Traffic Control.

Equipment likely to be required:

a) Suitable transport permitted to enter a runway;

b) Appropriately trained and competent personnel;

c) Means of recording data;

d) Means of measuring or assessing depth of contaminant;

e) Means of measuring either surface or air temperature;

f) Means of passing data.

Regardless of air traffic movements, the assessment should cover the promulgated runway length. Account should be taken of the cleared width of the runway in the case of contamination.

The assessed area should be divided up into equal thirds and reported as Touch Down, Mid Point and Stop End. The Runway Assessment Matrix provided should be referred to in order to assign an estimated braking action to the conditions observed.

The parameters for the assessment are:

a) General:

- Date and time of observation;
- Operations mode (CAT I, LVPs or RWY closed);
- Air temperature (surface temperature may be collected but will be used for comparison purposes only);
- Dew point.

b) For each runway third:

- Type of contaminant;
  - If present, restrictions to cleared width;
  - If present, restrictions to cleared length; and
  - If present, height of any snow banks.
- Percentage of cover (greater than 25%);
- Mean depth of contaminant per runway third.

Assessments should be repeated whenever conditions change and in any case before the first movement following any closure.

RUNWAY ASSESSMENT MATRIX

<table>
<tr><th>Depth</th><th>Water</th><th>Slush</th><th>Snow (Wet)</th><th>Snow (Dry)</th><th>Compacted Snow (any depth)</th><th>Ice/Rime</th><th>Frost</th></tr>
<tr><td>⬆ >19mm</td><td>Flooded</td><td>STOP</td><td>STOP</td><td>STOP</td><td rowspan="4">Warmer than -15C Medium

-15C and Colder Good to Medium</td><td rowspan="4">Poor</td><td rowspan="3">N/A</td></tr>
<tr><td>19mm
|
>13mm</td><td>Flooded</td><td>STOP</td><td>STOP</td><td>STOP</td></tr>
<tr><td>13mm
|
>3mm</td><td>Medium To Poor</td><td>Medium to Poor</td><td>Medium</td><td>Medium</td></tr>
<tr><td rowspan="2">3mm
|
0mm</td><td>Good</td><td>Good</td><td>Good</td><td>Good</td><td rowspan="2">Good</td></tr>
<tr><td colspan="5">See over for cautionary note ref 3 Kelvin Rule</td></tr>
<tr><td>Dry</td><td colspan="7">The runway is not affected by Water, Slush, Snow, Ice or Frost</td></tr>
</table>

UKGM ADR.OPS.B.045 Low Visibility Operations

Low visibility operations

Aircraft operations at aerodromes during reduced visibility or low cloud conditions present additional hazards to aircraft and to other aerodrome users. As visibility reduces, the ability of ATC, pilots, vehicle drivers and other personnel to identify hazards and to take remedial action in a timely manner becomes limited. In conditions of low cloud, the time available for the pilot of an approaching aircraft to visually assess the aerodrome environment is reduced.

Low Visibility Operations (LVOs) is a general term used for airside operations in conditions of reduced visibility or low cloud conditions and consists of low visibility safeguarding and low visibility procedures (LVPs).

Low visibility safeguarding is the process carried out which prepares the aerodrome for low visibility procedures.

Low visibility procedures are the actions carried out by ATC and the aerodrome operator in respect of aircraft operations and vehicle movements. This may include restricted access to the manoeuvring area, the protection of the ILS critical and sensitive areas and a reduced aircraft movement rate.

LVPs are required for the following types of operation:

Lower than standard category I;

Category II;

Other than standard category II;

Category III;

Take-offs below 550 m RVR;

Approaches utilising an Enhanced Vision System (EVS) where the actual RVR is below 550 m.

Low visibility safeguarding

The point at which LVPs are implemented will vary from one aerodrome to another and will depend on local conditions and facilities available. However, a period of time is required to prepare the aerodrome and, in particular, the manoeuvring area, in readiness for LVPs. The safeguarding measures should ensure that at the point when LVPs are declared to be in force, all actions to protect aircraft operations have been put in place.

When the visibility deteriorates to approximately 1000 m RVR and is expected to fall further below 550 m RVR, or the cloud ceiling reduces to 300 ft and is expected to fall further below 200 ft, safeguarding should be initiated. The withdrawal of vehicles and personnel involved in non-essential activities on the manoeuvring area should be initiated. Any temporary work in progress on the movement area should normally cease and the

work areas should be vacated and returned to operational condition or clearly marked/lit and notified as unavailable for use. Routine maintenance on visual and non-visual aids should be suspended and the ILS localiser and glide path critical and sensitive areas should be cleared of all traffic.

Aerodrome operators, in conjunction with ATC, should develop actions that ensure that, in good time prior to the introduction of LVPs, all airlines and other organisations with manoeuvring area access are notified. This is particularly important where companies exercise control over their own apron areas and maintenance facilities adjacent to the manoeuvring area.

Particular attention should be given to the protection of the runway and radio navigational aids. Access to the manoeuvring area should be restricted to essential operational safety vehicles and personnel only.

Where it is not practicable to secure the area in the manner recommended, the aerodrome operator should satisfy the CAA as to the security of the aerodrome's operations in low visibility conditions.

Responsibilities with respect to low visibility procedures

It is the responsibility of the aerodrome operator to develop and maintain the LVPs used at their aerodrome.

Whilst ATC are responsible for advising pilots of the status of LVPs at an aerodrome, it is the responsibility of the aerodrome operator to ensure that all measures required to protect aircraft operations in poor weather conditions are in place prior to their use.

Declaration of low visibility procedures in force

It is essential that the aerodrome operator verifies to ATC that all safeguarding measures are in place before LVPs are declared to be in force by ATC. Similarly, LVPs should be declared as cancelled before the aerodrome operator withdraws any measures.

> **Note:** It should be remembered that aircraft established on an approach may have commenced that approach believing that LVPs are in force. All measures taken to protect the approach aids and runway should remain in place until all such aircraft have completed their approach.

At aerodromes that support operations listed in paragraph 5 and in conditions that preclude Category I operations, under no circumstances should LVPs be declared to be in force if the appropriate safeguards for these operations are not fully in place to protect the landing aids and runway.

Low visibility procedures

As the RVR deteriorates to lower than 550 m, or the cloud ceiling reduces below 200 ft, low visibility procedures should be fully implemented. (The cloud ceiling criteria of below 200 ft is not required for aerodromes conducting take-offs below 550 m RVR but limited to Category I operations only, unless required for obstacle avoidance). The withdrawal of

non-essential vehicles and personnel from the manoeuvring area should be completed. Where possible free ranging should have ceased and all activities on the manoeuvring area should be under the direct control of ATC. It is normal practice for ATC to apply increased spacing between aircraft to allow additional time for the preceding arriving aircraft to vacate the Localiser Sensitive Area (LSA) or the previous departing aircraft to have overflown the localiser. Additionally, interference with the localiser and glide path signal can cause a deviation to an aircraft's flight path requiring a go-around to be flown.

The point at which LVPs are to be implemented should be clearly defined in terms of a specific RVR, expressed in metres, or cloud ceiling measurement, expressed as a height in feet, and should be promulgated in relevant notices and documentation to all those persons involved.

In order that flying operations may be safely conducted at aerodromes in low visibility conditions, aerodrome operators, in consultation with ATC, should determine the movement rate that they wish to sustain and develop LVPs that will support the desired movement rate. The aircraft movement rate will be dependent on the aerodrome infrastructure including the ground markings and lighting.

