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WP/09: Runway Visual Range (RVR) Location

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SUMMARY

- This working paper outlines the Challenges in Identifying Locations for **Runway Visual Range** (RVR) Instrument Installation at Indian Airports, particularly where RVR sensor placement conflicts with existing navigational aids like ILS, PAPI, and VASI.
- It proposes reviewing FAA practices for RVR site location and seeks ICAO clarification on the longitudinal and lateral placement of RVR sensors in such scenarios.
- The meeting is invited to review the information and discuss these issues.

INTRODUCTION

- Aviation Weather Observing Systems (AWOS), including RVR systems are essential for continuous monitoring of weather parameters i.e. wind direction, wind speed, air temperature, dew point, humidity, pressure, runway visual range (RVR), and cloud cover.
- The India Meteorological Department (IMD) has initiated the installation of integrated AWOS, including RVR systems, at 18 major airports in India.
- Installing the RVR instruments at most Indian airports poses a significant challenge in identifying suitable locations in the Touchdown zone **[about 300 meter along the runway from the threshold]** **in accordance with ICAO recommendations**

ICAO RECOMMENDATION OF RVR INSTRUMENTS

Annex 3 — Meteorological Service for International Air Navigation

Chapter 4. OBSERVING AND REPORTING OF METEOROLOGICAL ELEMENTS

4.3 Runway visual range

4.3.1 Siting

4.3.1.1 **Recommendation.**— *Runway visual range should be assessed at a height of approximately 2.5 m (7.5 ft) above the runway.*

4.3.1.2 **Recommendation.**— *Runway visual range should be assessed at a lateral distance from the runway centre line of not more than 120 m. The site for observations to be representative of the touchdown zone should be located about 300 m along the runway from the threshold. The sites for observations to be representative of the mid-point and stop-end of the runway should be located at a distance of 1 000 to 1 500 m along the runway from the threshold and at a distance of about 300 m from the other end of the runway. The exact position of these sites and, if necessary, additional sites should be decided after considering aeronautical, meteorological and climatological factors such as long runways, swamps and other fog-prone areas.*

DISCUSSION

- According to ICAO guidelines, *RVR observation sites should be positioned approximately* ***300 meters along the runway from the threshold*** *to ensure that the readings are representative of the touchdown zone.*
- However, this location often coincides with the placement of critical navigational aids such as:

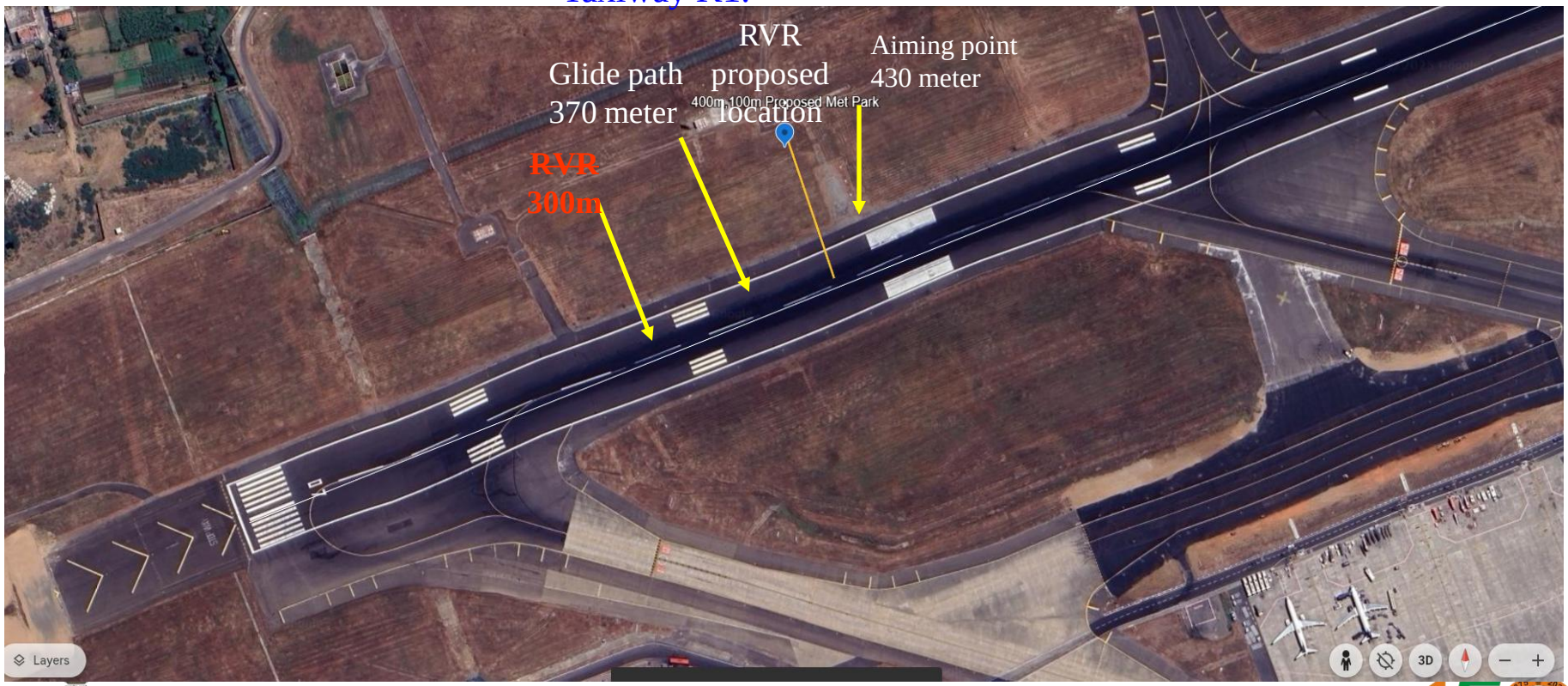
  a) The Instrument Landing System (ILS) Glide path (GP) antenna
  b) The Precision Approach Path Indicator (PAPI)
  c) The Visual Approach Slope Indicator (VASI)

