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(Formerly)

SUBJECT :

F.I.G.A.S.

Landing Facilities

CONNECTED FILES.

NUMBER AND YEAR.



0270/H

C.O Ref: COM 265/01

DESPATCH

CIRCULAR 375/55

THE CHURCH HOUSE,
GREAT SMITH STREET,
LONDON, S.W.1.

18th April, 1955.



Sir,

FIRE FIGHTING AND RESCUE FACILITIES AT AIRPORTS

I have the honour to refer to paragraph 5 of my circular despatch 1275/54 of the 31st December, 1954, on the subject of fire fighting and rescue facilities at airports and to express my regret for the delay that has occurred in supplying you with the material promised therein. It has been necessary, however, to decide on a basis for the categorisation of aerodromes and the allocation of scales of equipment, which will serve as a firm foundation for a later approach to I.C.A.O. in the hope that they will in due course be accepted as Recommended Practices for international application.

2. I now enclose a memorandum on the background of the categorisation scheme and on some of the general problems associated with the provision of fire and rescue services at aerodromes together with the following attachments:-

- Attachment A: (a) a table showing categorisation of aerodromes according to weight and frequency of movement of aircraft using them; and
(b) tables of fire fighting and rescue equipment for each category;
- Attachment B: a detailed questionnaire which need only be completed where further guidance is sought on a particular aerodrome;
- Attachment C: a note on previous scales of equipment and categorisation schemes.

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THE OFFICER ADMINISTERING
THE GOVERNMENT OF THE
FALKLAND ISLANDS.

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3. The Ministry of Transport and Civil Aviation intend to use the tables in Attachment A as a basis for the requirements to be enforced in future at licensed aerodromes in the United Kingdom. Before these requirements are introduced, however, it will be necessary to discuss them with aerodrome operators. I shall, of course, notify you if any significant alterations to the tables are made as a result of such discussions.

4. Detailed advice on standards and methods of training fire fighting personnel, emergency organisation, and other related questions is being prepared and will be sent to you as soon as possible. I considered, however, that the lack of this detailed advice should not delay the despatch to you of the material enclosed in this despatch.

5. In paragraph 4 of my circular despatch under reference I said that steps were being taken to bring I. C. A. O. Circular No. 4 - AN 3 up to date. This has not yet been done, though I. C. A. O. have recently published a circular (I. C. A. O. circular No. 41 - AN/36) on "suggested Aircraft Rescue and Fire Fighting Equipment and Operating Procedure for Aircraft", which is a reproduction of pamphlets prepared by the National Fire Protection Association (International) of the United States of America, but which does not represent the official I. C. A. O. view. The advice in this document differs on some points from that contained in the memorandum which accompanies this despatch. Nevertheless, it contains a good deal of useful information, and as soon as copies of the Circular are available, one will be sent to you for your information, accompanied by an explanatory note prepared by the Ministry of Transport and Civil Aviation.

6. I shall be glad to receive completed copies of the enclosed questionnaire from any Colonial Governments which require further guidance regarding the equipment, etc., to be provided, at the aerodromes for which they are responsible and to be furnished in due course with a report on the extent to which it has been possible to bring the fire fighting facilities available at the aerodromes in the territory or territories with which you are concerned into line with the scales recommended in the enclosed memoranda.

7. This circular has been addressed to all Colonies (including the Federation of Nigeria), Protectorates and Regional Organisations except the Virgin Islands the Regional Governments in Nigeria, Northern Rhodesia, Nyasaland, St. Helena, Seychelles, and Gilbert and Ellice Islands. Copies have been sent to the Director General of Civil Aviation, Singapore, and the Administrative Secretary,

/British

British Caribbean Air Transport Advisory Council. It has been sent to the High Commissioner for the Federation of Malaya under cover of a separate despatch.

I have the honour to be,
Sir,
Your most obedient,
humble servant,

Alan Lennard Boyd

CRASH, FIRE AND RESCUE EQUIPMENT AT AERODROMES

Any plan for the assessment of Aerodrome Fire Service requirements demands first a division of aerodromes into categories, and then the definition of scales of equipment and extinguishing media for each category. Various schemes of aerodrome categorisation have been prepared in the past - for example, the scheme set out in ICAO Circular 4-AN/3, and the United Kingdom scheme quoted in the report of the inquiry into the accident at Kallang on 13th March, 1954. The main defect of these schemes has been either in the vagueness of the phraseology used to describe each category, or in the failure to define what is meant by the "normal" use of an aerodrome. (A short comparative note on past categorisation schemes is at Attachment C.)

2. The United Kingdom considers that the frequency of movement as well as the weight of aircraft should be taken into account in assessing the approximate accident risk. The point at which frequency of use changes from "occasional" to "normal" is not capable of exact definition, but it is necessary to set a value which can be used to facilitate common sense decisions for particular aerodromes.

3. It is, of course, extremely difficult to produce a categorisation scheme based on the two factors of aircraft weight and traffic density which will be valid for application to aerodromes of all types all over the world. Indeed, whatever scheme is produced, there will always be local circumstances which will affect the provision of fire and rescue facilities. The question of such local circumstances, and the effects they may have, is dealt with in paragraph 7 below.

4. Nevertheless a categorisation scheme has been evolved which, it is considered, gives sufficient flexibility for application to aerodromes of varying traffic levels, whilst taking into account in its sub-division of aircraft weights the main classes of aircraft engaged in scheduled and charter civil transport operations. The scheme is set out in Table I of Attachment A.