LVPs will vary with each aerodrome and are subject to acceptance by the CAA prior to inclusion in the aerodrome manual and the Manual of Air Traffic Services Part 2 and their subsequent implementation.

In order to continue unrestricted operations for as long as possible while weather conditions deteriorate, many of the low visibility safeguarding measures should be implemented in good time and in certain circumstances before they are absolutely necessary. The reduction in the aircraft movement rate, which is activated by ATC, should be implemented only when the weather conditions demand it.

ICAO annex 14 currently recommends the provision of Surface Movement Radar (SMR) at aerodromes where operations in RVR less than 400 m take place. However, unless the CAA has approved specific procedures, SMR is a monitoring tool only; SMR enhances existing ATC procedures and its use should not be regarded as the prime method by which collision avoidance can be affected.

Visibility conditions and associated actions

Visibility condition 1:

Visibility sufficient for the pilot to taxi and to avoid collision with other traffic on taxiways and at intersections by visual reference, and for ATC to exercise control over all traffic on the basis of visual surveillance.

No additional requirements for the protection of ground operations by aircraft are required during visibility condition 1.

Visibility condition 2:

Visibility sufficient for a pilot to taxi and to avoid collision with other traffic on taxiways and at intersections by visual reference, but insufficient for ATC to exercise control over all traffic on the basis of visual surveillance.

Actions required in visibility condition 2 are dependent on the dimensions of the manoeuvring area and the position of the control tower. Procedures and visual aids will allow the pilot to determine his position and follow the required route.

In the lower ranges of visibility condition 2, the necessary measures might limit the movement rate unless some additional aids are available, such as SMGCS, which may enable a greater movement rate to be achieved safely. Adequate safeguards against runway incursions should be in place, such as limited taxi routeing, surface movement radar and stop-bars or physical barriers at runway access points.

Visibility condition 3:

Visibility sufficient for the pilot to taxi but insufficient for the pilot to avoid collision with other traffic on taxiways and at intersections by visual reference, and insufficient for ATC to exercise control over all traffic on the basis of visual surveillance. For taxiing, this is normally taken as visibilities equivalent to an RVR of less than 400 m but more than 75 m.

In such visibility conditions it is likely further ATC measures, such as block control, to assist aircraft and vehicle movement including RFF vehicles, should be considered.

Visibility condition 4:

Visibility insufficient for the pilot to taxi by visual guidance only. This is normally taken as an RVR of 75 m or less.

During visibility conditions 3 and 4, Advanced Surface Movement Guidance Control Systems (A-SMGCS), where available, may be used to determine the position of aircraft and vehicles on the manoeuvring area.

Precision instrument approach operations

Pilots will expect a precision instrument runway to be fully safeguarded and available for the operations listed in paragraph 5, and any guided take-off, if LVPs are declared to be in force by ATC at the aerodrome.

Review of low visibility procedures

The aerodrome operator, in co-operation with ATC and other agencies involved in LVP operations, should regularly review the effectiveness of LVPs. Any need for change should be agreed with the CAA prior to inclusion in the aerodrome manual and the Manual of Air Traffic Services Part 2 and subsequent implementation.

LVP table-top exercises should be completed on a regular basis to ensure all stakeholders are familiar with the procedures. They should also be considered for any forthcoming operational changes and development works that may significantly impact on LVPs.

EU-OPS approach operations

EU OPS and other national authority regulations may allow approved operators to carry out lower than standard category I or other than standard category II approach operations if certain conditions (specified in EU OPS) are met.

Lower than standard category I operations allow operators to carry out a Category I approach but with a lower RVR limit than previously available. The actual RVR limit will depend on a number of factors including the:

- lowest decision height available;
- level of aeronautical ground lighting available including approach lighting;
- ILS specification.

Aerodromes which are suitable for lower than standard category I operations should ensure that their LVPs are suitable for the lowest RVR limit possible. Further details of lower than standard category I or other than standard category II approach operations can be found on the CAA website.

EU OPS and other national authority regulations may allow approved operators to carry out specified approach operations utilising Enhanced Vision Systems (EVS) which reduce the traditional RVR minima required. Aerodromes that are suitable for the specified approach operations should review their LVPs to ensure they are adequate for aircraft and vehicle operations in such visibilities. Further details of EVS operations can be found on the CAA website.

UKGM2 ADR.OPS.B.055 Fuel quality

See CAP 748 for further guidance.

UKGM5 ADR.OPS.B.070 Aerodrome works safety

Whenever major work affecting operational areas is planned, aerodrome operators must be satisfied that unacceptable risks generated by Works in Progress (WIP) have been identified and removed, and that procedures are provided and followed which ensure no adverse impact upon levels of safety.

Part of effective safety management in connection with major development or other works lies in timely and comprehensive planning, conducted in consultation with all involved parties, including ATC and users. The aims of such consultation should be the identification of all those measures necessary for the work to be undertaken safely and the early notification to all who need to know of resulting operational changes.

Procedures

All parties involved with:

- WIP
- the movement of aircraft and vehicles
- the availability of aircraft ground routes
- the promulgation of declared distances
- the notification and availability of navigation aids and procedures etc

should work to an agreed programme of works authorisation and management, if the safety of the aerodrome is to be maintained. This programme should set out clearly where responsibilities for the authorisation and implementation of any proposed change to operational facilities lie, the point at which the facilities will be withdrawn or changed and the methods by which such changes will be promulgated.

Where shift working is in operation it will be necessary to ensure that each shift is properly and fully briefed. The safety management system should ensure a procedure for feedback from the parties involved and the swift implementation of corrective measures if they are necessary. Regular monitoring of contractors is essential to ensure continued safety. Operators should ensure that contractors have made support available outside normal working hours. Particular attention should be paid to the transfer of adequate information at shift or work handover. Ideally, any transfer of information should have a degree of redundancy, e.g. both verbal and written, preferably on a standard document retained for later checking and verification, if necessary.

Procedures for the control of works should include any or all of the following tasks (this list is not exhaustive):

1. Works permit procedures;
2. Relevant safety procedures;
3. Restrictions during low visibility conditions;
4. R/T communications;
5. Staff briefing;
6. Site marking, by day or night, or in low visibility;
7. Work on an 'on-off' basis;
8. Hot works where relevant;
9. Aerodrome operating procedures during the works;
10. Emergency procedures;
11. Supervisory and contact information;
12. Plans and diagrams.

Reduced Runway Length Operations

Additional hazards may arise when WIP involving a reduction in the available runway distances takes place. In such circumstances, where the runway length available is less than declared in the AIP, it is essential that:

1. the potential hazards before, during, and on ceasing operations with reduced runway length available and/or WIP are identified and mitigated as necessary in order to assure the safety of aircraft operations;

NOTE: Hazards may include inappropriate or potentially misleading display of visual aids; inappropriate or potentially misleading availability of navigational aids; adverse environmental impact; risks resulting from adverse or unusual meteorological conditions; and restricted obstacle clearance and wingtip separation distances. It is important to recognise that the hazards that may be identified can cover a wide range of areas, including those that do not pose a risk only to aircraft, for example the potential risk from interaction with jet blast.

2. a revised runway strip, runway end safety area (RESA) and obstacle limitation surfaces, such as the approach and take-off climb surfaces, are implemented, where necessary;

3. a safety zone is established between that area of the runway that is to be used by aircraft and the WIP or unusable runway;

NOTE: The location, size and shape of the safety zone are dependent upon the circumstances described above, to provide for items such as runway end safety areas, blast protection and abbreviated or simple approach light systems.

