נספח ג' לחלק ב' בחוברת המכרז- המפרט הטכני

RVR Checklist

Compliance Status	Findings	Evidence					Requirements – adopted from ICAO SARP: Annex 3 & RVR Manual, Doc. 9328	Topic
		System	IAA SAT report	Maintenance	AD Met. procedures	IMS field test report		
							only those based on transmissometers are recommended for use in assessing RVR.	1. Measurement method
							5.7.1 The accuracy should be compatible with the requirements to report RVR in given increments.The current recommendations for reporting increments are stated in Annex 3, Appendix 3, 4.3.6.1.	2. Measurement accuracy
							11.4.2 Annex 3, Appendix 3, 4.3.6.1, specifies that a reporting step of 25 m shall be used up to 400 m RVR, a reporting step of 50 m shall be used between 400 and 800 m RVR and a reporting step of 100 m shall be used for values of RVR above 800 m. Table 11-3 displays	

							the ranges and resolutions of RVR information included in meteorological reports.	
							9.4.2 Expressing the performance of an instrument in terms of accuracy with a single number (for example ±10 per cent) does not provide much information about the real performance of the instrument. The question may be posed whether the 10 per cent is a standard deviation of error, a mean error, a maximum median error, a repeatability error or a root mean square (rms) error. The numerous past comparisons of instruments (and the test method described here) have all used the same type of data analysis, based on box plots for different classes (ranges) of MOR. These boxes depict the distribution of the ratio between the MOR measured by the instrument and that used as the reference: median, 25 per cent and 75 per cent limits (50 per cent interval), 5 per cent and 95 per cent limits (90 per cent interval) and sometimes more. Therefore, the performance of an instrument is better represented by the distribution ratio (e.g. median value) and the intervals containing a given percentage (e.g. 50, 90 and 99 per cent) of the measurements.	
							7.2.4 A factor that must be taken into consideration when working with transmissometers is the contamination of optical surfaces. This effect may be minimized by hoods and by blown air. However, it is important to ensure that hoods and airflow systems do not interfere with the measurement path (see 7.1.6 c)). In systems where the contamination rate can be accurately determined, compensation for contamination could be applied.	3. Detection & alert of optical surface contaminations
							7.2.5 The high overall accuracy required of transmissometers demands a light source of constant intensity or monitoring the light intensity and correcting the measurement for any intensity variations. In addition, the transmissometer, as a system, should have means of calibration and should provide automatic adjustments for long- and short-term drifts.	4. Maintaining Stability of the light source

							7.3.1 The linearity of the transmissometers may be initially established by means of calibration against reference filters.	5. Calibration set and procedures to validate its accuracy
							5.4.1 It is therefore recommended that RVR should be assessed at a height of approximately 2.5 m (7.5 ft) (Annex 3, Appendix 3, 4.3.1.1, refers).	6. Installation height
							9.1. a) *runway lights* must not shine directly into the sensor and influence the measurement; and b) *direct sunlight* into the sensor must be avoided. A single background luminance sensor may be used on aerodromes, even if equipped with several instruments. However, to enhance the representativeness of measurements and system reliability (i.e. eliminating single points of failure), the use of two or more sensors may be preferable. 7.1.8 Background light will add to the source light arriving at the receiver, and to avoid errors due to this, it is normal to either modulate the transmissometer light source or to otherwise eliminate the unwanted background light. Despite these precautions, the linearity of the photo detector can still be affected by very high ambient illuminations such as direct or specularly reflected sunlight which will cause errors in measurement. To prevent direct sunlight from reaching the receiving photo detector, it is common practice for the transmissometer to be tilted downwards so that the centre line of the measurement beam is depressed by 0.5 degrees with respect to the horizontal.	7. Installation of background luminance sensor
							9.1.7.1 The computer calculates RVR by Allard's and Koschmieder's laws; whichever value is the greater is taken to be the reported RVR.	8. RVR calculation algorithms

							Computed values of RVR should be rounded down to the nearest lower step in the reporting scale.	

							6.1.4 due to a desire to prevent non-conservative RVR values (i.e. those higher than actual), RVR systems are intentionally biased in a conservative direction. This results in an inherent under-reporting of RVR. Ways in which States bias their respective systems are listed below: a) most round down the estimated value to the nearest lower step in the reporting scale, as recommended by Annex 3, Appendix 3, 4.3.6.1; 11.4.2 Any observed RVR value that does not fit the reporting scale in use should be rounded down to the nearest lower reporting step in the scale.	9. Rounding
							9.1.7.4 Basic data have to be smoothed to overcome noise and unimportant fluctuations, before they can be processed to obtain RVR. An averaging period of one minute, as recommended in Annex 3, Appendix 3, 4.3.4, should be used for local reports. An averaging period of ten minutes should be used for METAR and SPECI 11.5.3 In local meteorological reports, an averaging period of one minute should be used. In some cases, simple averaging is carried out every minute by the RVR computer; in others, the most recent one minute running mean value of RVR is displayed in real time. In METAR/SPECI, the RVR reported should be the mean value during the ten-minute period immediately preceding the observation. If a marked discontinuity in RVR values occurs during the ten-minute period, only those values occurring after the discontinuity should be used to obtain the mean values. *Note. — A marked discontinuity is considered to have occurred when there is an abrupt and sustained change in RVR, lasting at least two minutes, which reaches or passes through the RVR criteria for the issuance of SPECI (i.e. 150, 350, 600 or 800 m).*	10. Averaging

							11.6.1 Additional information concerning the variations of RVR is included in METAR/SPECI. All these variations refer to the ten-minute period immediately preceding the observation. The inclusion of this information requires that the instrumented RVR system calculates and stores the RVR values as follows: a) ten-minute period immediately preceding the observation; b) two five-minute periods preceding the observation; and c) ten one-minute periods preceding the observation.	11. RVR averaging needed for tendency calculations
							11.6.2 If the RVR values (during the ten-minute period) have shown a distinct tendency, i.e. the mean during the first five minutes varies by 100 m or more from the mean during the second five minutes of the period, this should be indicated by the abbreviation “U” for an upward tendency, and the abbreviation “D” for a downward tendency. If there is no distinct tendency during the ten-minute period, this should be indicated by using the abbreviation “N”	12. RVR tendency
							11.6.3 If any one-minute RVR values (during the ten-minute period preceding the observation) vary from the mean value by more than 50 m or more than 20 per cent of the mean value, whichever is greater, the one-minute mean minimum and the one-minute mean maximum values should be reported instead of the ten-minute mean value 11.6.4 If a marked discontinuity in RVR values occurs during the ten-minute period, only those values occurring after the discontinuity should be used to obtain the variations. (For the definition of a marked discontinuity, see Note under 11.5.3).	13. detection of RVR variability

								14. Installation according to manufacturer guidelines
								15. Maintenance policy and routine calibration procedures
							a. frangible mast	16. General requirements for any AD installation
							b. location and installation of the mast secure and appropriate	
							c. groundings and proper electricity feed	
							d. lightning & electric surge protection	
							e. UPS or electricity backup	
							f. automatic recovery after electricity failure	
							g. connection to other AD systems does not interfere with their proper work	
							h. time synchronization of system components and with AD clocks	
							i. Automatic archiving of raw data and computed/displayed data	