



**U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION**

Air Traffic Organization Policy

**ORDER
JO 7100.41A**

Effective Date:

April 29, 2016

SUBJ: Performance Based Navigation Implementation Process

- 1.** This order provides a standardized five-phase implementation process related to Performance Based Navigation (PBN) procedures and/or routes, referred to as the "Performance Based Navigation Implementation Process," which has been deemed compliant by the Office of Safety (AJI) and meets the requirements set forth by Federal Aviation Administration (FAA) Air Traffic Organization's (ATO) Safety Management System (SMS).
- 2.** National initiatives with defined alternative processes, such as Metroplex, are not subject to this order. A national initiative without an alternative process, such as VOR MON, would be subject to this order.
- 3.** This order is to be used in conjunction with other FAA orders and directives related to procedure development and implementation.

Original signed by

Heather Hemdal
Director, Air Traffic Procedures
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4/27/2016

Date Signed

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I. Introduction

1. Purpose of This Order.

- a.** This order provides a standardized design, development, and implementation process referred to as the “Performance Based Navigation Implementation Process.” Following this guidance ensures that Safety Risk Management (SRM) has been considered, addressed, and followed in accordance with Federal Aviation Administration (FAA) Air Traffic Organization (ATO) Safety Management System (SMS) Order 1000.37.
- b.** This order applies specifically to the following new and amended Performance Based Navigation (PBN) procedures and/or routes, Area Navigation (RNAV)/Required Navigation Performance (RNP) Standard Instrument Departures (SIDs), RNAV Standard Terminal Arrivals (STARs), RNP Authorization Required Standard Instrument Approach Procedures (RNP-ARs), and RNAV routes, including Q, T, Y, Z, and TK (helicopter) routes. Other non-specific PBN procedures may also be considered if agreed to by all parties concerned.
- c.** National initiatives with defined alternative processes are not subject to this order such as Metroplex, are not subject to this order. A national initiative without an alternative process, such as VOR MON, would be subject to this order.
- d.** This process is designed to be used by work groups to design, develop, and implement PBN procedures and/or routes that, upon effective establishment, meet agreed-upon project goals. It supports efforts ranging in scale from a single route and/or procedure to larger non-Metroplex projects that integrate multiple procedures and/or routes. For NAS-wide initiatives, benefits will be assessed at the project level, not for each individual procedure.
- e.** Instrument flight procedures developed with non-standard application of criteria will be processed in accordance with applicable FAA orders. Deviations from criteria should only be used as a last resort.
- f.** New and amended procedures and/or routes will be processed in accordance with applicable environmental and public outreach policies and directives.
- g.** Individuals participating in or supporting airspace redesign projects may find that this order provides an effective process for project implementation.
- h.** The process is divided into five phases:
 - (1) Preliminary Activities
 - (2) Design Activities
 - (3) Development and Operational Preparation
 - (4) Implementation
 - (5) Post-Implementation Monitoring and Evaluation

- i. The Project Tracking Tool (PTT) described in Attachment 5 provides a tracking mechanism for recording the design, review, and implementation of procedures and/or routes.
- j. The Lessons Learned Database described in Attachment 6 provides a tracking mechanism for all lessons learned throughout the five phases.
- k. This order is to be used in conjunction with (and does not supersede) other FAA orders and directives related to procedure development and implementation.

2. Audience.

- a. The primary audience for this order is the Air Traffic Organization (ATO) Mission Support Services (MSS) and all service providers who have the responsibility to design, develop, and/or implement instrument flight procedures. The secondary audience includes all other Air Traffic Organizations, Flight Standards, and regional office divisions/branches that have responsibilities related to instrument flight procedures.

3. Where Can I Find This Order?

- a. This order is available on the FAA Web site at:
https://www.faa.gov/regulations_policies/orders_notices/

Enter the PBN Implementation Process order number – FAA Order 7100.41.

4. What this order cancels and amends.

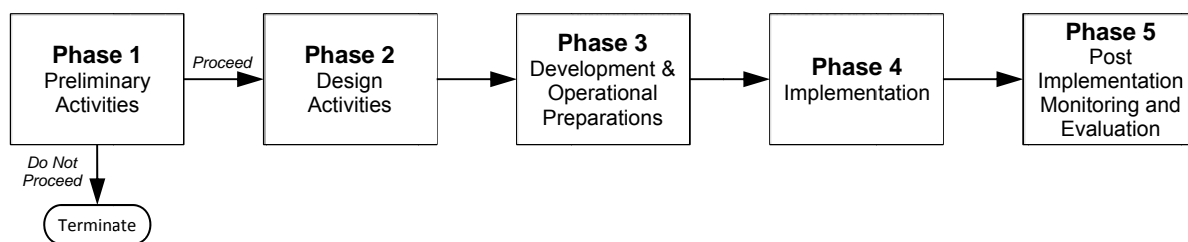
- a. This order cancels FAA Order 7100.41, Performance Based Navigation Implementation Process dated 3/3/2014.
- b. This order amends all portions of FAA Order 7100.9E that address PBN policies, processes, or topics not related to criteria as described in Attachment 7, FAA Order 7100.9E Changes. All portions of FAA Order 7100.9E that address criteria related to STAR development remain in effect.

II. Performance Based Navigation Implementation Process

1. Process.

- a. This section outlines a standardized, systematic process for designing, developing, and implementing PBN procedures and/or routes. This section also identifies the organizations involved in each phase and their respective roles and responsibilities.
- b. Proponents of a new or amended procedure and/or route are expected to submit their proposal via the Instrument Flight Procedure (IFP) Information Gateway, except where noted. The Operations Support Group (OSG) can assist the proponents with information on how to initiate an IFP Information Gateway request.
- c. The PBN Programs and Policy Group (AJV-14) provide program oversight and guidance for the implementation of PBN procedures and/or routes, and it recommends the development of supporting design criteria and regulatory standard improvements.
- d. The PBN Implementation Process is broken down into five separate phases with specific steps assigned to each as illustrated in Figure 1. This phased process may be shortened for amending existing PBN procedures and/or routes.

Figure 1. Five Phases of the PBN Implementation Process



2. Performance-Based Navigation Co-Leads and Work Group Structure.

- a. **PBN Co-Leads:** PBN co-leads are the designated representatives from OSG and National Air Traffic Controllers Association (NATCA). PBN co-leads are responsible for ensuring each step in the process is followed and completed.
- b. **Core Work Group (CWG):** The CWG's primary responsibility is to draft a mission statement and develop project goals and objectives. PBN co-leads are responsible for organizing and leading the CWG that will carry out the procedure and/or route design effort. This includes completing and submitting required documentation and ensuring the timely updating of the PTT and Lessons Learned Database during each phase of the project. Advancing a project to the next phase indicates that the CWG has completed all tasks associated with that phase. CWG members include the following personnel: PBN co-leads; terminal area route generation, evaluation, and traffic simulation (TARGETS) operator (who may also serve as project facilitator, as determined by the PBN co-leads); AJV-14; and the flight procedures team (FPT). The PBN co-leads may add additional subject matter experts (SMEs) to the CWG to address other issues or concerns identified by the CWG.
- c. **Full Work Group (FWG):** The FWG's primary responsibility is to complete procedure

and/or route designs that meet project goals and objectives. PBN co-leads are responsible for organizing and leading the FWG that will carry out the procedure and/or route design effort. This includes completing and submitting required documentation and ensuring the timely updating of the PTT and Lessons Learned Database during each phase of the project. Advancing a project to the next phase indicates that the FWG has completed all tasks associated with that phase. FWG members include the CWG as well as affected air traffic facilities, Aeronautical Information Services (AJV-5), and an Environmental Specialist. The following may be included as appropriate: Lead Industry Representative, Airport Authority, Proponent, and Flight Inspection Services. The PBN co-leads may add additional SMEs to the FWG to address other issues or concerns identified by the FWG.