5. With a low frequency of movement, the statistical chance of an accident is small, and for the purpose of this categorisation scheme it has been concluded that the acceptable risk is exceeded if the average movements per day exceed five for a given class of aircraft and above that it is requisite to provide the cover appropriate to an unlimited number of movements. In addition, a special allowance of one movement a week (50 a year) is made so that occasional movements of larger aircraft are not prevented. The special considerations which may apply to an aerodrome dealing with very small aircraft and to a major aerodrome with dual runways are reflected

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in the scheme.

6. The amounts of extinguishing media and the numbers firemen per watch which should be provided for each category are shown in Table 2 of Attachment A. Scales for rescue equipment are shown at Table 3. These levels of fire cover approximate to those now provided at State-controlled aerodromes in the United Kingdom and should be regarded as minima. Investment in vehicles of larger capacity than the minimum will often be wise, since this will allow for increases in aerodrome traffic or aircraft capacity. The United Kingdom in planning replacements for its present fleet of fire vehicles is working to this end, and will achieve increased hitting power without increasing manpower, although it is recognised that there is an upper limit to the increased fire fighting efficiency which can be given merely by increasing the total quantities of media. This limit may be reached for one of two main reasons - either because increases in the amounts of media mean very large numbers of fire fighting vehicles, which require larger numbers of men and which may be very difficult to handle tactically in fighting a crash fire, or because very large fire fighting vehicles will tend to have lower efficiency because acceleration and cross-country performance is lost.

7. It is recognised that the application of any categorisation scheme can never be rigid. Some of the local circumstances which may have to be taken into account at individual aerodromes are:-

(i) Availability of City or Other Local Fire Brigades

It has been found that even in a densely populated country like the United Kingdom it is extremely rare for a Town or City Fire Brigade to be situated close enough to an aerodrome to reach an aircraft crash fire in time to give effective assistance. (Generally if appliances cannot arrive at the scene of a crash within two minutes of a fire starting, they can do little towards the primary objective of life saving). Furthermore, a town Fire Brigade is not normally equipped with major appliances suitable for dealing with fuel fires. Owing to lack of hydrant supplies an Aerodrome Fire Brigade carries all its own water to the scene of an aircraft fire, whereas Town Fire Brigades rarely carry more than a first aid supply. Thus, it cannot be recommended that reliance should be placed on any Fire Service organisation outside an aerodrome to meet the needs of crash, rescue and fire fighting; the Aerodrome Fire Fighting Unit must be sited on the aerodrome itself. This is not to say that the Aerodrome Unit should not be part of a City Fire Brigade where economies of operation and training can be achieved by this means. It must be stressed, however, that the problems of domestic fire fighting and aircraft crash fire fighting are very different and if a City Fire Brigade undertakes the provision of a fire fighting unit at an aerodrome, the firemen must be properly trained for the specialised work.

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(ii) Aircraft Traffic of very Low Density

It is appreciated that at some aerodromes, particularly those off international routes, the rate of aircraft movements may be extremely low and the numbers of staff employed at the aerodrome very small. At such aerodromes the provision of fire and rescue services adequate for the size of aircraft using the aerodrome may be thought impracticable. Nevertheless, every effort should be made to provide such services on the appropriate scale, possibly in collaboration with aircraft operators. If adequate fire services are not provided their absence should be made quite clear to users and potential users of the aerodrome, both operators and passengers. Passengers on scheduled services of an airline, in particular, are entitled to expect reasonable provision of safety facilities.

(iii) Numbers of Firemen

It should be appreciated that the figures given for staff are based on trained British staff who are competent to act with a minimum of supervision. If the standard of staff which can be recruited locally is not comparable, then consideration must be given to increasing the number shown to permit of sufficient supervisory grades.

Training

8. It is not possible in a short memorandum to give detailed advice on the question of training of the fire and rescue crews, but it is obvious that the equipment is largely useless unless the men who have to use it are thoroughly trained in its use and in the techniques of aircraft rescue and fire fighting. While the standard of knowledge required of a fireman may reasonably be expected to vary somewhat having regard to the size and traffic of the aerodrome at which he is serving, there are certain minimum essential features which must be covered in every man's training and on which his knowledge and ability must as far as possible be complete. These may be summarised as follows:-

- (i) A thorough knowledge of all his equipment, its operation, maintenance and use.
- (ii) A thorough knowledge of the airport and surrounding terrain, including all features which might impede or assist passage to an aircraft accident; the availability of water supplies and similar matters.
- (iii) A thorough knowledge of the aircraft using the aerodrome and in particular, all normal and emergency exits available for rescue.

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- (iv) Knowledge gained through practical exercise and trials of the value and limitations of his equipment when used under actual fire conditions. To secure this there must be regular practical training sessions dealing with actual fires.
 - (v) A practical knowledge of the use and function of all rescue tools.
 - (vi) As complete a knowledge as possible of elementary medical first aid so that his handling of casualties may be intelligent and not promote further injury.
 - (vii) A knowledge of the airport emergency organisation and its functioning.

Assessment of Adequacy of Aerodrome Fire Service

9. The information given above and in the associated Attachments should be sufficient to enable an opinion to be formed about the adequacy and efficiency of the fire and rescue services at an aerodrome. It should, in cases where the facilities provided fall below the desirable minimum, show what is needed in terms of men and equipment to bring the services up to the proper standard.

