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CHAPTER 1

Introduction

1.1 It is for national Governments to lay down the framework of civil aviation within their national boundaries, and to determine the arrangements for the ownership and operation of their civil airports. These arrangements can take a variety of forms, and there may not necessarily be one form common to all civil airports within Ii given national boundary.

1.2 A government may decide to retain direct control of civil airports by giving this responsibility to a Government Department. Alternatively, it may:

(a) Set up an agency or a nationally owned corporation for this purpose; .
(b) Delegate the responsibility to provincial or local governments;
(c) Adopt a combination of these arrangements at different airports to suit the particular circumstances And aviation background of the State; or
(d) Permit cities/communities to provide and operate the airports with minimal governmental involvement.

1.3 Whichever policy it adopts, the State having jurisdiction over the airport, I.e. the national Government, must inevitably remain responsible for a number of aspects of civil aviation. A general list of these is as follows:

(a) Control of the development of a national airport structure;
(b) The licensing of airports and personnel involved in civil aviation, and the Iegis1ative framework within which licensing arrangements operate;
(c) The State's air traffic control system;
(d) The negotiation of traffic rights with other States;
(e) The establishment of procedures to ensure coordination between the development and operation of an airport and the development of the local neighborhood of that airport to avoid conflicts of interests;
(f) The formulation of policies relating to the environmental impact of airports on the community;
(g) The co-ordination of civil and military aviation; and
(h) The investigation of aircraft accidents.

1.4 As with the operations of airports. Responsibility for the provision of air traffic control and telecommunications can take a variety of forms, albeit subject to a national policy within the framework provided by ICAO. An air traffic control unit will normally be provided by the national Government but it may in special circumstances be the responsibility of the airport. Whatever the arrangement, it is essential that the closest co-operation exists between air traffic control and the airport's operations department; since without such co-operation no airport can be efficiently run, and at worst there may be safety implications.

1.5 Aside from the Government's responsibilities for civil aviation, and its impact on a specific airport, and regardless of the arrangements made for the provision of air traffic control, an airport operator or owner has a number of vital and specific responsibilities. These can be broadly summarized as follows:

(a) The design and provision of facilities in consultation with the appropriate State departments and the airport's users, and in accordance with the relevant Standards and Recommended Practices contained in ICAO documents; and
(b) The adoption and implementation of internationally recognized procedures for the safe conduct of airport practices and operations.

1.6 The latter will include the following aspects:

(a) The provision and maintenance of visual aids to navigation;
(b) The provision of rescue and fire fighting services;
(c) The provision and maintenance of the movement area surfaces;

(d) The provision and maintenance of apron marking, lighting and visual docking guidance systems;
(e) The control of vehicular traffic in apron areas;
(f) The regulation of movement area traffic. Except on those parts of the airport where direct control is exercised by air traffic control;
(g) The parking of aircraft
(h) The assessment of runway braking action and the measurement of water depth;
(i) Measures to discourage birds and other wildlife;
(j) The co-ordination of disabled aircraft removal operations;
(k) The adoption of measures intended to minimize the effect of the airport on the local environment;
(I) The clearance of obstacles where practicable; and
(m) The provision of airport data.

1.7 Thus it will be seen that the complex matter of operating a civil airport can be approached in a number of ways. Typical examples are:
- A government-owned and operated airport. With the air traffic control unit at that airport being provided by a government service.
- A local authority owned or privately owned airport, employing its own air traffic control unit, operating within a national framework of airports, and within a national air traffic control system.
- An airport operated by a nationally owned corporation or by a local authority, with an air traffic control system furnished by a Government Department, a Government Agency or by a different nationally owned body.

1.8 The above examples are not exhaustive. But they illustrate some of the Corms adopted in various Slates; and it must be remembered that more than one system may be found within a single national boundary. Overall operation of the airport.

CHAPTER 2
The Functional Responsibilities of The Airport Technical Departments

2.1 Introduction

2.1.1 The responsibility for the provision of technical services at an airport will normally be that of the airport owner but it may in special circumstances be the responsibility of the national Government.

2.1.2 A State owning and operating an airport may in special circumstances delegate this responsibility either in full or in part to another agency. For example. The provider of air traffic control may be responsible either directly or indirectly for some of the tasks listed in Chapter 1, 1.6. The system adopted will reflect national practice - Chapter 1, 1.2 and 1.4 refer.

2.1.3 A typical simple organizational chart of airport management is shown in Figure 2-1.

2.2 Operations Management Department

2.2.1 A typical organizational chart of the department of airport management responsible for airport operations is shown in Figure 2-2.

2.2.2 Functional Responsibllit1es of the Airport Rescue and Fire Fighting Service

2.2.2.1 Typical duties of the airport rescue and fire fighting service are:

(a) Dealing with all fires, emergencies and related Incidents on an airport. These will include, for example, aircraft or aircraft-related fires occurring on or in the immediate vicinity of the airport as well as building fires. Fuel spillages and road/rail accidents;

(b) Maintenance of an effective liaison with local fire departments. ambulance and police services. These services provide the major effort in dealing with aircraft rescue and fire fighting operations;

(c) Attendance at aircraft crash sites in the immediate vicinity of the airport. Familiarization with access routes;

(d) Regular training to enhance efficiency including negotiating water, swampy areas and other difficult environment in the vicinity of the airport;

(e) Other duties as necessary which do not interfere with the primary duties in meeting ; and training of non-rescue

Figure 2-2 Typical Organization of Airport Operations

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ay-to-day control and the airport and to and ns Officer is usually nd a Duty Operations Specialized units may ne Apron Management

2.2.3.2 A Movement Area Safety Unit is established to carry out the majority of the day-to-day duties of the Operations Department., with the exception of apron control. However, at a small airport, these functions will be combined within a single unit. Typical duties of a Movement Area Safety Unit are:

(a) Comprehensive and routine surface inspections of the maneuvering area, including adjacent unpaved areas. and submission of reports to air traffic control, airport maintenance. and airport operations of the condition of the areas inspected and the need for sweeping and/or surface maintenance;

(b) Comprehensive and routine surface inspections of the aprons and submission of reports to air traffic control. airport maintenance and airport operations of the condition of the apron areas inspected and the need for sweeping and/or maintenance;

(c) Inspections of lighting and submission of reports to air traffic control, airport

maintenance and airport operations of any lamp failures. circuit failures and other malfunctions;

(d) Bird dispersal measures;

(e) The measurement of friction coefficient; and

(f} The control and issue of temporary passes for people and vehicles requiring access to apron areas on an irregular basis.

2.2.3.3 Typical responsibilities of an Apron Management Unit are:

(a) Allocation of aircraft stands on the aprons to arriving aircraft;

(b) Maintenance of the necessary documentation in connation with aircraft stand allocation. The purpose of this documentation will be to ensure that adequate records are kept. for example to permit landing and parking charges to be Levied;

(c) The provision of Marshallese for use on aircraft stands without docking guidance systems; and

(d) At some airports. The unit may also be responsible for apron services including the provision of cargo. Baggage and aircraft handling, The Apron Management Unit may be combined with the Movement Area Safety Unit at a small airport.

2.2.4 Functional responsibilities of the Operations Services Section.

2.2.4.1 The Operations Services Section is responsible for the support functions necessary to the efficient running of airport operations. Noise monitoring, administration of airside passes, liaison with external emergency services are all examples of the work of this department.

2.2.5 Functional responsibilities of the Mechanical Transport Section

2.2.5.1 Typical duties of the Mechanical Transport Section are:

(a) The maintenance of all vehicles and specialist mobile engineering equipment, including rescue and fire fighting vehicles, snow clearance equipment and disabled aircraft removal equipment. including the allocation of priorities when required;

(b) The provision of drivers for airport vehicles as required; and

(c) The provision of drivers for specific duties, including sweeping, aircraft stand cleaning, snow clearance and disabled aircraft removal.

2.3 Airport Maintenance Department

2.3.1 Typical duties of an Airport Maintenance Department relating to operational matters are:

(a) Civil Engineering: The Civil Engineering Section will be responsible, either directly or indirectly through use of a contractor, for carrying out remedial repairs to surfaces of the airport. Including all the paved areas and the grass areas (including grass cutting), and the marking on the paved areas, together with the associated drainage. fire mains (if provided) and boundary fencing; and

(b) Electrical and Mechanical Engineering. This section will be responsible, either directly or indirectly through use of a contractor for the maintenance of all aerodrome lighting, associated taxiing guidance signs and other signs, apron guidance systems and standby power supplies serving these facilities. These sections are also responsible for building maintenance, but these duties are inappropriate to an operational manual.

2.4 Operations Room

2.4.1 A co-coordinating centre should be established, where information relating to the operation of the airport can be received and distributed. This may combine the functions of the Apron Management Unit as well as the Movement Area Safety Unit,

2.4.2 The room should be provided with direct telephone lines to ATC and any other operational control rooms as well as MET and AIS. Radio communications should be provided so that operational staff can be contacted whether on foot or in vehicles. Arrangements should be made for the preparation and issue of NOT AM (see Chapter 22),

2.4.3 Communications should be established with any management duty control room which is provided to cover the

CHAPTER 3
Airport Surface Inspections

3.1 Frequency of Inspection

3.1.1 Inspections of the movement areas should be regular and as frequent as possible. In any event the minimum frequency should be:

(a) Runways –four inspections daily as described below:

Dawn inspection-A detailed surface inspection covering the full width of all runways should be undertaken. This should take approximately 15 minutes for each runway (two runs).

Morning inspection-All runways normally carried out on an on\off basis concentrating on the area between the runway edge lights. Afternoon inspection - same as the morning inspection.

Dusk inspection-This should cover all runways. It is designed to bridge the gap in runway inspections when the lighting inspection is not required until late in the evening, and should cover the whole runway surface.

(b) Taxiways-daily for those in normal regular use.

(c) Aprons-Daily.

(d) Grass areas-Those areas that may be required to sustain aircraft should be inspected as frequently as the adjacent paved areas. Other grass areas should be inspected at intervals suitable to observe any deterioration of the surface.

3.2 Method of Inspection

3.2.1 The areas and distances to be covered necessitate the use of vehicles for airport inspections. However, the higher the speed, the less effective the inspection. Therefore, speeds should be kept as low as practicable. Detailed inspections of paved surfaces on foot will normally be completed by The Maintenance Department while other areas should be inspected by the relevant department. It will be necessary for airport operations to co-ordinate the programme to ensure that inspections are carried out at the correct frequency.

3.3 Inspection Procedures

3.3.1 Before commencing any runway inspection, permission must be obtained from air traffic control. On entering the runway a positive entry call, e.g. "checker entering for inspection," must be made; on leaving the runway, air traffic control must be advised when the inspection vehicle is clear of the runway strip. Most inspections are carried out on an ON/OFF basis (i.e. where the inspection vehicle may be required to enter or leave the runway at short notice). The above calls must be made on each occasion that the inspection vehicle enters the runway.

3.3.2 It is essential to maintain a listening watch on the appropriate R\T channel during any runway inspection.

3.3.3 If, during an ON/OFF inspection, air traffic control requests the inspection team to clear the runway, the vehicle must move outside the runway strip before advising air traffic control that they are clear. They must then remain outside the runway strip while awaiting re-entry instructions.

Note. - Inspectors should never clear a runway by entering an ILS critical/sensitive area.

3.3.4 Clearance must be obtained before crossing any runway.

3.3.5 All runway inspections are carried out in the direction opposite to that being used for landing or taking off, primarily for safety reasons. In the case of the first-light runway inspection involving two runs in the same direction, the "back-tracking" must be done outside the runway strip and can be utilized in inspecting the runway from a distance or the taxiways adjacent to the runway in question.

3.3.6 On final completion of a runway inspection the team should advise air traffic control of the fact and report the state of the runway.

3.3.7 The times of commencement and completion of the inspection must be noted and included in the Record of Inspection Log.

3.4 Paved Area Inspections

3.4.1 Attention should be paid to the following points:

(a) General cleanliness with particular attention to material which could cause engine ingestion damage. This may include debris from runway maintenance operations or excessive grit remaining after runway gritting. Any build-up of tire rubber deposits should be noted;

(b) Signs of damage to the pavement surface including cracking and spalling of concrete, condition of joint sealing, cracking and looseness of aggregate in asphalt surfaces or break-up of friction courses. Damage or deterioration which could cause aircraft damage should be reported immediately for inspection by the Airport Maintenance Department and, if the damage is sufficiently serious, the area closed to aircraft pending the results of such an inspection;

(c) After rain, flooded areas should be identified and marked, if possible, to facilitate later resurfacing;

(d) Damage of light fittings;

(e) Cleanliness of runway markings; and

(f) The condition and fit of pit covers.

3.4.2 The extremities of the runway should be inspected for early touchdown marks; blast damage to approach lights, marker cones and threshold lights; cleanliness and obstacles in the runway end safety area.

3.5 Grassed Area Inspections

3.5.1 The following points should be observed:

(a) The general state of ground cover vegetation ensuring, in particular, that excessive length is not obscuring lights, signs, markers, etc.;

(b) Any developing depressions should be noted and plotted;

(c) Any unreported aircraft wheel tracks should be carefully plotted and reported;

(d) The condition of signs and markers should be noted and necessary repair work ordered;

(e) The general bearing strength of grass areas, particularly those close to aircraft pavement surfaces, should be noted. A reasonable assessment can be made from the depth of vehicle wheel tracks. Any areas showing signs of persistent water logging should be reported. Any differences in levels between grass and paved areas should be noted and remedial action requested. Because of the hazard to aircraft engines particular note should be made of the general cleanliness of these areas. Signs of blast erosion should be noted and reported; and

(f) Waterlogged grass areas should be noted and reported particularly since they may be an attraction to birds.

