

### Subpart J—Microwave Landing System (MLS)

SOURCE: Docket No. 20669, 51 FR 33177, Sept. 18, 1986, unless otherwise noted.

#### § 171.301 Scope.

This subpart sets forth minimum requirements for the approval, installation, operation and maintenance of non-Federal Microwave Landing System (MLS) facilities that provide the basis for instrument flight rules (IFR) and air traffic control procedures.

#### § 171.303 Definitions.

As used in this subpart:

*Auxiliary data* means data transmitted in addition to basic data that provide ground equipment siting information for use in refining airborne position calculations and other supplementary information.

*Basic data* means data transmitted by the ground equipment that are associated directly with the operation of the landing guidance system.

*Beam center* means the midpoint between the -3 dB points on the leading and trailing edges of the scanning beam main lobe.

*Beamwidth* means the width of the scanning beam main lobe measured at the -3 dB points and defined in angular units on the boresight, in the horizontal plane for the azimuth function and in the vertical plane for the elevation function.

*Clearance guidance sector* means the volume of airspace, inside the coverage sector, within which the azimuth guidance information provided is not proportional to the angular displacement of the aircraft, but is a constant fly-left or fly-right indication of the direction relative to the approach course the aircraft should proceed in order to enter the proportional guidance sector.

*Control Motion Noise (CMN)* means those fluctuations in the guidance which affect aircraft attitude, control surface motion, column motion, and wheel motion. Control motion noise is evaluated by filtering the flight error record with a band-pass filter which has corner frequencies at 0.3 radian/sec and 10 radians/sec for azimuth data and 0.5 radian/sec and 10 radians/sec for elevation data.

*Data rate* means the average number of times per second that transmissions occur for a given function.

*Differential Phase Shift Keying (DPSK)* means differential phase modulation of the radio frequency carrier with relative phase states of 0 degree or 180 degrees.

*Failure* means the inability of an item to perform within previously specified limits.

*Guard time* means an unused period of time provided in the transmitted signal format to allow for equipment tolerances.

*Integrity* means that quality which relates to the trust which can be placed in the correctness of the information supplied by the facility.

*Mean corrective time* means the average time required to correct an equipment failure over a given period, after a service technician reaches the facility.

*Mean course error* means the mean value of the azimuth error along a specified radial of the azimuth function.

*Mean glide path error* means the mean value of the elevation error along a specified glidepath of the elevation function.

*Mean-time-between-failures (MTBF)* means the average time between equipment failures over a given period.

*Microwave Landing System (MLS)* means the MLS selected by ICAO for international standardization.

*Minimum glidepath* means the lowest angle of descent along the zero degree azimuth that is consistent with published approach procedures and obstacle clearance criteria.

*MLS Approach Reference Datum* is a point at a specified height located vertically above the intersection of the runway centerline and the threshold.

*MLS back azimuth reference datum* means a point 15 meters (50 feet) above the runway centerline at the runway midpoint.

*MLS datum point* means a point defined by the intersection of the runway centerline with a vertical plane perpendicular to the centerline and passing through the elevation antenna phase center.

*Out of coverage indication (OCI)* means a signal radiated into areas outside the

intended coverage sector, where required, to specifically prevent invalid removal of an airborne warning indication in the presence of misleading guidance information.

*Path Following Error (PFE)* means the guidance perturbations which could cause aircraft displacement from the desired course or glidepath. It is composed of the path following noise and of the mean course error in the case of azimuth functions, or the mean glidepath error in the case of elevation functions. Path following errors are evaluated by filtering the flight error record with a second order low pass filter which has a corner frequency at 0.5 radian/sec for azimuth data or 1.5 radians/sec for elevation data.

*Path following noise (PFN)* means that portion of the guidance signal error which could cause displacement from the actual mean course line or mean glidepath as appropriate.

*Split-site ground station* means the type of ground station in which the azimuth portion of the ground station is located near the stop end of the runway, and the elevation portion is located near the approach end.

*Time division multiplex (TDM)* means that each function is transmitted on the same frequency in time sequence, with a distinct preamble preceding each function transmission.

#### § 171.305 Requests for IFR procedure.

(a) Each person who requests an IFR procedure based on an MLS facility which that person owns must submit the following information with that request:

(1) A description of the facility and evidence that the equipment meets the performance requirements of §§ 171.309, 171.311, 171.313, 171.315, 171.317, 171.319, and 171.321 and is fabricated and installed in accordance with § 171.323.

(2) A proposed procedure for operating the facility.

(3) A proposed maintenance organization and a maintenance manual that meets the requirements of § 171.325.

(4) A statement of intent to meet the requirements of this subpart.

(5) A showing that the facility has an acceptable level of operational reliability and an acceptable standard of performance. Previous equivalent oper-

ational experience with a facility with identical design and operational characteristics will be considered in showing compliance with this subparagraph.

(b) FAA inspects and evaluates the MLS facility; it advises the owner of the results, and of any required changes in the MLS facility or in the maintenance manual or maintenance organization. The owner must then correct the deficiencies, if any, and operate the MLS facility for an in-service evaluation by the FAA.

#### § 171.307 Minimum requirements for approval.

(a) The following are the minimum requirements that must be met before the FAA approves an IFR procedure for a non-Federal MLS facility:

(1) The performance of the MLS facility, as determined by flight and ground inspection conducted by the FAA, must meet the requirements of §§ 171.309, 171.311, 171.313, 171.315, 171.317, 171.319, and 171.321.

(2) The fabrication and installation of the equipment must meet the requirements of § 171.323.

(3) The owner must agree to operate and maintain the MLS facility in accordance with § 171.325.

(4) The owner must agree to furnish operational records as set forth in § 171.327 and agree to allow the FAA to inspect the facility and its operation whenever necessary.

(5) The owner must assure the FAA that he will not withdraw the MLS facility from service without the permission of the FAA.

(6) The owner must bear all costs of meeting the requirements of this section and of any flight or ground inspection made before the MLS facility is commissioned.

(b) [Reserved]

#### § 171.309 General requirements.

The MLS is a precision approach and landing guidance system which provides position information and various ground-to-air data. The position information is provided in a wide coverage sector and is determined by an azimuth angle measurement, an elevation angle measurement and a range (distance) measurement.