

December 8, 2006

Mr. Nicholas Sabatini  
Associate Administrator for Aviation Safety  
Federal Aviation Administration  
800 Independence Avenue,  
S.W. Washington, D.C. 20591

Dear Nick:

The PARC tasked its Critical Decisions Working Group (CDWG) to develop recommendations that could be used as the basis for developing a government/industry consensus on the critical high-level policy decisions FAA needs to make for the implementation of a Performance based NAS. The PARC is pleased to notify you that the CDWG has successfully completed all of the tasks in its Terms Of Reference (TOR).

On behalf of PARC, I am pleased to submit, as an attachment to this letter, additional government/industry consensus recommendations for critical high level policy decisions on the performance-based navigation concepts, capabilities, and priorities that are needed for the Performance based NAS. The attached recommendations, which resulted from completion of the remaining tasks in the CDWG TOR, were reviewed in detail and a government/industry consensus on those recommendations was developed during the PARC Face-to-Face meeting on 19 – 20 October 2006. These consensus recommendations augment the performance-based navigation concepts, capabilities, and priorities recommended in the letters PARC sent to you on 30 August 2005 and 31 March 2006.

The completion of the tasks in the CDWG TOR and the additional recommendations contained in this report represent a significant milestone in the continued implementation of the Performance based NAS. It's positive impact on implementation choices, priorities, and decisions are due to the efforts of Jerry Davis, and the other members of the Critical Decisions Working Group.

PARC appreciates your continued support of our activities and invites you to join us in a discussion of these recommendations at your convenience. Please call me if you have any questions or would like to set up a discussion.

Sincerely,



Dave Nakamura  
Chairman, PARC

Cc: PARC  
J. McGraw  
J. Williams

**ATTACHMENT**  
**RECOMMENDATIONS FOR IMPLEMENTATION OF THE REMAINING**  
**PERFORMANCE-BASED INSTRUMENT FLIGHT OPERATIONS OUTLINED IN**  
**THE CDWG TOR**

PARC is pleased to report that during its Face-to-Face meeting on 19 - 20 October 2006 it achieved a government/industry consensus on recommendations resulting from completion of the remaining items in the CDWG TOR. This attachment outlines PARC recommendations regarding implementation of the performance-based instrument flight operations associated with those CDWG recommendations. These consensus recommendations augment the performance-based navigation concepts, capabilities, and priorities recommended in the letters PARC sent to the Associate Administrator for Aviation Safety on 30 August 2005 and 31 March 2006.

***“Real-time monitoring” of the NAVAID used to define the path.***

PARC recommends that FAA establish criteria for Performance-based systems that does not require “Real-time monitoring” of the NAVAID used to define the path of an instrument flight operation when Performance-based navigation systems are used to conduct an operation that is based on conventional NAVAIDS, unless the aircraft has a statement in the AFM requiring it or it is required by AC 90-100A, as amended. This criteria should specify that “Real-time monitoring” is not applicable to the operation of other aircraft. The criteria should also clarify that there is no need for “real-time monitoring” of any raw data or available nav aids when conducting an RNAV or RNP published procedure or route.

For aircraft with a monitoring requirement in the AFM, PARC recommends that operators should comply with the AFM when conducting an operation with an underlying navaid (e.g., a VOR approach overlay) and that FAA should establish policies to permit operators to request a change to these AFMs through the OEM.

***NAVAID Substitution and Alternate Means of Navigation***

PARC recommends that FAA establish criteria for the use of AC 90-100A, as amended, and TSO C-129A/TSO C-146a compliant RNAV and RNP systems as “Substitute Means of navigation guidance” when a conventional ground-based navigation facility is out of service (OTS). PARC also recommends that FAA establish criteria which authorizes these Performance-based systems to be used as “Alternate Means of navigation guidance” (without “real-time monitoring” of the underlying NAVAID) when conducting instrument flight operations that are based on conventional ground-based NAVAIDS.

PARC recommends that these criteria should also permit Performance-based systems to be used for positioning over and guidance to VOR, NDB, Compass Locator, and DME fixes. These criteria should also permit use for holding at VOR, NDB, Compass Locator, DME fixes and for flying DME Arcs. PARC recommends that the criteria should require compliance with any pertinent AFM restrictions

***Procedure Design Criteria That Specifies When RNP Continuity Is Required***

PARC recommends that FAA establish Performance-based criteria for use by instrument flight procedure designers to determine when RNP Continuity should be required to

conduct the procedure. PARC recommends that the criteria should require RNP Continuity when RNP systems are used to conduct a missed approach with RNP values less than 1.0. PARC further recommends that the criteria should require RNP Continuity for operations with RNP values less than RNP-0.3 when precise navigation guidance is required for an early go-around. PARC also recommends that FAA develop guidance that procedure designers can use to determine when precise guidance is essential. The criteria should also require RNP Continuity when it is required by the aircraft qualification requirements.