3.5.2 The main object of grass cutting is to ensure that lights and markers are not obscured by tall vegetation. Vegetative growth should be managed in order to limit the attraction of birds and other wildlife (see Chapter 9). Grass cutting must be coordinated so as not to interfere with aircraft movements. Ensure that mounds of grass cuttings are not left on areas where engine ingestion is possible.

3.6 Obstacles

3.6.1 A check should be made of all authorized obstacles for proper lighting and marking.

3.6.2 Any unauthorized obstacles must be reported to the designated persons or organizations immediately. When possible, prompt removal of the obstacle should be carried out. If this is not possible, immediate consideration must be given as to whether aircraft operations should be restricted, in any form, and appropriate marking and lighting of the obstacle carried out.

3.7 Reporting

3.7.1 If a dangerous unserviceability is discovered during a runway inspection (e.g. damaged pit covers or broken lights), the fact should be immediately reported by R/T in

order that appropriate ATC action can be taken. In addition, airport operations should be informed. If the runway is closed as a result of such damage the inspection team should continue their inspection whilst awaiting the arrival of airport maintenance support. The team should also be prepared to inspect any subsidiary runway if required.

3.7.2 If the runway unserviceability of a type that will not affect its use is discovered, the matter must be reported to the Airport Maintenance Department on the appropriate form stating the degree of urgency, date and trine, etc.

3.7.3 should aircraft parts or tire pieces be found during a runway inspection , then airport operations and air traffic control must be informed immediately so that tracing and notification action can be taken.

3.7.4 To assist in identifying the location of faults on a runway, reference plates should be installed outside the runway edge lights on one side of the runway.

Ground Checks of Visual Aids

4.1 Introduction

4. 1.1 The integrity and reliability of lighting aids should be comparable with those of non-visual aids. The integrity of the lighting system depends on the design of both the internal airport circuits and external power supply. The reliability of the system depends on the level of preventive maintenance employed and the degree of inspection carried out. Guidance on preventive maintenance of visual aids is contained in the EAC139-26

4.1.2 Operational checking of lighting is normally carried out by the Movement Area Safety Unit but rectification is the responsibility of Airport Maintenance. At some smaller airports the checking may be delegated to Airport Maintenance.

4.1.3 Faults in the lighting systems will be detected by monitoring. Monitoring by visual display on the control panel will ensure detection of circuit failures and verification that brilliancy selection by air traffic control provides the desired light output. Monitoring by visual inspection is necessary, even if there is an automated system, in order to detect defective lamps, contamination of fittings by dirt and rubber deposits or misalignment. Routine visual ground inspections should be augmented by flight checks from time to time.

4.2 Frequency of Inspection

4.2.1 The frequency and detail of inspections depends to some extent on the complexity of the visual aids provided. In the case of precision approach runways, flight checks and ground inspection of visual aids should be more frequent and detailed than those carried out on other runways.

4.3 Routine Ground Inspection

4.3.1 Daily checks

(a) All inset and elevated approach lighting systems and runway and taxiway lights, as well as stop bars and illuminated ILS Category 11 or III holding position signs, should be checked for lamp failures, breakage or gross misalignment, see ICAO Annex 14, Section 5. Lamp failures on runway centre line lights of precision approach runways Category II and 111 should be repaired as soon as possible; and

(b) Major deficiencies in electrical circuits affecting the integrity of visual aids, e.g., breaks in the distribution network or unserviceability of the standby power generators, should be reported to airport operations, maintenance and air traffic control, and NOTAM (Notice to Airmen) action taken.

4.3.2 Weekly checks

(a) Check all approach lighting systems for burnt out lamps. Check obsolete lights in the vicinity of the airport, which are the responsibility of the airport operator. Ensure grass cutting, etc., has been carried out and that approach lighting systems are not becoming obscured;

(b) Check all runways lighting where it is likely to become contaminated and arrange for cleaning programs as necessary;

(c) On all precision approach runways Category 11 and III, light cleaning should be followed up by photometric measurements of the light output of runway centre line lights from the threshold to a longitudinal distance of 910 m down the runway. This will be carried out by either Movement Area Safety Unit or Airport Maintenance personnel, depending on local circumstances. These checks can be readily carried out by mounting a photometer in an inverted box which carries wheels at its front end and can be moved swiftly from fitting to fitting;

(d) The visual approach slope indicator systems should be checked for accuracy and realigned if necessary;

(e) The serviceability of retro-reflective markers should be examined and any unserviceable ones replaced

(f) All other markers should be checked and

(g) Any taxi-holding position lights at side of stop bars should be checked for serviceability.

4.4 Inspection Procedures

4.4.1 Before commencing any runway lighting inspection, permission must be obtained from air traffic control on R/T or, if the runway is closed, from ground movement control. On entering the runway, a positive entry call (e.g., "checker entering for inspection") must be made. On entering the runway, air traffic control must be advised when the inspection vehicle is clear of the runway strip. Most inspections are carried out on an ON/OFF basis and the above calls must be made on each occasion that the inspection vehicle enters the runway.

4.4.2 It is essential to maintain a listening watch on the appropriate R/T channel during any runway lighting inspection.

4.4.3 If during an ON/OFF inspection air traffic control requests the inspection team to clear the runway, the vehicle must move outside the runway cleared and graded area before advising air traffic control that they are clear. They must then remain outside the runway strip while awaiting re-entry instructions.
Note. - Inspectors should never exit a runway by entering an ILS (Instrument Landing System) critical/sensitive area.

4.4.4 All runway lighting inspections are carried out in the direction opposite to that being used for landing or taking off, primarily for safety reasons. Touchdown zone lighting cannot be checked easily from the upwind direction and is the subject of a separate inspection carried out immediately following the main inspection.

4.4.5 On final completion of a runway lighting inspection, the team should advise air traffic control of the fact and the serviceability state reported.

4.5 Emergency Ground Lights

4.5.1 A stock of ground fights that have interchangeable filters and can indicate green, blue, red or white light should be held.

4.5.2 These lights are used in emergency situations, or where no other form of lighting can be used.

4.6 Approach Lighting System Inspections

4.6.1 Approach lighting systems should be inspected every 24 hours. In addition they must be inspected on request from airport operations or air traffic control.

4.6.2 The inspection should cover all elements of the approach lighting system including the side row (red) barrettes of a precision approach Category II and III lighting system.
Note. - These barrettes are also checked when switched on in Category III conditions.

4.6.3 The inspecting team should inform air traffic control before commencing the approach lighting system inspection, normally by telephone. Separate clearance must be obtained ON R/T to enter the runway strip or runway end safety zone.

4.6.4 The ILS localizer critical/sensitive areas must not be infringed.

4.6.5 Air traffic control should be informed when the check is complete in order that no operational lighting can be turned off.

4.6.6 Reporting: If a major failure is discovered during the inspection, air traffic controlled airport maintenance should be informed immediately by R/T.

4.6.7 Long grass or trees obscuring approach lighting systems should be reported to airport operations.

4.7 Visual Approach Slope Indicator System (VASIS) Inspections

4.7.1 Introduction

4.7.1.1 Visual approach slope indicator systems are installed to indicate to landing aircraft the correct approach slope. ECAR 139 specifies the following types of visual approach slope indicator systems:

VASIS
3-BAR VASIS
T- VASIS
PAPI

4.7.1.2 Under certain circumstances it is possible to use abbreviated configuration of VASIS , 3- BAR VASIS AND T-VASIS . These abbreviated configuration are know respectively as AVASIS and AT-VASIS

4.7.2 Inspection details

4.7.2.1. The following inspection procedures are common to all the visual approach slope indicator systems:

(a) The system should be checked for alignment at regular intervals. It should also be checked on request from operations or air traffic control, and after an aircraft landing incident accident;
(b) On each runway inspection a visual check is made of the system in use to ensure serviceability;
(c) Before commencing alignment checks, air traffic control and telecommunications engineering must be informed if entry into the ILS (Instrument Landing System) glide path critical sensitive area is required;
(d) Checking at night and in bad visibility should be avoided if at all possible;
(e) Alignment cheeks should be carried out with the system set at 30 percent intensity;
(f) during the system check the vehicle must remain clear of the strip, and one member of the team must remain in the vehicle monitoring the radio channel while the checking team proceeds on foot to the system location;
(g) If the system is located within the ILS glide path critical/sensitive area, the vehicle must be parked outside, and upwind of, the glide path critical/sensitive area boundary. The checking party must proceed on foot to the runway edge, remaining clear of the ILS glide path critical/sensitive area, then turn and walk along the grass or area adjacent to the runway edge to the system, leaving by the same route;
(h) A previous arrangement should be made between the lookout and the checking party to agree on a signal should it become necessary for them to clear the area rapidly (e.g., portable radio); and
(i) Care must be taken not to obstruct the front of the system when aircraft are on final approach to land.

4.7.2.2 VASIS alignment checks. The T-VASIS and AT-VASIS alignment checks of these systems should be carried out as follows:

(a) Select the correct sighting stick;
(b) place the sighting stick upon the relevant checking peg located approximately 31 m downwind from the VASIS unit, ensuring that the stick is held vertically;
(c) Align the eyes with the top edge line on the green Perspex and vasi unit a the pencil line of even white light should appear below the red light
(d) Lower the eyes to the lower edge lne and the pencil line of white light should disappear;
(e) Any vartion to c) and d) indicates that the VASIS unit is out of alignment;
(f) Any un service abilities should be dealt with by the engineer accompanying the checking party; and
(g) The procedures described above should be repeated for each unit of the system

4.7.2.3 T-VASIS alignment checks T-VASIS units are factory-adjusted and the optical units being compact and stiff, the subsequent check on beam angles is only confirmatory. The unit should be levelled laterally and longitudinally and then checked periodically. To achieve a sharp signal and maximum system range, it is essential that the most intense sector of the lamp be utilized. This can be achieved by means of a target that is temporarily installed at the front of the light unit so that each lamp can be correctly aimed by adjustments in azimuth and elevation.

4.7.2.3 PAPI alignment checks. The precision approach path indicator (PAPI) and APAPI units are optically set in the factory and all that is required is the setting of the unit to the required approach angle. In some cases there my be a levelling device that is incorporated

into the unit. In other cases a inclinometer should be utilized to ensure that the desired angle is achieved.

4.7.3 Reporting

4.7.3.1 VASIS. When the VASIS has an unserviceable or when unit have to be unplugged. The following standards apply:

- Failure of one lamp in one unit-UNIT SERVICEABLE;
- Failure of two lamps in one unit-UNIT UNSERVICEABLE; c)
- Not more than two units of a 12-unit system unserviceable-SYSTEM REMAINS IN USE;
- More than two units of a 12-unit system unserviceable on one side-REMAINDER OF THAT SIDE UNPLUGGED AND THE OTHER USED AS AN AT-VASI; and e)
- More than one unit unserviceable on the remaining side-SYSTEM UNSERVICEABLE.

4.7.3.2 In the cases of T-VASIS or AT-VASIS the following applies:

- Failure of one lamp in one unit-UNIT SERVICEABLE;
-failure of two lamps in one unit-UNIT UNSERVICEABLE;
- Single sided system;
- More than one unit unserviceable-SYSTEM UNSERVICEABLE;
-Two sided system;
- More than one unit of system unserviceable on one side-REMAINDER OF THAT SIDE UNPLUGGED AND THE OTHER SIDE USED; and g)
- One or more of the remaining side unserviceable-SYSTEM UNSERVICEABLE.

4.7.3.3 3-BARS VASIS. When the 3-BARS VASIS has an unserviceable or when unties have to be unplugged the following standard
-failure of more than one lamp in each unit-UNIT UNSERVICEABLE; and
- Failure of any one unit-SYSTEM UNSERVICEABLE
- not more than three unit of an 18-unit system unserviceable on one side – REMAINDER OF THAT SAID UNPLUGGED AND THE OTHER SIDE USED AS A 3- BAR AVASIS
- More than one unit unserviceable on the remaining side – SYSTEM UNSERVICEABLE
In the case of 3-BAR AVASIS the slander are the same as for AVASIS

4.7.3.5 T-VASIS in the case of T-VASIS the following applies :

- Two out of eight reference light units;
- One out of six fly-up light units; and
- One out of six fly-down light units.

4.7.3.6 In the event that more failures occur than describe above, and provided that they are on the same side of the runway, the failed side may be withdrawn from service and remaining side used as an AT-VASIS. In that event, no further unit failures can be tolerated.

4.7.3.7 PAPI. In the case of PAPI the following applies:
- Failure of more than one lamp in each unit-UNIT UNSERVICEABLE; and
- Failure of any one unit-SYSTEM UNSERVICEABLE.

4.7.3.8 If PAPI is provided on both sides of the runway, failure of a light unit in a symmetrical PAPI system may be tolerated by completely switching off the failed side, leaving the PAPI system operating only on the serviceable side of the runway.

4.7.3.9 Long grass or construction material obstructing light units should also be reported.

4.7.4 Further guidance on the subject is included in the EAC139-12

CHAPTER 5
Flight Checks of Visual Aids

5.1 General

5. 1.1 Flight checking visual aids is very important and arrangement for flight checking will be made at designated intervals. Airport operations staff should take part in these inspections.