10. If the information given is not sufficient, and further advice is desired, the information required by the questionnaire at Attachment B should be supplied, and the advice of the Ministry of Transport and Civil Aviation will then be sought on how best to bring the fire cover at a particular aerodrome to an acceptable minimum.

ATTACHMENT "A"

TABLE 1

PROVISIONAL TABLE FOR ASSESSMENT OF CATEGORY

Movements⁽ⁱ⁾ per year of Commercial Passenger Carrying Aircraft of Maximum Weight⁽ⁱⁱ⁾:-

Aerodrome Category	Up to 4000 lbs	4000/15000 lbs	15000/50000 lbs	50000/95000lbs	Over 95000lbs
1.	DUAL RUNWAY AERODROMES ⁽ⁱⁱⁱ⁾				
2	No Limit	No Limit	No Limit	No Limit	No Limit
3	No Limit	No Limit	No Limit	No Limit	1800 ^(iv)
4	No Limit	No Limit	No Limit	1800 ^(iv)	50 ^(iv)
5	No Limit	No Limit,	1800(iv)	50(iv)	Nil
6	No Limit	200 of aircraft up to 10000 lbs	Nil	Nil	Nil

- NOTES:- (i) A movement means a landing or a take-off.
- (ii) Maximum weight means the maximum total weight authorised by the Certificate of Airworthiness
- (iii) Dual Runway Aerodrome means an aerodrome at which the traffic requires simultaneous use of more than one runway
- (iv) These mean average movements not exceeding five a day or one a week respectively.

ATTACHMENT 'A' continued

Table 2 Minimum Scale of Equipment

Category	Extinguishing Media Minimum Requirement			Maximum Discharge Rates to be not less than:-		Number of Men to be available at any time during flying.
	Water Gals.	Foam Compound Gals	CO ₂ lbs.	Foam G.P.M.	CO ₂ lbs/per min.	
1	2400	120	2400	4,000	800	12
2	1800	90	1200	2,000	400	9
3	1300	65	500	2,000	200	7
4	900	45	240	2,000	100	4
5	300	15	240	600	100	3
6	75 or 2x30 Gal. Chemical Extinguishers	5	15	240	-	2

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- NOTES: 1. Water, if carried in water tenders, must be capable of being transferred to the foam producing unit at a rate adequate to sustain the foam output required in column (5).
2. The amounts of extinguishing media indicated are the minimum quantities which must be carried on the vehicles. Sufficient foam compound must be carried for the quantities of water in column 2 and with certain types of foam producing equipment it may therefore

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be necessary to increase the quantities of compound in column 3. In every case it will be necessary to maintain reserve stocks of not less than two complete refills of foam compound and CO₂ or its substitute.

3. The amount of CO₂ shown in Col. 6 is the minimum considered necessary when used in conjunction with foam. Other vapourizing liquid extinguishing agents or dry chemical may be considered following a determination of their extinguishing efficiency and effectiveness and their compatibility with foam. When such other agents are used, however, their efficiency should equal that of comparable amounts of CO₂ and should not create an unacceptable toxicity hazard. Provision of additional water may also be considered, provided that this extra water can be used, not only to provide increased foam, but also to supply a secondary firefighting medium (i.e. in the form of a water spray) without reduction of the required discharge rate of foam.
4. All the equipment required to meet the minimum cover indicated must be available for immediate turnout during periods when aircraft movements are taking place. The vehicles must be capable of carrying all the men shown in column 7 and at least half of that number shall be immediately available to man the appliances at the time of actual landings and take-offs. During the hours the aerodrome is open, the whole number in column 7 shall be available to man the equipment quickly in emergency though they may be employed on other duties on the aerodrome.
5. All the men in Column 7, whether full time or auxiliary, must receive regular training in the use of their equipment and in aircraft firefighting and rescue techniques.
6. Firemen should be equipped with suitable clothing, including boots, and a helmet with vizor, all designed to afford maximum protection against radiated heat. In addition each man should be provided with an axe.
7. All equipment must be maintained in a serviceable condition and must be mounted on a suitable type of chassis to permit a cross-country performance and if not self propelled, must be connected to a suitable towing vehicle whenever aircraft movements are taking place.
8. These scales should be regarded as minima, and for good practice a margin should be provided in excess where possible. It is advisable when purchasing new equipment to take the opportunity of providing more than the present minima, to cover possible

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11

increases in aerodrome traffic and aircraft capacity, or possibly increases in the minima themselves should further experience unfortunately show this to be necessary. For a small increase in expenditure it is often possible to provide considerably increased quantities of media.

ATTACHMENT "A" continued

Table 3 RESCUE EQUIPMENT

Category	Rescue Equipment	Quantity
	Item	
1, 2 and 3	Power driven break-in tool capable of rapidly cutting an emergency aperture, of sufficient size for rescue of occupants, through the fuselage of a metal skinned aircraft.	1
1, 2, 3, 4 and 5	Combined drift and axe Axe, aircraft type Cropper, bolt 24" Crowbar 3 ft. 6 inch Hacksaw, heavy duty Blades, heavy duty hacksaw Hook, grab Saw, double edged Shovel Snippers, tin Knife, quick release Gloves, asbestos or P.V.C. Blanket, asbestos	1 1 1 1 1 1 1 1 1 1 pair 1 2 pairs 1
6	Axe, Aircraft type Crowbar 3 ft. 6 inch Hacksaw, heavy duty Blades, heavy duty hacksaw Hook, grab Saw, double edged Knife, quick release Gloves, asbestos or P.V.C.	1 1 1 2 1 1 1 1 pair

Note: For the power tool sufficient depth of cut is required to sever completely any fuselage frame members of aircraft normally using the aerodrome. A 4½" depth of cut is recommended.