***Use of Destination / Alternates that only have RNAV (GPS) approaches***

PARC recommends that FAA establish criteria authorizing the use of destinations and/or alternates that only have Performance-based approaches, such as RNAV (GPS). For operations that are conducted with approach approved WAAS-based or Performance-based GPS/IRU integrity systems, PARC recommends that the criteria permit operations to be conducted at both the destination and any required alternates when only Performance-based approaches (RNAV(GPS)) are available to the runway of intended landing. PARC also recommends that FAA establish qualification criteria for Performance-based GPS/IRU integrity systems (tightly-coupled systems) that can be used for these operations. PARC further recommends that dual equipment should be required if the operations are conducted under FAR Parts 121, 125, 129, 135, or 91 Subpart K.

For systems that do not use WAAS-based or Performance-based GPS/IRU integrity systems, PARC recommends that FAA establish criteria authorizing the use of destinations or alternates that only have Performance-based approaches, such as RNAV(GPS), provided that either the destination or alternate(s) has an approach to the intended landing runway that is based on conventional ground-based NAVAIDS and the aircraft is suitably equipped to conduct these traditional approaches. PARC further recommends that dual equipment should be required if the operations are conducted under FAR Parts 121, 125, 129, 135, or 91 Subpart K.

***Expediting the De-commissioning (Divestment) of NDB and VOR NAVAIDS.***

PARC recommends that FAA expedite the de-commissioning (or divestment) of NDB and VOR NAVAIDS and any instrument approaches that are based on use of these facilities. PARC recommends that FAA aggressively de-commission NDB facilities and NDB approaches where other conventional approaches are available to serve the affected airports. PARC also recommends that FAA de-commission VOR facilities IAW the FAA/PARC RNP Roadmap transition strategy for Performance-based Navigation. PARC further recommends that FAA develop strategies that accelerate voluntary equipment for Performance-based operations and eliminate barriers to operators transitioning to Performance-based operations.

PARC notes that FAA has already established criteria to authorize suitably equipped operators to remove ADF equipment from their aircraft and has established criteria to permit operators to use Performance-based system as a substitute for those facilities.

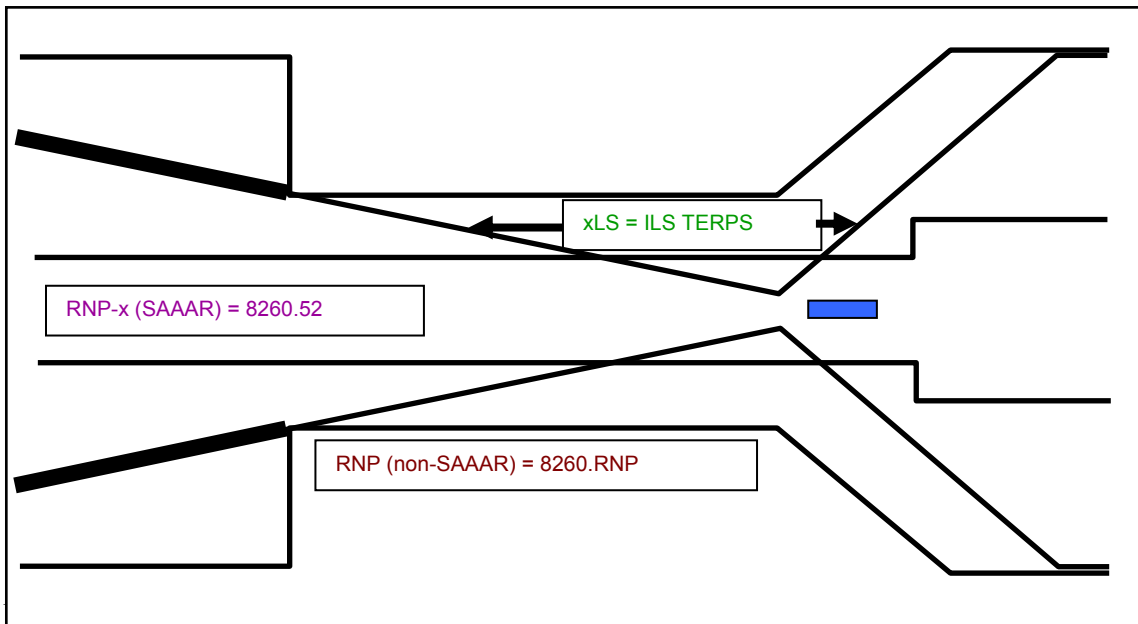
PARC recommends that FAA expedite the RNAV Final Rule and develop criteria, that is compatible with the Performance-based NAS transition plan in the second version of the RNP Roadmap, to permit VORs to be removed from the aircraft.