4. markings are provided to indicate clearly the extent of the safety zone, the WIP area and any movement area or roadways that are to be used by persons involved in the WIP and not to be used by aircraft;

5. the presence, activities and movement on or around a runway or taxiway of contracted staff, who may not be as familiar with the aerodrome and aviation practices as expected, are properly managed and controlled;

6. the impact on the ability of the rescue and firefighting and emergency services to perform their functions is considered and addressed;

7. all operational information is correct, available and promulgated in a timely manner to all relevant parties;

8. roles and responsibilities for operations and tasks associated with the reduction of the runway length available and the WIP are clearly understood and complied with; and

9. wherever practicable, the suitability of a procedure is tested prior to implementation.

The aerodrome operator is responsible for the coordination and management of the opening and closing of the runway (and other movement areas, as necessary) and the WIP. Management of aircraft operations may be contracted out to an independent organisation (e.g. an ANSP) but a tactical decision concerning aircraft operations made by that organisation outside, or that deviate from, the agreed operational procedures, unless of an urgent safety nature, must be adopted only in cooperation with the aerodrome operator.

The aerodrome operator should put in place measures to monitor closely the safety of the aerodrome and aircraft operations during runway WIP such that timely corrective action is taken when necessary to assure continued safe operations. This is particularly important when operational change or unprecedented or unpredicted events occur. Wherever practicable the stakeholders should agree any strategic decisions that might need to be made after operations with reduced runway length available and/or WIP have commenced.

Aerodrome operators are reminded that they are not permitted to declare a distance exceeding that notified in the AIP without the prior approval of the CAA.

UKGM3 ADR.OPS.B.075 Safeguarding of aerodromes

See CAP 738 for further guidance.

Aerodrome Maintenance

UKGM2 ADR.OPS.C.010 Pavements, other ground surfaces and drainage

See CAP 781 and CAP 683

Emergency Planning

UKGM1 ADR.OPS.B.005 (b) General

Emergency planning arrangements at aerodromes may be developed to align with UK best practice and the requirements of civil contingencies legislation. Further guidance can be found in the ICAO Airport Services Manual, Part 7, Airport Emergency Planning (Doc 9137-AN/898)

The Aerodrome Emergency Plan may describe how an emergency situation or incident can be managed in order to minimise the effects it may have on life, property, the environment, and aerodrome operations, and how the best use of appropriate available resources should be applied to achieve that aim.

In considering the need for any specialist rescue and access routes, the following should be considered:

1. the environment of the risk area, in particular the topography and composition of the surface
2. the physical hazards and associated risks that exist within the area
3. the options for access and for rescue and fire fighting purposes
4. changes to the response area, e.g. tidal, seasonal
5. the hazards, risks and control measures of the options for rescue
6. the use of external services
7. an analysis of the advantages and disadvantages of the options
8. policies and procedures to define and implement standards
9. competence standards to match the above
10. monitoring and review of the capability

UKGM1 ADR.OPS.B.005 (a) Aerodrome Emergency Planning

(1) Purpose of the Aerodrome Emergency Plan

The operator should be able to demonstrate that the aerodrome's emergency arrangements are effective, and that appropriate use can be made of all available resources, in particular external emergency services, if an aircraft accident or other incident were to occur.

(2) Civil Contingencies Act (As amended)

The Civil Contingencies Act 2004 and supporting regulations and statutory guidance establish a clear set of roles and responsibilities for those involved in emergency

preparation and response at the local level. In developing the aerodrome emergency plan operators should take into account the requirements of the CCA

Detailed guidance regarding emergency preparedness and the Civil Contingencies legislation can be found on the UK Government website – www.gov.uk

(3) Emergency Planning Objectives

The objective of aerodrome emergency planning is to anticipate the effects an emergency might have on life, property, and aerodrome operations, and to prepare a course, or courses, of action to minimise those effects, particularly in respect of saving lives.

(4) Emergency Planning Arrangements

The list below is intended to assist an aerodrome operator in choosing those organisations that should be represented on the Aerodrome's Emergency Planning Committee. However, the list is not comprehensive and some aerodromes may need expertise from organisations not shown, while others may find some of the organizations shown to be inappropriate.

On- and off-aerodrome services from which Planning Committee Members could be selected:

Aerodrome Services	Local Authority or Other Services
Aerodrome RFFS	Local Ambulance Trust
Aerodrome Police	Coastguard & Offshore Rescue
Aerodrome Security	Doctors
Airline Operators	Local Authority Fire and Rescue Service
Customs and Excise	First Aid Organisations
Occupational Medical	Local Hospital Trust
Mechanical	Transport Police
Telecommunications	Press
Works Facilities	Religious Leaders
	Environment Agency

The tasks that the emergency planning arrangements may consider are:

1. terms of reference of the Planning Committee;
2. development of an emergency plan and orders;
3. tactics;
4. liaison;
5. co-operative training;

6. exercise planning;
7. post accident/incident and post exercise reviews;
8. review and monitoring;
9. recording.

A senior member of the aerodrome management team with the direct support of the operator should chair any meetings. Records of the meetings should be taken and retained and the person accountable for the emergency planning arrangements should be identified within the Aerodrome Manual.

UKGM2 ADR.OPS.B.005 (a) Aerodrome emergency planning

(1) Aerodrome Emergency Planning Document

The emergency plan should observe human factors principles to ensure optimum response by all existing agencies participating in emergency operations. The principles should include:

- the effects of human performance on the plan, for example workload, capabilities, functions, decision aids, environmental constraints, team versus individual performance;
- training effectiveness;
- staffing including numbers, skills levels and organisational structure;
- personnel selection;
- safety and health aspects, for example hazardous materials, safety systems and protective equipment.

The aerodrome Emergency Planning Document should:

Aerodrome Operators may choose to review their existing emergency plans/orders to ensure that they meet the requirements of AMC2 ADR.OPS.B.005(b). The emergency planning document is intended to:

- be confined exclusively to actions to deal with emergencies or incidents.
- provide details to individuals, or to departments, of the actions required to initiate the emergency plan.
- clearly translate the emergency plan into a course or courses of action to be followed for a given emergency or incident, that will ensure the achievement of the emergency planning objectives.
- detail the lines of communication that will ensure all the agencies (or services) appropriate to the emergency are notified and alerted.

- include procedures for leading passengers evacuated from aircraft to secure areas away from the scene of an incident.

UKGM4 ADR.OPS.B.005 (a) Types of Emergencies

(1) Aircraft Emergencies

The aircraft emergencies for which services may be required are described in EASA GM (GM4 ADR.OPS.B.005(a)). Aerodrome Operators could also include:

- Weather Standby – When weather conditions are such as to render a landing difficult, or difficult to observe
- Unlawful Acts – Actions to be taken in the case of any unlawful act may be drawn up in conjunction with local Police using Department for Transport (Dft) guidance, and contained in the emergency plan.

(2) Non Aircraft Emergencies

Aerodrome Emergency Plans are generally focused on an aircraft accident or incident. Equipment and techniques recommended are generally directed towards this goal. However, the plans may include other incidents that occur such as domestic fires, road traffic collisions and hazardous materials. If the operator decides to include other emergencies the plan should include the action to be taken by aerodrome-based responders and, where appropriate, external emergency services, in the event of such calls being received.

The classification ‘domestic’ is given to any incident:

- on the aerodrome (not including aircraft emergencies)
- outside the aerodrome boundary (other than aircraft accidents) which is liable to constitute a danger to flying or aerodrome property;
- which the aerodrome rescue and fire fighting service might attend where the response is according to an agreement with the local emergency services;
- which is in response to calls from the public or police on humanitarian grounds.