5.1.2 Approach lighting systems, approach side row (red) barrettes where fitted, visual approach slope indicator systems, threshold lights, touchdown zone lights, runway edge lights and runway centre line lights will be checked for failures and alignment. The Visual approach slope indicator systems will be checked for compatibility with non-visual approach systems. The brilliancy control system will be exercised. Taxiway lighting and stop bars will be checked on those routes in use at the time of the flight check. Further information on flight checking visual approach slope indicator systems is contained in the ECA 139-12

5.2 Flight Checks after Major Maintenance

5.2.1 After major maintenance or developments affecting operational facilities within the movement area, special flight checks will be arranged as necessary.

5.2.2 Daylight visual aids checks. At east once per year, inspect surface markings, VASIS for range and beam spread, and the balance of the runway and approach lighting system at maximum brilliancy.

5.2.3 New Installations. Before any new installations are brought into use or when there have been substantial changes to existing installations, a flight check should be arranged.

5.3 Approach and Runway Lighting Systems

Note.- For simplicity in presentation the following is written in a series of logical steps. But persons with in-flight experience may wish to combine these steps in a reduced number of approaches.

5.3.1 Approach lighting pattern

5.3. 1.1 Carry out a normal approach from about 6 to 8 km starting with all elements of the approach lighting system excluding the side row barrettes (red) at the maximum brilliancy setting. Check that a uniform pattern is presented to an aircraft on the normal approach path. Variation should be made about the approach path. Small variations in elevation and azimuth should not produce any noticeable change in the intensity of the lights. Large variations will produce a progressive reduction in intensity as the aircraft leaves the area of primary cover of the lights. These changes in intensity should be substantially the same for all fights. Ragged changes are normally attributable to incorrect setting angles of individual units, and a note of these lights should be made for subsequent checking on the ground.

5.3.1.2 During the approach, call for progressive reductions in brilliancy down to the minimum setting. Check that all lights respond correctly and simultaneously to the setting changes. With the lights set at a suitable brilliancy (the lowest at which the individual lights are discernible in the current conditions), check that all the individual lights are illuminated. Note and record all failures.

5.3.2 Approach side row (red) barrettes (when installed)
5.3.2.1 Repeat checks 1 and 2 above for side row (red) barrettes of the approach lighting system.

5.3.2.2 Repeat with all the elements of the approach lighting systems including the side row (red) barrettes.

5.3.3 Runway edge, threshold and end lights

5.3.3.1 With edge, threshold and end lights at maximum brilliancy, check that a uniform pattern is presented to an aircraft taking off, landing and overshooting. Check that there is a progressive reduction in the intensity as the aircraft leaves the area of primary cover of the lights.

5.3.3.2 From the downwind leg, check that all omni-directional runway edge lights are visible and clearly define the runway edges.

5.3.3.3 During a normal approach, and starting with the runway lights at maximum intensity, call for progressive reductions in the light intensities down to the minimum setting. Check that all lights respond correctly and simultaneously to the setting changes. At a low brilliancy setting, carry out a low overshoot and check for any light failures.

5.3.4 Runway centre line lights

5.3.4.1 Repeat checks 5.3.3.1 and 5.3.3.3 above for the runway centre line lights.

5.3.5 Touchdown zone lights

5.3.5.1 Repeat checks 5.3.3.1 and 5.3.3.3 above for the touchdown zone lights.

5.3.6 Complete check of approach and runway lighting systems

5.3.6.1 With the approach (including side row red barrettes where installed) and runway lighting systems set at the brilliancy levels appropriate to the conditions, carry out a normal approach. Check that a balanced lighting system is presented to the pilot. Call for brilliancy adjustments appropriate to other conditions and check that balance is maintained.

5.3.6.2 Repeat the above check with the addition of side row barrettes of the approach lighting systems and touchdown zone lights.

5.4 Location/Identification Beacon

5.4.1 Check that the beacon is clearly discernable at a range appropriate to the conditions, and that the coding/flash rate is correct.

CHAPTER 6
Adverse Weather Conditions

6.1 Introduction

6. 1.1 Adverse weather conditions requiring special action by the airport operator are fog, and strong winds,

6.1.2 It is essential that a communication net be established so that messages from the Meteorological Office giving adequate warning of all the above meteorological phenomena are passed to operations, air traffic control and the airlines.

6.2 General

6.2.1 During adverse weather conditions, airport operations will advise air traffic control of relevant surface conditions and should carry out such various checks that the weather dictates.

6.2.2 Adverse weather can be divided into seven groups:

(a) ice - temperatures below 0O C;
(b) frost;
(c) freezing rain;
(d) strong winds;
(e) rain - giving reduced runway friction;
(f) fog or low visibility; and

6.3 RESERVED

6.4 Strong Winds

6.4.1 A method of disseminating strong wind warnings to airlines, airport operations and handling agents should be implemented.

6.4.2 Airport operations should arrange for checks to be made of work in progress to ensure markers and equipment are secure.

6.4.3 Airport operations should arrange for airside patrols to be carried out to collect blowing objects and warn air traffic control and operations regarding any objects that cannot be retrieved and are blown onto the operational areas.

6.4.4 The safeguarding of light aircraft should be the responsibility of the owner. Operational staff should be aware of the effect of high winds on such aircraft, and take positive steps to turn aircraft into the wind and to assist in tying them down.

6.4.5 The safeguarding of aircraft ground equipment should be the responsibility of the owner. But a careful watch should be maintained by airport operations and adequate warnings passed to all airline and handling agencies.

6.5 Rain

6.5.1 There is an operational need for information on runways which may become slippery when wet. To this end there is a need to measure Periodically the friction characteristics of a wet runway surface to ensure that they
do not fall below an agreed level (see Chapter 7).Details of Methods for measuring and expressing friction characteristics of a wet runway can be found in ECAR 139 subpart E and; the EAC 139-19

6.5.2 Standing water checks should be carried out on request from air traffic control or airport operations. A verbal assessment for the centre half of the width of the runway is required ECAR 139 subpart E . On completion of the check the results should be passed to air traffic control and recorded for reference purposes.

6.6 Fog or Low Visibility

6.6.1 During conditions of low visibility, normally caused by fog, special procedures will be required to ensure that vehicles or workers on foot do not inadvertently lose their way and enter active runways or taxiways. In such conditions the time available for aircraft and possibly vehicles to take evasive action will. be too short to avoid an accident.

6.6.2 The visibility at which special procedures will become necessary may vary from airport to airport. (Category III operations will require special procedures but so may Category II operations.) Regardless of the visibility at which an airport decides to initiate low visibility procedures would be given. Once low visibility procedures have been implemented they should remain in force until there is a clear trend of improving visibility. Again a slightly higher visibility should be selected at which to terminate low visibility procedures.

6.6.3 It should be remembered that in addition to procedures, special airport facilities are required for Category II/III operations. For example, the runway approach lighting, taxiway lights and secondary power supplies have to conform to Category II/III standards as laid down in Annex 14. The ILS must be up to Category II/III requirements as laid down in Annex 10, Volume 1, Part 1, Chapter 3, and the runway must be protected by an obstacle-free zone as specified in Annex 14.

6.6.4 Low visibility procedures

6.6.4.1 When low visibility operations are likely, and at a pre-agreed visibility condition, air traffic control should notify airport operations, and Category II/III airport surface security checks should commence. After operators should be notified immediately prior to low visibility procedures actually beginning .

6.6.4.2 Airport appropriate should respond to the initial call from air traffic control by arranging for the tasks detailed below, as appropriate, to be carried out:

(a) advise airport security so that airside access for vehicles and personnel is restricted;
(b) prohibited areas are closed off by lighting, portable or switched ;
(c) ensure that all contractors working in manoeuvring area evacuate the area, and leave the site marked and secure;
(d) check that any lights provided to indicate the ILS sensitive area are switched on and working;
(e) notify the following, advising them that "Category ….operations on the appropriate runway are being conducted":

-Airport rescue and fire fighting service
- Security control staff
- Apron management staff
- Senior operations management; and

(f) advise ATC when the checks are completed and safeguarding complete.

6.6.4.3 Once all controlled accesses have been closed by airside security, operations may have to arrange escort vehicles to supervise taxiway crossings to remote stands, fuel farms, etc., for the movement of essential vehicles.

6.6.4.4 Perimeter security should notify operations of any unauthorized vehicle or persons seen entering the manoeuvring area, and a team should be dispatched to investigate and keep air traffic control and senior operations management informed.

6.6.4.5 When advised by the air traffic control that Category II/III conditions are cancelled, operations should ensure that the actions detailed in previous paragraphs are positively restored and previously notified personnel are re-advised.

6.7 Snow RESERVED

CHAPTER 7
Measurement of Surface Friction

7.1 Introduction

7. 1.1 Wet runway surface friction need to be considered in order to fulfil the requirement to provide information on the condition of runways to arriving and departing aircraft.
7. 1. 1.1. Information that a runway or portion thereof is slippery when wet shall be made available.

7.1.2 The concept of wet runway measurement is based on periodic checks to ensure that the friction level of a runway does not fall below specified minimum values these is therefore an infrequent task.

7.2 Procedures
7.2.1 Full details on the method of undertaking and expressing friction values using different types of equipment are specified in, EAC139-37 and the EAC139-10.

7.3 Administration
7.3.1 Whatever type of equipment is deployed by an airport authority for the purposes of friction measurement, it is important that written instructions are provided for the guidance of personnel. The following topics should be covered:

(a) who initiates the requirements for a measurement (air traffic control, airport operator, pilots);
(b) who is undertaking the measurement;
(c) the circumstances leading to the need for measurement - including an after-accident report when runway conditions may be a factor;
(d) operation of the equipment and calculation of the results,
(e) onward transmission the results (ATC, NOTAM);
(f) testing and calibration of the equipment;
(g) storage and servicing of the equipment;
(h) training of operatives; and
(i) record keeping

7.4 Record Keeping
7.4.1 In view of the need to maintain runway surfaces so that they provide adequate friction, it is important that records of wet friction assessment be kept. This permits the airport operator to monitor the surface conditions and undertake remedial action - such as rubber removal - in good time.

7.5 Maintenance of Runways
7.5.1 With time, a progressive reduction in the measured coefficient of friction (wet) will occur. Corrective action must be taken when the measured coefficient of friction (wet) of a runway or part of a runway falls below a specified level.

7.5.2 Among the factors that can result in a reduction in the measured coefficient of friction(wet) are rubber deposits. Information on the methods which can be used to remove rubber are given in the EAC139-19

CHAPTER 8
Control of Work in Progress on the Movement Area and Precautions to be Taken

8.1 Control

8. 1.1 The Airport Operations Section is responsible for co-ordinating work on the movement area and for dictating the safety requirements. Further guidance is contained in the EAC139-23 and EAC139-26

8.2 Routine Maintenance

8.2.1 Persons, or sections specially authorized in writing by airport operations, may enter active part s of the movement area subject to clearance from air traffic control or by the separate unit in charge of apron management services as appropriate by R\T or telephone for routine tasks such as light maintenance, grass cutting, etc. Individuals carrying out such duties must comply with local rules concerning the control of vehicles on the manoeuying area .

8.3 Minor Construction/Maintenance Work

8.3.1 For minor work on active parts of the movement area a system of work permits should be established. The actual system employed at each airport should be jointly agreed upon between airport management and air traffic control. The objectives of the work permit are to ensure that:

(a) no work takes place on the active movement area without the knowledge of airport operations staff and air traffic control;
(b) permitted times of work are strictly followed; and
(c) all individuals taking part in the work are briefed in detail on the following:
    (1) precise areas in which work may be done;
    (2) the routes to be followed to and from the working area;
    (3) the R\T procedures to be used;
    (4) the safety precautions to be observed, the maintenance of a listening watch and the use of look-outs; and
    (5) the reporting procedure to be followed on completion of work.

8.3.2 At the conclusion of work, airport operations staff, or other appropriate staff, should inspect the working area to ensure that it has been left in a satisfactory condition.

8.4 Major Construction/Maintenance Work

8.4.1 Liaison machinery. Before the commencement of any substantial work on the movement area, liaison machinery comprising representatives from the Airport Operations Department, Air Traffic Control, Airport Maintenance Department, and contractors' agent should be established. The group should meet as often as considered necessary to review progress and consider the need for any change in working practices to meet operational requirements.

8.4.2 Isolation of work area. As far as practicable, working areas should be blocked off from the active parts of the movement area by physical barriers. This is to both warn pilots and preclude work vehicles inadvertently straying onto the movement area. Any barriers must be marked for day use and adequately lit by night. The lights of taxiway leading into working areas, must be permanently "off'. Guidance for marking of unserviceable areas is contained in ECAR 139 subpart j

8.4.3 General working rules. Before work commences, agreement should be establish on:

(a) the hours of work;
(b) the authorized routes - preferably these should be marked with contractor's signs. At critical points Controls should be established. Where there is real risk of conflict between aircraft and vehicles, control points should be manned. At less critical points, controls may be effected by lights or warning signs;
(c) communications facilities to be used. Where direct control of vehicles is required, each vehicle should either have a R/T or be escorted by suitably equipped vehicle. In some circumstances it may be sufficient to have direct communications with control points by R/T or by direct telephone lines to air traffic control;
(d) permitted heights of vehicles and equipment and the limitations to be placed on operating heights of crane jibs; and

(e) any limitations to be placed on use of electrical equipment which might cause interference with navigational facilities or aircraft communications.