ATTACHMENT "B"

(Suitable Heading).....

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Questionnaire

[To be completed only in cases where further advice is required]

In order that an assessment may be made of the adequacy or otherwise of the measures taken and the equipment provided for dealing with fire and rescue operations following an aircraft accident you are asked to reply to the following questions giving as much detail as possible.

Part "A"

- 1. Civil Aviation Authority responsible.....
Territory.....Airport.....
Nearest town and distance from.....

- 2. Brief detail of aerodrome and local terrain (e.g. runways or grass, adjoining country, scrub, jungle, sea, lagoon etc).

3. Water supplies

- (a) Is there any fire water main system on the aerodrome?
If so give brief details of number and location of hydrants and pressure and rate of flow of water available.
- (b) Are there any tank static water supplies? If so give details of capacity and situation.
- (c) Are there any accessible natural water supplies in the immediate vicinity? If so give brief details.

- 4. Give details of all aircraft using the aerodrome and frequency of movement rate by types:-

<u>Type</u>	<u>Frequency of movement.</u>
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- 5. Hours during which aerodrome opens for flying.

PART "B"

Aerodrome Fire and Rescue Facilities

- 1. Give complete details of number and type of major appliances available on the aerodrome for aircraft firefighting and rescue in accordance with the following detail, adding such information as is necessary adequately to describe such appliances.

Foam Tender

- (a) Type of engine, chassis and tyres (track grip or road).
- (b) Amount of water carried.
- (c) Amount of foam compound carried.
- (d) Type and capacity of pump.
- (e) Method of foam production employed.
- (f) Foam output rate and number of deliveries.
- (g) Whether CO2 carried on Foam Tender and if so what amount.
- (h) Mechanical condition of tender.

Water Tender

- (a) Type of engine, chassis and tyres.
- (b) Amount of water carried.
- (c) Type and capacity of pump (if fitted).
- (d) Whether permanent connections from water tank to pump.
- (e) If no pump fitted describe method employed for transferring water to Foam Tender.
- (f) Mechanical condition of tender.

Carbon Dioxide (CO2) Tender

- (a) Type of engine, chassis and tyres
- (b) Amount of CO2 carried.

- 15
- (c) Number of deliveries or application.
 - (d) Maximum rate of delivery per minute
 - (e) Mechanical condition of tender.

Light Rescue Tender

- (a) Type of chassis, engine and tyres.
- (b) Equipment carried.
 - (i) Fire equipment - extinguishers etc.
 - (ii) List of rescue tools. Rescue tools carried on other appliances should be included in this list but this fact should be indicated.
 - (iii) Lighting equipment - searchlights etc.
- (c) Mechanical condition of tender.

N.B. If no light rescue vehicle is available and the rescue tools are carried on the fire appliances then a list of such tools should be given below.

Ambulances - Type and capacity

2. If major fire appliances as listed above are not available on the aerodrome then give below full details of such fire and rescue equipment as is available and the method employed for conveying it to the scene of an accident.

3. Personnel

- (i) Please give details of the authorised complement and actual strength of men employed on fire and rescue duties. If ranks are employed the title and number of men in each rank should be given. Information should be given as to whether these men are employed whole time or part time on fire and rescue duties and, if part time, on what other duties they are employed. If the total strength is divided into watches, details of the watch strength and hours of duty per watch should be given.

In particular, information is required as to the officer in charge as under.

- (a) Who is immediately responsible for the operational command
/and

and efficiency of the fire and rescue personnel and equipment.

(b) What general and specialised fire/rescue experience and training has this officer had

(c) Is he wholly or only partly engaged on fire duties

(ii) How are the fire personnel trained. How frequently do they

(a) Produce foam from their appliances

(b) Discharge CO2 for training

(c) Deal with actual practice fires

(d) Physically inspect aircraft emergency exits etc. and other necessary features.

Are any of the firemen trained in medical first aid?

Are exercises held embracing any outside, or reinforcing, fire, ambulance or rescue services,

(iii) What equipment is issued to personnel, e g. boots, helmet, gloves, axe, quick release knife, etc

4. Communications

What facilities and arrangements exist for

(a) Alerting aerodrome fire and rescue services

(b) Summoning outside assistance - Fire Brigades, Ambulances, Doctors, Nurses, etc

(c) Is any appliance radio equipped ?

5. Aerodrome Medical and First Aid facilities

Give details of medical and first aid facilities on the aerodrome.

6. Outside assistance

Give details of assistance available from outside sources.

(a) Fire Brigade

(b) Ambulance Services

(c) Doctors, Nurses

(d) Hospitals

giving in each case the approximate distance or time involved in obtaining such assistance.