***Performance-based Obstacle Clearance Criteria.***

PARC notes that FAA has already established Performance-based Obstacle Clearance Criteria for RNP SAAAR instrument approach procedures that use linear OCS of  $\pm 2$  times RNP (with no transition surfaces) and with scaleable RNP and/or RF legs in any segment of the approach or missed approach. PARC appreciates this action by FAA because it permits operators to achieve significant benefits from using LNAV and VEB VNAV systems or LNAV and SBAS-based or GBAS-based VNAV systems to conduct RNP SAAAR operations that cannot be supported by conventional ground-based NAVAIDS.

PARC recommends that FAA expedite establishment of Performance-based Obstacle Clearance Criteria for basic RNP instrument approach operations using the linear OCS concepts recommended by the PARC RNP Working Group (e.g., linear OCS with RNP 1, 1, 0.3, 1 and  $\pm 2$  times RNP primary surface plus a RNP transitional surface of less than  $\pm 1$  times RNP). These criteria should permit operators to conduct RNAV (GPS) or RNAV (RNP) approaches that do not required SAAAR using LNAV or LNAV and “conventional” Baro-VNAV lines of minima.

PARC recommends that FAA establish Performance-based Obstacle Clearance Criteria for “Conventional Integrations” of ILS, MLS, GLS, and LPV. PARC also recommends that the ILS obstacle clearance surfaces be used for these systems. PARC further recommends that instrument approach procedures for “conventionally integrated” ILS, MLS, GLS should be system specific and that all “conventionally integrated” LPV approaches should be performance-based. PARC recommends that these Performance-based criteria also include hybrid concepts such as a RNP or RNP SAAAR transition to an ILS final or an ILS approach to a RNP or RNP SAAAR missed approach.



PARC recommends that FAA establish Performance-based Obstacle Evaluation and Airport Airspace Assessment surfaces as quickly as possible. PARC recognizes that this will likely require an extensive rulemaking effort which should be initiated as soon as possible to assure that airspace is available in the future for the most beneficial Performance-based approach and departure operations. PARC recommends that FAA

initiate action to amend Part 77 to accommodate Performance-based operations and to protect airspace for use by Performance-based systems.

PARC recommends that the Performance-based OE/AAA surfaces should be a composite of the surfaces developed for RNP SAAAR LNAV / VEB VNAV operations, basic RNP (non-SAAAR) LNAV and LNAV/VNAV operations, and Performance-based operations using “conventional ILS, MLS, LPV, GLS integrations” and existing ILS obstacle clearance surfaces. PARC recommends that the OEAAA protected surface would be the portions of the composite lateral and vertical surfaces that require the most airspace.

#### ***FAR 121.579 revision***

PARC notes that the Flight Guidance Harmonization Working Group (FAA / JAA / AWO / Industry) reached consensus on the changes needed to flight guidance requirements to accommodate Performance-based operations and drafted the needed regulatory changes. PARC also notes that AC 25-1329 has been already been updated.

PARC recommends that FAA expedite action to amend FAR 121, 125, 135 policies to be compatible with the recommendations of the Flight Guidance Harmonization Working Group and the revised AC 25-1329. This action is necessary to achieve full benefits from the Performance-based NAS.

#### ***Ongoing PARC activities related to CDWG recommendations***

The CDWG has also recommended that PARC discuss a number of other critical decisions to establish a government/industry consensus on recommendations concerning the best course of action to address these issues. PARC has not yet concluded its discussions on these critical decisions. PARC plans to forward any recommendations it may develop concerning these critical decisions at a later date.

These critical decisions include the best processes for developing a government / industry consensus on recommendations related to:

- Determining the optimum integration of Performance-based navigation, surveillance, and communication concepts.
- Establishing VNAV as a primary means of vertical reference and developing Performance-based VNAV criteria for use in airspace planning and air traffic control to increase capacity in descending segments of en route and terminal area operations.
- Standardizing path definition for procedure design and path performance of navigation systems. Performance-based path definition criteria is needed for the design of instrument flight procedures, FMS, and ground-based automation to facilitate “trajectory negotiation” in future operations
- Developing Performance-based NAS education and training programs. PARC believes that one of the biggest challenges in the Performance-based NAS is education and training of all segments of the aviation community concerning PARC recommended concepts and capabilities and the benefits of Performance-based operations. The CDWG recommended that PARC determine the best course of action to develop a government / industry consensus on the processes that should be used and the critical elements of the various education and training programs that are needed.