8.4.4 Safety. Contractors should be warned, in writing, of possible hazards to personnel working on airports, in particular, the jet blast problem and noise. Where necessary, contractors should be briefed to provide lookout personnel. A distinctive jacket must be worn at all times. This can be a waistcoat variety, coloured day-glow red, reflective orange, or reflective yellow.

8.4.5 Paved area cleanliness. Aircraft pavement contractor work on or traverse aircraft pavement area, these areas should be thoroughly inspected before they are opened again for aircraft use, with particular attention to the presence of debris and the general cleanliness of the surface. Where aircraft are constantly using areas open to contractors, inspection should be carried out at frequently intervals to ensure that the contractor has carried out any necessary cleaning .

8.4.6 Marking and lighting. Adequate marking arrangements should be insisted on for crane jibs when extra complicity is considered desirable. If work is of prolonged duration, a constant watch should be maintained to ensure that the marking and lighting of obstacles and unserviceable areas does not degrade below acceptable limits. This is particularly important with marking and lighting arrangements, indicating a displaced threshold.

8.4.7 Effect on operations limits. The effect to tall on ILS (Instrument Landing System) and radar will need to considered in conjunction with those responsible for electronic landing aides and step taken to reduce limitation to the minimum construction equipment may have adverse effect on obstacle clearance limits and dominant obstacle allowance and These should be considered and the appropriate authorities consulted when working arrangements are being planned.

CHAPTER 9
Bird Hazard Reduction

9.1 Introduction

9.1.1 The appropriate authority shall take such action as necessary to decrease the number of birds constituting a hazard to aircraft operations by adopting measures for discouraging their presence on or in the vicinity of an airport. ECAR 139 .345

9.1.2 Guidance on the method to be adopted to assess the bird hazard, and the organization necessary to deal with it, together with the methods which can be employed, and procedures for reporting bird strikes are detailed in the. EAC 139-11

9.2 Organization

9.2.1 The correct assessment of the problem will indicate the scale of resources which required to be deployed to reduce the hazard. At the very lest , at a minor airports, this will entail an alertness to the hazard and an arrangement to convey information to the pilot. At the other extreme , at major airport , there will need to be a co-ordinated organization with clearly defined functions and comprehensive equipment.

9.2.2 Whatever the scale of organization adopted, a senior member of staff should be made responsible for the following functions as far as they are applicable:

(a) collection and recording information on bird concentrations and movement patterns;
(b) an appraisal of the bird strike rate and an assessment of the local risk;
(c) liaison between the airport operator and other parties;
(d) arranging for the services of a wildlife biologist;
(e) training of operators;
(f) coordinate the activities of personnel concerned;
(g) coordinate the supply of bird-scaring materials identify and reduce sources of bird feeding locations;
(h) warning pilots, through air traffic control of the presence of bird concentrations;
(i) supervise bird strike reports in accordance with national procedures
(j) prepare standing instructions identify and reduce bird shelter locations;
(k) supervise the maintenance of a comprehensive bird control log.

9.3 Conclusion

9.3.1 The effort to be devoted to bird control will be related to the resources that can reasonably be provided at individual airports, and will take account of the extent to which a local hazard has been identified.

9.3.2 Bird dispersal arrangements must, however, cover all hours of operation of the airport, including night hours.

9.3.3 Where bird dispersal techniques are employed, it is essential to realize that persistence is necessary in many cases to achieve the degree of control required.

CHAPTER 10
Apron Management and Apron Safety

10.1 Introduction

10.1.1 The Air Traffic Control Service at an aerodrome extends throughout the manoeuvring area. But no specific instructions relating to such services on the apron. Therefore, an apron management service is required to required to regulate the activities and the movement of aircraft and vehicles on the apron ECAR 139.347

10. 1.2 There are a variety of different approaches to apron management service which have been developed and which can, depending on the particular condition, accommodate the requirements of the aerodrome.

10. 1.3 Apron management services may be provided by the aerodrome traffic service unit, by a unit set up by the aerodrome authority, by the operator in the case of a company terminal, or by coordinated control between air traffic service and the aerodrome authority or operating company.

10.2 Co-ordinated Management

10.2.1 One form of the co-ordinated apron management service is where radio control of aircraft requiring start-up or push-back clearance on the apron is vested in the Air Traffic Control Unit, and the control of vehicles is responsibility of airport authority or the operator. At these airports, instructions to aircraft are given on the understanding that safe separation between the aircraft and vehicles, not under radio control, is not included in the instruction.

10.2.2 The Apron Management Unit, provided by the Airport Authority or operator, maintains close communication with the Air Traffic Control Service Unit. And is responsible for aircraft stand allocation, dissemination of movement information to aircraft operators by monitoring ATC frequencies, and by updating basic information on aircraft arrival times, landings, and take-offs. The apron management unit may also provide a marshalling service and a "follow me" vehicle, leader service.

10.2.3 The unit staff is will be responsible for the maintenance of discipline and compliance with regulations relations relating to the control of vehicles, as laid down by the Airport Authority or operating company. Chapter 19 provides additional guidance.

10.3 Management by Airport Authority or Operating Company

10.3.1 Some aerodrome have found that a preferred system of operating aprons has been to set up a traffic management control procedure in which single unit to takes over the responsibility of aircraft and vehicles at a pre-determined hand-over point between the apron and the manoeuvring area. This unit then assumes responsibilities for monitoring and co-ordinating all aircraft traffic on the apron, issuing verbal advisory information on an agreed radio frequency and monitoring all apron vehicle traffic, and other apron activities, in order to advise aircraft of potential hazards within the apron area. By arrangement with the airport (ATC), start-up and taxi clearances will be given to departing aircraft to the hand-over point where the ATC assumes responsibility.

10.4 General

10.4.1 Whichever method of operating an apron management service is provided, the need for close liaison between the Aerodrome Authority, aircraft operator, and ATC is paramount. Stand allocation, aircraft arrival or departure time, start-up clearances, dissemination of information to operators, notification of work in progress and non-availability of facilities, security arrangements and the availability of safety services, are all items of vital importance to both ATC and the Airport Authority. The operational efficiency and safety of whichever system is adopted, depends very largely upon this close co-operation.

10.5 Apron Management Functions

10.5.1 Overall, responsibility for aircraft stand allocation should be retained by the airport operator although, for operational convenience and efficiency, a system of preferred user stands may be established. Instructions should clearly state which stands may be used by which aircraft or groups of aircraft. Where considered desirable, a preferred order of use of stands should be laid down. Apron control staff should be given clear guidance on the stand

occupancy times to be permitted and the steps to be taken to achieve compliance with the rules.

10.5.2 Aircraft parking/docking guidance system. The apron guidance system provided will depend upon the accuracy of parking required and the type of aircraft operating. The simplest form of stand guidance where precise accuracy is not required will comprise stand identification and centre line paint markings with an arrow to indicate the position in which the aircraft should be brought to rest. This system is suitable for nose-in parking where the aircraft does not have to mate with a loading bridge and hydrant refuelling is not in use. Paint markings must be maintained in a clean condition to ensure maximum visibility. Where frequent night movements take place, centre line paint markings will be supplemented by centre line lighting. These will comprise omni-directional fittings with a yellow filter. Switching for stand centre line lighting will either be locally controlled or at the centralized apron control room. Stand centre line lighting should be inspected weekly to ensure replacement of lamp failures where necessary. Where a nose-in stand is equipped with a loading bridge, precision parking is required to mate aircraft with the loading bridge. In such cases, a visual docking guidance system will be used. For further guidance on such systems see the EAC 139-12 Should these systems become unserviceable, it will be necessary either to marshal aircraft onto stands where loading bridges are provided, or to park aircraft short of the loading bridge to ensure safety clearances are maintained.

10.5.3 Marshalling service.

10.5.3.1 An airport marshalling service should be provided where self-help guidance systems do not exist or are unserviceable and where guidance to aircraft parking is required to avoid a safety hazard or to make the most efficient use of available parking space. Proper training arrangements should exist for marshmallows and only those who have demonstrated satisfactory competence should be permitted to marshal aircraft. Where airport marshalling is provided, comprehensive instructions should be written for Marshallese including:

(a) the absolute necessity for using only authorized signals (copies of these should be displayed at suitable locations point);
(b) the need to ensure that the stand to be used is clear of fixed and mobile obstructions;
(c) the circumstances in which single man marshalling may be used and the occasions when assistance of wingtip men should be employed; and
(d) the action to be taken in the event of aircraft damage occurring during marshalling;

A distinctive jacket must be worn at all times. This can be of the waistcoat variety coloured day-glow red, reflective orange, or reflective yellow. A badly executed aircraft manoeuvre could lead to the need for use of excessive engine power for corrective action, with subsequent risk of injury or damage from blast. If necessary, aircraft in these situations should be signalled to close down engines and repositioning carried out by tractor.

10.5.4 Leader vans service.

10.5.4.1 At airports where ground guidance(follow-me) vehicles are in use, local orders should ensure that drivers are suitably trained in R/T procedures, visual signals, taxiing speeds and the correct aircraft/vehicle spacing.

10.6 Apron Safety

10.6.1 Blast precautions.

10.6.1.1 All apron users should be made aware of the hazards arising from jet effluxes and propeller slipstreams. Where necessary, apron design shall incorporate blast fences and the best used must be made to protect equipment. All vehicles and wheeled equipment must be left properly braked and, where appropriate, on jacks to minimize the risk of movement when subjected to jet blast or propeller slipstream. Particular care must be exercised with apron equipment having a large flat side surface area. Litter or rubbish can constitute a risk when acted on by blast and it is thus necessary to ensure that aprons are kept clean. Responsibility for the marshalling of passengers across aprons rests with the airline or it's agent. However, airport staff should be aware of the risk to passengers on aprons from jet blast and should be prepared to give warning when necessary.

10.6.2 Aircraft refuelling.

10.6.2.1 Airlines and fuel companies are responsible for the observance of safety procedures during the fuelling of aircraft. All personnel working on aprons should, however, be made aware of major safety precautions and should report any apparent breach to the person in charge of the fuelling operations, the fuelling overseer. The main points to be observed are:

(a) No smoking or naked lights within the fuelling zone;
(b) Auxiliary power units and ground power units shall not be started during the fuelling operation;
(c) A clear exit path shall be maintained to and from the aircraft to allow the quick removal of fuelling equipment and persons in an emergency;
(d) Aircraft and supply sources shall be correctly bonded and the correctly bonded and the correct earthling procedures employed;
(e) Fire extinguishers of a suitable type should be readily available; and
(f) Fuel spillage should be immediately brought to the attention of the fuelling overseer. Detailed instructions should be laid down for dealing with fuel spillage.

When necessary, aircraft fuelling companies should be given instructions with respect to the acceptable positioning of vehicles relative to the aircraft to ensure that taxiing clearance limits are not infringed. Guidance on precautionary measures to be taken while fuelling operations are carried out is contained in the EAC 139-18

10.6.3 Apron sweeping.

10.6.3.1 The Cleanliness of paved areas is vital in prevent foreign object damage (FOD) to the engines of taxiing aircraft. A regular program should be instituted for the mechanical sweeping of aprons and taxiways so that in a given period of time all the operational paved areas where aircraft taxi or park will have been swept. In addition, sweeping should be available "on request" to deal with those areas on which loose material has accumulated since the last regular sweeping and which represent a hazard to aircraft. It is unlikely that there will be any requirement to sweep the runway on a regular basis unless the airfield is located in a dusty or sandy area.

10.6.4 Apron cleaning.

10.6.4.1 At regular intervals, aircraft stands should be withdrawn from service and scrubbed with a chemical solvent to remove oil, grease, and rubber marks. This is also required prior to repainting stand markings. The solvent may be applied from a browser using spray booms and the stand is then scrubbed using a mechanical rotary brush. It is important that the stand being scrubbed not be used by aircraft during the scrubbing operation.

10.7 Diversions

10.7.1 Contingency arrangements should be made at each airport to deal with the possibility of apron congestion due to a large influx of diverted aircraft. These arrangements should include the setting up of a liaison committee of all parties concerned to enable quick decisions to be made. Warning arrangements should be made to alert operators to any approaching saturation of apron or terminal facilities.

CHAPTER 11
Control of Ground Noise

11.1 Introduction

11. 1. 1 Ground noise can be a severe nuisance to residents in the vicinity of an airport, particularly at night, as well. as to passengers and airport employees. If nuisance remain unchecked, it can lead to total ban on operations by way of curfew or to the lesser restrictions of the airport and limit air services.

11. 1.2 The limitation of aircraft airborne noise by certification also leads to an improvement in the ground noise situation. But the regulation of ground noise is not amenable to international standards and local action is often necessary to contain the problem.

11. 1.3 The responsibility for control of the noise from aircraft will be determined by national legislation. at one extreme the airport operator may have no responsibility.

11. 1.4 the problem is divided between:
(a) Air noise; and
(b) Ground noise.

11. 1.5 Measure to minimize air noise include:
(a) Use of quieter aircraft according to standards laid down by national or international noise certification procedures;
(b) Operating procedures designed to reduce the noise on the ground. These may be enforced by a noise monitoring system;
(c) Operating restrictions to regulate the type of aircraft permitted, the numbers allowed and the hours of airport operation;
(d) Land-use planning; and
(e) Sound insulation of property adjoining the airport, or the purchase of such property.

