RA 3521 - Permanent Fixed Wing Aerodrome - Facilities

Rationale

►The Safety of Aerodrome operations rely on the Quality and proper functioning of its facilities, which support the safe operation of Air Systems. Incorrect installation or inaccurate promulgation of Aerodrome facility information could compromise Safety and lead to operational errors. Facilities must be installed to required standards and maintained effectively. Accurate and timely dissemination of facility information is essential, supported by robust Quality Assurance and regular Audits to ensure compliance and Safety.◄

Contents

Regulation 3521(1)

Air System Arresting Systems

3521(1) Heads of Establishments (HoEs) and Aviation Duty Holder-Facing Organizations (ADH-Facing Organizations) **shall** ensure that information regarding installed Air System Arresting Systems is promulgated ►for◄ all Aerodrome users.

Acceptable Means of Compliance 3521(1)

Air System Arresting Systems

1. Aerodrome Operators **should** promulgate arrestor system details in the relevant Aeronautical Information Publications.

Guidance Material 3521(1)

Air System Arresting Systems

2. Clearance for Air Systems to engage arrestor systems or trample cables is published in Release To Service documents and Aircrew Manuals.

Regulation 3521(2)

Runway Visual Range Systems

3521(2) HoEs and ADH-Facing Organizations **shall** ensure that Runway Visual Range (RVR) measurement and assessment is provided for airfields that perform low visibility operations.

Acceptable Means of Compliance 3521(2)

Runway Visual Range Systems

3. **Instrumental RVR (IRVR)**. An IRVR system **should**:

   a. Consist of transmissometers appropriately located along the length of the Runway;

   b. Have an audited calibration of the forward-scatter meter trace and verified to a transmissometer standard; and

   c. Have the accuracy of the system verified over the intended operational range.

4. ►◄

   a. ►◄

      (1) ►◄

      (2) ►◄

      (3) ►◄

      (4) ►◄

Acceptable Means of Compliance 3521(2)

(5) ►◄

(a) ►◄

(b) ►◄

(c) ►◄

(d) ►◄

(e) ►◄

(f) ►◄

b. ►◄

(1) ►◄

(2) ►◄

(3) ►◄

(4) ►◄

(5) ►◄

(6) ►◄

(7) ►◄

c. ►◄

Guidance Material 3521(2)

Runway Visual Range Systems

5. Further information is contained within RA 3275[1].

Civil Equivalence.

6. This Regulation is in line with International Civil Aviation Organization (ICAO) Annex ►3 ref 4.6.3.1. and ICAO Doc 9328 ref 9-1◄

Regulation 3521(3)

Compass Calibration Bases

3521(3) HoEs and ADH-Facing Organizations **shall** ensure that compass calibration bases are constructed to Class 1 or Class 2 requirements. The calibration base **shall** be an area of appropriate size to cater for the turning circle and all up weight of all Air Systems likely to be swung on that base and located sufficiently far from magnetic disturbances.

Acceptable Means of Compliance 3521(3)

Compass Calibration Bases

7. Classes:

a. Class 1 calibration bases **should** be utilised for Air Systems requiring refined or standard compass swings, as stipulated by the ►Aviation Duty Holder / Accountable Manager (Military Flying).◄

b. Class 2 calibration bases **should** be utilized for standard compass swings only.

8. Construction:

a. The size of the datum compass circle **should** be sufficient to allow the safe operation of the largest Air System to use the base. Typical radii are:

(1) Large Air Systems (eg C-17) – 60 m;

(2) Medium Air Systems (eg Chinook) – 45 m; and

(3) Small Air Systems (eg Tutor) - 35 to 30 m.

[1] Refer to RA 3275 – Runway Visual Range.

Acceptable Means of Compliance 3521(3)

9. The radius of the sterile area **should** be the radius of the datum compass circle plus 15 m.

10. The centre of the compass base **should** be at least 200 m from large buildings or continuous wire fences.

11. The compass base and access tracks **should**:

a. Be constructed of non-ferrous concrete or bituminous material;

b. Be protected against fuel spillage;

c. Be constructed free from any magnetic material;

d. Be capable of withstanding the all-up weight of the heaviest Air System to be swung; and

e. Have a maximum gradient not exceeding 1 in 80.

12. Magnetic Deviation Limits **should** be no greater than:

a. 0.1^0 at 1.5 m above ground level for Class 1 bases; and

b. 0.25^0 at 1.5 m above ground level for Class 2 bases.