ATTACHMENT "C"

CRASH FIRE AND RESCUE EQUIPMENT AT AERODROMES

NOTE ON METHODS OF AERODROME CATEGORISATION

ICAO Guidance 1948 and U.K. Scales 1946-51

1. ICAO guidance on crash, fire and rescue services at aerodromes is given in Circular 4 - AN/3, first published in 1948. Copies of this Circular were sent in March 1949 to those Colonies which then had a separate Civil Aviation Department. The main substance of the Circular is a reprint of a paper prepared by a Working Party and forming part of the Report (ICAO Doc 4809/AGA 558) of the 3rd Session, ICAO AGA Division in 1947. It should be noted first of all that the recommendations of the Circular do not have the status of Standards or Recommended Practices, but are merely intended as general guidance material. The scales of fire and rescue cover given in the Circular are expressed in terms of amounts of extinguishing media, divided into six grades which correspond to ranges of aircraft weights. The Circular recommends that the scale of facilities should be related to the largest type of aircraft normally or recurrently using the aerodrome; no attempt is made to define the term "normally".

2. The amounts of extinguishing media recommended in the ICAO scales resembled very closely, in the four lower grades, the amounts recommended in the United Kingdom scales of fire cover current at that time (called the "Sandro" scales after a committee on Safety and Rescue Organisation which sat in 1946.) The highest category in the United Kingdom Sandro scales was equivalent in amounts of media to the ICAO grade 3, and was related to "aircraft over 65,000 lbs". There was no higher sub-division of aircraft weights corresponding to the ICAO Grades 1 and 2. Like the ICAO scales, the United Kingdom scales were related to the heaviest aircraft normally using the aerodrome, and again there was no specific definition of "normally". In the period between 1946 and 1951 limits on equipment, manpower and money prevented provision of fire cover up to the full Sandro standard at some State-operated aerodromes in the United Kingdom, although the Sandro standards were recognised as a desirable aim.

3. Finally, it may be noted that the ICAO Circular recognized that the scale of facilities actually provided might have to be related to the level of traffic using the aerodrome (see paragraph 7 of the Circular.)

United Kingdom Current Scales

4. In 1951 it was felt that sufficient experience in the operation of
/Aerodrome

18

Aerodrome Fire Services by the Ministry of Transport and Civil Aviation had been gained for a review to be made of the "Sandro" recommendations, to see whether they required re-assessment. Some two years of consideration were given to the problem by a special committee and a subsidiary working party and the main result was that, whilst they confirmed the broad basic principle of the Sandro recommendations - that of relating the level of fire and rescue facilities to the gross weight of aircraft using an aerodrome - considerable changes in detailed application were made. The purpose of these changes was, in effect, to translate the word "normally" into numerical terms and to relate the level of fire and rescue services not only to the weight but also to the frequency of movement of aircraft using an aerodrome. However, although a new system of categorization of State-controlled aerodromes in the United Kingdom was introduced (see paragraph 5 below), related to changed scales of fire and rescue facilities, the numerical basis underlying the system was not published in definite terms.

5. The categorization scheme divided State-controlled aerodromes into six broad classes. These are listed below with the amounts of extinguishing media and numbers of firemen related to each class. It must be emphasized that the descriptions of categories were framed solely for application to State-controlled aerodromes in the United Kingdom and they were drawn up, therefore, to cover a particular set of aerodromes and not for general application.

<u>Category and Description</u>	<u>Amounts of water for foam production and CO₂</u>	<u>Number of Firemen per watch.</u>
1. Major international airports dealing with largest types of aircraft.	2,500 galls. 2,400 lbs.	13
2. International airports dealing with medium-sized aircraft, or with large aircraft at a comparatively low movement rate.	2,000 galls. 1,200 lbs.	8

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<u>Category and Description</u>	<u>Amounts of water for foam production and CO₂</u>	<u>Number of Firemen per watch.</u>
3. Major diversion airports, where normal traffic is of low density or consists of small aircraft only	2,000 galls. 1,200 lbs.	7
4. Aerodromes dealing with medium-sized aircraft, domestic or short-range international traffic.	1,250 galls. 1,200 lbs.	7
5. Aerodromes dealing with frequent air transport movement of small aircraft, or low density medium aircraft traffic.	1,000 galls. 200 lbs.	4
6. Aerodromes dealing only with small aircraft, or with medium-sized aircraft at very low density.	3-400 galls. 200 lbs.	3

6. This system was introduced in 1953, but further consideration has shown that whilst it may be suitable for the restricted purpose of application to State-controlled aerodromes in the United Kingdom (almost all of which are intended for the operation of regular and comparatively frequent scheduled services) its application requires too subjective an assessment of an aerodrome's traffic to be suitable for wider application, even to non-State aerodromes in the United Kingdom. This has led to the preparation of the more detailed categorisation scheme described in the accompanying paper.

H.C.S.

FIRE FIGHTING FACILITIES.

This despatch is the direct result of a crash of a B.O.A.C. Constellation aircraft at Singapore in March, 1954, in which the Colonial Government of Singapore were held responsible by the Court of Inquiry for the heavy loss of life owing to the poor organisation of their airport, and in particular the fire service at the airport.

Paragraph 6 of the despatch calls for a report 'in due course' on the extent to which it has been possible to bring our fire-fighting services into line with the recommendations made in the appendices.

We can play for time by enquiring what services are required at a water aerodrome, since these are not specifically mentioned in the text, but this will simply be staving off the evil day, since the ICAO coverage for water dromes approximates very closely to the land drome requirements, so we may therefore assume that the answer when received would at any rate be similar.