11.1.6 Methods of alleviating the disturbance caused by ground noise are outlined in 11.2 to 11.6.

11. 1.7 Regardless of the legal responsibility, the airport operator will seek to live in harmony with the communities adjoining the airport, and to take such action as is justified to maintain a balance of interests between those communities and the needs of the airport.

11.2 Reverse Thrust

11.2.1 The use of reverse thrust after landing improves safety margins by providing a retardation largely independent of runway surface conditions. Its use also increases runway capacity. The full value of reverse thrust however is only realized at high engine thrust and this surge of power, particularly during the evening and night, or in a period when there are no take-offs dominating the noise environment, may create a noise problem.

11.2.2 Because of the safety considerations it is not possible to ban the use of this technique. In practice, however, it is often possible to balance the safety aspect in terms of the actual runway length available rather than in terms of a shorter length required by an aircraft operating near to its limits of performance capability. Consequently, on long runways the selection of idle rather than full reverse thrust will significantly reduce the noise, whilst ensuring that the system is immediately available in case an emergency develops. It is therefore quite proper for an airport to request that aircraft operators restrict the use of reverse thrust whenever safety considerations permit.

11.3 Auxiliary Power Units

11.3.1 The auxiliary power unit (APU) provides electric power independent of the airport for certain aircraft services when the main engines are not running. Its use is required during certain maintenance processes as well as before and after flight.

11.3.2 The noise problem created by APUs is confined principally to airport workers and passengers in the apron area but, particularly at night, may also lead to complaints from neighbouring communities.
11.3.3 According to the extent of the nuisance an airport authority may choose to restrict the length of time that APUs are permitted to run after an aircraft arrives on the stand and prior

to its departure. In extreme cases, it may be necessary to forbid the use of APUs altogether at sensitive locations during the night.

11.4 Fixed Ground Power

11.4.1 Fixed ground power provides an alternative to the use of APUs or ground power units, both of which produce high noise levels.

11.5 Aircraft Taxiing Noise

11.5.1 A marginal reduction of aviation to the noise environment of residents in near vicinity of an airport can be achieved by a limitation on the number of engines employed during taxiing, particularly the high engine on tri-jet aircraft. Use of tractors for the positioning of aircraft may also lead to an improvement during otherwise quiet hours.

11.6 Engine Running for Maintenance Purposes

11.6.1 Modem aircraft jet engines require less regular routine maintenance ground running than previously the case. It is, however, a necessary function of airline activity, particularly at their home base, and when it is required it may well occur during the night. It is potentially the most serious source of ground noise annoyance.

11.6.2 At airports with local communalities and where regular engine maintenance takes place, it is normal to install some form of suppressor appropriate to the type of aircraft involved. These can achieve a reduction of up to 30 dB, although the improvement is usually less. Whatever type of suppressor is provided, they are expensive installations and their construction can normally be justified only at engineering base airports.

11.6.3 Restriction on ground runs. At airports where noise suppression equipment is not available, it is still possible to limit the noise nuisance from ground running by controlling the location on the airport where it takes place, its duration and type of run-up and the times when it is permitted.

11.6.3.1 Location. The most important factors are the distance to nearby communities and the wind direction. The transmission of ground noise is clearly dependent on the distance between the source and the recipient, but wind direction is also an important consideration. It is therefore useful to select a location downwind of the noise sensitive areas.

11.6.3.2 Shielding. It may also be helpful to use the shielding effect provided by a large hangar or natural feature. The closer the aircraft is to the structure or feature, the higher will be the attenuation. Use of this technique, however, must include consideration of employees who may be working in and around the hangar.

11. 6.3.3 Aircraft heading. The noise pattern generated around an aircraft varies from one type to another, but generally the maximum noise occurs on either side of the tail in about an angle of 45 degrees. It can therefore be advantageous to select the aircraft heading in relationship to local communities. An overriding factor, however, is the wind direction, as some engine types are sensitive to cross and tail winds. This is particularly true of high bypass ratio engines.

11.6.3.4 Type of run and duration. Some ground runs can be completed satisfactorily without the use of maximum thrust. It may be necessary, therefore, to specify the permitted thrust and also the duration for which it may be employed.

11.6.3.5 Time. If employment of the foregoing methods does not reduce ground noise below the level at which disturbance is caused in local communities, it may be necessary to further contain the problem by imposing restrictions on the time when testing can be carried out. Concentration of ground running activities may be possible at times when other activities are at a peak, such as the busy times for air traffic and during rush hour periods when road and rail transport is at its busiest. Additionally, it may be necessary to restrict ground running during the evening, at night, and during weekends.

CHAPTER 12
Airport Zoning and Obstacle Clearance

12.1 Introduction

12. 1.1 the purpose of zoning is to ensure that development does not occur, which would be prejudicial to the continued operation of the airport, Detailed guidance on this subject is included in the.EAC139-23

12.2 Zoning Responsibility

12.2.1 Responsibility for zoning is frequently vested in the national department responsible for the control of civil aviation. To give effect to this a zoning map is prepared for the guidance of the responsible local authority. The zoning map is a composite relating all zoning criteria to the ground level around the airport. It covers not only ECAR 139 obstacle limitation surfaces, but also radar and ILS zoning criteria, etc. and any local zoning ordinances that may be applicable.

12.2.2 The map shows the height above which new construction near the airport may interfere with its use. It also defines the area within which the siting of gravel pits, refuse dumps, sewage outfalls, and other features attractive to birds may be subject to restriction in the interests of aviation safety.

12.2.3 It is common practice for architects, consultants, and local authorities to refer proposals or planning applications at or close to airports to the airport for comment. Opposition to the proposal generally takes the form of suggesting height limits where the height limits specified on the zoning map are violated, but other local factors could also lead to an objection. For example, one could object to rubbish dumps, gravel extraction, or in-filling on the basis that increased bird activity and/or smoke could affect operations at an airport.

12.3 Obstacle Limitation Surfaces

12.3.1 Of the ECAR 139 obstacle limitation surfaces, the following are the essential elements of any zoning map: take-off climb surface, approach surface, transitional surface, inner horizontal surface, conical surface, and outer horizontal surface (where provided).

12.3.2 ECAR139 requires that all existing objects penetrating the approach, transitional, take-off climb, inner horizontal and conical surfaces should, as far as practical, be removed, except when in the opinion of the ECAA are shielded by existing immovable objects. Detailed requirements concerning marking and lighting obstacles are contained in ECAR139 Subpart I.

12.4 Obstacle-Free Zone

12.4.1 The obstacle free zone, also specified in ECAR 139, is made up of the inner approach surface, inner transitional surface, and balked landing surface. These additional surfaces are established to protect aircraft near the runway from fixed or mobile obstacles during Category I, II, and III approaches and any subsequent balked landing.

12.5 Plane of Approach Lighting System

12.5.1 This is established to prevent the lights of the approach lighting system from being obscured. Ideally, no object should penetrate the plane. For further guidance on this issue, see.EAC139-41

12.6 Aerodrome Obstruction Chart-Type "A"

12.6.1 The Aerodrome Obstruction Chart-Type "A" represents a profile of the take-off obstruction environment on departure from a specific runway. The basic slope shown on the chart is 1 per cent, i.e., half that of the projected ECAR 139 take-off surface established for a runway intended for use by large aircraft.

12.6.2 Although objects may penetrate the 1 percent slope, there is no requirement to remove any which are beneath ECAR 139 take-off climb surface. However, all objects shown are accountable in the calculation of the aircraft take-off performance and in some instances may affect the payload of a particular departing aircraft. The extent of this limitation depends on individual circumstances, but it is possible to significantly reduce the

payload penalty by judicious obstacle removal close to the airport. Conversely, it may be that an obstacle several kilometers from the airport is the limiting factor.

12.6.3 Obstacle removal to improve the Aerodrome Obstruction Chart-Type "A" obstacle profile should be based on a clear understanding of the performance requirements of the aircraft that regularly use the airport, or those proposed to be brought into use.

12.7 Obstacle Removal

12.7.1 When considering obstacle removal, the following must not be over looked:

(a) Objects that penetrate the approach surface are critical since they represent erosion of the clearance between the approach path, usually 3°, and fixed or mobile obstacles on the ground. The safe operation of aircraft on an approach where the approach surface is significantly obstructed is ensured by raising the obstacle clearance limit. This can have an adverse effect on the regularity of operations;

(b) the transitional surfaces are adjacent to the runway strip and approach surface and penetration by an obstacle results in a reduction in the clearance available whilst carrying out an approach to land or a missed approach procedure. Such obstacles may have an adverse effect on the obstacle clearance limit altitude/height;

(c) The take-off climb surface is critical to this particular phase of flight. However, certification criteria require that all aircraft climb out over all obstacles by a minimum specified margin, even in the event of an engine failure. Therefore, objects that penetrate this surface do not represent a degradation of safety standards. However, they may impose payload penalties on operations from that runway;

(d) The inner horizontal surface is more significant for VFR operations. It does not usually represent a critically limiting surface around a large airport handling IFR traffic, except in so far as it extends beneath the approach surface; and

(e) The conical surface represents the obstacle-limiting surface some distance from an airport. It is often not practical to remove obstacles that penetrate this surface, although it does usually provide a limit to new construction.

CHAPTER 13
Aircraft Accidents/Incidents

13.1 Introduction

13. 1.1 An accident is an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, in which:

- A person is fatally or seriously injured;
- The aircraft sustains damage or structural failure; or
- The aircraft is missing or is completely inaccessible.

13.1.2 An incident is an occurrence other than an accident associated with the operation of an aircraft which affects or could affect the safety of operation. Further details on the explanation of the terms "accident" and "incident" are included in Annex 13

13.2 Airport Emergency Planning

13.2.1 In the event of an aircraft accident the primary consideration is to save lives. In order that this may be accomplished expeditiously it is necessary to plan the action to be taken in advance and publish orders which clearly denote the responsibility of the various emergency services involved in the rescue.

13.2.2 Each airport should draw up an emergency plan containing a comprehensive set of procedures detailing the action to be taken for all degrees of aircraft emergencies. These procedures should be approved by the airport, off airport and other appropriate authorities as necessary.

13.2.3 Guidance on the preparation and content of the emergency plan is given in Chapter 15 of this manual.

13.3 Reporting Procedures

13.3.1 Notifiable accidents. Responsibility for official reporting of notifiable accidents to the Accident Investigation Authority is usually vested in air traffic control, but airport staff should co-operate as much as possible in the process.

13.3.2 Other incidents. In addition to the official reporting procedure described above, airport operations staff should report any other incidents which are considered to be of operational significance.

13.4 Post-Emergency Procedures

13.4.1 NOTAM action

13.4.1.1 where an accident or incident is likely to result in any interference with aircraft operations, immediate Class I NOTAM action should be taken. If the runway strip, stop way or clearway is obstructed, operations on the runway affected should be notified as suspended pending examination of the situation.

13.4.1.2 The location and effective height of any crashed or disabled aircraft should be determined as quickly and accurately as possible. Where this establishes that none of the safeguarded surfaces or areas are infringed, the runway may be reported as available for operation with any cautionary advice considered necessary.

13.4.1.3 Where safeguarded surfaces and areas are infringed by a crashed or disabled aircraft, consideration must be given to the possibility of operating the runway with reduced distances. The distances to be offered will be determined in practice by the need to achieve satisfactorily marked and lighted thresholds and runway ends. It may be necessary to restrict a runway to only take-offs or landings.

13.4.1.4 Close liaison must be maintained with air traffic control in the preparation and dispatch of a NOTAM.

13.4.1.5 A list should be Prepare and maintain constantly updated of all persons in airlines and other agencies with whom contact may need to be made.

13.4.2 Marking and lighting for temporarily revised distances. The arbiter of what is the acceptable in the from of temporary runway markings and lighting is the appropriate national authority. Airports should discuss contingency arrangements with their local national office, and seek provisional approval for them.

13.4.2.1 Thresholds. Temporary threshold lighting may be provided by temporary wing bars. VASIS light units may be used for threshold indication if green filters are available. The normal threshold lights must be extinguished. For temporary displacements of thresholds of less than 24 or 48 hours, the standard runway markings may not be a practical proposition. It may be acceptable to mark the temporarily closed lengths of runway with portable "cross" markings.

13.4.2.2 Runway ends. Runway ends may be indicated by portable battery powered lights with red filters or by prefabricated "Plug in" light sets. Closed markings, i.e., a white cross ECAR 139 SUBPART J figure 7.1 should be displayed on the section of runway not available beyond the temporary runway end.

13.4.2.3 Approach lighting. When thresholds are temporarily displaced, the continued use of approach lighting systems is open to considerable doubt. Where the displacement is small (less than 150 m) continued use may be acceptable if free standing approach lights of appropriate intensity can be provided to extend the centre line up to the temporary threshold.

13.4.2.4 Runway edge and centre line lights. Runway centre line and edge lights in closed sections should be extinguished.

13.4.2.5 Touchdown zone lighting. If thresholds are displaced, the appropriate touchdown zone lighting should be extinguished.

13.4.2.6 Visual approach slope indicators. These should be extinguished when thresholds are temporarily displaced.

13.4.3 Radio navigation aids. Before any displaced threshold is implemented, check to ensure that the ILS glide path for the runway concerned has been taken out of service.