- d. Selection of Work Group Members:** Appendix A outlines the roles and responsibilities of each functional position that could be assigned to the CWG and FWG. PBN co-leads have the responsibility to ensure that all required stakeholders are included.

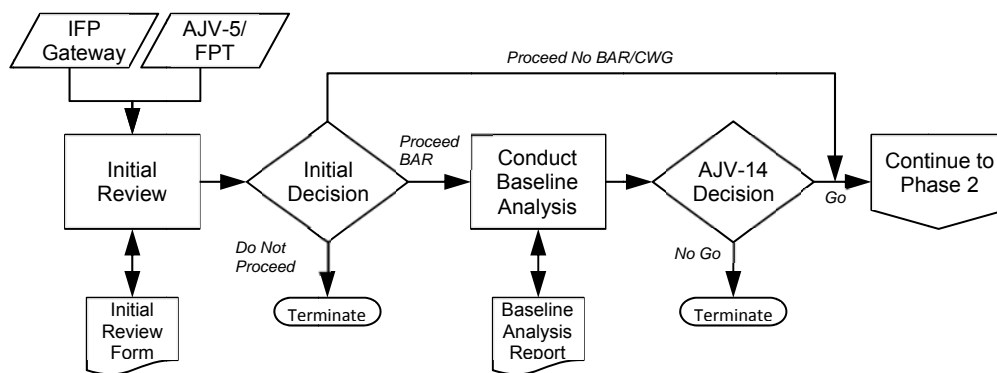
III. PBN Implementation Process Phase Breakdown

1.0 Phase One: Preliminary Activities.

- 1.1** Phase one preliminary activities begin when a proponent initiates a request on the IFP Information Gateway or when identified by AJV-5 or the FPT. In this phase, a proponent defines and provides justification for a new or amended PBN procedure and/or route request. The PBN co-leads then coordinate an initial review and forward recommendations to AJV-14. If AJV-14 concurs with the request, the PBN co-leads will establish a CWG, if required. The CWG conducts a baseline analysis that examines current operations, drafts a mission statement, develops a concept of operations, and records expected benefits. The proponent's request could be terminated during phase one or could be forwarded as a project to phase two for continued processing.

- 1.2** Figure 2 illustrates the major steps in phase one – preliminary activities.

Figure 2. Phase One. Preliminary Activities



1.3 Initial Review.

- a. The FPT monitors and reviews requests from the IFP Gateway or AJV-5. The FPT forwards all PBN requests to the PBN Co-leads and AJV-14 for processing. At this time, if there are any items such as known restrictions, impacts to other programs or general items for consideration, these should be included. Additionally, if a request qualifies as an abbreviated amendment, this should be identified as well.
- b. Phase one initial review is coordinated by the PBN co-leads. The purpose of the initial review is to provide AJV-14 with sufficient information to determine whether the proponent's request should proceed. The results are documented on the initial review form (IRF), which is subsequently submitted to AJV-14 for review. See Attachment 1. Initial Review Form Template.

NAS-wide initiatives will be assessed at the project level, not at the level of each individual procedure.

c. PBN Co-Leads.

- (1) Ensure that AJV-14 is notified of all requests when received.
- (2) For abbreviated amendments as identified by FAA Order 8260.19 or other FAA criteria, the PBN co-leads will determine which steps in the process will be required to be completed. PBN co-leads will coordinate with affected air traffic control (ATC) facilities to assist in determining which process steps are required.
- (3) Review requests to ensure the request is clearly defined and that there is justification or rationale to support the request. Document the request, FPT considerations and justification on the IRF. If this is an abbreviated amendment, "Notification Only/Abbreviated" should be selected on the IRF.
- (4) Coordinate with the FPT to ensure official airport data is in compliance and supports the request in accordance with the appropriate tables in AC 150/5300-13A.
- (5) Ensure that the FPT contacts the appropriate airport authority to ensure there are no objections or issues related to the request.
- (6) Obtain an initial assessment of the level of effort and type of actions required to support the project and review the request for potential complications.
- (7) Consolidate inputs from all sources on the IRF and forwards recommendation to AJV-14 for review.
- (8) Ensure the FPT makes the appropriate notifications after review by AJV-14.

d. AJV-14.

- (1) Reviews the IRF and requests additional information from PBN co-leads, if needed, and then makes a decision on whether the request should proceed (with or without a baseline analysis) or not proceed based on FAA goals and objectives.
 - (a) If the decision is to proceed with a baseline analysis, AJV-14, in coordination with the PBN co-leads, will authorize the formation of a CWG to perform the baseline analysis and produce a baseline analysis report (BAR).
 - (b) If the decision is to proceed without a baseline analysis, AJV-14 will notify the PBN co-leads. The project will continue in phase one with project prioritization and scheduling.
 - (c) If the decision is not to proceed, AJV-14 will document the rationale and notify the PBN co-leads.

1.4 Conduct Baseline Analysis. The purpose of the baseline analysis is to identify expected benefits and develop conceptual procedures and/or routes for the proposed project. It also serves as a decision tool for AJV-14 and aids in the evaluation of the expected benefits during the Post Implementation and Monitoring phase. In addition, a mission statement and concept of operations is developed and recorded in the BAR for AJV-14 approval. The result of this step is a project BAR. See Attachment 2 – Baseline Analysis Report Template.

a. Core Work Group (CWG).

- (1) Documents and records baseline data used for analysis.
- (2) Identifies and documents expected benefits for the project. Expected benefits should be measurable rather than just general statements. Possible benefits may include reduced level-offs for arrivals, increased departure efficiency, increased air traffic flow/capacity, operational independence between traffic flows, increased access to airspace or airports, and/or environmental improvements. Other benefits may include a reduction in the number of redundant or underutilized instrument flight procedures or discontinuance of ground navigation aids.
- (3) Designs and/or reviews conceptual procedures and/or routes in TARGETS.
- (4) Reviews applicable PBN-related knowledge databases and historical documents (e.g., Performance Data Analysis and Reporting System (PDARS), Sector Design Analysis Tool (SDAT), Letters of Agreement (LOAs), Comprehensive Electronic Data Analysis and Reporting (CEDAR), Air Traffic Safety Action Program (ATSAP), Aviation Safety Action Program (ASAP), Aviation Safety Information Analysis and Sharing (ASIAS), etc.) to identify potential constraints that may impact and/or influence the design of the procedures and/or routes.
- (5) Identifies additional significant information and potential risks associated with the project.

b. PBN Co-Leads.

- (1) Compile the BAR. The BAR includes the mission statement, baseline of current operations, conceptual procedures and/or route designs, perceived benefits, constraints, and potential costs and risks.
- (2) Ensure copies of the BAR and any illustrations of the conceptual procedures and/or routes designs are uploaded to the PTT.
- (3) Ensure that CWG member names and contact information are entered into the PTT.

1.5 Submit PBN Project for Approval. Project goals and a concept of operations based on the findings in the BAR are reviewed during this step.**a. PBN Co-Leads.**

- (1) Confirm CWG consensus with the content incorporated within the BAR.
- (2) Submit the BAR to AJV-14 for review, approval, and advancement of the project from phase one, preliminary activities, to phase two, design activities.
- (3) Report back to CWG.
- (4) Project co-leads provide project status to the FPT. FPT is responsible for updating the Proponent.
- (5) Ensure that all necessary documentation and lessons learned have been uploaded to the PTT.