UKGM1 ADR.OPS.B.005 (b) Coordination with other agencies and organisations

(1) Command and Control

The Aerodrome Operator should liaise with local emergency responders and establish responsibilities for incident command, particularly for the scene immediately adjacent to the aircraft. Any agreements may be recorded in (or be referenced from) the aerodrome manual.

The importance of an agreed framework for command and co-ordination should not be underestimated. This enables each agency to tailor its own response and interface with the plans of other agencies without disrupting its own procedures.

There is an agreed national framework for managing the local multi-agency response to, and recovery from, emergencies. This national framework can be found on the Government website – www.gov.uk. This section describes the three management tiers that comprise the framework and briefly mentions the arrangements for managing an incident site.

Whether it should be fully implemented at an aircraft accident should be determined by the severity and numbers of casualties. At the start of any incident for which there has been no warning, the Operational level should be activated first, with the other levels coming into being with the escalation of the incident, or a greater awareness of the situation.

An aerodrome should have a clear and coherent policy that sets out the approach for delivering effective aircraft incident command and liaison with external emergency services.

Management Structures

The Management of emergency response is based upon a framework of one or more of three ascending levels, namely Operational, Tactical and Strategic. It is important to note that not all tiers, single or multi-agency, will necessarily be convened for all emergencies.

Operational, Tactical and Strategic are sometimes referred to as Bronze, Silver and Gold.

Operational (Bronze)

Operational is the level at which management of immediate “hands-on” work is undertaken at the site(s) of the emergency or other affected areas.

First responders will act on delegated responsibility from their parent organisation until higher levels of management are established.

Tactical (Silver)

The Purpose of Tactical Management is to ensure that the actions taken at an operational are co-ordinated, coherent and integrated in order to maximise effectiveness and efficiency.

Working in Co-ordination, the responder agencies ‘tactical commanders or managers will:

- Determine priorities for allocating available resources
- Plan and co-ordinate how and when tasks will be undertaken
- Obtain additional resources if required
- Assess significant risks and use this to inform tasking of operational commanders

- Mitigate risks to the health and safety of the public and personnel

Strategic (Gold)

In those cases where it becomes clear that the complexity or scale of the emergency requires resources, expertise or co-ordination beyond a tactical level, it may be necessary to invoke the strategic level of management to take overall control and set strategic direction

The purpose of the strategic level is:

- To consider the emergency in its wider context
- Determine longer-term and wider impacts and risk with strategic implications
- Define and communicate overarching strategy and objectives for the emergency response
- Establish a framework, policy and parameters for lower-level tiers
- Monitor risks, impacts and progress towards defined objectives.

Control of the Incident Site

RFFS personnel should be identified by markings in accordance with the national Incident Command System. The commanders of the aerodrome RFFS should wear conspicuous tabards (or similar) in order to become distinguishable from the local authority fire officer. Design characteristics of such markings and tabards should be agreed through the emergency planning committee.

The UK government has issued guidance on how an incident site should be managed including the use of cordons. This guidance can be found on the Government website:

https://www.gov.uk/government/publications/the-central-government-s-concept-of-operations

https://www.gov.uk/government/publications/emergency-preparedness

http://www.readyscotland.org/ready-government/preparing-scotland/

(2) Medical Equipment

The objective is to ensure that sufficient medical services are provided. This objective should have regard to the type and configuration of aircraft, and the facilities should be based on a formal assessment. The assessment should ensure that the available emergency medical services provided are adequate and take into account the largest aircraft using the aerodrome.

Aerodrome Operators should:

- assess the level of medical supplies to be held on the aerodrome for emergency purposes.

- seek the advice and co-operation of the local NHS Trust and responding ambulance services.

Consider whether additional supplies should be made available to cater for an accident involving more than one aircraft.

Portable casualty shelters and blankets for use during inclement weather conditions should be considered, taking into account the numbers of casualties that could reasonably be expected.

Portable lighting should be provided for illuminating an accident scene, particularly triage and casualty handling areas.

Aerodrome Operators should ensure that records appertaining to the medical facilities, covering specification, tests and inspection, and maintenance, are retained and can be made available for CAA inspection if requested. The records should:

- include details of consequential action where an inspection has revealed a defect or deficiency.
- be retained for a minimum period of five years.

Additional guidance on the provision of medical equipment and services can be found in the ICAO Airport Services Manual Part 7 Airport Emergency Planning appendix 3 (Airport Medical Services).

Where the journey time for the first Local Authority ambulance could exceed 15 minutes the provision of an on-site ambulance should be considered or alternative arrangements agreed with the NHS.

(3) Supporting services, operating companies, or agencies

It is important that full details of the aircraft are available, i.e. number of persons aboard, details of any dangerous goods or unusual freight (radio-active materials, livestock, etc.) and in this respect the aircraft operating company or its agents should be responsible for providing any documents, passenger lists and manifests concerning the aircraft involved.

The post-accident arrangements for any survivors who are not injured, as well as for passengers' relatives and friends who may be at the aerodrome waiting for the aircraft to land and may be unaware that an accident has occurred, is a joint responsibility between the aerodrome, the airline and/or its agents, and category I responders and should be set out in the emergency plan.

Following an aircraft accident, specialist equipment e.g. additional lighting or heavy lifting gear may be required that may not normally be readily available. The emergency committee should consider the potential need for this equipment and arrange for it to be available should circumstances require it. Care should be taken to ensure that the type and use of this equipment does not introduce the risk of fire in areas which may have become contaminated by fuel spillage.

Incidents involving aircraft will attract the attention of the press and media. Aerodrome Operators may wish to appoint a member of staff to liaise with members of the local and national press.

(4) Assembly of Assisting Services

An aerodrome emergency plan must consider that category I responders are not likely to be familiar with the aerodrome layout, or the incident may occur in weather conditions that could hamper the ability of emergency services to find the accident site. A system may be devised whereby emergency services, familiar or unfamiliar with the aerodrome, can be easily guided to the accident or incident. One such system is to distribute a plan of the aerodrome overlaid with a grid, such that each square has an individual identifier. Consideration should be given to escort arrangements.

Suitable assembly or rendezvous points (RVP) should be established, to which incoming vehicles should report, and from which they can be escorted to the accident or incident site with the minimum of delay. A person should be posted at the aerodrome main gate and the rendezvous point, and a telephone should be made available at both locations.

RVP signs should be displayed at designated point(s) as agreed through the emergency planning group. Signs should be clearly visible from any direction from which vehicles are likely to approach.

Sufficient signs bearing RVP directional arrows should be placed in such a manner that ‘off-aerodrome’ responders are directed to the RVP.

Signs located on the aerodrome should be large enough to be seen from a distance and comprise bright, white letters ‘EMERGENCY SERVICES RENDEZVOUS POINT’ on a contrasting green background with a contrasting yellow border.

Where appropriate, signs should be illuminated.

Signs placed on a public highway will need to conform to the dimensions and colour scheme as defined by the Department for Transport (DfT) ‘Working drawings for traffic signs’; details are available on the www.gov.uk website. Examples of these signs are:

		
2708	2709	2710
Junction ahead leading to route for emergency vehicles to a temporary incident control post	Direction of route ahead leading to a route for emergency vehicles to an emergency services incident point	Direction of route ahead leading to a route for emergency vehicles to an emergency services incident point

UKGM3 ADR.OPS.B.005 (c) Emergency Exercises

Modular exercises

The following are examples of the high level enabling objectives to be achieved during each of the ten modules which, once complete, should ensure the Main Objective is achieved:

Module 1: Raising the Alarm

This module focuses on the call out systems; it covers the period from commencement of the incident until all relevant agencies have been informed. It is envisaged that this module would be run using the actual procedures, resources and equipment required as if it were in a live time incident. The exercise could be conducted on numerous occasions over a given time period to ensure competence by all those expected to become involved; evidence may be recorded from actual incidents.