CHAPTER 14
Removal of Disabled Aircraft

14.1 Legal Considerations

14. 1.1 Accident investigations. The Accident Investigation Authority must be notified of any accident. Responsibility for notification is normally delegated to air traffic control. No crashed aircraft or wreckage shall be moved until clearance has been received from the Accident Investigation Authority unless it constitutes an obstruction to the public, air navigation or to other transport. These exceptions must be considered conservatively, and the general rule about not moving wreckage should apply unless a definite hazard exists. The alternative of diverting aircraft is acceptable. As stated in 13.5.1.3, operations can often be continued with reduced distances.

14.1.2 Insurance aspects. The aircraft is the property of the aircraft operator and his insurers. A claim for damages could follow an attempt to move a crashed aircraft if it can be proved that the act of moving exacerbated the damage. Therefore, only the aircraft owner, operator, or his/her appointed representatives should control the aircraft removal operation.

14.1.3 Customs and immigration requirements. Both customs and immigration clearance may be required before aircraft removal operations commence.

14.1.4 Guidance on removal of a disabled aircraft, including recovery equipment, is given in EAC 139-22

14.2 Capability for Aircraft Removal

14.2.1 Information concerning the capability to remove an aircraft on or adjacent to the movement area should be made available. This information may be expressed in terms of the largest type of aircraft which the airport is equipped to remove ECAR 139

14.3 Division of Responsibilities

14.3.1 Airport operations should co-ordinate the aircraft removal operation and an officer should be designated for this purpose. His telephone / telex number should be made available to aircraft operators.

14.3.2 The task of moving the aircraft is responsibility of aircraft owner or operator .

14.3.3 Each operator using the airport should nominate a person or organization authorized to act on his behalf prior to the commencement of flight operations into the airport.

14.4 Record of Operation

14.4.1 A detailed log of the aircraft removal operation should be maintained and supplemented by photographs if possible.

14.5 Disabled Aircraft Removal Plan

14.5.1 Each airport should draw up a comprehensive plan for the removal of a disabled aircraft. In addition to covering and amplifying the points above, the plan should deal with the following:

(a) A list of equipment available on or in the vicinity of the airport;
(b) A list of additional equipment available from other airports on request;
(c) A list of nominated agents acting on behalf of each operator at the airport;
(d) A statement of the airline arrangements for the use of pooled special equipment; and
(e) A list of local contractors (with names and telephone numbers) able to supply heavy removal equipment on hire.

14.6 Communications

14.6.1 A mobile office should be available for the aircraft removal operation. Adequate communication systems linking this office with the Air Traffic Services Unit should be provided, particularly if the removal operation interferes in any way with flight operations.

CHAPTER 15

The Airport Emergency Plan

15.1 Introduction

15.1.1 An airport emergency plan should be prepared to indicate the responsibilities of, as well as the actions to be taken by, agencies which could be of assistance in responding to an emergency. The plan should serve as a guide to internal and external agencies (services) who have a part to play, especially local fire departments, police, ambulance services, hospitals, and medical units in the event of an aircraft accident on or near the airport. It is imperative that the airport authority arrange mutual aid emergency arrangements with surrounding communities.

15.1.2 No emergency plan can be completely comprehensive and every one who has pert to play in the event of an aircraft accident occurring at airport should ensure they are fully conversant with the details of the plan as they are expected to interpret these as events dictate.

15.1.3 Detailed guidance on the preparation of the emergency plan, the agencies involved and their role and responsibility for the different types of emergency together with related subjects are given in the EAC139-24.

15.2 Purpose

15.2.1 The purpose of an emergency plan is to set out procedures to alert the various emergency services, both ON and OFF the airport, and to co-ordinate their activities in the event of an aircraft accident or emergency situation occurring. The plan should set out in detail the responsibilities of all the emergency organizations as to their role in response and participation in an aircraft accident both ON and OFF the airport.

15.2.2 No emergency plan can cover every situation, as no two incidents will follow the same pattern. Nevertheless, a basic set of procedures, interpreted and applied in a common-sense manner to a given situation can ensure that lives are saved and the injured removed to receive medical care in the shortest possible time.

15.2.3 The plan should set out in sequence the arrangements for calling the airport rescue and fire fighting services, as well as police, ambulance, hospitals, medical services, and fire departments to aircraft accidents both ON and OFF the airport. Air traffic control will generally be the originator when the plan is used in that they will alert the airport rescue and fire service, in the event of an aircraft accident or other aircraft emergency. The airport telephone exchange will normally play a key part in passing on to external and internal participants air traffic control messages.

15.2.4 Local fire departments and other external emergency services should be alerted within a communications network that ensures the air traffic control message is received as soon as possible so that an immediate response can be forthcoming by all.

15.2.5 The need to consider "on site" care and to establish a command post as soon as possible should be included in the plan. The availability of a readily identifiable (day and night) commands post vehicle equipped with four wheel drive to enhance its capability of reaching an accident site in the minimum time is necessary. The command post vehicle should carry all the necessary communication equipment that will be required on site. The command post vehicle should become the focal point so that all the efforts of airport and externally based emergency services are co-ordinated to enhance command, communications, and co-ordination.

15.2.6 Consideration should be given to the provision of a fixed emergency operations centre for use during an emergency. This centre should be a part of the airport facilities and should be responsible for the overall co-ordination and general direction of the response to an emergency.

15.2.7 Stakes and lines to allow the accident site to be fenced off should be available. Consideration should also be given to the provision of one or more portable tents that can be easily erected and used to provide succour to the injured.

15.3 Responsibility

15.3.1 Normally, the officer-in-charge of the airport rescue and fire service will be the first person in command of the emergency services. He or she should establish radio communications with air traffic control as soon as possible. Prior agreements between the airport rescue and fire fighting services and the local fire department as to who is to command the combined rescue and fire fighting operations should be written into the airport emergency plan under the mutual aid emergency agreement.

15.4 Response

15.4.1 The degree of response by the airport and externally based emergency services will be governed by the category of the emergency and the location of the accident/incident. The predetermined response of externally based emergency services to an aircraft accident should be prearranged in the mutual aid emergency agreement.

15.4.2 Aircraft accidents and incidents are normally associated with the take-off and/or landing of an aircraft on the airport or in the area immediately adjacent to the airport perimeter. The airport emergency plan will be implemented when an aircraft accident occurs, be it on or off the airport.

15.4.3 A full attendance will be made by the airport rescue and fire fighting services to aircraft accidents and incidents which occur on the airport and in the vicinity of the airport and the senior fire officer will be in charge. This is sometimes referred to as the full response area.

15.4.4 When an aircraft accident occurs outside the perimeter fence, this is known as an "off-airport" accident and the degree of response by the airport rescue and fire fighting services will depend on the distance that the accident site is from the airport.

15.4.5 The extent of the area outside the airport attended by the airport fire service and the level of the response should be discussed and agreed to with the local authorities. The boundary of this area should be marked on maps, copies of which should be held by both the local authority fire service and the airport fire service.

15.4.6 The boundary of this area will be influenced by the existence of both man-made (e.g., railways) and natural (e.g., rivers) barriers and the availability of crossings. Thus at some locations the boundary may be only two or three kilometres from the airport boundary. In other instances, it may extend up to eight kilometres (5 miles) from the centre of the airport.

15.4.7 where an aircraft accident occurs more than eight kilometres from the airport. the airport rescue and fire fighting services will not normally respond unless requested to do so.

15.4.8 Normally externally based emergency services, when responding to an aircraft accident or emergency on the airport, should report to a designated rendezvous point(s). Escort vehicles provided by the airport authority should be waiting their arrival and after obtaining the necessary clearances by radio from air traffic control should escort the externally based services to the scene of the accident or a staging area, as appropriate.

15.4.9 In the case of an aircraft emergency where rescue and fire fighting vehicles have taken up predetermined standby positions for a landing aircraft, externally based emergency services should normally remain at the designated "staging area" unless "called forward." In such circumstances, they should only proceed onto the manoeuvring area under escort.

15.5 Maps

15.5.1 Two grid maps should be provided. One , The airport internal map, should depict all relevant airport details including taxiways, access roads, water supplies, staging areas, and rendezvous points. The second, an airport external map, should show in detail the perimeter of the airport, surrounding communities, access roads, stretches of water or swampy areas, rendezvous points, etc., up to approximately eight kilometres from the airport. It is essential that all airport and externally based emergency services, including fire, police, ambulances, medical, and hospital authorities, have copies of both grid maps. It is important that grid maps do not conflict, and that the external maps give details of medical facilities and the availability of hospital beds in the area. Both grid maps should be included as appendices to the emergency plan and should show date of revision.

15.6 Access Roads

15.6.1 Emergency access roads in the vicinity of the runway extremities should be shown on grid maps and the topography of these roads should be feature of the local training programme.

15.6.2 Where an airport is fenced with access gates should be carried on all airport rescue and fire vehicles as well as on police and local fire and ambulance vehicles.

15.7 General

15.7.1 Airports which have an expanse of water in, lakes, rivers, sea, or swamps on the boundary should have detailed emergency plans to cope with an aircraft accident occurring in these locations.

15.7.2 Local fire departments, police, ambulance, and medical services should respond to the airport with predetermined equipment and staff, these being decided by the degree or type of emergency declared.

15.8 Exercises

15.8.1 Procedures should be established for testing the plan and reviewing the results to allow for improvements to enhance its effectiveness. The response of internal and external emergency services and communications aspects should be tested and reviewed at intervals not exceeding one year.

15.8.2 Liaison between the services provided on the airport and those of responding local authorities should be fully tested during familiarization training and combined exercises.

CHAPTER 16
Medical Services

16.1 Introduction

16.1.1 Medical services my be an integral part of airport services, particularly ambulance service is in many cases part of the airport rescue and fire fighting service. If medical and ambulance services are not provided by the airport authority, arrangements should be made with local services to ensure rapid response to an emergency.

16.1.2 Additional guidance on these and related matters is given in the EAC 139-25 Emergency Planning.

16.2 Handling of Casualties

16.2.1 Immediate evacuation of casualties will be carried out by the rescue and fire fighting services and the casualties moved to an area of immediate safety.

16.2.2 The seriously injured should be moved to an area nominated by the on-scene commander. This then becomes the casualty collection area. The site has to be decided with regard to the numbers of casualties involved, traffic flow, accessibility, available emergency vehicles, staff, and equipment.

16.2.3 To ensure that lives are not lost unnecessary and injuries are not aggravated, it is essential that attention by trained personnel be provided prior to removal of survivors of an accident to more appropriate facilities.

16.2.4 Those with minor injuries and the uninjured should be quickly moved from the scene to a designated holding area. Their evacuation can be aided by any suitable means of transport, e.g., coaches, vans, cars, readily available at the scene. The speed of this aspect obviously depends upon the numbers involved, the prevailing weather conditions and available transport.

16.2.5 Those individuals with minor injuries should be seen at the reception centre and treated either by doctors, nursing staff, or personnel qualified in first aid. Minor injury includes nervous traumatism and/or smoke inhalation, where pertinent.

16.3 Identification of Emergency Service Personnel

16.3.1 There will be great confusion at the scene of the incident caused by the flashing coloured lights and the headlamps of the numerous vehicles, together with the large numbers of staff who will be wearing similar protective clothing. Therefore, it is essential that the emergency service personnel are readily identifiable.

16.3.2 Arriving medical services should report to the nominated rendezvous point. From where they will be called forward by the on-scene commander as necessary. Furthermore, all staff and vehicles arriving at the scene should make themselves known to the on-scene commander or his reprehensive in order to prevent the scene of the incident getting blocked up with vehicles and manpower.

16.4 Communications

16.4.1 The overall casualty evacuation procedure will be co-ordinated by the on-scene commander. It is essential, however, that the medical services have a co-ordinated communications and response procedure. The medical co-ordinator will be responsible for the control of the injured at the scene but he must co-ordinate the dispatch of casualties to hospitals with the transportation officer.

16.5 Protection from the Weather

16.5.1 Some from of temporary shelter should be erected at the care area or transportation area to protect the casualties. Mobile lighting and heating systems may also be necessary. Inflatable tents have been used for such temporary accommodation.

16.6 Emergency Equipment

16.6.1 The type and quantity of emergency equipment will depend upon the air traffic, airport staff qualified in first aid, availability of local specialized services, etc.

16.6.2 Immediate first aid supplies and resuscitation equipment can be kept readily available either in a suitable vehicle or in a trailer which can be taken directly to the scene of the accident. This vehicle or trailer must have the capability of traversing rough terrain.

16.6.3 The equipment must be in easily identifiable containers which can be used by any manpower that reports to the scene.

16.6.4 The dead will need to be placed in body bags and removed to a temporary mortuary remote from the medical care area, or any area where relatives and the public have access or congregate.

CHAPTER 17
Rescue and Fire Fighting Services

17.1 General

17. 1.1 The requirement for rescue and fire fighting services at airports is specified in ECAR 139 Subpart L. Details of the scale of provision and the equipment and organization required are also discussed in the Annex, and more fully developed in the EAC 139-18 Rescue and Fire Fighting. In considering these references the principal objective of airport rescue and fire fighting services, to save lives in the event of an aircraft accident, should be paramount.

17.1.2 The responsibility of management, in respect of the airport rescue and fire fighting service, can be divided into three main areas:

a) The organization of the service, including its operational relationships with other services and agencies likely to become involved in the airport's overall emergency plan;
b) Day-to-day management and supervision, including the selection and career-development processes for all personnel engaged in rescue and fire fighting duties; and
c) The provision of equipment and technical facilities which will enable the service effectively to fulfil its operational objectives.