Going through Sec. of States recommendations, in Attachment 'A' Stanley falls into Aerodrome Category 5, but by such a narrow margin that I feel that we are quite justified to count ourselves in Category 6. Category 6 allows up to 200 movements per annum of aircraft between 4000 and 15,000 lbs weight, whereas we have 400 movements of an aircraft of 5000 lbs. Our smaller aircraft movements, of which we are allowed an unlimited number in Category 6, are in fact negligible, so what we lose on the roundabouts we gain on the swings.

Table 2 gives our minimum scale of equipment required, and it is interesting to note that we should have a foam discharge rate of 240 GPM whereas I am informed by the Chief Constable that his best fire pump has a rate of only 150 GPM. This in itself shows how far below the minimum standards we fall.

In fact FIGAS makes no provisions whatever for mishaps on landing and take-off, excepting in bad conditions in Stanley (rough water or poor light) when the "Alert" is kept standing by on the alighting area. She is not however equipped for fire fighting, only two small extinguishers being carried, and the whole idea of her availability is to safeguard against an overturn. We may therefore say that our fire-fighting facilities are nil.

To even partially implement the requirements of S. of S. will be very expensive: to start with another crash tender will be essential, or the "Alert" will have to be entirely reconstructed. More men will have to be employed, putting up the annual operating costs. I would not oppose either of these steps simply on grounds of economy, but I do on grounds of common sense. If the money is available, I am confident that it can be much better spent upon improving the meteorological services for the aircraft, which are to my mind of far more practical value to us. A FIGAS disaster is in my opinion much more likely through encountering severe weather conditions than through a crash resulting in a fire on Stanley Harbour; and it should be borne in mind that pilots here frequently have to break the rules by flying without a proper forecast - indeed, every early morning flight does so. This infringement is just as likely to lead to my loosing my licenee as the inadequacy of the landing facilities is to loosing my job. So if money is to be spent I feel justifie in claiming that it should be where the greatest value can be obtained for the Air Service. Actually this was precisely the plea put forward by the Director General of Civil Aviation for Malaya: he was aware that his fire-fighting services were inadequate, but thought other services had a higher claim to the funds available. I am not his defending council, and I do not think he made his case very well, but I do sympathise with this attitude and I have the added advantage over him in that I am an active pilot likely to be involved personally in any accident, in consequence I am unlikely to cut any essential safety service.

Having put forward my point of view, I still feel I have not helped

very much towards the report 'in due course'. Can we get round this by your asking me in a direct memo whether the facilities are adequate and my saying 'yes' without going into details? I carry the whole can then if anything goes wrong, and I would be quite prepared to do so if, as a quid pro quo, the Government take up the matter of providing a more adequate Met. Service for FIGAS as soon as possible. If you consider this a reasonable way around the difficulty, quite obviously this minute will have to be destroyed, so I am sending it to you privately: if you don't agree with the method, then I will re-type this last page so that blackmail of my superiors does not appear in the files.

J. H. Dicks

H.M.

A.

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[Handwritten signature]

- 1. ... article 10 marks on aircraft - these are not required here, so we have not bothered to do them.
- 2. ... article 10 and Regulations 14, 13 & 16. These lay down that an aircraft must be weighed at intervals (normally at each 6. or 12. months). The equipment required would be a platform scale and would be used twice a year on two aircraft - obviously aerodynamical ones. With a one aircraft one may assume that the weight is approximately as given by the maker, but as they get older this assumption could be very open to criticism. The various articles and regulations are of necessity very...
- 3. Regulations 20, 21, 24, deal with equipment to be carried in aircraft under varying circumstances. It must be noted that in looking the regulations it should only be considered if loss of life was directly attributable to this breach. As an example Regulation 21(d) requires a means of protection or removal of ice from the aircraft. This would be costly and would always a great deal of time to carry out effectively. The system now in work is to watch the formation of ice, and before it gets too great, make a precautionary landing. However, if an aircraft were to land and as it is not clear through the ice formation on the wings, the breach of this regulation would then be serious.
- 4. Certificates of Maintenance are referred to in the Rules & Article 10 and Regulations 30 & 31. They are very important in that in fact the engineers certificate that the aircraft is fit to fly before taking off. We do not write them, but the fact is not in itself a serious matter, because we only do so in the event of the thing by being the necessary inspection. If the aircraft is forced up weather to remain in the air for any length of time, the certificates of maintenance must be up to date, and must be signed by a competent person.

AIRCRAFT SAFETY REGULATIONS.

With reference your memorandum 0270/A/III dated 4th July.

To go through all the regulations and orders governing the operation of aircraft would be almost a lifetimes work! However, Kerr and I have utilised one day of non-flying to cover the major ordinances, the Civil Aviation Air Navigation Order and the General Regulations, which were revised in the U.K. in 1954, and although the revised editions have not yet been applied to the Colonies, information has been received from the Sec. of State that they will be introduced in the near future. There seemed little point in consequence in pointing out our shortcomings on the existing ordinances, as they are shortly to be withdrawn. As a matter of fact, on all the fundamental issues (with one exception) our divergence from the regulations is the same in both cases.

