AC NO: 97-1A
DATE: 9/28/77

ADVISORY CIRCULAR

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

SUBJECT: RUNWAY VISUAL RANGE (RVR)

1. PURPOSE. This advisory circular is issued to describe RVR measuring equipment and its operating use.

2. CANCELLATION. AC 97-1, dated November 4, 1976, is canceled.

3. DEFINITIONS.

a. Prevailing Visibility. The greatest horizontal visibility equaled or exceeded throughout at least half the horizon circle which need not necessarily be continuous.

b. Runway Visual Range (RVR). An instrumentally derived value based on standard calibrations that represents the horizontal distance a pilot will see down the runway from the approach end. It is based on the sighting of either high intensity runway lights or on the visual contrast of other targets whichever yields the greater visual range. RVR, in contrast to prevailing or runway visibility, is based on what a pilot in a moving aircraft should see looking down the runway. RVR is horizontal visual range, not slant visual range and is reported in hundreds of feet.

c. Touchdown RVR. The RVR visibility readout values obtained from RVR equipment serving the runway touchdown zone.

d. Mid-RVR. The RVR readout values obtained from RVR equipment located midfield of the runway.

e. Rollout RVR. The RVR readout values obtained from RVR equipment located nearest the rollout end of the runway.

f. Designated RVR Runway. The runway officially designated by the FAA for reporting RVR values on the hourly weather reports. This will normally be the runway with the lowest authorized landing minima.

Initiated by: AFS-224

The hourly RVR report is issued for flight planning purposes only, and is not necessarily associated with traffic flow requirements during the reporting period.

4. GENERAL INFORMATION. All-weather instrument approach operations are divided into categories corresponding to different standards of instrumentation in the aircraft and on the ground. For each category, there is a minimum value of specified runway visual range (RVR) below which operations are not permitted. The following table identifies the categories and LOWEST minima associated with each:

Category	Visibility (RVR)
Nonprecision	2400 feet
Category I	1800 feet
Category II	1200 feet
Category IIIa	700 feet
Category IIIb	150 feet
Category IIIc	0

5. SYSTEM DESCRIPTION.

a. A full RVR system consists of the following:

(1) Transmissometer projector and related items.

(2) Transmissometer receiver (detector) and related items.

(3) Analogue recorder.

(4) Signal data converter and related items.

(5) Remote digital or remote display programmer.

b. The transmissometer projector and receiver are mounted on towers either 250 or 500 feet apart. A known intensity of light is emitted from the projector and is measured by the receiver. Any obscuring matter such as rain, snow, dust, fog, haze, or smoke reduces the light intensity arriving at the receiver. The resultant intensity measurement is then converted to an RVR value by the signal data converter. These values are displayed by readout equipment in the associated air traffic facility and updated approximately once every minute for controller issuance to pilots.

c. The signal data converter receives information on the high intensity runway edge light setting in use (step 3, 4, or 5), transmission values from the transmissometer, and the sensing of day or night conditions. From the three data sources, the system will compute appropriate RVR values. Due to variable conditions, the reported RVR values may deviate somewhat from the true observed visual range due to slant range considerations, brief time delays between the observed RVR conditions and the time they are transmitted

to the pilot, nonhomogeneous obscurations, and rapidly changing visibility conditions.

d. An RVR transmissometer established on a 500-foot baseline provides digital readouts to a minimum of 1000 feet. A system established on 250-foot baseline provides digital readouts to a minimum of 600 feet, which are displayed in 200-foot increments to 3000 feet and in 500-foot increments from 3000 feet to a maximum value of 6000 feet.

e. RVR values for Category IIIa operations extend down to 700 feet RVR; however, only 600 and 800 feet are reportable RVR increments. The 800 RVR reportable value covers a range of 701 feet to 900 feet and is therefore a valid minimum indication for Category IIIa operations.

