Eighth Meeting of the Aerodromes Operations and Planning Sub-Group (AOP/SG/8)

Tolerance in Physical Characteristics of Aerodrome WP/14

Malaysia Airports Holdings Berhad

Objectives

This paper presents tolerance studies and proposed deviation in the physical characteristics of aerodromes from the perspective of the aerodrome operator. Permissible tolerance in Annex 14 is crucial for maintaining consistent and safe aerodrome operations.

It provides aerodrome operators and civil aviation authorities with clear guidelines on acceptable deviations from standard dimensions without compromising both safety and operational efficiency.

As outlined in Annex 14, these characteristics encompass a spectrum of elements from runway markings to lighting systems which need to be complied at an aerodrome.

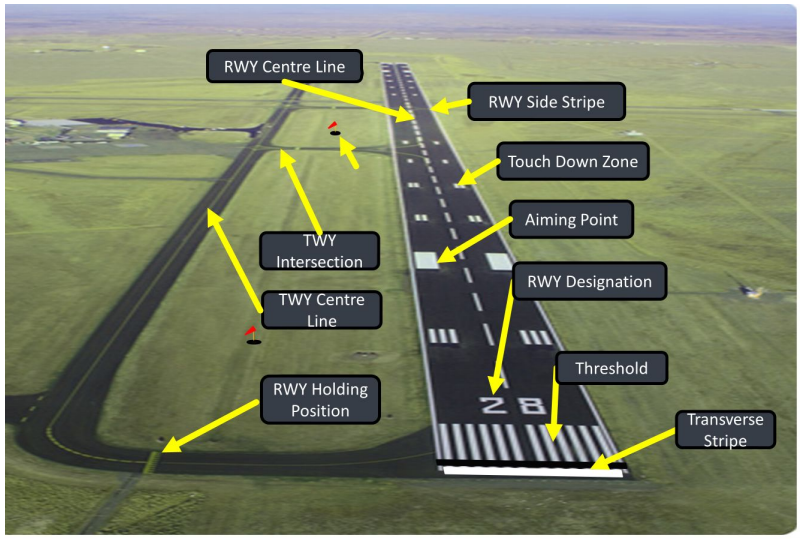
This paper explores permissible deviation/tolerance in the physical characteristics of aerodromes which required deliberation

1. Aerodrome Markings
2. Lightings - Runway Edge Light Configuration
3. WDI Circular Band - Dimensions
4. Signages - Location

Tolerance in Aerodrome Markings

2.1.1 Markings

Annex 14 Vol I Chapter 5 specifies the marking color, dimensions and spacing generally for all markings in the movement area which include Runway Centerline Marking, Threshold markings, Runway stripe markings, Taxi side stripe markings, taxiway centerline marking, Runway holding position markings and various apron markings,
However, due to construction works, application methods or wear and tear, some tolerance deviations in dimensions or spacing should be allowed if it is within the acceptable limit. The limit was not clearly defined in the ICAO documents.



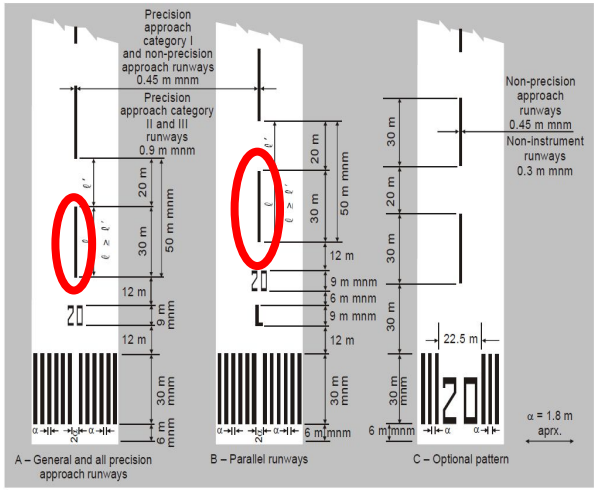


Figure 5-2. Runway designation, centre line and threshold markings

As for best practice comparison, FAA Advisory Circular AC 150/5370-10H, which outlines the Standard Specifications for Construction of Airports, Part 9, provides details regarding dimensions and spacing tolerances limit for runway and taxiway markings:

