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**Docket No. DOT-OST-2015-0053**  
**Response to DOT Request for Response regarding**  
**Enhanced LORAN complimentary PNT**

**APPLICATIONS**

RACCA's membership includes more than 50 FAA-certificated operators flying approximately 1,000 aircraft chiefly engaged in delivery of high-priority small package freight domestically and internationally, for integrators such as DHL, FedEx, and UPS. These flights often operate between major hub airports and smaller communities where traffic does not support use of large jet freighters. Due to weather conditions, these aircraft often must operate IFR and utilize instrument approaches at the destinations.

As to the "Timing" element of PNT, RACCA requirements would only relate to inherent features of GPS.

**COMPLIMENTARY PNT REQUIREMENTS**

Enhanced LORAN would only be useful if it could provide enroute navigation and instrument approach capability at least as good as VOR/DME navigation in the current NAS, including approach minima equal to current VOR-DME approaches, at a price that could be justified by RACCA members in view of the likelihood of need for its use.

**COVERAGE AREA**

In order to have sufficient utility to warrant installation of enhanced LORAN capability in member airplanes, the complimentary PNT capability would need to be able to serve a majority of the stations on members' current route structure – in a quick view, airports at communities where the integrators mentioned above currently provide next day air shipping.

**WILLINGNESS TO EQUIP**

Members would need to balance cost vs. utility here. How likely is a disruption of GPS capability at stations where there are currently no alternative instrument approach procedures

with similar minima? How long would such disruptions last? How severely would a disruption of GPS capability interfere with domestic enroute and long-range navigation requirements? How expensive would installation of airborne equipment to utilize the complimentary PNT capability be? Bear in mind that most LORAN C equipment has been removed from member aircraft that may have had it, and at any event it may not be compatible with the “enhanced” system.

Furthermore, many operators of smaller aircraft among RACCA’s membership are flying airplanes that are 40+ years old with total values under \$100,000 – which would preclude installation of enhanced LORAN capability. A further question exists as to the real value of such a “backup” system, considering that it might only be used one or two days per year, if that – which augurs against the economic viability of such capability.

#### CURRENT AVAILABILITY OF E-LORAN CAPABILITY

As to transmitter and monitoring sites, most – if not all – of the U.S. operated Loran C stations have been decommissioned. Cost to re-commission them, make whatever modifications are necessary to provide “enhanced” capability would have to be balanced against likely public benefit and available funds. A similar balance would apply to monitoring stations necessary to achieve required levels of navigational accuracy.

#### AVAILABILITY OF USER EQUIPMENT

As to airborne equipment, (a) it appears that completely new airborne enhanced LORAN units would be necessary to achieve levels of accuracy proposed in current writings on the subject; (b) this equipment is not yet on the market; and (c) cost would be a critical issue, particularly for operators of older, smaller aircraft, and in view of the likely limited time periods during which such equipment would be needed as a primary means of navigation.

#### OTHER TECHNOLOGIES

It appears that the most practicable solution to the air navigation element of a complimentary PNT is to simply utilize the currently-existing VOR-DME-ILS system available in large parts of the world. While there has been some discussion about decommissioning elements of this system with the advent of GPS-WAAS, RACCA believes that maintaining it in operation, and possibly updating some of the oldest ground stations, would be the most practicable option: (a) The ground equipment is already in place and operating; (b) the necessary airborne equipment is already in place and operating; (c) no new training for use and maintenance of ground or inflight equipment would be required, and (d) operators would not need to acquire new maintenance and test equipment to support enhanced LORAN aircraft installations.

As to the “timing” element of PNT, alternative sources of accurate time data are available from NIST broadcast stations WWV and WWVH, as well as time standard radio stations operated by other countries.

#### OTHER CONSIDERATIONS

Particularly in smaller aircraft, such considerations as space in the instrument panel for receivers and indicators, and sufficient electronic noise “quietness” for successful enhanced LORAN represent potential problems.

Since enhanced LORAN will presumably use the same frequency band as LORAN C, accuracy and radius of usability will vary widely not only in regard to the number and position of transmitters and monitoring sites, but also with propagation conditions – day vs. night, solar storms, etc. These are not significant problems with the current VOR-DME-ILS system.

Practical application of enhanced LORAN as a complimentary PNT would require major modified or new ground installations, and all-new airborne and support equipment whose acquisition, certification, and installation cost is, at present, unknown, to satisfy navigation requirements during (probably narrow and infrequent) windows of time when GPS navigation is unavailable and during which VOR-DME-ILS as either a primary or backup means of navigation is also unavailable.

#### CONCLUSION

RACCA does not believe that returning to a LORAN-based system to provide complimentary PNT would survive a cost-benefit analysis, either from the standpoint of the governments involved, or for aviation users – particularly when backup using available ground and airborne equipment already exists in the form of the VOR-DME-ILS system. In short, our Association is not in favor of pursuing implementation of an E-Loran-based complimentary positioning, navigation, and timing network.

Thank you for the opportunity to comment upon this important matter.

Sincerely,

A handwritten signature in black ink, appearing to read 'John W. Hazlet, Jr.', with a stylized flourish at the end.

John W. Hazlet, Jr.  
Vice President