Objective: Test Call Out System	**Consider, but not limited to**
1.1 Initiating the call	Instigated by ATC. Alerting method and communications. Test Omni crash / direct line. Communications with AFS, on and off airport response include each LAES
1.2 Differing levels / types of emergency	Description of Aircraft accident, Ground incident, Full emergency, Local Standby etc
1.3 Terminology / abbreviations	AGI. A/C accident imminent on/off AD
1.4 Normal methods / contingencies	Power failure, loss of communication
1.5 Communications exercise	Airport switch board / PBX / ATC etc.
1.6 Organisations involved	ATC, AFS, OPS, PBX, LAES, Security,
1.7 EPC and LA Emergency Planners	Policy, Procedures, Planning, Preparing, Training. Civil Contingencies and Risk Register
1.8 Training	Assess adequacy of prior training given to those expected to become involved.
1.9 Assessment and Feedback	Assessed locally on each occasion the module is tested, or externally by NAA Inspectors during their visits. Feedback sought/provided and acted upon. If successful move forward, or repeat module.
1.10 Recording outcomes	Accurate records maintained

Module 2: Rendezvous Point (RVP)

This module deals with the RVP, it focuses on the incident from the period that the call has been received, all those services from both on and off the airport are in position at the RVP and ready to move forward. This module will include practical demonstration of escorting members of the LAES from the RVP to an incident site. It is envisaged that this module would be run using the actual procedures, equipment and resources from all of the organisations required as if it were in a live time incident.

Objective: Test RVP	Consider, but not limited to
2.1 Determine which RVP is to be used	(Appropriate only where there are multiple RVP's provided). The test should be planned so that each RVP is practiced on a rotational basis over varying times of day and night.
2.2 RVP Directional signage	Ensure they are Visible, Adequate, and Appropriate to responding services that may not necessarily be familiar with the airport.
2.3 Opening / security of RVP	Adequate staffing at RVP, training/procedures, physical barriers, locks, chains etc.
2.4 Fit for purpose	Marshalling / manoeuvring area, parking, lighting, communications, information, maps etc.
2.5 Escorts	Adequate amounts of trained staff/vehicles, procedures
2.6 Traffic management	Police, security, Ops, procedures
2.7 EPC and LA Emergency Planners	Policy, Procedures, Planning, Preparing, Training, Liaison. Civil Contingencies and Risk Register
2.8 Training	Assess adequacy of prior training given to those expected to become involved including training records.
2.9 Assessment and Feedback	Assessed locally on each occasion the module is tested or externally by NAA Inspectors during their visits. Feedback sought/provided and acted upon. If successful move forward, or repeat module.
2.10 Recording outcomes	Accurate records maintained

Module 3: Operational Command (Bronze)

This module deals with the Operational Command at the Incident. It focuses on the Operations at the incident, more specifically at command. It is envisaged that this module could be run using simulation, possibly tabletop. It should involve organisations from on and off the airport together with members from all LAES who may attend the incident. Using modern virtual reality (VR) technology, it could be run on airport or at a remote site.

Objective: Test Operational Command	Consider, but not limited to
3.1 Liaison	Inter service on/off airport liaison visits/training days, interoperability procedures and operational practices.
3.2 Organisational Structure	Identification of commanders
3.3 Decision making	Staff training, procedures. Decisions taken are appropriate to Operational Commanders. Support available if required
3.4 Communications	Effective communications between services/departments both on and off airport?
3.5 Forward Control	Is there a dedicated forward control point vehicle and, is it effective?
3.6 Cordons	Adequate resources, trained staff, procedures.
3.7 EPG and LA Emergency Planners	Policy, Procedures, Planning, Preparing, Training, Liaison. Civil Contingencies and Risk Register
3.8 Training	Assess adequacy of prior training given to those expected to become involved including training records.
3.9 Assessment and Feedback	Assessed locally on each occasion the module is tested or externally by NAA Inspectors during their visits. Feedback sought/provided and acted upon. If successful move forward, or repeat module.
3.10 Recording outcomes	Accurate records maintained

Module 4: Medical services

This module deals with the Medical services at the Incident. It focuses on the practical aspects of medical care and evacuation of any casualties. It may be conducted on or off airport, should involve organisations from both on and off the airport together with members from the Local Health Authority, Primary Care Trust or Hospital Authority who may attend the incident. It could be run as a tabletop or using simulation and modern virtual reality (VR) technology.

Objective: Test Medical response	Consider, but not limited to
4.1 Liaison	Inter service on/off airport liaison visits
4.2 Organisational Structure	Identification of commanders
4.3 Triage	Worst first walking wounded etc. Staff training, procedures
4.4 Communications	Is there effective communications between AFS, LAES / departments both on and off airport?
4.5 Emergency shelters	Are adequate facilities to provide emergency shelter available, from on or off airport? Resources; training, testing /inspecting.
4.6 Transport	Removal of Casualties. Adequate resources.
4.7 Evacuation routes	Consider one-way routes. Contingency if access is blocked
4.8 NHS / Local hospitals	Contingency for possible large number of casualties.
4.9 EPG and LA Emergency Planners	Policy, Procedures, Planning, Preparing, Training, Liaison. Civil Contingencies and Risk Register
4.10 Training	Assess adequacy of prior training given to those expected to become involved including training records.
4.11 Assessment and Feedback	Assessed locally on each occasion the module is tested or externally by NAA Inspectors during their visits. Feedback sought/provided and acted upon. If successful move forward, or repeat module.
4.12 Recording outcomes	Accurate records maintained

Module 5: Tactical Command (Silver)

This module deals with tactical command at the incident. It focuses on the tactical aspects of the incident from a point in the incident when sufficient resource has arrived to instigate Tactical Command. It should involve organisations from both on and off the airport together with members from all LAES who may attend the incident. It could be run as a

tabletop exercise or using simulation and modern virtual reality (VR) technology; it could be run on airport or at a remote site.

Objective: Test Tactical Command	Consider, but not limited to
5.1 Liaison	Inter service on/off airport liaison visits
5.2 Organisational Structure	Identification of commanders
5.3 Decision making	Staff training, procedures. Decisions taken are appropriate to Tactical Commanders. Support available if required.
5.4 Location	Consider best location to set up Tactical Command. Is there a dedicated on airport facility.
5.5 Communications	Effective communications between services/departments both on and off airport. Sufficient telephone, fax, computers.
5.6 Resources	Are adequate resources made available? White boards, flip charts maps, and writing aids. Training, procedures.
5.7.Training	Assess adequacy of prior training given to those expected to become involved including training records.
5.8 EPG, LA Emergency Planners and Crisis Management Team	Policy, Procedures, Planning, Preparing, Training, Liaison. Civil Contingencies, Risk Register appropriate to Silver Command
5.9 Assessment and Feedback	Assessed locally on each occasion the module is tested or externally by NAA Inspectors during their visits. Feedback sought/provided and acted upon. If successful move forward, or repeat module.
5.10 Recording outcomes	Accurate records maintained

Module 6: Strategic Command (Gold)

This module deals with Strategic command at the incident. It focuses on the strategic aspects of the incident from a point in the incident when sufficient resource has arrived to instigate Strategic Command. It should involve senior managers from both on and off the airport, senior local council officers together with senior members from all LAES who may attend the incident. It could be run as a tabletop exercise or using simulation and modern virtual reality (VR) technology; it could be run on airport or at a remote site.