No.	Dimension and Spacing	Tolerance
1	36 inch (910 mm) or less	±1/2 inch (12 mm)
2	Greater than 36 inch to 6 feet (910 mm to 1.85 m)	±1 inch (25 mm)
3	Greater than 6 feet to 60 feet (1.85 m to 18.3 m)	±2 inch (50 mm)
4	Greater than 60 feet (18.3 m)	±3 inch (76 mm)

Reference: FAA Advisory Circular AC 150/5370-10H

2.1.2 Aeronautical Ground Light

Runway Edge Light

Annex 14 Volume I Para 5.3.9.6 stated that runway edge lights must be uniformly spaced, with intervals not exceeding 60 meters for instrument runways and 100 meters for non-instrument runways. However, irregularities in the spacing of runway edge lights can occur at airports globally due to construction, maintenance, or design.

As for benchmarking of practices, CAA UK CAP168 Licensing of Aerodromes Para 6.52 specifies that on runways of up to 50 m in width, the longitudinal spacing of the lights should be 60 m ± 6 m. Where the width of the runway exceeds 50 m, a closer longitudinal spacing as determined by the CAA may be required depending upon the nature of operations and other visual aids serving the runway.

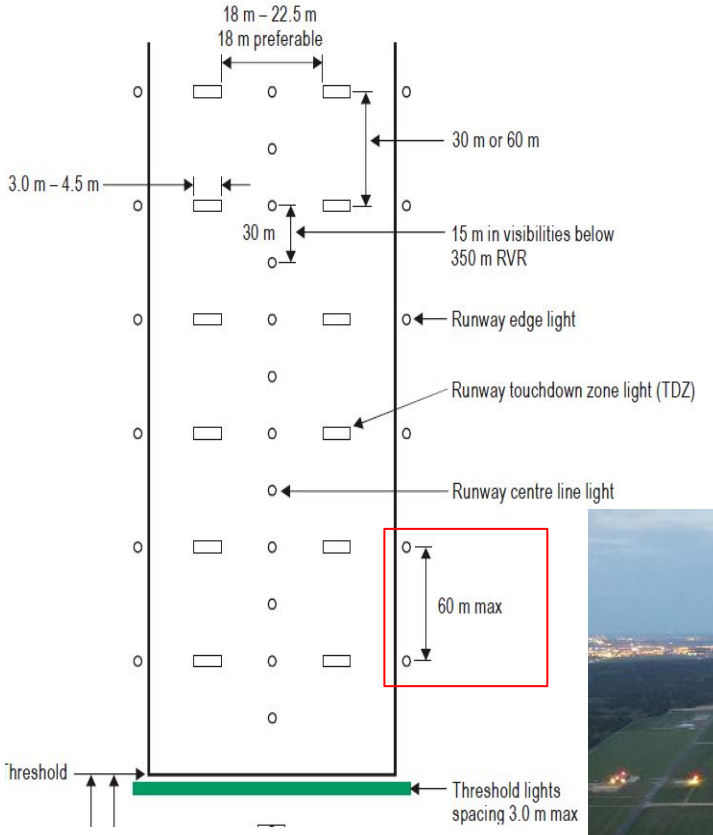
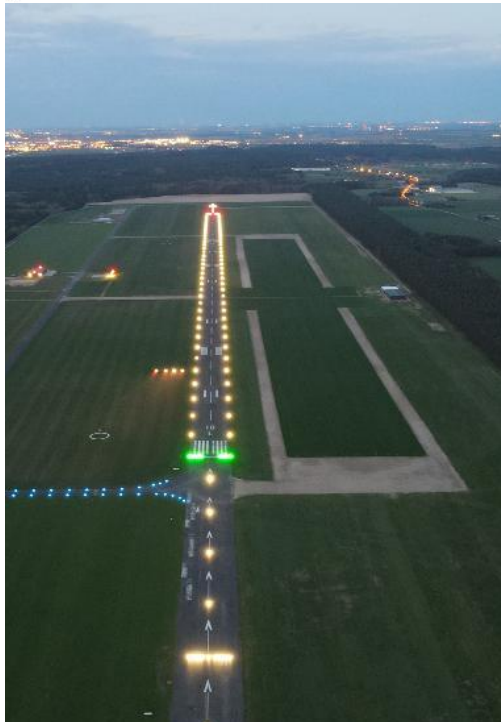