6. OPERATIONAL CRITERIA. Operational use of RVR is predicated on the normal operation of all system components except that RVR authorization will not be denied by an inoperative analogue recorder. RVR values are disseminated in accordance with Air Traffic Control procedures and when requested by the pilot. Pilots are responsible for compliance with minima prescribed for their class of operation in appropriate Federal Aviation Regulations (FAR) and/or operations specifications.

a. Arriving Aircraft.

(1) Category I weather conditions (1800 RVR or greater).

(a) Touchdown RVR - required (controlling).

(b) Mid/rollout RVR, where installed (advisory).

NOTE: Minima below 2400 feet will not be authorized unless touchdown zone (TDZ) and centerline lighting (C/L) are available.

(2) Category II weather conditions (1200 RVR up to but not including 1800 RVR).

(a) Touchdown RVR - required (controlling).

* (b) Mid-RVR - not required for Category II operations but is an FAA system requirement for runways in excess of 8000 feet. Where installed, provides advisory visibility information to pilots.

(c) Rollout RVR - required for operations when RVR is less than 1600 to provide advisory information to pilots. The mid-RVR transmissometer, if installed, may be substituted for an inoperative rollout transmissometer.

(3) Category IIIa weather conditions (below RVR 1200 to RVR 700).

(a) Three transmissometers are required unless it can be shown that two transmissometers (touchdown and rollout) can meet the operational needs for a particular airport. Where three transmissometers are *

*installed, touchdown and mid are controlling and rollout provides advisory visibility information to pilots. If a runway requires only two transmissometers, touchdown and rollout are controlling. *

b. Departing Aircraft. For operations conducted under FAR's 121, 123, 129 and 135, takeoff minima below 1800 RVR are authorized only for the individual operators through approved operations specifications. The following values apply:

(1) Weather conditions 1600 RVR or greater: Touchdown RVR (controlling).

(2) Weather Conditions below 1600 RVR to 600 RVR.

* (a) 500-foot baseline transmissometers installed--touchdown RVR 1200 and rollout RVR 1000, both required and controlling.

(b) 250-foot baseline transmissometers installed--touchdown RVR 700, mid-RVR 700 (if installed), and rollout RVR 600, all controlling.

NOTE 1: Where only two transmissometers are installed, the touchdown and rollout RVRs are required and controlling. If three transmissometers are installed, the failure of any one transmissometer will not affect operations provided the remaining two RVR values are at or above appropriate minima stated in 6.b(2) above.

NOTE 2: Existing RVR equipment lower value readouts are in increments of 200 feet; i.e., 600, 800, 1000, etc. The lowest actual value display capability of a 250-foot baseline system is RVR 600; for a 500-foot baseline system, it is RVR 1000. Thus, 250-foot baseline systems are required for establishment of minima below 1000. A reportable value of RVR 800 covers a range from 701 to 900 and is the lowest displayed value that can be used for an RVR 700 minimum.

NOTE 3: Minima below 1600 RVR will not be authorized unless the runways are equipped with C/L lights and two operative transmissometers.

c. Visibility Measurements. Visibility measurements at airports are presently reported in terms of statute miles or fractions thereof and, in case of RVR, in terms of feet. RVR equipment is not capable in all cases of reporting the precise increment of feet equal to the usually reported fractions of a statute mile. RVR reports, when given for a particular runway, are controlling for all takeoffs and landings on, and approaches to, the runway. In many nations RVR values are reported only in meters. As the RVR minimums applicable to United States air carriers conducting operations at foreign airports are prescribed in terms of feet, a substitution table is contained in the standard operations specifications.

d. RVR Reporting. Ten-minute maximum and minimum RVR values for the designated RVR runway are reported in the remarks section of the aviation weather report when the prevailing visibility is less than one mile and/or the RVR is 6000 feet or less. Air traffic control towers report RVR when the prevailing visibility is 1½ miles or less and/or the RVR is 6000 feet or less.

J. A. FERRARESE
Acting Director
Flight Standards Service