- Given this overlap, **ICAO clarification is required on the longitudinal and lateral positioning of RVR visibility sensors at runway ends in such scenarios.**
- A key question is whether the RVR instrument can be installed behind the ILS Glideslope (GS) antenna, PAPI, or VASI without affecting the operational integrity of these systems along the runway from the threshold

RVR Location Identification at Chennai Airport (RWY07 -RWY25: 3.6 km)

- RVR Location as per ICAO [Annex 3] recommendations: **about 300m** from the RWY Threshold and 90 to 120 m from RWY Central Line(CL)

- **On the left side of Runway 07**, the Glide Path is located at 370 meters from the threshold. Therefore, as per ICAO criteria, a site around 300 meters for RVR cannot be selected, as it would interfere with the safe functioning of Glide Path at the Runway 07
- **On the right side of Runway 07**, a location for installing the Transmissometer **(RVR)** could not be identified in accordance with ICAO criteria due to the presence of the existing and proposed Taxiway K1.



TOUCHDOWN ZONE LENGTH

1) **Runways with a length between 1500m and 2400m**

a) Touchdown zone has a total length of 600 meters and

b) Aiming point markings are located about 300 meters from the threshold

2) **For Runways longer than 2400 meters**

a) Touchdown zone has a total length of 900 meters

b) Aiming point markings are located about 400 meters from the threshold.

According to ICAO Annex 3 (Meteorological Service for International Air Navigation), Chapter 4 mentions that:

"The site for runway visual range (RVR) observations intended to be representative of the touchdown zone should be located about 300 meters from the threshold along the runway."

FAA practices for RVR site location

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

National Policy

ORDER 6560.10C

Effective Date: 1/20/11

SUBJ: Runway Visual Range (RVR)

c. Longitudinal Location.

(1) Touchdown RVR VSs are located 0 to 2,500 ft (0 to 750 meters (m)) from the threshold, normally behind the instrument landing system (ILS) glideslope (GS) antenna, precision approach path indicator (PAPI), or Visual Approach Slope Indicator (VASI). See Figure 1, Runway Visual Range Visibility Sensor Longitudinal Locations.

(2) Rollout RVR VSs are located 0 to 2,500 ft (0 to 750 m) from the threshold at the rollout end of the runway, normally behind the ILS GS antenna, PAPI, or VASI.

(3) Midpoint RVR VSs are located within ±1,000 ft (300 m) of the center point of the runway.

(4) Runways longer than 12,000 ft may require four RVR VSs to adequately support low-visibility operations to both ends of the runway. Placement of RVR VSs will be in a manner that ensures the maximum continuous coverage. The touchdown RVR VS must be located 0 to 2,500 ft (0 to 750 m) from the threshold. The midfield RVR VSs will be located within 1,000 ft (300 m) of a point one-third of the way down the runway from the respective thresholds. RVR reporting for the "touchdown, mid, and rollout" will be referencing the first three sensors

d. Lateral Location. RVR VSs are installed adjacent to the instrument runway that they serve, in a location that does not conflict with an adjacent runway or taxiway.

(1) Single-point RVR VSs are located at least 400 ft (120 m) from the RCL. RVR VSs must also be sited outside any taxiway object-free areas. Coordinate locations with the responsible FAA Airports Regional Office or Airport District Office (ADO).

ACTION BY THE MEETING

The meeting is invited to:

a) Take note of the information presented in this paper.

b) Consider ICAO clarification on the placement of RVR visibility sensors in situations where their recommended location coincides with existing navigational aids.

c) Review the practices in Appendix A

THANK YOU