17.1.3 It is anticipated that the direction of the service will be delegated to a qualified person, designated as chief of the service. This person would be responsible for the overall efficiency of the service and its ability to meet the operational objectives and technical standards specified by the management. The following paragraphs indicate the principal areas in which the airport management will need to specify standards of performance, operational procedures and associated guidance material. Any policies expressed must provide the chief of the service with appropriate authority to achieve the objectives and ensure that access to management is available where difficulties arise or where experience suggests that a particular policy should be reviewed or amended.

17.2 Determination of Rescue and Fire Fighting Category

17.2.1 The minimum level of protection to be provided at an airport can be determined by the application of the process contained in ECAR 139. The quantities of media specified in the Annex indicate the advantages to be gained in adopting improved foam concentrates, which are more fully discussed in the Airport Services Manual, Part 1. The number and types of vehicles and the quantities of agents they will carry should have regard to factors additional to those mentioned in the Annex. Substantial advantages are available if provision is made for any anticipated growth in traffic which may lead to an increase in the rescue and fire fighting category. Excess capacity in the initial scale of provision can accommodate upgrading without requiring the acquisition of additional equipment. The availability of support from externally based rescue and fire fighting agencies should also be considered. Where unacceptably long response times are anticipated from supporting agencies, some additional provision may be made at the airport as a precautionary measure.

17.2.2 The number and types of vehicles to be provided for the rescue and fire fighting service will be determined by the categorization study and any additional factors related to local assessments, based on guidance in the preceding paragraph. The design criteria for these vehicles are expressed in Chapter 5 of the EAC139-18. The two elements to consider are the functional features of a vehicle, as a rescue and fire fighting unit and its ability to deliver the required proportion of the level of protection, and the automotive features. In this second element it is essential to consider the supporting services which will be necessary to maintain the vehicle in service and preserve its overall performance. Any study conducted by management prior to the acquisition of a new vehicle should include consultation with the officers who will have immediate responsibility for its operational use and its maintenance.

17.3 The Deployment of Rescue and Fire Fighting Services

17.3.1 The most important consideration in the deployment of rescue and fire fighting services is the achievement of minimum response times. Response time criteria are defined in ECAR 139 subpart L but it is obvious the more quickly the initial intervention can be made, the greater the prospects of survival to those exposed to a post-accident fire. Therefore the operational objective is to provide equipment, accommodation, and communications which, combined with training, will achieve minirnum response times rather than to accept the upper time limit expressed in the Annex.

17.3.2 The location of the fire station, together with guidance on design features, is discussed in Chapter 9 of the. EAC 139-18 the need for additional stations, described as satellite stations, as a means of achieving acceptable response times, may arise as a consequence of airport development or operating practices. Wherever possible, the location of a fire station should be determined by local studies and in anticipation of development, with response tirne to aircraft accidents as the primary objective. Subsidiary factors, such as the employment of rescue and fire fighting personnel on subsidiary duties, should be subordinated to this objective. The responsibility of management in respect of siting will continue once the fire station is in use. The maintenance of the structure and its technical facilities should be accorded priority, based on a regular inspection and reporting procedure. The first level of inspection would be the responsibility of the chief of the rescue and fire fighting service, but periodic inspections by qualified structural technicians should also be required.

17.3.3 Communications of various types will be essential in the transmission of information which will mobilize, dispatch, and control the rescue and fire fighting service. Communications and alarm requirements are defined in Chapter 4 of the EAC139-18. It is important, in the use telephone and radio facilities, to develop precise and unambiguous terminology to avoid the risk of misunderstanding in emergency situations, when operatives are subjected to stress. The use of standard messages and abbreviations should be developed in inter-agency training exercises to ensure complete familiarity. The policy, in this respect, will have to be specified by management in consultation with the various agencies, on and off the airport, which may be required to operate in concert during an emergency.

17.4 Personnel Employed on Rescue and Fire Fighting Duties

17.4.1 In addition to the chief of the service, whose role is identified in 17.1.3, the selection of personnel for rescue and fire fighting duties should have regard to Chapter 10 of the. EAC139-18 the organizational structure of the service depends on the hours of availability of the airport, the duty system employed and any relevant labour regulations. A typical structure would provide a supervisory grade to command each duty watch, with direct responsibility to the chief of the service. Within each watch it may also be desirable to nominate a crew chief, to direct the operation of each vehicle deployed, in accordance with a predetermined operational plan. Where the fire station provides a control room or communications centre, specially trained staff must be provided to man this facility. In the overall complement of the service, some provision must be made to meet the absences from duty created by leave, sickness, and training.

17.4.2 It is important, for morale purposes, to create a career structure, wherever possible, through which members of the service can achieve promotion, based on merit. To some extent, the process of selection will be dependent on technical achievement, through the continuous training program, which is proposed in 17.6. The demonstration of qualities of leadership and individual effort in operations, training, and other professional activities would also be relevant. To provide a standard basis for periodic assessment and career development, it is essential for management to create a system of reporting, perhaps supported by interviews, in which the chief of the service is aided by a management representative experienced in staffing matters.

17.5 Operational Requirements

17.5.1 The primary commitment of the rescue and fire fighting service will be to aircraft accident situations and to other forms of emergency where aircraft are involved. The types of emergency for which a response will be required are discussed in chapter 12 of the Airport Services Manual, Part 1, which Rescue and Fire Fighting. This should be read in conjunction with the EAC139-24 Airport Emergency Planning. A full appreciation of the

factors covered by these references will indicate the need for consultation with all of the agencies likely to contribute to the effective conduct of all types of emergency response. All these details are fully described in the airport emergency plan explained in Chapter 15 of this manual, and Chapter 3 of the, EAC139-24 Airport Emergency Planning. It is important to appreciate that an emergency plan, once developed and issued to the agencies concerned, must be kept under constant review, and to amendment where any aspect the plan or response capability of any agency, is changed.

17.5.2 In the concept of the emergency plan, emergencies other than those involving aircraft are normally included, the most obvious being a requirement for the airport rescue and fire fighting service to attend fires or other emergencies in buildings, technical installations, or other airport features. Such involvement is wholly appropriate where the service is trained and equipped to make an effective intervention. Subject to the development of operational procedures which ensure that the service can be disengaged from an operation if an aircraft emergency is declared, the structural fire fighting experience will be of significant benefit in extending professional knowledge and enhancing the status of service.

17.5.3 EACR139 expresses a requirement in appropriate cases for the provision of a specialized rescue capability to deal with aircraft accidents which have occurred in difficult environments, usually external to the airport. The EAC 139-18 lists the range of environmental conditions to which this requirement applies and identifies the possible use of the airport's rescue and fire fighting service as one element of the total response. In these circumstances, as with all off-airport accident situations, management must define the form of response to be made, provide appropriate equipment and training, set limits on the distances to which response is to be confined, and establish the inter-agency command relationship which will ensure effective coordination of operations (see 15.4).

17.5.4 There are duties of a non-emergency nature which can be undertaken by rescue and fire fighting personnel by reason of their training and equipment. These include the inspection of premises to advice on, and supervise, their fire security. The inspection and maintenance of fire extinguishers and installed protection systems would also be appropriate. The performance of these tasks, which may also include the training of airport staff to increase awareness of fire prevention and elementary fire fighting, can make a valuable contribution to the airport, provided that the availability of the service to respond to an emergency is not impaired. Dependent on the extent of the programme which may be allotted to the service in this area, the chief of the service can delegate suitably qualified personnel to these duties without necessarily reducing the cover available for emergencies, using the spare capacity produced by most rostering systems. Some work can be undertaken by a crew with a vehicle, retaining availability by use of the vehicle's radio equipment. Where the commitment is very large, however, a special fire prevention element may be added to the complement. Where duties of this kind are undertaken by rescue and fire fighting personnel, they must be given the authority by the management, which will enable them to fulfil the commitment. A reporting system, directed to the appropriate branch of management, should facilitate administrative action where breaches of fire security regulations are revealed.

17.5.5 ECAR139 requires information on the level of protection provided by rescue and fire fighting services be made available, and this is usually achieved by an entry in the Aeronautical Information Publication (AIP) or an equivalent publication. The ECAR also requires significant changes in the normal level of protection to be notified to the ATC service so that arriving and departing aircraft may be informed. The expression of a significant change is usually achieved by stating the level of protection currently available in the form of a new category. Chapter 17 of the EAC139-18 explains the procedure more fully and the action of notification is usually undertaken by the officer in charge of the rescue and fire fighting service at the time of the occurrence. Restoration of normal cover is similarly notified. The management must ensure that this procedure is adopted and may wish to include simultaneous notification of a significant change to a designated officer within the management structure so that appropriate action can be co-ordinated to ensure the earliest restoration of the normal level of protection.

17.5.6 Where conditions of low visibility are likely to lead to impairment of response capability, the provision of guidance equipment or directions from air traffic control may reduce the problem. Additionally, the use of special standby positions may serve to shorten probable response distances. The procedures developed to meet these difficult situations must recognize the special hazards to vehicles and aircraft of movement in poor visibility and must incorporate communications which minimize these hazards. Where vehicles are exposed for long periods to conditions which may impair vehicular performance or reduce the efficiency of crew members, suitable precautions must be taken to eliminate or limit these effects.

17.5.7 There are a number of duties with a positive relationship to safety which may be allocated to rescue and fire fighting personnel. These include some aspects of bird hazard control, runway visual range observations, runway surface function measurements. In all cases the specification of a particular duty must include provision of adequate training, ensure that control of personnel engaged in a task remains with their own officers and maintains the operational availability of the service for its primary responsibility to aircraft operations. With these safeguards, the wider involvement in aviation safety offers advantages to management and to the service.

17.6 Training

17.6.1 Training is essential in developing the professional skills of all members of the rescue and fire fighting service. The guidance material in the EAC139-18, should be considered with the more comprehensive advice in the Training Manual (Doc 7192-AN/857), Part E-2-Aerodrome Fire Services Personnel. The infrequency of significant emergency situations makes training even more essential, as it is the principle source of personal motivation and the development of teamwork. All training sessions should be recorded and a periodic summary of training should be required by the management.

17.6.2 Management must appreciate and accept the inevitable cost of training and ensure that it is conducted with regularity and enthusiasm. Considerable impetus can be added to any training program if members of the management team take a direct interest in some of the activities. The provision of a training area and equipment for the presentation of training material will extend the scope of the program and permit the introduction of appropriate material produced by aviation safety authorities.

17.6.3 It is essential to accept that it may be necessary to augment the professional knowledge and experience of the instructors within the rescue and fire fighting service by providing opportunities to attend specialized training establishments, including the centralized ICAO training schools or similar facilities operated by government. Opportunities for studies are available, subject only to the ability to comprehend the language used by the selected training establishment. The benefits of exposure to a wider range of experience and modem training methods can provide a lasting stimulus to local training programs.

17.6.4 In a wider sense, the airport's emergency plan must be tested periodically as a form of training. This requirement, described in the EAC 139-24 as an "airport emergency drill," will identify problems of communication, equipment compatibility, inter-service relationships, and the overall effectiveness of the emergency plan. Where an airport is available for use at night, alternate exercises should be held in night-time conditions. The initiative for full-scale exercises involving agencies on and off the airport, must come from the airport management. To achieve effective liaison it is usual for the management to conduct any preliminary discussions and to co-ordinate the vital post-exercise analysis, from which the lessons learned can revise the emergency plan.

17.7 Airport Facilities Affecting Rescue and Fire Fighting Services

17.7.1 The provision of water supplies for fire fighting and emergency access roads and gates both entail management decisions and funding, although the operational requirement and construction aspects may be established by other submissions. EAC 139-18 contains additional guidance on these items.

17.7.2 The provision of piped water supplies may have to be determined by a combination of environmental, engineering, and financial considerations. The availability of a supply of water offers a valuable advantage at an aircraft accident but will be more significant for a major structural fire or where a technical installation, such as a fuel storage facility, is involved. The siting of hydrants, where the extent of a system must be limited, should have regard to this form of preferential location. Where hydrants are provided, the rescue and fire fighting service should be required to conduct regular inspections and tests. Any defects should have priority repair action, endorsed by management.

17.7.3 Emergency access roads and associated gates or barriers should be regularly inspected, and priority repair action should be afforded to any defects reported.

CHAPTER 18
Security

18.1 General

18. 1.1 it is essential that a security system be established at an airport to deny access by unauthorized persons to those parts of the airport not intended for public use. Whether or not an authorized person has the intention of breaking the law is immaterial; the dictates of safety in the environment of an airport require that effective measures be taken to ensure that trespassers are prevented from gaining access to airside facilities.

18.1.2 the movement area of the airport should protect by a fence or other suitable barrier to prevent / deter the inadvertent or premeditated access of unauthorized personnel ECAR 139 SUBPART I . The height of such fencing and the material of which it is made may be dictated by the need to ensure that non-visual aids to landing are not unobstructed.

18.1.3 Gates will need to be provided for access to the movement area by emergency services, maintenance parties, and other authorized personnel. Such gates should be locked when not in use. Gates that are not locked should be manned by a qualified security guard.

18.1.4 a system of identify passes for person and vehicles should be instituted. Those without correct passes should be denied entry to the movement area. A system of notices and publicity should be utilized to warn that entry to the movement area by unauthorized person is prohibited.