13. No magnetic anomalies **should** be present in Class 1 bases.

14. The maximum allowable magnetic anomaly in a Class 2 base **should** be +/- 0.25^0 provided that:

a. The anomaly is clearly marked on the surface ►◄.

b. The size and shape of the exclusion zone ►needs◄ to be determined during routine magnetic surveys.

15. The datum compass circle is a narrow pathway used to position the datum compass. It **should** be clearly marked. The datum compass circle **should** comprise a continuous painted line on non-reinforced concrete or asphalt.

Guidance Material 3521(3)

Compass Calibration Bases

16. Further information and guidance on the location and construction of Compass Calibration bases can be obtained from QinetiQ, Land Magnetic Facilities[2].

17. If a base will be used for Air Systems which have magnetic sensors below 1.5 m, a special survey may be required.

18. QinetiQ Land Magnetic facilities need to be notified at the earliest opportunity of any planned work within 200 m of the centre of the compass base.

19. Periodic surveys of all compass bases will be undertaken by staff from QinetiQ, Land Magnetic Facilities. Class 1 bases will be re-surveyed every 5 years. However, Class 2 bases are normally subject to magnetic anomalies, the effects of which are liable to change with time; these bases need to therefore be re-surveyed every 2 years.

Regulation 3521(4)

De-icing / Anti-icing

3521(4) HoEs and ADH-Facing Organizations **shall** ensure that Air System de-icing / anti-icing facilities are provided.

Acceptable Means of Compliance 3521(4)

De-icing / Anti-icing

20. De-icing / anti-icing facilities **should** be iaw in ICAO Annex 14, Volume I, Chapter 3, Section 15.

21. De-icing / anti-icing facilities **should** be provided either at Air System stands or at specified remote areas along the taxiway leading to the Runway meant for take-off, provided that adequate drainage arrangements for the collection and safe disposal of excess de-icing / anti-icing fluids are available to prevent ground water contamination. The effect of volume of traffic and departure flow rates **should** also be considered.

[2] LTPAenquiries@QinetiQ.com.

Acceptable Means of Compliance 3521(4)

22. The remote de-icing / anti-icing facility ►◄**:**

a. ►**Should** be located outside of the Obstacle limitation surfaces specified in RA 3512[3].

b. **Should not** cause interference to the radio navigation aids.

c. **Should** be clearly visible from the Air Traffic Control tower for clearing the treated Air System. ◄

23. The remote de-icing / anti-icing facility **should** be so located as to provide for an expeditious traffic flow, perhaps with a bypass configuration. ►The facility **should** facilitate routine◄ taxiing manoeuvres into and out of the stand.

24. The size of a de-icing / anti-icing stand **should** be equal to the parking area required by the most demanding Air System in a given category with at least 3.8 m clear paved area all around the Air System for the movement of the de-icing / anti-icing vehicles.

25. The number of de-icing / anti-icing stands required **should** be determined based on the meteorological conditions, the type of Air System to be treated, the method of application of de-icing / anti-icing fluid, the type and capacity of the dispensing equipment used, and the departure flow rates.

26. The de-icing / anti-icing stand **should** be provided with suitable slopes to ensure satisfactory drainage of the area and to permit collection of all excess de-icing / anti-icing fluid running off an Air System. The maximum longitudinal slope **should** be as little as practicable, and the transverse slope **should not** exceed 1%. ►The de-icing / anti-icing stand **should** be capable of withstanding the traffic of the Air System it is intended to serve, due consideration being given to the fact that the de-icing / anti-icing pad (like an Apron) will be subjected to a higher density of traffic[4] and, as a result of slow-moving or stationary Air Systems, to higher stresses than a Runway.◄

27. ►◄

28. A de-icing / anti-icing stand **should** provide the minimum clearances specified in RA 3511[5] for Air System stands. If the pad layout is such as to include bypass configuration, the minimum separation distances specified in Table 1, column ►13◄, **should** be provided.

29. Where the de-icing / anti-icing facility is located adjoining a regular taxiway, the taxiway minimum separation distance specified in Table 1, column 11, **should** be provided (see Figure ►1◄).