I attach the relevant regulations. We have used the following system of notation:-

- (a) Breaches of the regulations practiced in the Colony which cannot under any circumstances result in serious damage or loss of life and which would not be open to censure in an enquiry are marked with a broken line in the margin.
- (b) Breaches of the regulations which under some circumstances could lead to serious damage or loss of life, and which would, if the cause of an accident be open to severe censure during an enquiry are marked with one solid line in the margin.
- (c) Breaches of the regulations which are bound to be censured during an enquiry, whether they cause the accident or not, are marked with two solid lines in the margin.

The system of marking referred to above in all cases refers to the ink marks and not to the pencil lines, which are put there for a different purpose altogether.

As the subject is a technical one requiring some explanation, I will go through the two ordinances together, commenting briefly on each article marked.

1. Order, Article 8. Marks on aircraft - these are not required here, so we have not bothered to do them.
2. Order, Article 12 and Regulations 14, 15 & 16. These lay down that an aircraft must be weighed at intervals (actually at each C. of A. overhaul). The equipment required would cost approximately \$500 and would be used twice a year with two aircraft - obviously uneconomical here. With a new aircraft one may assume that the weight is approximately as given by the makers, but as they get older this assumption would be very open to criticism. The notices giving the weights etc are unnecessary here.
3. Regulations 20, 22, 24, deal with equipment to be carried in aircraft under varying circumstances. In most cases where we break the regulations we should only be criticised if loss of life was directly attributable to this breach. As an example Regulation 24(10)(a) requires a means of prevention or removal of ice from the aircraft. This would be costly and would occupy a great deal of time to carry out effectively. The system Kerr & I work to is to watch the formation of ice, and before it gets too great, make a precautionary landing. However, if we misjudged over this, and we did in fact crash through the ice formation on the wings, the breach of this regulation would then be serious.
4. Certificates of Maintenance are referred to in the Order & Article 16 and Regulations 30 & 31. They are very important: it is in fact the engineers certificate that the aircraft was fit to fly before taking off. We do not write them out, which is not in itself a serious matter, because we obey the spirit of the thing by doing the necessary inspections. But if the aircraft is forced by weather to remain in the camp for any length of time, the certificate of maintenance expires before it is possible to return to town, and under those circumstances the return flight becomes illegal. A

crash under these circumstances would be quite inexcusable to the enquiry, and a crash under any circumstances would be almost bound to expose this breach and produce censure.

5. Order, Article 17 deals with the operation of aircraft from the pilots' point of view.
 - (a) Radio. If our radio does not work we say 'b----r it' and press on, contrary to the provisions of Article 17 (2)(b). It is naturally mended on the next non-flying day.
 - (b) Loading. Regulations 42 & 43 cover this quite clearly. Our system, very roughly, is to look at the floats and if they are still above water she is not overloaded! It is quite impossible to work out the loads accurately here, as we should require every passenger and their baggage to weighed at each farm when making their booking. By the time they fly their baggage weight may easily have changed however, rendering this weighing null and void. And even if this weighing was achieved accurately, we should still be faced with varying fuel contents, varying water in the floats and so on. But practically the first thing to be asked in an enquiry is 'was the aircraft correctly loaded'? Our system cannot supply an answer, and we should I am sure be stopped operating until we could, which in turn would make the whole service so slow and cumbersome that it would no longer be practicable.
 - (c) Take-off and landing areas - Article 17 (2)(vii) - here it is stated that the pilot must ensure that the areas to be used on the flight are safe. In the Colony we frequently (nearly every day) fly knowing that at least one stop will not be within the limits laid down. H.H. the O.A.G. will recall recently flying with me to pick up the dentist at West Point: we took off with an available run of approximately 500 yards, with a 600 foot hill a further 400 yards on. A take-off in the open water outside would have been impossible that day owing to the heavy swell: I therefore accepted the lower standard on conditions inside. But had I hit the hill, this regulation would have immediately been quoted against me. Actually this was not a glaring example, but some settlements are much worse (Roy Cove, Port Howard). Although the operating conditions for aircraft are touched upon in these two ordinances, they are in themselves the subject of further lengthy ordinances.
 - (d) Article 18 of the Order requires an operator to produce an operations manual for the guidance of pilots, which lays us open to criticism if (for example) I hit the top of Mount Usborne when flying at 2750 feet: it is marked on the chart as 2250, so theoretically my height would be quite justified, but from experience FIGAS knows that it is a good deal higher, and an operations manual would state this. The work involved however, is unjustified, and the information here is exchanged by word of mouth from pilot to pilot. Operational training and testing is also laid down in this Article and also in Regulation 44. This is a new scheme, and is the exception referred to in my opening paragraph. The testing here will not be possible: Kerr cannot test me effectively while I'm his head of department, & I cannot test him effectively while he is my first pilot! Actually I am rather in favour of this scheme for permanent pilots employed here, but modified to suit our peculiar circumstances. I consider that during our U.K. leaves we should carry out ten hours flying under conditions which cannot be simulated here, but which we should be competent to deal with to maintain our licence (night and instrument flying, recovery from unusual positions etc) and then be tested and certified as still up to the standard required for the licence we hold. If a pilot here ran into fog and 'spun in' while flying on instruments, contravention of this regulation could be blamed for his lack of skill in instrument flying
6. I have placed broken line markings against several ordinances governing the keeping of log books. These contraventions could never be serious to us, as there would be ample time before an enquiry to 'cook the books'. By and large, we stick to the regulations, but we are generally rather late in making the entries, and we certainly never carry them in the aircraft - they get wet if we do.
7. Article 40 of the Order covers drunkenness. Kerr and I are careful (and consequently unpopular) not to allow drunkards aboard