18.2 Unlawful Interference with Civil Aviation

18.2.1 An airport security programme for safeguarding against acts of unlawful interference with civil aviation and its facilities will need to be instituted . Government policy will determine what this programme will be activated, and what general precautions are to be taken. These in turn will be based on an assessment of the threat to civil aviation as determined by the State. Guidance on the implementation and maintenance of the required program is contained in the Security Manual for Safeguarding Civil Aviation against Acts of Unlawful Interference (ICAO Doc 897312).

CHAPTER 19
Vehicle Control

19.1 On Manoeuvring Area

19.1.1 Air traffic control responsibility: Air traffic control is responsible for the control of the movement of vehicles on the aircraft manoeuvring area. To maintain such control, vehicles operating on the manoeuvring area should be fitted with R\T on the appropriate channel, or closely escorted by an R\T equipped vehicle.

19.1.2 Airport responsibility: The airport operator is responsible for ensuring that all possible steps are taken to co-operate with air traffic control in discharging its responsibility for control of vehicles on the manoeuvring area. In particular, action should be taken to see that:

(a) A system of vehicle passes is established and only authorized vehicles are permitted on the manoeuvring area;
(b) R\T equipment is provided on vehicles and is maintained in a fully serviceable condition;
(c) Drivers are fully conversant with:
  (1) Proper R\T procedures;
  (2) The terms and phrases used in air traffic control, including the ICAO spelling alphabet;
  (3) The meaning of visual signals on the airport, with particular emphasis on those intended to prevent inadvertent infringement of active runways;
  (4) The geography of the airport
  (5) the "rules of the road" relating to vehicles and aircraft; and
  (6) the need to avoid infringement of the restricted areas associated with radio navigation facilities;
(d) An airport plan is displayed in the cab of all vehicles indicating the boundaries of the manoeuvring area and the runway crossing points;
(f) Unless specifically exempted, vehicles are fitted with appropriate obstacle marking and lighting as specified in EACR 139 SUBPART I

19.1.3 The airport operator is responsible for the supply, fitting, and maintenance of signs, lights and marking as needed for the control of traffic on the manoeuvring area.

19.2 On Apron Areas

19.2.1 Air traffic control responsibility: Air traffic control normally has no responsibility for control of vehicles on apron areas.

19.2.2 Airport responsibility: The airport operator is responsible for regulating vehicular traffic movement on the apron in order reduce to a minimum the risk of aircraft \vehicle and vehicle \vehicle conflict and to promote the safety of pedestrians and to achieve efficient traffic flows (see also 10.1 and 10.2). Control can be exercised by regulating the vehicles that can enter the apron and by instruction of drivers.

19.2.3 All vehicles used on the apron areas shall display an air side or apron pass and the person responsible for a given vehicles shall ensure that all drivers are properly briefed. An air side or apron pass should not be issued unless the vehicle operator can produce a certificate showing that the vehicle is in good working condition.

19.2.4 The person responsible for a vehicle shall bring the following points to the attention of the driver:

(a) Speed limits – in specific or general terms;
(b) authorized routes;
(c) Rules relating to rights of way of aircraft and vehicles; and
(d) authorized parking areas.

19.2.5 Physical controls: Adequate controls should be established to ensure that drivers have no difficulty in complying with safety measures. In some cases it may be necessary to set up manned crossing points. In other cases control by traffic lights, warning signs, or pavement markings may be sufficient. A careful check should be made to ensure that all

lights, signs, and markings conform with standards laid down by the airport licensing authority and/or the airport operator.

CHAPTER 20
Incidents Affecting People and Property outside the Airport Boundary

20.1 Icefalls from Aircraft

20. 1.1 Lumps of ice may occasionally fall from aircraft. This will usually occurs during the approach phase of flight, and the incident may occur over a considerable distance from the airport.

20.1.2 National procedures for the investigation of such incidents and the settlement of claims will vary but an airport operator should endeavour to ascertain the following information as is appropriate:

(a) Date, time, and location of the fall;
(b) Name, address, and telephone number of the reporter;
(c) Details of injuries to persons or animals, and damage to property;
(d) Meteorological data for the relevant time and place; and
(e) Aircraft movements for the relevant time and place.

20.1.3 Where possible, samples of the ice should be kept in a refrigerator and photographs should be taken of any damage as soon as possible.

20.2 Objects Falling From Aircraft in Flight

20.2.1 Parts of the structure may occasionally detach from an aircraft, during any phase of flight, and may be reported by someone on the ground.

20.2.2 On being notified of such an incident the airport operator should endeavour to ascertain as much of the following information as is appropriate:

(a) Date, time, and location of the incident;
(b) Name, address, and telephone number of the reporter;
(c) Details of injuries to persons or animals, and damage to property;
(d) Description of the object; and
(e) Details of aircraft movements in the area.

20.2.3 Where possible, photographs should be taken of any damage and, where the object seems to be significant (in-flight safety being affected), engineering advice should be sought as to its importance and Steps taken to notify the aircraft operator as soon as possible.

20.3 Fuel Jettisoning

20.3.1 Aircraft may deliberately dump fuel in response to an emergency or, more frequently, there may be inadvertent occurrences of jettisoning-mainly during take-off.

20.3.2 Where complaints are received the airport operator should obtain the following information:

(a) Date, tirne, and location of the incident;
(b) Name, address, and telephone number of the reporter;
(c) Details of any harmful effects to people , animals or property; and
(d) Aircraft movements of the relevant time and place.

20.4 Wingtip Vortices

20.4.1 As a natural function of flight, vortices are shed from aircraft wings. In light wind conditions, and particularly in the case of large aircraft in the last stages of the landing approach, these vortices may reach the ground and cause damage to roofs.

20.4.2 Procedures for the investigation of such occurrences and the settlement of claims will vary but the airport operator should record the following information:

(a) Date, time and location of the incident;
(b) Details of injuries to and general description of damage to property;
(c) Meteorological data for the relevant time and place; and
(d) Aircraft movements for the relevant time.

20.4.3 Where possible, photographs should be obtained of the damage before any repairs are carried out.

CHAPTER 21
Safety at Air Displays

21.1 Initial Organization

21.1.1 The proposal to hold an air show or display at a particular airport should, in the first instance, be referred to the airport manager preferably at least 12 months and in any event not less than six months before the proposed date. It is his decision as to whether he can accept such a display, but before reaching a decision there should be full consultation with air traffic control.

21.1.2 Priority must be given to minimizing the disturbance of routine airport operations while the general nuisance to people living around the airport must obviously be considered.

21.1.3 at all times, and in every respect, safety is of paramount importance. Nothing can be permitted which in any way adversely affects the overall level of safety.

21.2 Organization Responsibility

21.2.1 The responsibilities of the principal authorities involved in a flying display are summarized below:

Airport owner:

(a) Safety of normal operations;
(b) Maintenance or normal airport operations;
(c) Avoidance of inconvenience to passengers and airline operators;
(d) Provision of safety services;
(e) Arrangements for parking of display aircraft;
(f) Sitting of spectator areas;
(g) Attendance of operations manager and senior fire officer at pilot briefing;
(h) Approval of participation of display aircraft;
(i) Collection of landing fees and arrangement of rebates as necessary; and
(j) Ensuring that adequate insurance coverage for all foreseeable eventualities has been arranged.

Egyptian civil aviation authority ECAA:

(a) Initiation of Class II NOTAM action;
(b) Issue of any exemptions from the requirements of national legislation;
(c) Variations in airport licenses if required;
(d) Provision of air traffic control services and control of flying display;
(e) Ground movement control of display aircraft;
(f) Special briefing of pilots participating in flying display; and
(g) Provision of advice to display organizer on weather minima and technical air traffic problems.

Display organizer:

(a) Co-ordination of all display arrangements;
(b) Liaison with police, local authorities, public transport undertakings, and motoring organizations;
(c) Safety of spectators including provision of barriers and marshals;
d) Provision of all spectator services (e.g., car parking, catering, toilets, first aid);
(e) Security of aircraft in static park;
(f) Refuelling of display aircraft;
(g) Insurance coverage to cover all foreseeable eventualities-consulting with airport owner as necessary;
(h) Notification to the public of practice sessions; and
(i) Safety of pleasure flying parking areas.

21.3 Airport Owner's Responsibility

21.3.1 The primary responsibility must obviously be to maintain the normal operations through the airport with the minimum possible inconvenience to airline operators and passengers.

21.3.2 To enable an air display to be run without interference some rescheduling of movements is virtually inevitable. The proposed tirning of the flying display and the extent of rescheduling must be discussed with air traffic control and the airlines involved well in advance of the event.

21.3.3 Inconvenience to passengers will usually result mainly from large numbers of spectators attending the flying display rather than rescheduling of flight times. Thus, it is usually preferable to locate the static aircraft park, spectator enclosures, and the display car park well away from the airport terminal area desirably with a different access road.

21.3.4 There may be a requirement for two aircraft parks, one for static aircraft and the other for display aircraft. These may be on separate parts of the airport. In both instances care must be taken to ensure that the designated area is of sufficient size.

21.3.5 The surface of the parking area should be sufficient to withstand the loads imposed by military aircraft that do not normally use civil airports.

21.3.6 The designated parking area should ensure that the display aircraft do not mix in any way with normal commercial movements.

21.3.7 Sufficient space must be allowed for safe refuelling of the display aircraft and for each aircraft to taxi in and out of the park without being blocked by another aircraft.

21.3.8 Spectator areas should be positioned well away from the main terminal area of the airport and as close as possible to the display parking area.

21.3.9 Prior to commencement of the flying display, spectators should be removed from the vicinity of the parking area occupied by display aircraft.

21.3. 10 Car parks and spectator areas should not be located within the runway strip or approach areas.

21.3.11 Spectators should be confined to one side of the runway, thus allowing aircraft freedom to manoeuvre on the opposite side.

21.4 Safety Services

21.4.1 Airport fire services will attend aircraft accidents occurring within the aerodrome boundary with all available appliances. For aircraft accidents occurring beyond the airport boundary and thought to be located within the boundary shown on the map which is used for off-airport attendance, the attendance will be less (Section 15.4).

21.5 Accidents

21.5.1 The procedures to be followed in the event of an accident are the same as those promulgated in Chapter 13.

21.6 Post-Display Tasks

21.6.1 Immediately after completion of the display, the runway surface and light fittings shall be examined for damage. And as soon as possible, the approach light fittings.

21.6.2 The display parking area(s) should be examined for similar damage and thoroughly cleaned. Particular attention should be paid to removal of litter.

21.6.3 Any spectator area facilities that infringe on the airside must be removed and, although this is the responsibility of the display organizers, the area should be inspected to see that it is restored to its original state and all litter removed.

CHAPTER 22
The Provision of Airport Data

22.1 General

22.1.1 All aerodrome operational data which are relevant to the safe and efficient operation of aircraft at an aerodrome must be promulgated in the appropriate Aeronautical Information Publications of each State. This data will range from permanent descriptive material of the aerodrome to information of a short term and temporary nature.

22.1.2 The responsibility for the provision of aerodrome data rests with the Aerodrome Operating Authority. In some States, this may include data on air Traffic Control Services as well as the basic airport descriptive data.

22.2 The Types of Information

22.2.1 Data can be divided into three broad groups as follows:

22.2.1.1 Permanent data: This comprises basic descriptive material for the aerodrome which rarely, if ever, changes. The data which would fall into this category would include airport reference points, runway strength, runway dimensions and layout, elevations, and permanent obstacles. ECAR 139 Subpart E describes most of the data in this category.

22.2.1.2 Variable data: Data in this category are of a semi-permanent nature but are liable to change, and provision must be made for such changes to be promulgated promptly. Data in this category would include such items as runway declared distances, obstacles, hours of operation, visual aids, and such facilities as rescue, fire fighting, and salvage. It is doubtful whether data in the category would change more frequently than once per year.

22.2.1.3 Temporary data: Data in this category are subject to short-term variations. These include limitations and warnings such as temporary runway or taxiway closures, temporary obstacles, runway surface condition reports, system failures, and bird hazards.

22.3 Procedures

22.3.1 The Airport Authority must ensure that all data are published in the appropriate Aeronautical Information Publications and that such data are kept up to date by timely amendment action.
22.3.2 If the amendment process is too slow for the publication of changes then the Class II NOTAM should be used to promulgate information.

22.3.3 Short notice changes which occur within variable or temporary data categories must be promulgated promptly using the NOTAM Class I.
22.3.4 The Aerodrome Air Traffic Control Unit must be informed immediately when such changes occur so that they may advise flight crew by R\T where appropriate.

22.3.5 Procedures must be established to forward any new data or variations of existing data to the Aeronautical Information Service of the State concerned, as indicated in Annex 15.

22.3.6 Any variations which affect the accuracy of the charts described in Annex 4 must be submitted to the authority responsible for the publication of such charts.

22.4 Responsibility for Notification of Changes

22.4.1 Each aerodrome must establish a system for the prompt notification of changes to the variable data and the immediate notification of any temporary data throughout the aerodrome's published hours of operation.

22.4.2 Aerodrome which closes at night should establish a system for the notification of circumstances which may occur during the hours of closure and which will be very significant as soon as the airport opens.

22.4.3 A senior aerodrome official, normally the manager responsible for aerodrome operations, should be made responsible for the provision of airport data and any changes.