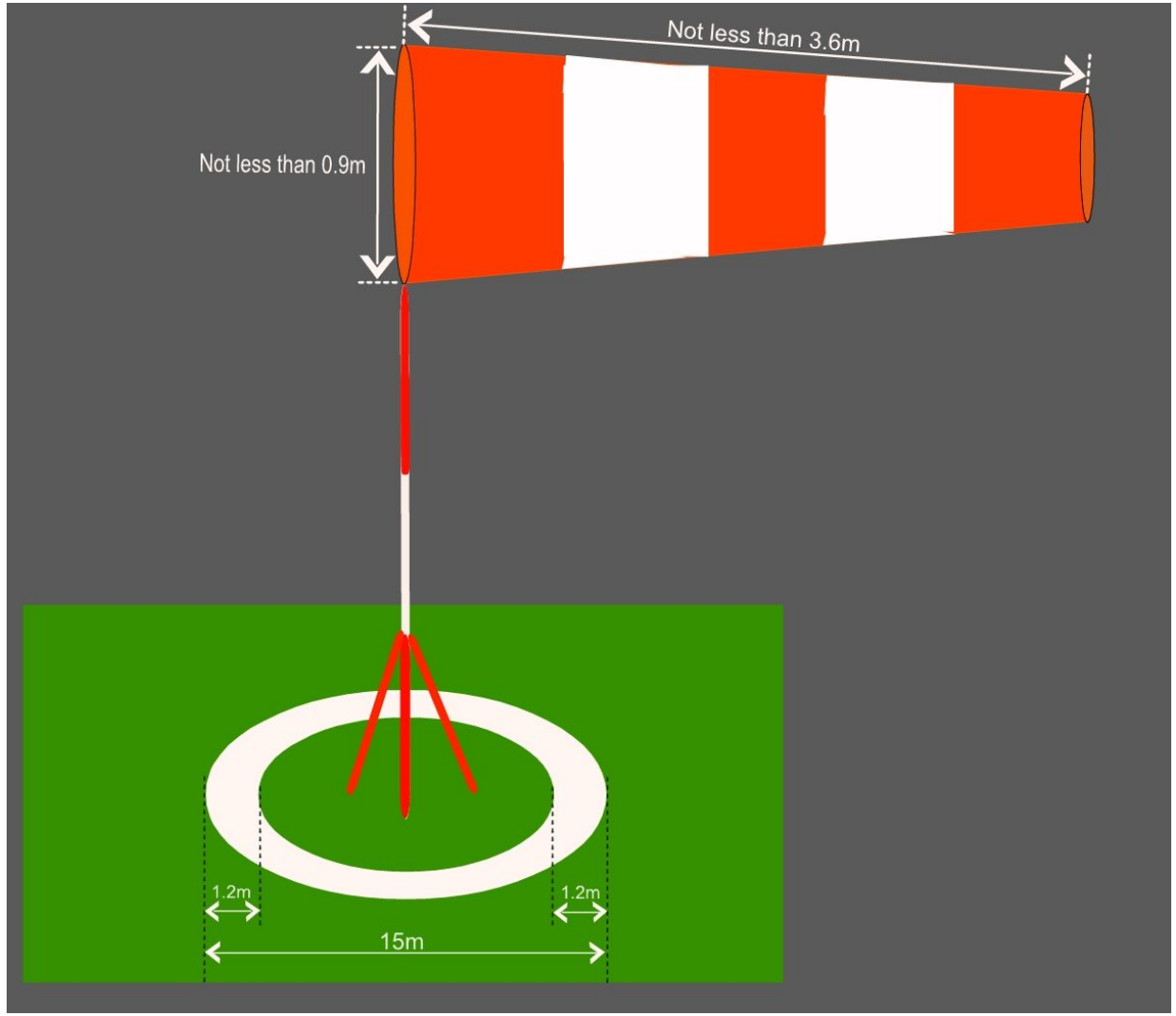
Figure 5-15



2.1.3 Wind Directional Indicator Circular Band

The circular band specified in Annex 14 Vol 1 Para 5.1.1.4 serves as a recommendation for indicating wind direction, advising that at least one indicator should feature a circular band measuring 15 m in diameter and 1.2 m in width. Variations of 3-5% larger than the prescribed standards are observed due to construction work or maintenance.

Further clarification is required regarding the acceptable tolerance for deviations from the prescribed standards.

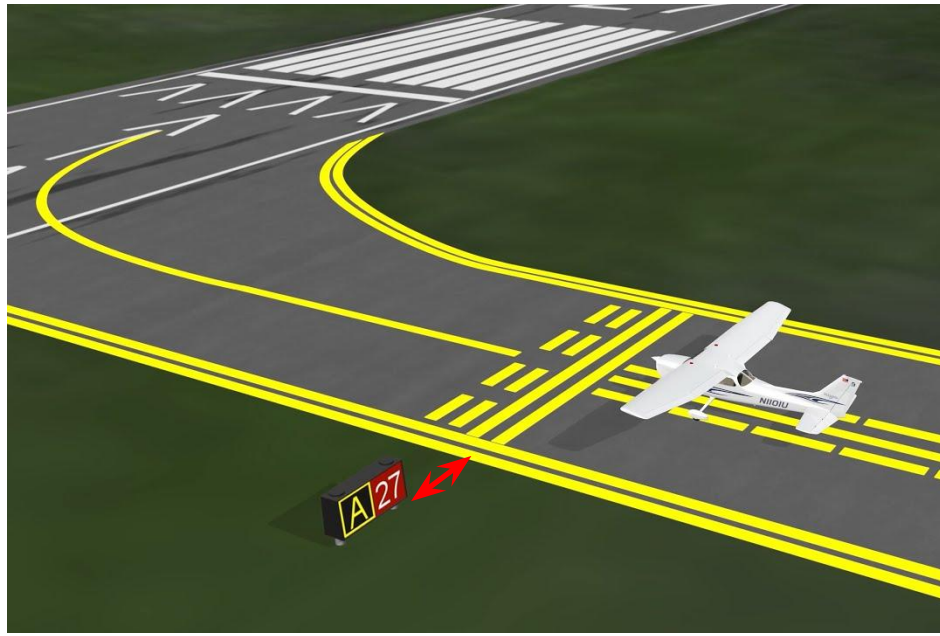


2.1.4 Location distances for taxiing guidance signs

Further clarification is necessary to define the term "pavement edge" as referenced in Annex 14 Vol 1 Table 5-5, which outlines the perpendicular distances from defined taxiway and runway edges to the near side of signs based on aerodrome reference codes. Specifically, it is essential to determine whether the pavement edge measurement begins from the outer side stripe markings or from the furthest point of the pavement's edge.

Table 5-5. Location distances for taxiing guidance signs including runway exit signs

Code number	Legend	Sign height (mm) Face (min.)	Sign height (mm) Installed (max.)	Perpendicular distance from defined taxiway pavement edge to near side of sign	Perpendicular distance from defined runway pavement edge to near side of sign
1 or 2	200	300	700	5–11 m	3–10 m
1 or 2	300	450	900	5–11 m	3–10 m
3 or 4	300	450	900	11–21 m	8–15 m
3 or 4	400	600	1 100	11–21 m	8–15 m



Action By the Meeting

The meeting is invited to:

a) deliberate the information contained in this paper; and

b) discuss any relevant matters as appropriate.

THANK YOU