Objective: Test Strategic Command	Consider, but not limited to
6.1 Organisational Structure	Identification of commanders
6.2 Location	Consider the Emergency Plan and identify pre-determined location for Strategic Command.

Objective: Test Strategic Command	Consider, but not limited to
6.3 Communications	Effective communications between services/departments both on and off airport.
6.4 EPG and LA Emergency Planners and Crisis management Team	Identify link into Strategic Command Centre. Policy, Procedures, Planning, Preparing, Training, Liaison. Civil Contingencies and Risk Register
6.5 Assessment and Feedback	Assessed locally on each occasion the module is tested or externally by NAA Inspectors during their visits. Feedback sought/provided and acted upon. If successful move forward, or repeat module.
6.6 Recording outcomes	Accurate records maintained

Module 7: Airport Reception Centres / Non Emergency Services Response

This module deals with the assistance provided by agencies other than AFS and LAES. It focuses on the incident from a point when survivors / casualties are being removed from the scene of operations and efforts are being made to reunite them with their friends and families. It should involve organisations from both on and off the airport who might be expected to participate. It is envisaged that this would be conducted as a practical exercise on airport in the actual building/location that has been set-aside for the purpose.

Objective: Test FRC / SRC / Voluntary Agencies	Consider, but not limited to
7.1 Liaison	Planning, Training, Liaison
7.2 Roles and responsibilities	Procedures, roles and responsibilities of Airport, Airline and Handling Agent. Staff training / familiarisation
7.3 Friends and Relatives Reception Centre (FRC)	Assess the building; room, shelter, screens etc are they adequate for the expected numbers of casualties commensurate to the scale of operation? Procedures / Staff training / familiarisation. The reunion process.
7.4 Survivors Reception Centre (SRC)	Assess the building; room, shelter, screens etc are they adequate for the expected numbers of casualties commensurate to the scale of operation? Resources / Procedures/ Staff training / familiarisation
7.5 Media Area	Is there a suitable area set aside for the media, away from the scene of operations and those attending FRC/SRC?
7.6 Voluntary Organisations	WRVS, Ministers of religion, social services etc. Liaison visits & training including procedures for gaining access onto the airport.
7.7 Information Centres	The role of British Airways Emergency Planning

Objective: Test FRC / SRC / Voluntary Agencies	Consider, but not limited to
	Coordination Unit (EPIC) or Casualty Bureau or other information service providers.
7.8 EPG and LA Emergency Planners	Policy, Procedures. Planning, Preparing, Training.
7.9 Assessment and Feedback	Assessed locally on each occasion the module is tested or externally by NAA Inspectors during their visits. Feedback sought/provided and acted upon. If successful move forward, or repeat module.
7.10 Recording outcomes	Accurate records maintained.

Module 8: Post Disaster Management

This module deals with Post Disaster management. It focuses on the latter stages of the incident from a point when all survivors / casualties have been removed and the work of body recovery, Police investigators and the Air Accident Investigation Branch (AAIB) begins. Primarily it will involve the Police, the Airport operator and the AAIB. Training could be via a tabletop exercise, or as a simulation on or off airport.

Objective: Test Post Disaster Management procedures	Consider, but not limited to
8.1 Air Accident Investigation Branch	The role of the AAIB
8.2 Body recovery	Specialist Police unit
8.3 Temporary mortuary	Identify if there is any appropriate local facility near the airport as agreed with the Coroner and EPC
8.4 Body holding area	Local facility appropriate to the airport
8.5 Body identification	Specialist Police unit, Coroner, casualty bureau
8.6 Undertakers	Specialist agencies e.g. Kenyons
8.7 Family liaison / Assistance centres	Local authorities, social services
8.8 EPG and LA Emergency Planners	Policy, Procedures, Planning, Preparing, Training
8.9 Assessment and Feedback	Assessed locally on each occasion the module is tested or externally by NAA Inspectors during their visits. Feedback sought/provided and acted upon. If successful move forward, or repeat module.
8.10 Recording outcomes	Accurate records maintained

Module 9: Business Recovery

This module deals with Business Recovery. It focuses on the end of the incident from a point when all survivors / casualties and the deceased have been removed, the investigators have concluded their investigation and the airport is working towards returning to business as usual. It will involve the Police liaising closely with the Airport

operator, the NAA, the AAIB and the EPG. It is envisaged that this would be conducted as a tabletop or simulated exercise on or off airport.

Objective: Test Business Continuity / Recovery	Consider, but not limited to
9.1 Short / long term closure	Local decision on Airport closure
9.2 Evacuation	Local procedures
9.3 Aircraft Recovery	RAF or Local procedure
9.4 Accommodation	Local facility appropriate to the airport here food and shelter may be provided
9.5 Contingency plans	Robust contingency plans covering all eventualities, local to each airport
9.6 EPG and LA Emergency Planners	Policy, Procedures, Planning, Preparing, Training
9.7 Assessment and Feedback	Assessed locally on each occasion the module is tested or externally by CAA Inspectors during their visits. Feedback sought/provided and acted upon.
9.8 Recording outcomes	Accurate records maintained

Module 10: Live Full Scale Exercise

This module deals with the practical Firefighting, search and rescue operation of the incident. It focuses on the point from when the aircraft has recently crashed up to the point when all survivors are released. It will involve the Airport Fire Service (AFS), members from each of the LAES who may be expected to attend the airport, Airport Operations, Airport Security and senior airport managers. It may be held on or off the airport and should closely simulate an actual aircraft accident commensurate to the size of aircraft operating from the aerodrome. It may be possible to pre assemble all those playing an active role in the exercise at a suitable location close to the scene.

Objective: Test Practical Fire-fighting, Search and Rescue	Consider, but not limited to
10.1 Aim & Objectives	Specific aim & objectives to be tested
10.2 AFS attendance	AFS tactics / techniques. AFS Objectives
10.3 LAES attendance	Specific Objectives for each of the LAES. Fire, Police & Ambulance, consider other agencies where appropriate i.e. Coast Guard, RNLI, Military.
10.4 AAIB	Scene preservation
10.5 Liaison	Interoperability, prior liaison and training days involving each service
10.6 Incident Command (Bronze)	Joint Operational Command involving the AFS and each

Objective: Test Practical Fire-fighting, Search and Rescue	**Consider, but not limited to**
	LAES
10.7 Sectorisation	Cordons, specific areas of operations
10.8 Debriefing	Hot debrief at the end of exercise followed by full formal debrief where learning is identified, notes are taken and actions are cleared.
10.9 Assessment and Feedback	Assessed locally on each occasion the module is tested or externally by NAA Inspectors during their visits. Feedback sought/provided and acted upon. If successful move forward, or repeat module.
10.10 Recording outcomes	Accurate records maintained

Where an aircraft accident occurs to which the response has adequately tested all or part of the plan, an aerodrome operator may use that experience as part of the above exercise process.

Aerodrome RFFS Category 3 to 10 wishing to enter into this alternative method of testing the plan should prepare a rolling five year plan highlighting precise details of how and when each module is to be tested. NAA Inspectors may attend tests of the modules as appropriate.

Guidance on exercises is available from the following sources:

ICAO Airport Services manual Part 7, Airport Emergency Planning, chapter 13 under ‘preparation and planning for emergencies’ at www.gov.uk.