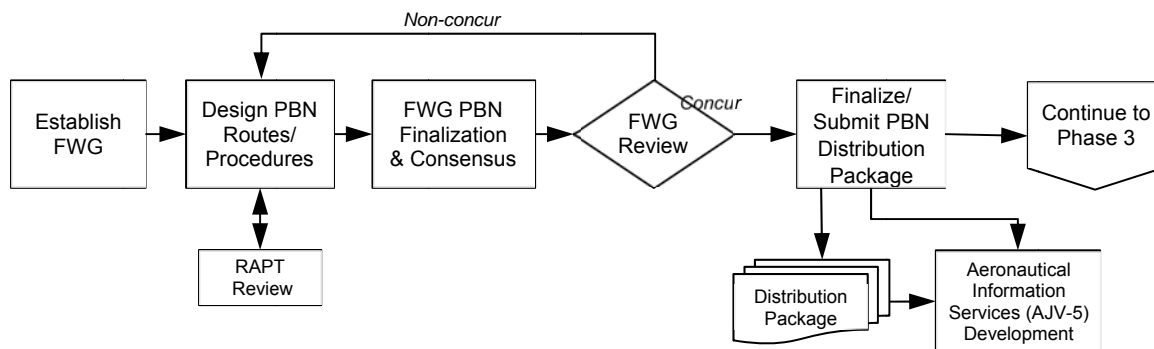
b. AJV-14.

- (1) Reviews the BAR and determines whether the project should proceed or not proceed based on FAA goals and objectives.
- (2) Provides the PBN co-leads a formal response.
- (3) Determines if additional information or justification is required.

2.0 Phase Two: Design Activities.

- 2.1** The purpose of the design activities phase is to generate a single PBN procedure and/or route or a set of PBN procedures and/or routes that meet project objectives. During this phase, an FWG is formed; the procedures and/or routes are designed, evaluated, and checked; and the required documentation is assembled.
- 2.2** Phase two starts with assembling the FWG and holding a formal project-kickoff meeting. It ends with the submission of the procedures and/or routes for development per FAA Order 8260.19.
- 2.3** Figure 3 illustrates the major steps in phase two, design activities.

Figure 3. Phase Two, Design Activities



- 2.4 Establish PBN Full Work Group.** The first step in this phase is to set up the FWG to complete procedure and/or route designs that meets project goals and objectives. This group includes the members of the CWG established in phase one although the FWG may be expanded to include new members and SMEs as needed.
- a. PBN Co-Leads.**
- (1) Review lessons learned from previous projects.
 - (2) Establish an FWG for the project. Appendix A describes principle participants' roles and responsibilities.
 - (3) Schedule a formal kickoff meeting (virtual, teleconferences, and/or face-to-face) for the members assigned to the FWG. The PBN co-leads should send a formal announcement to FWG invitees no less than 45 days prior to the scheduled meeting date. When possible, the PBN co-leads will schedule meetings to allow maximum participation of all stakeholders.
 - (4) Ensure a record is maintained of individuals invited and those who participate in supporting the project. The minutes of meetings/teleconferences should reflect this.
- 2.5 Full Work Group Meetings.** This section describes the activities involved in planning, conducting, and administering FWG meetings. The purpose of the kickoff meeting is to introduce the FWG to the proposed project, including the goals and objectives, perceived benefits, a review of lessons learned from past projects, and (if needed) further

refinement of the elements contained in the BAR. The kickoff meeting can also be used to initiate formal procedure and/or route design work.

a. PBN Co-Leads.

(1) Kickoff Meeting Requirements

- (a) Introduce the process for designing and integrating PBN procedures and/or routes as outlined in this order.
- (b) Introduce design basics, potential benefits, safety, and operational considerations.
- (c) Present and discuss baseline analysis findings, operational concepts, and conceptual procedures and/or routes.
- (d) Review the project mission statement and concept of operations submitted and approved as part of the BAR during phase one. Coordinate any changes with AJV-14.
- (e) Lead discussion on further development of conceptual PBN procedures and/or routes.
- (f) Encourage presentations by the proponent and lead industry representatives on operational goals and the operator's perspective.
- (g) Discuss all identified hazards.

(2) Administrative Requirements

- (a) Ensure maintenance of project documentation, including meeting notes, participant attendance, and action item status.
- (b) Oversee the establishment of the meeting schedule.
- (c) Oversee the development of a formal project schedule, including timelines, milestones, etc.
- (d) Ensure the PTT updates include applicable project-related material, progress reports, and project activities, as required, in a timely manner.
- (e) Submit the project scope and conceptual design of procedures and/or routes to the Regional Airspace and Procedures Team (RAPT) for prioritization and publication dates.
- (f) Ensure the chart date is entered into the PTT when received from the RAPT.

b. TARGETS Operator.

- (1) Operate TARGETS during meetings.
- (2) Provide project documentation, TARGETS files, and other relevant information to the PBN co-leads and ensure that they are uploaded to the PTT.
- (3) Assist the PBN co-leads with project facilitation.
- (4) Assist the PBN co-leads with meeting and teleconference scheduling.

c. Full Work Group Members (all others).

- (1) Participate in kickoff and subsequent FWG meetings.
- (2) Consider implementation alternatives (i.e., simple design if air traffic facility is new to PBN or a more complex design for air traffic facilities that have previously implemented PBN).
- (3) Consider establishing sub-groups to discuss specific issues.
- (4) Design procedures and/or routes that meet project objectives.
- (5) Communicate any known or suspected risks associated with proposed procedures and/or routes.

2.6 Design of PBN Procedures and/or Routes. This section describes the roles and responsibilities of those involved with the design of PBN procedures and/or routes.**a. TARGETS Operator.**

- (1) Evaluate procedure and/or route design in accordance with the procedure criteria outlined in applicable FAA orders.
- (2) Notifies the PBN co-leads when procedure and/or route designs do not meet criteria. Waivers should be considered only as a last resort.
- (3) Ensure that the procedure and/or route pass a TARGETS flyability evaluation and comply with established criteria.
- (4) Provide the PBN co-leads with conceptual design procedures and/or routes in a TARGETS file and other needed information, as required.

b. Air Traffic Facility.

- (1) Identifies and resolves airspace and other procedure and/or route conflicts. Any airspace, position, or sector changes required will require a specific SMS for those changes.
- (2) Reviews facility automation system requirements.
- (3) Coordinates the preliminary design with Traffic Management Unit (TMU) or ATF representative and Air Traffic Control System Command Center (ATCSCC).

c. Aeronautical Information Services (AJV-5).

- (1) Reviews TARGETS conceptual designs of procedures and/or routes.
- (2) Provides technical assistance as needed.

d. PBN Co-Leads.

- (1) Organize meetings and teleconference calls as necessary to reach agreement on procedure and/or route designs.
- (2) Ensures OSG representative coordinates ATC operational waiver requirements within the service area.
- (3) Review all documentation for completeness and accuracy and ensure it is uploaded

to the PTT.

2.7 Procedure and Route Evaluation and Approval. This section describes the requirement to evaluate the proposed procedures and/or routes from design, safety, and operational perspectives.

a. Full Work Group Members.

- (1) Review the procedures and/or routes to ensure that they meet the project goals and objectives.
- (2) Review and assess all risks and planned mitigations. Discussion and mitigation documentation must be included in PTT.

b. Air Traffic Facility.

- (1) Conducts introductory briefings with and receives feedback from the workforce.
- (2) Conducts air traffic simulations as necessary in order to evaluate the workability of the proposed procedures and/or routes and identify potential adverse impacts (hotspots, conflicts with opposing traffic, etc.). When possible, pilots should be included in the air traffic simulations.
- (3) Updates or creates LOAs and/or SOPs as needed to accommodate implementation of the new or amended procedures and/or routes. Further SMS on the change to the LOAs and/or SOPs is not required, provided that the only changes are the addition and/or inclusion of a new or amended procedure and/or route. If other changes are made, appropriate SMS will be required.
- (4) TMU or ATF representative identifies potential impacts, develops methodology to mitigate impacts, coordinates with involved facilities and disseminates information and the mitigation plan.

c. Flight Standards Service (AFS)/Lead Industry Representative(s).

- (1) As required, evaluates the procedure and/or route in a flight simulator.
- (2) If requested, submits simulator worksheets and reports flyability results and operational issues to the FWG. Flyability results must consider aircraft that represent the current fleet mix at the airport(s) for which the procedures and/or routes are designed. See Attachment 3 – Flight Simulator Worksheet and Instructions or worksheet in TARGETS software.