as was the unfortunate practice of previous pilots. However, no amount of care can stop an occasional mishap, as occurred to me the other day when a character in the back seat got out a bottle and got nicely pickled between Stanley and Port Howard and had to be carried off at the other end: the only consolation I obtained was the fact that I dropped his rear rather heavily on the jetty! Being serious about this however, it is a question Kerr and I have discussed at intervals, and our feelings on the matter, should a passenger become a nuisance through drinking is that we shall clout him hard with the fire extinguisher, (conveniently placed between our feet and easy to release), and we trust the Government to get us off the subsequent manslaughter charge if he pegs out, which he probably will if I have to hit him. The actual chances of his endangering the aircraft are therefore small, except at take-off and landing.

8. Order, Article 54, deals with passenger aerodromes. We break this in that we should only fly from Stanley to one other settlement and then return. This contravention is not to my mind very serious, having regard to the circumstances here.
9. Schedule II, Section III, 9 (2) of the Order specifies the weather reports and forecasts a pilot should study before take-off. We do not, particularly in the case of early flights, and this would be regarded as a great sin were I to crash through running into bad weather. My argument for breaking this rule is that with the very limited resources available to the Met. Service here, I might just as well fly without an early forecast as with one for all the good it will be until there is an observer on the West Falkland. But quite obviously this is not argument for a court of enquiry
10. In the same Section III, 15 (4) the minimum altitude for flying is given as 500 feet, excepting during landings and take-offs. In bad weather we frequently have to break this rule here, and provided we do not hit anything this does not matter.
11. My last point concerns the medical requirements for holding various licences given in pages 62 et seq. in the Regulations. I am informed by the S.M.O. that the equipment available in the Colony does not permit these requirements being examined in full. However, I am quite satisfied in my own mind that the S.M.O. would spot any weakness in a pilot which should preclude his flying here, so this is merely a technical point.

This completes my observations on the contraventions to the Air Navigation Order and the Air Navigation Regulations; there are still 23 other ordinances to be examined, and contraventions in these will be submitted as opportunity offers, but as some of these are somewhat long and complicated, I regret the early reply you require will be impossible.

f

at
b.c.

Y. H.

1-25 with Statutory Instruments at G.C. submitted.
The H.M.'s mins. at 21 to 25 reveal how badly our
air service falls short of minimum safety requirements
as laid down in International Regulations.
2. We cannot continue forever hoping that a fatal
crash will not occur.
3. The first essential requirement appears to be
a Meteorological Observer on the West. I have
discussed this with C.M.O. She, too, agrees that
the appointment is most necessary.
4. There are at present three part-time observers
on the West, i.e. at Pebble, Fox Bay East & West
Point. They are, however, little more than amateurs
& can only give the wind strength and visibility.
What is needed is an observer who has trained.
One of the W/P/Met. Assistants who has completed
his apprenticeship here would be ideal but
such an officer is not available. The alternative
is to recruit from the U.K. a suitable officer at
say £500 a year. He could be included
in F.I.D.S. Headquarters Met. Service and it would
cost the Colony only 15% of salary, i.e. £75 a year.
(The Colony pays 15% of the cost of Headquarters staff)
and the £75 could be hidden in the annual
contribution which, for the 15 months ^{current} Estimates, is
£1100.

5. I favour this way of doing it rather than a
direct approach for funds chargeable to the Air
Service in view of the present unfavourable
financial position of the Service.

We should aim at getting a man here
by the early summer, if possible, so that advantage

can be taken of the longer flying hours.
The C.M.O. informs me that with a captive balloon
on the West, good local forecasts could be obtained.

6. As regards fire fighting facilities, to comply
with International Regulations in full would
be the end of the air service, as the cost would
be prohibitive. We cannot, of course, consider
the Air's proposal at 22. Neither can we provide
adequate fire fighting facilities at each
settlement. It would be most expensive to
keep a boat standing-by in Stanley all the
time, but this may have to be faced.

7. May we discuss this problem, please?

[Signature]
19/7

If we are to have an aerial survey here,
it will be essential to have a qualified observer
on the West as it is unlikely that pilots unfamiliar
with local weather conditions would be prepared
to take off without first obtaining a weather briefing.

[Signature]
19/7

C.S.

For discussion next non-flying day at 2.15. p.m. with

1. Yourself.
2. Huckle
3. Kerr.

It will be a longish session and for it I should like a note as
to what priority is required of the West Forecasts on observer and what qualification
and training he should have. Please bring these papers with you.

[Signature]
21/7.

Action on West Observer to await outcome of
negotiations with Air Ministry.

[Signature]

Bul 16/2/55

McJ

2 para 6 We have never replied to the
S of S & informed him of our fire-fighting
equipment. This minute on the subject is
at 21.

W. H. M. 19/10/56

A.C.S./

How that the Air Service is being run by a responsible individual
I am for the moment about it.

The more I read this dispatch the more concerned I am
that it does not apply to small floatplane flying services such as
we have here. In any event we could not possibly conform - it would
bring the air service to a grinding halt if we did try.

H. F. A.

A. G. T.
19/10/56

SA