Rescue and Fire Fighting Service (RFFS)

UKGM5 ADR.OPS.B.010 (a) Response Time

Response time is considered to be the time between the initial call to the rescue and fire fighting service, and the time when the first responding vehicle(s) is (are) in position to apply foam at a rate of at least 50% of the discharge rate specified in AMC4 ADR.OPS.B.010 Table 1.

> **Note**: Optimum visibility and surface conditions are defined as daytime, good visibility, no precipitation with normal response route free of surface contamination e.g. water, ice or snow.

When calculating response time the aerodrome operators should consider the following:

- providing direct access to the operational runway(s);
- designating access routes to the response area;
- the maintenance of roads and access routes;
- eliminating the possibility of any vehicle blocking the progress of responding emergency vehicles;
- taking account of the gross weight and maximum dimensions of the RFFS vehicle(s) expected to use them;
- that roads are capable of being traversed in all conditions;
- exit gates or frangible sections in the security fence;
- exit points will need to be clearly identified. Retro-reflective tape or markers will be of assistance where the aerodrome may need to be accessible during the hours of darkness or conditions of low visibility;
- any delethalisation requirements;
- providing sufficient vertical clearance from overhead obstructions for the largest vehicle.

RFFS vehicles should approach any aircraft accident by the quickest route commensurate with safety, although this might not necessarily be the shortest distance to the scene. Traversing through unimproved areas can take longer than travelling a greater distance on paved surfaces, therefore a thorough knowledge by RFFS personnel of the topography of the aerodrome and its immediate vicinity is fundamental. The use of grid maps and careful selection of routes is essential for success in meeting the response objective.

RFFS vehicles should be equipped with an airfield chart clearly showing all taxiways, runways, holding points and vehicle routes marked with their appropriate designation. The chart(s) should be accompanied by written instructions clearly detailing the action that the

driver should take in the event that the vehicle should break down or that the driver should become unsure of the vehicle's position on the aerodrome.

A response safe system of work includes a number of elements that must come together to deliver an effective and safe response. A comprehensive hazard and risk analysis should be conducted over the optimum response routes within the aerodrome boundary that RFFS vehicles are likely to use to achieve the operational objective. The analysis and system of work should consider: standard operating procedures.

1. call handling
2. alerting system
3. position of the fire station or standby area
4. position of training area where a response may be made from
5. suitable access roads and routes
6. visibility and surface conditions
7. a clear route
8. vehicle performance
9. vehicle maintenance
10. effective equipment
11. competent staff
12. communications
13. an effective safety culture
14. effective leadership and incident command
15. human factors
16. monitoring and review including records

In assessing an effective response all of these areas should be considered and reviewed. Aerodrome Operators should not focus on any one aspect in isolation when measuring effectiveness.

Where RFFS vehicles respond to incidents using the public highway, an assessment of the implications of such a response should be carried out. The following should be considered:

1. the legal requirements for vehicles and drivers
2. that suitable policies and procedures are in place
3. competence and training requirements for drivers

4. pre-planning of routes for suitability
5. the monitoring and review of such responses

UKGM ADR.OPS.B.010 (a) (2) Communication and alerting systems

A method of monitoring the movement area for the purpose of alerting and deploying the RFFS without delay should be considered as a means to achieve AMC1 ADR.OPS.B.010(a)(2)(d).

Communications equipment provided should ensure effective two-way communication between parties with an effective range that ensures reception within all areas that the RFFS may be required to operate in.

Radio equipment to enable Incident Commanders to maintain communications when not in their vehicles should be provided.

Radio telecommunications (RTF) equipment should be provided to enable the airport fire officer(s) to communicate with the aircraft flight deck. An aeronautical radio frequency, 121.600 MHz, may be used for this purpose. All RTF communications on this frequency should be recorded on suitable equipment that has the capability to identify the time the communication took place. Procedures should be in place to store recordings on archival media for a minimum period of 30 days from the date of the last recorded message. The CAA and Air Accident Investigation Branch (AAIB) may require access to the recordings.

To use 121.600 MHz, the RFFS must obtain prior approval to install and operate radio equipment from the relevant licensing authority. The use of 121.600 MHz is limited to direct communications between the fire officer and pilot when the aircraft is on the ground and only within the period of a declared emergency.

UKGM6 ADR.OPS.B.010 (a) (2) Number of RFFS personnel

It is recognised that RFFS personnel may be engaged in duties other than those directly associated with the RFFS role. These ‘extraneous’ duties, which should be the subject of an impact assessment, should be organised so as not to create conditions likely to compromise individual or crew performance or introduce additional hazards. RFFS personnel designated as part of the minimum level for response, and who are engaged on extraneous duties, should be able to disengage safely, so as to be capable of meeting the response time objective.

UKGM2 ADR.OPS.B.010 (a) (2) Number of RFFS Personnel

In determining the minimum number of rescue and fire fighting personnel and supervisory levels required, a Task and Resource Analysis (TRA) should be completed and the level of staffing and qualification promulgated in, or referenced to, the aerodrome manual. CAP 1150 may be referred to for additional guidance

The objective of providing an adequate level of competent personnel is to have available sufficient staff at all responsibility levels to ensure that:

- the RFFS is capable of achieving the Principal Objective;
- all vehicles and equipment can be operated effectively and safely;
- continuous agent application at the appropriate rate(s) can be fully maintained;
- sufficient supervisory grades can implement an Incident Command System;
- the RFFS elements of the aerodrome emergency plan can be effectively achieved.

UKGM5 ADR.OPS.B.010 Number of RFFS vehicles and Rescue Equipment

Rescue Equipment

The level of rescue equipment provided should take into consideration:

1. the level of aircraft operations
2. the task and resource analysis
3. relevant Health and Safety legislation e.g Provision and Use of Work Equipment Regulations (PUWER), Personal Protective equipment at Work Regulations (PPE)
4. a suitable test and inspection regime for which appropriate records should be maintained (for a minimum period of 5 years) Records should include details of consequential action where an inspection has revealed a defect or deficiency.

UKGM4 ADR.OPS.B.010 (a) (2) Extinguishing Agents

Details on foam specifications can be found in CAP 168.

The objective of an extinguishing agent is to extinguish/suppress a fire on which it is applied. Principal agents are provided for permanent control, i.e. for a period of several minutes or longer. Complementary agents may provide rapid fire suppression but generally only offer a transient control, which is available during application. The ICAO Critical Area Concept is not intended to ensure extinguishment of the entire fire, it seeks to control only the area of fire adjacent to the fuselage. The objective is to safeguard the integrity of the fuselage and maintain tolerable conditions for its occupants.

The required quantities of extinguishing agents should be in accordance with the aerodrome category, and should be available for immediate discharge from RFFS appliances.

For RFFS Categories 3-10, the discharge rates for foam, as detailed in AMC4 ADR.OPS.B.010(a)(2) Table 1, should be achievable using vehicle monitor(s).

Training foams do not comply with any recognised national or international standards; however, they will be quality assured by the manufacturer. They may be formulated to mimic the operational foams for induction, drainage and expansion properties; however, their fire fighting properties may be reduced. Personnel must understand this feature of training foams before they are used. Care should be taken to prevent confusion between the storage and use of training foams with their operational counterparts. Where the manufacturer can demonstrate that the training foam produces identical test results to those expected to be obtained by the operational fire fighting foam, it may be used to conduct the foam production performance and in- service tests.

NOTE: Training foam should be managed in the same manner as operational foam.