The Flight Technologies and Procedures Division may conduct simulations.

d. Operations Support Group.

- (1) Review the Categorical Exclusion (CATEX) documentation. If a CATEX is not possible, coordinate with AJV-14.
- (2) Ensures adherence to the process outlined in this order for SMS compliance.
- (3) Follows the Regional Airspace and Procedures Team (RAPT) process outlined in FAA Order 8260.43.
- (4) Provides a copy of the RAPT consensus form to the PBN Co-Leads.

- (5) Reviews and forwards project documentation to AJV-5.

e. TARGETS Operator.

- (1) Conducts a Distance Measuring Equipment (DME)/DME assessment, using RNAV-Pro for procedures and/or routes that are not restricted only to aircraft equipped with Global Navigation Satellite System (GNSS). See FAA Order 7470.1.
- (2) Ensures appropriate documentation is uploaded to the PTT.

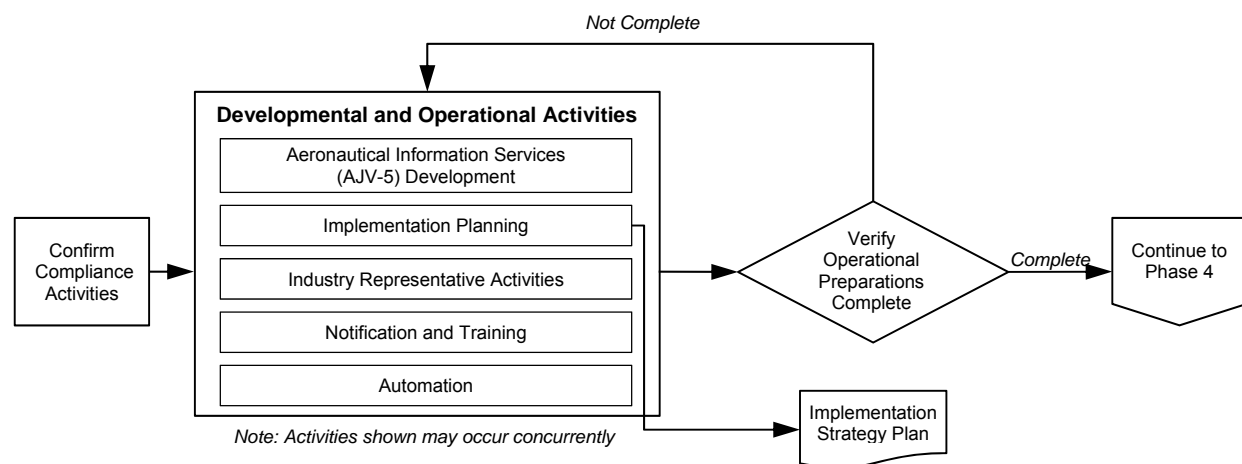
f. PBN Co-Leads.

- (1) Shall be vested with full authority to reach agreement for all matters within the scope of the project and shall make every effort to reach agreement through consensus. If consensus cannot be reached, PBN co-leads and AJV-14 will follow the agreed upon dispute resolution process, as defined in the signed MOU between FAA and NATCA and MOA between AJV-14 and OSG.
- (2) Complete and provide final project documentation, TARGETS files, and other relevant data to AJV-5.
- (3) Ensure that all necessary documentation and lessons learned developed during phase two have been uploaded to the PTT.

3.0 Phase Three: Development and Operational Preparation.

- 3.1** The purpose of the development and operational preparation phase is to develop procedures and/or routes and complete all pre-operational items necessary to implement the procedures and/or routes.
- 3.2** This phase includes training, issuing notifications, automation, TMU or ATF representative coordination, updating radar video maps, and processing documents. This phase ends when procedures and/or routes are submitted for publication, all the necessary operational preparation steps have been completed, and a planned implementation date has been set by the FWG.
- 3.3** Figure 4 illustrates the major steps in phase three – development and operational preparation.

Figure 4. Phase Three, Development and Operational Preparations



- 3.4 Procedure and Route Processing.** This step describes the actions needed to process a procedure and/or route once the FWG finalizes its design.

a. Operations Support Group.

- (1) Coordinates any necessary airspace actions with the Airspace and Rules Group for any rulemaking actions associated with the project. (See FAA Order 7400.2)
- (2) Ensures final rulemaking is completed prior to procedure publication in accordance with FAA Order 8260.26.
- (3) Confirms that environmental activities and associated documentation are complete.
- (4) Transfers completed forms and project documentation to AJV-5.

b. PBN Co-Leads.

- (1) Confirm that the final rulemaking and chart dates coincide.
- (2) Assist the OSG in preparing documentation required to support airspace or rulemaking actions.

- (3) Maintain close coordination with AJV-5 to ensure that procedure and/or route development is on schedule to meet the chart date and ensure PTT is updated.
- (4) Facilitate the resolution of any issues identified by AJV-5.

c. Aeronautical Information Services (AJV-5).

- (1) Develops PBN procedures and/or routes in accordance with appropriate FAA orders and guidance.
- (2) Occasionally, procedures and/or routes approved by the FWG and forwarded to AJV-5 may require technical, administrative or other minor changes. In those cases, it may not be necessary to reconvene the entire FWG. The PBN co-leads should coordinate with AJV-14 and the affected facilities to determine how to proceed. At a minimum, all FWG members will be notified of any changes.
- (3) Provides updated radar video maps upon request.

d. Air Traffic Facility.

- (1) Reviews and provides comment on procedures and/or routes.

e. Lead Industry Representative(s).

- (1) As needed, confirms that Flight Management System (FMS) navigation database coding and the published charted procedure and/or route match FAA-published procedure data.
- (2) As requested, review and provide comments on procedures and/or routes.

3.5 Notification and Training. This step provides guidance for notification and training for pilots, controllers, and industry.

a. Air Traffic Facility.

- (1) Provides procedure and/or route information as necessary to develop training.
- (2) Develops controller training material that includes (but not be limited to) the following:
 - (a) Description of the operational concept.
 - (b) Phraseology and procedure changes as necessary.
 - (c) Updated LOAs, SOPs, and waivers (if applicable).
 - (d) Timeline for implementation.
 - (e) Training that must include an overview of RNAV/PBN and any non-standard applications.
 - (f) Updated radar video maps.
- (3) Uses simulation tools as needed for ATC familiarization.
- (4) Uses the lead industry representative as a resource to assist with the training to provide the flight crew perspective.
- (5) Completes ATC training in accordance with the bargaining unit agreement.

- (6) Verifies that formal training has been completed.

b. Lead Industry Representative.

- (1) May prepare and distribute pilot training aides and notification material.
- (2) May coordinate with other industry representatives as needed on the project.
- (3) Should assess their capability to navigate in case of failure of critical DME while airborne. (See AC 90-100 preflight requirements.)

c. Full Work Group.

- (1) Advises industry groups including Air Transport Association, Regional Airlines Association, and National Business Aircraft Association of new procedure and/or route development and conducts meetings as necessary to explain the scope of work.

3.6 Automation. This step provides guidance on automation activities to be completed prior to the procedure and/or route implementation. Generally, a six-month lead time is needed for automation personnel in preparation for implementation. This period may vary depending on workload and complexity of the implementation.

a. Air Traffic Facility.

- (1) Ensures that coordination occurs between all affected facilities including the ATCSCC, first-tier facilities, and second-tier facilities. Determines each participating facility's specific automation requirements.
- (2) Ensures that radar data tags and scratch pad requirements have been identified and addressed.
- (3) Coordinates with adjoining facilities to ensure fix-pair information is the same in all facilities.
- (4) Reviews inter/intra-facility handoff procedures for possible modifications.
- (5) Evaluates the impact of the new procedure and/or route relevant to the flight plan filing system to ensure that identified issues have been resolved.
- (6) Obtains and installs updated radar video maps in preparation for implementation.
- (7) Coordinates with the OSG to determine if further SMS is needed.