Table 1. Taxiway minimum separation distances

Code letter	Distance between taxiway centre-line and Runway centre-line								Taxiway centre-line to taxiway centre-line (metres)	Taxiway, other than Air System stand taxilane,	Air System stand Taxilane centre line to aircraft stand taxilane centre line	Air System stand taxilane centre-line to object
	Instrument Runways Code number				Non-Instrument Runways Code number							
	1	2	3	4	1	2	3	4				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
A	►77.5◄	►77.5◄	-	-	37.5	47.5	-	-	23	15.5	19.5	12
B	►82◄	►82◄	►152◄	-	42	52	►67◄	-	32	20	28.5	16.5
C	►88◄	►88◄	►158◄	►158◄	►48◄	58	►73◄	►93◄	44	26	40.5	22.5
D	-	-	►166◄	►166◄	-	-	►81◄	101	63	37	59.5	33.5
E	-	-	►172.5◄	►172.5◄	-	-	►87.5◄	107.5	76	43.5	72.5	40
F	-	-	►180◄	►180◄	-	-	►95◄	115	91	51	87.5	47.5

[3] Refer to RA 3512 – Permanent Fixed Wing Aerodrome - Obstacle Environment.
[4] ►Refer to ICAO Annex 14 Vol 1, 1.1 - Definitions, Aerodrome Traffic Density.◄
[5] Refer to RA 3511 – Permanent Fixed Wing Aerodrome – Physical characteristics.

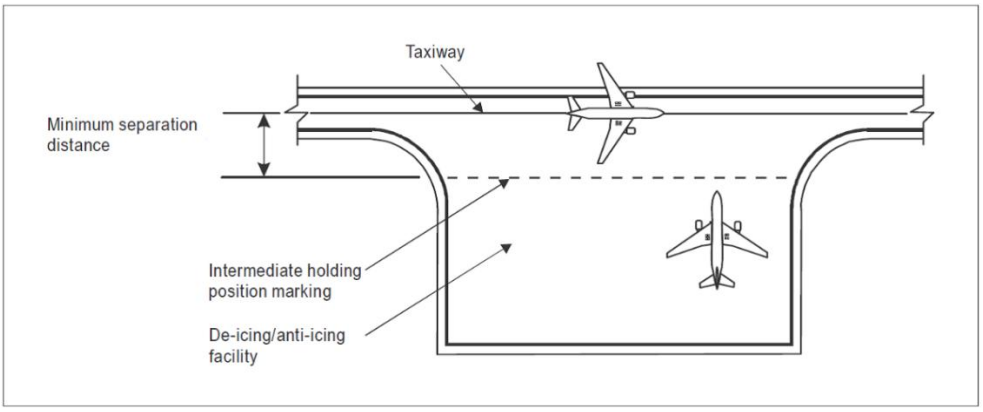
Acceptable Means of Compliance 3521(4)

►Note 1 – All figures in Table 1 are in metres.◄

Note ►2◄ – The separation distances shown in columns (2) to (9) represent ordinary combinations of Runways and taxiways. The basis for development of these distances is given in the Aerodrome Design Manual (ICAO Doc 9157), Part 2.

Note ►3◄ – The distances in columns (2) to (9) do not guarantee sufficient clearance behind a holding Air System to permit the passing of another Air System on a parallel taxiway. See the Aerodrome Design Manual (ICAO Doc 9157), Part 2.

Figure ►1. Minimum separation distance on a de-icing / anti-icing facility◄



Guidance Material 3521(4)

De-icing / Anti-icing

30. One of the primary factors influencing the location of a de-icing / anti-icing facility is ►◄ that the holdover time of the anti-icing treatment is still in effect at the end of taxiing and when take-off clearance of the treated Air System is given.

31. Remote facilities compensate for changing weather conditions when icing conditions or blowing snow are expected to occur along the taxi-route taken by the Air System to the Runway meant for take-off.

32. The jet blast effects caused by a moving Air System on other Air Systems receiving the anti-icing treatment or taxiing behind need to be considered to prevent degradation of the treatment.

33. An Air System de-icing / anti-icing pad consists of:

a. An inner area for parking of an Air System to be treated. ►◄

b. An outer area for movement of two or more mobile de-icing / anti-icing equipment.

34. Where more than one de-icing / anti-icing pad is provided, consideration needs to be given to providing de-icing / anti-icing vehicle Movement Areas of adjacent pads that do not overlap but are exclusive for each pad. Consideration will also need to be given to bypassing of the area by other Air Systems with the clearances specified in Table 1.

35. The excess de-icing / anti-icing fluid running off an Air System poses the Risk of contamination of ground water in addition to affecting the pavement surface friction characteristics.

Civil Equivalence.

36. This Regulation is in line with ICAO Annex 14 Vol I para 3.15.

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