LPV Approaches

What Part 91 Pilots Need to Do to Prepare Before Accepting an LPV Approach

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There has been a recent upsurge of incidents related to the air traffic control (ATC) at airports in Europe, in which ATC has asked US FAA Part 91 general aviation (Part 91) pilots whether they are capable and authorized to accept and execute RNAV LPV approaches. The use of the LPV approach has increased notably around the world, where the most important airports of principal cities have implemented it. In the United States, 1690 airports have the capacity to proceed with LPV approaches, and approximately 3500 procedures have been recorded. Because FAA Advisory Circular 90-107 training and approval requirements do not apply to Part 91 general aviation operators, however, most Part 91 flight crews have had no formal training to recognize operational approval requirements for Part 91 operators. Therefore, ATC questioning pilots causes confusion during a critical phase of the flight, thereby increasing the likelihood of pilot incidents and endangering the public.

GNE during cruise flight of more than 25NM off-center while operating at high altitudes have little probability of terrain closure. The high probability of terrain closure on departures and approaches, on the other hand, requires far greater accuracy, namely .3 of a 1 NM displacement on Approach and Landings. The obvious need for this level of accuracy exemplifies the importance of the pilot's clear frame of mind without being distracted by unexpected inquiries for which the pilot is not likely to have a ready answer.

The FAA and the ATC recognize that a significant proportion of navigational errors, GNE, and RNAV-1 departure and arrival incidents are caused by Part 91 general aviation pilots. The FAA mandates that all Part 91 flight crews must pass a training course on P-RNAV and receive an FAA Letter of Authorization (LOA) prior to operating in P-RNAV airspace. The FAA also mandates that all aircraft operating in the Europe P-RNAV/B-RNAV meet all the navigation requirements and communication equipment. For LPV approaches, on the other hand, neither specific training nor an LOA is required for Part 91 operations.

In many cases pilots who accept clearance from ATC to fly P-RNAV departures in Europe and RNAV departures in the U.S. are not familiar with the aircraft navigation equipment capabilities or the proper procedures to use the navigation equipment to properly execute an RNAV 1 departure. Yet the FAA specifically excludes Part 91 pilots from requirements to receive training to execute an LPV approach to CAT 1 minimum. See FAA AC 90-107, Section 9(a) bolded text stating, "No special crew qualification, other than those necessary for RNAV and ILS instrument approaches, are currently specified for WAAS operations." Even if Part 91 operators attempt to create programs based upon these items, they have no opportunity for verification from the FAA that their programs are sufficient.

This means that it is up to Part 91 pilots to ensure they are aware of their capabilities and requirements before accepting an LPV approach.

What Do Pilots Need to Know

AC 90-107 Section 9(a) states that pilots should be familiar with the following items prior to conducting LPV approaches:

1. The information in AC 90-107
2. The meaning and proper use of aircraft equipment/navigation suffixes.
3. Procedure characteristics as determined from chart depiction and textual description
4. Use of navigation system including procedure selection and ILS look-alike principle:
    a. Methods to select approaches (i.e., procedure name menus or channel number) and confirming correct approach ID/reference path identifier (RPI).
    b. No manual change of waypoints included in the approach.
    c. Flying the procedure.
5. Distinction between ILS flight guidance cues and LPV guidance cues.
6. Required navigation equipment for approach operations using WAAS or any operational restrictions/limitations, as outlined in the AFM, RFM, AFMS, OpSpec, or LOA.
7. Levels of automation, mode annunciations, changes alerts, interactions reversions, and degradations.
8. Functional integration with other aircraft systems.
9. Set-up and interpretation of electronic displays and symbols.
10. Use of LNAV mode(s).
11. Use of VNAV mode(s).
12. Understanding the performance requirement and the fail-down capabilities of the system.
13. ATC procedures/phraseology.
14. Functionality of vector to final mode.
15. Flight crew contingency procedures for a loss of GPS and/or WAAS capability to emphasize maintaining separation from terrain, obstacles and other aircraft.
16. Impact of aircraft integrations that incorporate both (WAAS) LPV/LP capability and baro-VNAV capability.
17. Alternate airport requirements and selection of an alternate airport.

Operators should develop a program and make sure pilots are trained in the following areas before being allowed to accept an LPV approach:

1. **Operational Source Documents.** Ensure that the operator and pilots know of and reference the appropriate source documents for the operation, including:
    a. Instrument Flying Handbook
    b. FAA Instrument Procedures Handbook
    c. FAA AIM
    d. ICAO DOC 9613 PBN Manual.
2. **Pilot Training.** Ensure the crew has proper training regarding:
    a. Whether the FMS' WAAS Avionics are capable of supporting all lines of minima; and
    b. The use of avionics to comply with LPV approaches in accordance with the manufacturer operations manual.
3. **Development of Contingency Procedures.** Ensure that operators and pilots react safely following the law of GPS and WAAS capability.

AeroSpatialle and the Bentz Law Firm are working together to encourage the FAA to develop a method to ensure that all pilots receive appropriate training and certification before accepting an LPV approach. In the meantime, pilots should be aware of the issue and prepare accordingly in pre-flight procedures. AeroSpatialle and the Bentz Law Firm, P.A. work with operators to create the necessary procedures and pilot training. Please contact us if you are interested in learning more about this issue and what you can do to prepare.