3.7 Implementation Planning. This step describes factors to consider when developing the plan to implement procedures and/or routes.

a. Full Work Group (FWG).

- (1) Considers post-publication flight trials with operators prior to implementation. This provides a controlled atmosphere to identify unanticipated operational and ATC issues and permits initial data collection of flight tracks and profiles.
- (2) The FWG determines if a go-team is needed. The go-team will be on site during the initial implementation to address any ATC or operator issues. Participants of a go-team may include select members of the FWG and other stakeholders, such as

operators, flight standards personnel, and air traffic facility representatives.

b. Lead Industry Representative.

- (1) If needed, updates the flight management system database and company-stored preferred routes.

c. Air Traffic Facility.

- (1) Finalizes expected air traffic flow management initiatives.
- (2) Finalizes and disseminates all required documentation prior to implementation.
- (3) Collaborates with industry stakeholders to develop delay mitigation strategies.

d. PBN Co-Leads.

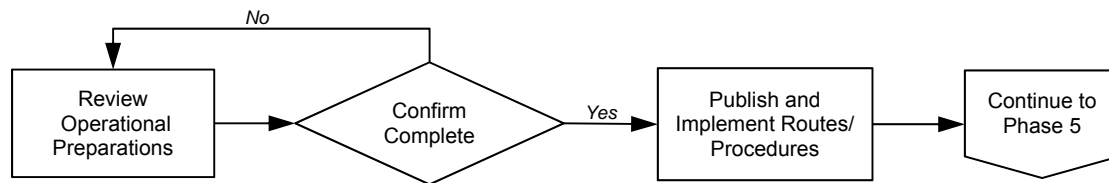
- (1) Coordinates with the OSG to confirm that all required safety, environmental, flight inspection, and rulemaking activities are complete.
- (2) Ensures that all necessary documentation developed and lessons learned during phase three have been uploaded to the PTT.
- (3) Discusses potential need for peer-to-peer meetings with Air Traffic Facilities.
- (4) Coordinates with ATC facility if a go-team is required.

4.0 Phase Four: Implementation.

4.1 The purpose of the implementation phase is to implement the procedures and/or routes as designed. This phase starts with confirmation by the FWG that all required pre-implementation activities have been completed and ends when the procedures and/or routes are published and implemented.

4.2 Figure 5 illustrates the major steps in phase four, implementation.

Figure 5. Phase Four, Implementation



4.3 Operational Preparations Confirmation. This step describes the actions to be taken just prior to the use of the new or amended procedures and/or routes.

a. PBN Co-Leads.

- (1) Confirm that all activities required for the implementation of the procedures and/or routes in this project have been completed.
- (2) Ensure that the go-team is located on-site, or is readily available, for the initial implementation of the procedures and/or routes.
- (3) Ensure that all necessary documentation developed and lessons learned during phase four have been uploaded to the PTT.

4.4 Implementation of Procedures and/or Routes. Procedures and/or routes are typically available to be flown on their chart date in order to coincide with new or current database installations in both the facility systems and the aircraft. However, there are times when circumstances dictate delaying implementation to a date beyond the chart date. The implementation milestone is considered to have been met when the procedures and/or routes are available to be flown.

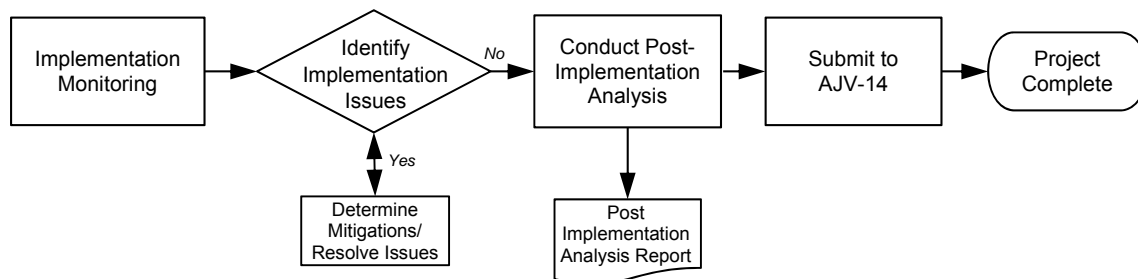
5.0 Phase Five: Post-Implementation Monitoring and Evaluation.

5.1 The purpose of the post-implementation monitoring and evaluation phase is to ensure that the new or amended procedures and/or routes perform as expected and meet the mission statement finalized during the design activities phase. Post implementation activities include collecting and analyzing data to ensure that safe and beneficial procedures and/or routes have been developed.

5.2 Phase five starts with the use of the procedures and/or routes and includes 24- hour monitoring of initial usage. The phase ends with the completion of the post-implementation analysis report and AJV-14 direction to close the project.

5.3 Figure 6 illustrates the major steps in phase five, post-implementation monitoring and evaluation.

Figure 6. Phase Five: Post- Implementation Monitoring and Evaluation



5.4 Implementation Monitoring. Implementation monitoring starts with the first operational use of the procedures and/or routes. PBN co-leads will select FWG members that will monitor implementation of the procedure and/or route for approximately 60 days and then transfer those responsibilities to the affected facility or facilities. The monitoring must include a review of data from ASAP, ATSAP, mandatory occurrence reports (MORs), electronic occurrence reports (EORs), pilot deviation (PD) reports, aviation safety information analysis and sharing (ASIAS), etc.

a. PBN Co-Leads.

- (1) Document any issues with the usage of the procedures and/or routes.
- (2) Conduct meetings or teleconference calls to discuss implementation issues and overall performance.
- (3) Review causes of all events and concerns associated with the procedures and/or routes and recommend an appropriate mitigation strategy based on SME inputs. Co-leads will review issues identified during the monitoring period with AJV-14.
 - (a) If it is determined that there is an immediate need the FWG resolves the issue and implements mitigation strategies.
 - (b) If it is determined that there is not an immediate need to resolve an issue then the FWG must decide if issues are associated with the current project or constitute the start of a new project.

- (c) If it is determined that the issue is part of the same project then the process is looped back to Phase Two and/or Phase Three depending on the issue identified.
- (d) If it is determined that the issue is not part of the same project then the issue will be entered into the IFP Gateway (Phase One).
- (4) Ensure appropriate notification to all stakeholders if amendments are required.

b. Air Traffic Facility.

- (1) Collects radar track, dependent surveillance location/track information, and other data for post-implementation analysis.
- (2) If needed, collects data from the service center concerning communication navigation and surveillance (CNS) related issues and/or anomalies that affect the procedure and/or route.
- (3) Documents operational incidents in accordance with FAA Order 7210.632, *Air Traffic Organization Occurrence Reporting*.
- (4) Coordinates procedure and/or route design concerns with the PBN co-leads for possible redesign or mitigations.
- (5) Coordinates the implementation of changes as necessary to resolve problems.

5.5 Post-Implementation Analysis. This section describes the tasks necessary to conduct a post-implementation analysis study once the procedures and/or routes are in use. The goal of this study is to verify that the new procedures and/or routes meet objectives (e.g., efficiency, safety, controller workload, capacity, etc.) and to collect lessons learned. The results of the post-implementation analysis study should be published in the post-implementation analysis report (PIAR) 45 calendar days following the six month post implementation analysis period. PBN co-leads may extend the post implementation analysis period if there is insufficient data.

a. Full Work Group.

- (1) Gathers data from the affected facilities using dependent surveillance location/track information, radar track data, issues/anomalies, ASAP, ATSAP, MOR, EOR, PD reports (FAA Form 8020-17 and FAA Form 8020-18), etc.
- (2) Validates the perceived benefits identified in phase one.
- (3) Interviews operators and air traffic control personnel and gathers lessons learned.
- (4) Drafts the PIAR. A PIAR template is provided in Attachment 4.
- (5) Recommends process and implementation improvements.

b. Air Traffic Facility.

