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ADVISORY CIRCULAR

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION

SUBJECT: OMEGA AND OMEGA/VLF NAVIGATION SYSTEM INSTALLATION APPROVAL
IN THE CONTERMINOUS UNITED STATES AND ALASKA

1. PURPOSE. This circular presents the criteria and an acceptable means of compliance, but not the only means, for the installation approval of Omega and Omega/VLF Navigation Airborne Equipment as a means of VFR/IFR RNAV en route navigation within the conterminous United States and Alaska.
 2. REFERENCE. Federal Aviation Regulations 23, 25, 27, 29, 91.33(d); AC 90-45A.
 3. DEFINITIONS. For purposes of this advisory circular:
 - a. Omega: The Omega ground transmitter navigation network, directed by U.S. Coast Guard personnel under the sponsorship (until 1981) of the U.S. Navy, and/or a related airborne receiver.
 - b. VLF: The very low frequency communication stations operated by the U.S. Navy and/or an airborne receiver using these stations for purposes of navigation.
 - c. Omega/VLF: An airborne receiver(s) combination capable of utilizing either the Omega network or the Navy VLF communication stations for the purpose of navigation.
 4. CRITERIA FOR INSTALLATION APPROVAL. The installation of airborne Omega or Omega/VLF systems may be approved as a means for VFR/IFR RNAV en route navigation within the conterminous United States and Alaska through Type Certification (TC) or Supplemental Type Certification (STC) when:
 - a. A TC or STC evaluation of the system installation has been performed, which is to include the location and installation of the antenna and preparation of the aircraft for reducing static noise to a minimum, e.g., bonding and RFI/EMI antenna location evaluation.
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b. The Omega or Omega/VLF system includes:

(1) Annunciation to alert the flightcrew that the system's navigation function is unreliable due to received signal not having:

(a) Adequate range and geometry relative to aircraft position and other stations received,

(b) Adequate signal-to-noise ratio and

(c) Signal quality sufficient to support position fixing, considering phase instabilities arising from propagation and transmission irregularities and, for VLF system portion, frequency shift keying or minimal shift keying.

(2) No VLF-only receivers.

c. A flight test of the system has been performed to evaluate:

(1) Proper functioning of the system.

(2) Proper functioning of the other equipment interfaced with the system, such as air data, magnetic compass, flight director, autopilot, etc.

(3) The en route accuracy for the initial TC or STC installation should be $1\frac{1}{2}$ NM crosstrack/ $1\frac{1}{2}$ NM longtrack with two sigma value. Manual or automatic updating may be considered to meet this accuracy.

5. OPERATIONAL LIMITATIONS. This advisory circular is guidance material applicable to navigation equipment installation approval as a means for VFR/IFR en route navigation in the conterminous United States and Alaska and should not be construed as providing a basis for:

a. Authorization to perform VFR/IFR flight into any area for which such operation is not authorized based only on installed equipment required by paragraph 5.d., without Omega or Omega/VLF, (REF 91.33d(2)).

b. Using Omega or Omega/VLF as a sole means of navigation.

c. Using Omega or Omega/VLF as an FAA-approved means of navigation for overwater flights beyond the range of approved ground navigation facilities.

NOTE: The aircraft should have navigation equipment installed and operating appropriate to the ground facilities to be used (not including Omega or Omega/VLF systems). When the route to be flown is an RNAV route, another RNAV system (not including the Omega or Omega/VLF system) or VOR and DME are required to be installed and operating.

6. AIRPLANE FLIGHT MANUAL MATERIAL. The following is recommended for the airplane flight manual (AFM) for en route VFR/IFR RNAV navigation approvals.

a. Position information should be checked for reasonableness (confidence check) of the Omega or Omega/VLF equipment as a means of navigation and under the following conditions:

(1) Prior to compulsory reporting points during IFR operation when not under radar surveillance and control.

(2) At or prior to arrival at each en route waypoint during RNAV operation along designated and established RNAV routes.


b. Omega or Omega/VLF equipment should be updated when a cross-check with other onboard approved navigation equipment reveals an error greater than 2 NM alongtrack or crosstrack.

c. Omega or Omega/VLF equipment should not be used as a means of navigation when the equipment is operating in the dead reckoning mode for any extended period.

d. Following a period of inadvertent Omega or Omega/VLF dead reckoning mode of operation, a position fix should be verified by visually sighting a ground reference point if feasible, and/or by using other navigation equipment such as VOR, DME, TACAN, or a combination of such equipment.

e. Omega or Omega/VLF equipment may only be used as a means for VFR/IFR en route area navigation but not sole means of navigation. The system(s) is not to be used for navigation in terminal areas or during departures from or approaches to airports or into valleys, e.g., between peaks in mountainous terrain.

f. Other limitations deemed appropriate in meeting the guidance of this advisory circular.


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