Supplementary Water Supplies

Supplementary water supplies, for the expeditious replenishment of rescue and fire fighting vehicles at the scene of an aircraft accident, should be considered.

The objective of providing additional water supplies at adequate pressure and flow is to ensure rapid replenishment of aerodrome RFFS vehicles. This supports the principle of continuous application of extinguishing media to maintain survivable conditions at the scene of an aircraft accident for far longer than that provided for by the minimum amounts of water set out in table 8.3.

Additional water to replenish vehicles may be required in as little as five minutes after an accident; therefore, licence holders should conduct an analysis to determine the extent to which it, and its associated storage and delivery facilities, should be provided.

The aerodrome should consult closely with the local authority fire and rescue service when conducting this analysis, and the following factors are among those items which should be considered (but not limited to):

1. sizes and types of aircraft using the aerodrome
2. the capacities and discharge rates of aerodrome fire vehicles
3. the provision of strategically located hydrants
4. the provision of strategically located static water supplies
5. utilisation of existing natural water supplies
6. vehicle response times
7. historical data of water used during aircraft accidents
8. the need and availability of supplementary pumping capacity
9. the provision of additional vehicle-borne supplies

10. the level of support provided by local authority emergency services
11. the pre-determined response of local authority emergency services
12. fixed pumps where these may provide a rapid and less resource-intensive method of replenishment
13. additional water supplies adjacent to airport fire service training areas
14. overhead static water supplies
15. foam concentrate compatibility

A quantity of gaseous agent or CO2 should be provided for use on small or hidden fires. A minimum extinguisher size is 5kg for major and 2kg for smaller vehicles.

Certification Specifications

UKGM2 ADR-DSN.M.615 General

Aeronautical Ground Lighting – Minimum Certification Requirements										
	Day or Night Operations					Night Only Operations			Notes	Certification Specification (CS) Reference.
	App. Cat II & III	T/O RVR (see note)	App. Cat I	T/O RVR 400-800m	App. N/P Instrument.	T/O RVR 800-1200m	App. Non-Instrument	T/O >1200m		
Aerodrome Beacon	O	-	O	-	O	-	O	-		CS ADR-DSN.M.620
Approach										
HI Centreline	R	-	R	-	-	-	-	-		CS ADR-DSN.M.630;635
Side Row/Supplementary	R	-	-	-	-	-	-	-		CS ADR-DSN.M.635
Simple	-	-	-	-	R	-	R	-	1, 2	CS ADR-DSN.M.626
Sequenced strobe	-	-	O	-	O	-	O	-		CS ADR-DSN.M.630
Approach Slope										
PAPI	R	-	R	-	R	-	-	-		CS ADR-DSN.M.640
HI APAPI	-	-	-	-	R	-	O	-	3	CS ADR-DSN.M.645
LI APAPI	-	-	-	-	-	-	R	-	4	CS ADR-DSN.M.645
Runway										
HI edge, threshold, end	R	R	R	R	R	O	-	-		CS ADR-DSN.M.675; 680; 685
LI edge, threshold, end	-	-	-	-	-	R	R	R	4	CS ADR-DSN.M. 675; 680; 685
HI Centreline	R	R	O	O	-	-	-	-	5	CS ADR-DSN.M. 630; 635; 690
Touchdown zone	R	-	O	-	-	-	-	-		CS ADR-DSN.M.695
Stopway	R	R	R	R	R	R	R	R		CS ADR-DSN.M.705
Taxiway										
Centreline	R	R	O	O	O	O	O	O	6, 7	CS ADR-DSN.M.710; 715
Edge	-	-	R	R	R	R	R	R	8	CS ADR-DSN.M.720

Aeronautical Ground Lighting – Minimum Certification Requirements										
Illuminated Signs	R	R	R	R	R	R	R	O	9	CS ADR-DSN.M.775
Stop bars	R	R	O	R	-	-	-	-	10	CS ADR-DSN.M.730
Runway Guard	R	R	O	R	R	R	-	-	11	CS ADR-DSN.M.745
Obstacle	R	R	R	R	R	R	R	R	12	CS ADR-DSN.Q.840; 850
Alt. Input Power Supply	R	R	R	R	O	O	O	O		CS ADR-DSN.S.880
Illuminated Wind Sleeve	R	R	R	R	R	R	R	R		CS ADR-DSN.K.490

HI = High Intensity, LI = Low Intensity, N/P = Non Precision, App = Approach

R = Required, O = Operationally desirable,

NOTES:

1. Where physically practicable, a simple approach lighting system specified in CS ADR-DSN.M.626 should be provided to serve a non-precision approach runway, except when the runway is used only in conditions of good visibility or sufficient guidance is provided by other visual aids.

2. Where physically practicable, a simple approach lighting system as specified in CS ADR-DSN.M.626 should be provided to serve a non-instrument runway where the code number is 3 or 4, and intended for use at night, except when the runway is used only in conditions of good visibility, and sufficient guidance is provided by other visual aids.

3. PAPI or APAPI should be provided where the code number is 1 or 2 when the pilot of an aeroplane may have difficulty in judging the approach due to inadequate visual guidance.

4. Low intensity systems are suitable only for night time use.

5. HI centreline lights are required for take-off in RVR <400m

6. HI centreline lights are required in conditions of RVR <350m

7. Taxiway centre line lights should be provided on a taxiway intended for use at night in runway visual range conditions of 350m or greater, and particularly on complex taxiway intersections and exit taxiways, except that these lights need not be provided where the traffic density is light and taxiway edge lights, and centre line marking provide adequate guidance.

8. May not be required where aerodrome operates a non instrument runway and take-off is above 1200m, visibility and adequate guidance can be achieved by surface illumination or other means

9. Signs must be illuminated when intended for use:

   a) in runway visual range conditions less than a value of 800m; or

   b) at night in association with instrument runways; or

   c) at night in association with non-instrument runways where the code number is 3 or 4.

10. A stop bar is required at every runway-holding position serving a runway when it is intended that the runway should be used in runway visual range conditions less than a value of 550m

11. A runway guard light is required at every runway-holding position serving a runway when it is intended that the runway should be used in runway visual range conditions less than a value of 550m

12. See CS ADR-DSN.Q.840 ‘Objects to be marked and/or lighted’ for application requirements

UKGM2 ADR-DSN.S.895 Serviceability levels

Minimum Percentage of Serviceable Light Fittings

	Landing ↓		Take-off ↑	
AGL	**Category I**	**Category II/III**	**RVR <800m**	**RVR >800m**
Approach beyond 450 m	85%	85%	-	-
Approach inner 450 m	85%	95%	-	-
Runway threshold	85%	95%	-	-
Runway end	85%	85%	85%	75%
Runway edge	85%	95%	95%	85%
Runway centreline (where fitted)	85%	95%	95%	85%
Touch Down Zone (where fitted)	85%	90%	-	-

The maintenance of AGL should have as its objective that during any period of operations all AGL equipment is serviceable but that, in any event, the serviceability levels detailed in the Table above should be regarded as the absolute minimum for the operation intended.

The objectives contained in the Table above specifically target precision instrument approach runways and operations in low visibility. For precision instrument approach runways the CAA expects the aerodrome authority to provide evidence that the performance of the associated AGL meets the requirements for all weather operations, which include the Table above. The benefit of consistently achieving the above is outlined in **CS ADR-DSN.M.635 Precision approach category II and III lighting system** Figure M-3B.

One method of providing such evidence is to carry out regular measurements of the photometric performance (i.e. the luminous intensity, beam coverage and alignment) of the AGL when in service.