- (1) Provides radar track data for flights using PBN project procedures and/or routes to the FWG.
- (2) Discusses any issues or anomalies, areas of possible improvement, and any lessons learned.

- (3) Follows the guidance specified in FAA Order 7210.632, as necessary, to document unusual occurrences pertaining to the procedure and/or route implementation.

c. PBN Co-Leads.

- (1) Ensures adequate time is given to post-implementation data gathering, evaluation, and analysis.
- (2) Notifies AJV-14 if the recommended six-month post-implementation monitoring and analysis time frame should be extended to provide adequate time to assess PBN project performance.
- (3) Ensures the PIAR is uploaded to the PTT.
- (4) Ensures lessons learned have been uploaded to the PTT.
- (5) Ensures the PIAR, including lessons learned, are submitted to AJV-14.

5.6 Project Completion. This marks the end of the project.

- a. PBN co-leads confirm that all required documentation is complete and that all required project files and documentation have been uploaded to the PTT.
- b. AJV-14 closes out the project. This includes formal notification to the OSG and PBN co-leads. The PBN co-leads will notify the FWG the project is closed. Any further requests to amend the project procedures and/or routes must re-enter the process at phase one.

5.7 Documentation Requirements. This section lists the documentation that must be completed and retained. All documentation, both original and revised, must be entered into the PTT.

- a. IRF.
- b. BAR, if applicable.
- c. PBN CWG and FWG contact lists.
- d. Flight simulator worksheet, as required.
- e. TARGETS distribution packages including, but not limited to, terminal area route generation, evaluation, and traffic simulation (TARGETS) files.
- f. RAPT consensus form.
- g. Environmental reviews, actions, and decisions, as required.
- h. PIAR.
- i. Meeting minutes.
- j. SRM documents, as required.

Appendix A. PBN Work Group Roles and Responsibilities.

- 1. Purpose.** This appendix contains a list of the principal participants of the Core Work Group (CWG) and the Full Work Group (FWG) and outlines the roles and responsibilities to ensure the successful coordination, development, and implementation of PBN procedures and/or routes.

Other parties not listed who may have a vested interest in the procedure and/or route may also be included in the CWG and FWG.

- 2. Proponent.** The proponent is the organization or individual who originally requests implementation of a new or amended procedure and/or route. Primary roles and responsibilities include:
 - a.** Submitting the proposed procedure and/or route via the IFP Gateway.
 - b.** Participating in the CWG and FWG meetings as required by the PBN co-leads, especially to provide background information and justification for the requested procedure and/or route and assisting in drafting the Project Mission Statement and Baseline Analysis Report.

- 3. PBN Co-Leads.**

- a.** The PBN co-leads serve as the focal point for coordinating internal and external CWG and FWG activities.
- b.** PBN co-leads must receive SMS training.
- c.** Primary roles and responsibilities include:
 - (1) Ensuring that project progress is updated in the PTT and that all necessary actions are complete and archiving all relevant project documentation and files.
 - (2) Leading meeting/teleconference discussions, updating the project schedule, and maintaining all project documentation.
 - (3) Tracking open or completed issues and tasks.
 - (4) Providing updates to the CWG and FWG on procedure and/or route status, as needed.
 - (5) Providing assistance to the go-team to identify, track and resolve issues.
 - (6) Coordinating with responsible airport authorities and office of public affairs.

- 4. TARGETS Operator.**

- a.** The TARGETS Operator(s) is/are coordinated by the OSG.
- b.** Primary roles and responsibilities include:
 - (1) Operating and updating TARGETS software and project databases.
 - (2) Provides project documentation, TARGETS files, and other relevant data to the PBN co-leads.

- (3) Assists the PBN co-leads with project facilitation, as determined by the PBN co-leads.
- (4) Assists the PBN co-leads with meeting and teleconference scheduling.

5. Operations Support Group (OSG).

- a.** Provides oversight and support for procedure and/or route design changes. These changes may affect operations, effectiveness and efficiency, and special activities within the NAS.
- b.** Primary roles and responsibilities include:
 - (1) Providing assistance to air traffic facilities to support procedure and/or route design and implementation.
 - (2) Assigning an environmental specialist to the CWG and FWG.
 - (3) Coordinating with the air traffic facility to complete an airspace review to ensure that the proposed procedure and/or route is compatible with existing procedures and/or routes and contained wholly within controlled airspace.
 - (4) Coordinating with the Airspace and Rules Group, as necessary.
 - (5) Coordinating ATC operational waivers.
 - (6) FPT reviews procedure and/or route proposal requests and processes the project in accordance with applicable orders.
 - (7) FPT coordinates with the Regional NextGen Branch (RNGB) to process criteria waiver requests.
 - (8) FPT is responsible for updating the Proponent.
 - (9) FPT is responsible for coordinating documentation issues with AJV-5.

6. Aeronautical Information Services (AJV-5).

- a.** Aeronautical Information Services (AJV-5) is responsible for the development, quality assurance, technical approval and maintenance of public-use flight procedures, production, and distribution of aeronautical charts and related publications and products. It is also directly responsible for managing the agency's program to provide aeronautical information services to ensure the flow of information necessary for safety, regularity, and efficiency of air navigation. Additional detailed responsibilities are addressed in FAA Order 8260.19, Flight Procedures and Airspace. AJV-5 participates on the FWG and as needed on the CWG.
- b.** Primary roles and responsibilities include:
 - (1) Providing guidance on Instrument Flight Procedures (IFP) development.
 - (2) Develop, maintain, and disseminate procedures and/or routes in accordance with FAA Orders.
 - (3) Providing procedure and/or route packages to Flight Inspection Services (FIS).
 - (4) Coordinating priorities for publication and changes to the chart dates.

7. Lead Industry Representative.

- a.** The Lead Industry Representative represents the operational perspectives on the project. Although participation of a representative is highly encouraged, it is not mandatory. For purposes of continuity and consistency, the representative should be available throughout the life cycle of the project and speak for industry as a whole.
- b.** Recommended roles and responsibilities would include:
 - (1) Providing feedback on procedure and/or route design, flyability, and Flight Management System (FMS) operational considerations. FMS expertise is recommended for Lead Industry Representatives.
 - (2) Conducting simulations to assess flyability, flight crew human factors, and operational issues before a procedure and/or route is submitted to AJV-5 for review. A Flight Simulator Worksheet for PBN procedures is provided in Attachment 3.
 - (3) Disseminating procedure and route data to other operators for review and simulation in additional aircraft types. This helps ensure Flight Simulator Worksheets are submitted to the PBN co-leads and distributed to other operators.
 - (4) Coordinating simulator and flight crew simulator evaluations.

8. Air Traffic Facilities.

- a.** All air traffic facilities, affected by the procedure and /or route design, development, and implementation participates on the FWG and as needed on the CWG.
- b.** Primary roles and responsibilities include:
 - (1) Serving as the focal point for ATC-related coordination and providing assistance in resolving problems identified during the design process.
 - (2) Providing information to the PBN co-leads regarding traffic flows and operational considerations (e.g., arrival/departure routes, aircraft types and characteristics, minimum Instrument Flight Rules (IFR) altitudes, airspace boundaries, sector requirements, and Standard Operating Procedures [SOP]).
 - (3) Providing data to the PBN co-leads (e.g., radar track data, LOA, SOP, etc.), which contain information on current or anticipated flight operations in order to define flight profiles and/or separation procedures.
 - (4) Addressing and coordinating facility concerns regarding procedure and/or route design and implementation requirements. At a minimum, this must include evaluation of the need for training and notification, new ATC procedures, phraseology, equipment, and changes to automation.
 - (5) TMU or ATF representative identifies potential impacts on projects, develops methodology to mitigate impacts, coordinates with other affected facilities, and disseminates information and mitigation plans.

9. Airport Authority.

- a.** Airport Authority may participate on the FWG and as needed on the CWG.
- b.** Primary roles and responsibilities include:
 - (1) Providing input on procedure and/or route design, including any potential operational or environmental impacts to the airport and surrounding communities.
 - (2) Providing information concerning planned airport construction that may impact procedure and/or route implementation.
 - (3) Providing current airport obstacle data to the PBN co-leads, as required.

10. PBN Programs and Policy Group (AJV-14).

- a.** AJV-14 provides PBN program oversight, management, and support.
- b.** Primary roles and responsibilities include:
 - (1) Reviewing all IRFs for concurrence and further action.
 - (2) Approving or disapproving PBN projects.
 - (3) Participating on the CWG and FWG.
 - (4) Verifying and validating FAA Order 7100.41 compliance during the lifecycle of procedure and/or route development.
 - (5) Coordinate PBN co-leads requests for Lead Industry Representatives with Airlines for America (A4A).
 - (6) Support PBN co-leads requests for peer-to-peer and go-team activities.

Appendix B. Acronyms, Terms, and Definitions.

<u>Acronym/Term</u>	<u>Definition</u>
A/C	Aircraft
AFS	Flight Standards Service
ATCSCC	Air Traffic Control System Command Center
ATSC	Air Traffic Service Center
ARTCC	Air Route Traffic Control Center
AR SIAP	Authorization Required Standard Instrument Approach Procedure
ASAP	Aviation Safety Action Program
ASIAS	Aviation Safety Information Analysis and Sharing. ASIAS is a data warehouse and integrated database system. It enables users to perform queries across multiple databases and display queries in useful formats.
ATC	Air Traffic Control
ATO	Air Traffic Organization
ATS	Air Traffic Service
ATQA	Air Traffic Quality Assurance. Formerly known as the National Airspace Incidents Monitoring System, the ATQA database is a collection of databases specific to certain subjects (near midair collisions, pilot deviations, vehicle/pedestrian deviations.)
ATSAP	Air Traffic Safety Action Program. ATSAP is a non-punitive, voluntary reporting program for ATC employees modeled after the Aviation Safety Action Program (ASAP). It allows employees to submit safety concerns and deficiencies so issues can be resolved before a major error occurs.
BAR	Baseline Analysis Report
CATEX	Categorical Exclusion
CDI	Course Deviation Indicator
CEDAR	Comprehensive Electronic Data Analysis and Reporting. CEDAR is a tool that provides air traffic management with an electronic means of assessing air traffic employee performance, managing resources, and capturing safety-related information and metrics. The tool provides a standard interface for the collection, retrieval, and reporting of data from multiple sources. It also automates the creation, management, and storage of facility activities and events; briefing items; Quality Assurance Reviews; technical training discussions; and FAA forms.
Chart Date	Publication date for route/procedure. The date is based on a 56-day cycle.

CNS	Communications, Navigation, and Surveillance
CWG	Core Work Group
DME	Distance Measuring Equipment
DME/DME Coverage	Distance Measuring Equipment/ Distance Measuring Equipment Coverage. DME Coverage is the area where the availability of DME facilities permits the minimum standard RNAV system performance, as defined in FAA Advisory Circular 90-100 or AC90-105.
EA	Environmental Assessment
EIS	Environmental Impact Statement
EOR	Electronic Occurrence Report
FAA	Federal Aviation Administration
Fix	A geographical position determined by visual reference to the surface, by reference to one or more radio NAVAIDs, by celestial plotting, or by another navigational device.
FMC	Flight Management Computer
FMS	Flight Management System
FPT	Flight Procedures Team
FWG	Full Work Group
GNSS	Global Navigation Satellite System
Go-Team	An “if needed” sub group of the FWG established to monitor or address any ATC or operator issues associated with the turning on of procedures and/or routes. The team can be in-place or teleconference.
GPS	Global Positioning System
ICAO	International Civil Aviation Organization
ID	Identification
IFR	Instrument Flight Rules
IRF	Initial Review Form
ISA	International Standard Atmosphere
Kt	Knot
Lead Industry Representative	One or more operators who have agreed to serve as the focal point for the development of an airport project for designing and implementing PBN routes/procedures. Industry representatives help develop the procedures and/or routes and ensure flyability by all aircraft expected to use the routes/procedures.
Leg Type	See “Path and Terminator” below
LNAV	Lateral Navigation

Metroplex	A geographic area covering several airports serving a major metropolitan area. Optimization of Airspace and Procedures in Metropolitan Areas.
MOR	Mandatory Occurrence Report
MSL	Mean Sea Level
NAS	National Airspace System
NOTAM	Notice to Airmen
NRS	National Reference System
OSG	Operations Support Group
PDC	Pre-Departure Clearance
Path and Terminator	A set of two alphabetic characters: The first identifies the type of flight path, and the second indicates where the route leg terminates, e.g., TF, DF, CF, VI, VM. The term is defined in ARING 424, the Navigation System Data Base Standard as an international standard file format for aircraft navigation data.
PBN	Performance Based Navigation
PD	Pilot Deviation (FAA Form 8020-17/-18)
PDARS	Performance Data Analysis and Reporting System. PDARS calculates a range of performance measures, including traffic counts, travel times, travel distances, traffic flows, and in-trail separations. Based on these data points, PDARS: <ul style="list-style-type: none"> • Automatically collects and analyzes radar tracks and flight plans; • Automatically generates and distributes daily morning reports; • Shares data and reports among facilities; and • Provides support for exploratory and causal analysis.
Peer-to-Peer	Prior to ATC facilities implementing PBN procedures, proactive ATC Peer-to-Peer activities place NATCA and Industry PBN subject matter experts (SME) together with certified professional controllers (CPC's) and ATC management to share lesson learned, best practices and operational experiences.
PIAR	Post Implementation Analysis Report
PTT	Project Tracking Tool
Proponent	The originator of a PBN procedure and/or route project request. This may be an individual, user group, ATC, Aeronautical Information Services (AJV-5), or other appropriate government agency.
Q Route	RNAV routes available for use by RNAV-equipped aircraft between

	FL 180 and FL 450 inclusive.
QA	Quality Assurance
RAPT	The Regional Airspace and Procedures Team, is chaired by the OSG/FPT and is comprised of representatives from the Service Center Air Traffic Operations Support and Planning and Requirements, Regional Flight Standards and Airports. The RAPT evaluates requests that may have an impact on airspace, airports, or flight procedures.
RNAV	Area Navigation. A method of navigation that permits aircraft operation on any desired flight path within the coverage of station-referenced navigation aids or within the limits of the capability of self-contained aids or a combination of both.
RNGB	Regional NextGen Branch
RNP	Required Navigation Performance. A statement of the navigational performance accuracy necessary for operation within defined airspace.
SDAT	Sector Design Analysis Tool is used to obtain track data for TARGETS and other airspace design purposes.
SID	Standard Instrument Departure
Significant Benefits	Tangible or intangible advantages resulting from the implementation of a PBN procedure and route, such as fuel savings from reduced flight tracks and time, reduced inter/intra facility coordination, reduced communication between ATC and pilots, and increased flexibility of airspace management and sectorization.
SMS	Safety Management System
SOP	Standard Operating Procedure
SRM	Safety Risk Management
SRMD	Safety Risk Management Document
SRMDM	Safety Risk Management Decision Memorandum
SRMP	Safety Risk Management Panel
STAR	Standard Terminal Arrival. A preplanned instrument flight rule (IFR) air traffic control arrival procedure published for pilot use in graphic form. STARs provide transition from the en route structure to an outer fix or an instrument approach fix/arrival waypoint in the terminal area.
STARS	Standard Terminal Automation Replacement System
T Route	Low-level RNAV ATS route available for use by RNAV-equipped aircraft from 1,200 feet above the surface (or in some instances higher) up to, but not including, 18,000 feet MSL.

TARGETS	Terminal Area Route Generation, Evaluation, and Traffic Simulation
TERPS	United States Standard for Terminal Instrument Procedures (Order 8260.3)
TK Route	Low-level IFR RNAV Helicopter Route
TMU	Traffic Management Unit
VNAV	Vertical Navigation
VOR	VHF Omni-directional Radio
VORTAC	VOR and Tactical Air Navigation
WP	Waypoint. A predetermined geographical position used for route/instrument approach definition, progress reports, published VFR routes, visual reporting points, or points for transitioning and/or circumnavigating controlled and/or special-use airspace that is defined relative to a VORTAC station or in terms of latitude/longitude coordinates
Wt.	Weight

Appendix C. Related Publications.

AC 20-138, Airworthiness Approval of Positioning and Navigation Systems

AC 25-15, Approval of Flight Management Systems in Transport Category Airplanes

AC 70/7460-2K, Proposed Construction or Alteration of Objects That May Affect the Navigable Airspace
AC 90-100, U.S. Terminal and En Route Area Navigation (RNAV) Operations

AC 90-105, Approval Guidance for RNP Operations and Barometric Vertical Navigation in the U.S. National Airspace

AC 150/5300-13A, FAA Standards and Recommendations for Airport Design

Aeronautical Information Manual (AIM)

FAA Order 1000.37, Air Traffic Organization Safety Management System Manual

ARINC Specification 424-18 Navigation System Database ICAO Annex 11, Air Traffic Services

ICAO ATM 4444, Air Traffic Management

FAA Order 1050.1, Environmental Impacts: Policies and Procedures

FAA Order 1100.161, Air Traffic Safety Oversight

FAA Order 6050.32, Spectrum Management Regulations and Procedures Manual

FAA Order 7100.9, Standard Terminal Arrival Program and Procedures

FAA Order 7110.65, Air Traffic Control

FAA Order 7130.3, Holding Pattern Criteria

FAA Order 7210.3, Facility Operation and Administration

FAA Order 7350.8, Location Identifiers

FAA Order 7400.2, Procedures for Handling Airspace Matters

FAA Order 7400.8, Special Use Airspace

FAA Order 7400.9, Airspace Designations and Reporting Points

FAA Order 7470.1, Distance Measuring Equipment (DME)/DME Infrastructure Evaluation for Area Navigation (RNAV) Procedures and/or Routes

FAA Order 7610.4, Special Military Operations

FAA Order 7930.2, Notice to Airman (NOTAM)

FAA Order 8200.1, United States Standard Flight Inspection

FAA Order 8240.32, Request for Flight Inspection Services

FAA Order 8240.36, Instructions for Flight Inspection Reporting

FAA Order 8260.3, United States Standard for Terminal Instrument Procedures (TERPS)

FAA Order 8260.19, Flight Procedures and Airspace

FAA Order 8260.23, Calculation of Radio Altimeter Height

FAA Order 8260.26, Establishing and Scheduling Civil Public-Use Standard Instrument Procedure Effective Dates

FAA Order 8260.40, Flight Management System (FMS) Instrument Procedures Development

FAA Order 8260.43, Flight Procedures Management Program

FAA Order 8260.46, Departure Procedure (DP) Program

FAA Order 8260.53, Standard Instrument Departures That Use Radar Vectors to Join RNAV Routes

FAA Order 8260.58, United States Standards for Performance Based Navigation (PBN) Instrument Procedure Design

RTCA, Document DO-187, Minimum Operational Performance Standards for Airborne Area Navigation Equipment Using Multi-Sensor Inputs

RTCA, Document DO-236, Minimum Aviation System Performance Standards: Required Navigation Performance for Area Navigation.

Attachment 1. Initial Review Form Template.

AJV-14 Initial Review Form			
PTT#	<i>AJV-14 Inserts PTT Number</i>		
Project Name	<i>AJV-14 Inserts Project Name</i>		
Project Information			
Submission Date	<i>Insert Date Email Received</i>	IFP Gateway #	<i>Insert IFP Gateway #</i>
Airport Name	<i>Insert ICAO ID and Full Airport Name</i>	Airspace Class	<i>Insert Airspace Class</i>
Project			
<input type="radio"/> New <input type="radio"/> Amendment <input type="radio"/> Notification Only / Abbreviated			
Procedure Type(s)			
<input type="checkbox"/> STAR <input type="checkbox"/> SID <input type="checkbox"/> RNP AR <input type="checkbox"/> Q / T / TK / Y / Z			
Proponent Justification			
<i>Insert proponent justification from the IFP Gateway/AJV-5 Request</i>			
Core Work Group Members			
Required		Optional	
<ul style="list-style-type: none"> Project Co-Lead (OSG) Project Co-Lead (Article 48) TARGETS Operator FPT AJV-14 		<input type="checkbox"/> Terminal <input type="checkbox"/> Environmental <input type="checkbox"/> En Route <input type="checkbox"/> AJV-5 <input type="checkbox"/> Industry <input type="checkbox"/> Others <input type="checkbox"/> Airport Authority	
Considerations/Recommendation			
OSG Considerations			
<input type="radio"/> GO <input type="radio"/> NO GO		<i>Insert OSG Considerations</i>	
Co-Lead Names			
Project Co-Lead (OSG)		<i>Insert name</i>	
Project Co-Lead (Article 48)		<i>Insert name</i>	
Co-Lead Considerations			
<i>Insert Co-Lead Considerations</i>			
Co-Lead Recommendation			
<input type="radio"/> Proceed with BAR <input type="radio"/> Proceed - No BAR <input type="radio"/> Do Not Proceed			

AJV-14 Initial Review Form	
PTT#	AJV-14 Inserts PTT Number
Project Name	AJV-14 Inserts Project Name

AJV-14 Approval	
<input checked="" type="radio"/> CONCUR <input type="radio"/> NON	<i>Insert AJV-14 Management Considerations</i>
<div style="border-bottom: 1px solid black; height: 40px;"></div> <div style="display: flex; justify-content: space-between;"> <i>AJV-14 Manager Name</i> <i>Date</i> </div>	

Attachment 2. Baseline Analysis Report Template.

Baseline Analysis Report	
PTT#	<i>PTT auto assigned number</i>
Project Type and Name	<i>Insert project name from PTT, procedures, and type</i>

The Baseline Analysis Report (BAR), required in the Preliminary Phase of FAA Order 7100.41 Performance Based Navigation (PBN) Implementation Process, is a collection of quantitative data derived from the PBN Dashboard, qualitative data gathered by the Core Working Group (CWG), analysis, and supporting documentation that support the production of PBN procedures/projects. The purpose of the BAR is to:

- identify expected benefits and develop conceptual procedures or routes for the proposed project
- serve as a decision aid to AJV-14
- evaluate the benefits of the final product during the Post Implementation and Monitoring phase

The BAR template is a standard format for the CWG to use when a proponent request has been assigned. The Project Lead is responsible for ensuring that the BAR is complete by ensuring the following elements are included:

- Mission statement
- Qualitative data of current operations from the dashboard
- Conceptual procedures and routes
- Perceived benefits
- Constraints
- Potential costs and risks.

THINGS TO CONSIDER BEFORE CONDUCTING A BAR

Identify initial high level risks

- ✓ Check for any runway construction projects planned for the airport.
- ✓ Check for any Magnetic Variation change that would require runways to be renumbered.
- ✓ For RNP AR procedures, evaluate for proper survey and Glide-path Qualification Surface (GQS) penetrations.
- ✓ Check for impacts due to En Route Automation Modernization (ERAM) implementation.
- ✓ Check for Environmental Assessments, Environmental Impact Studies, or Part 150 studies that may be in progress at affected airports.
- ✓ Identify key stakeholders and note their expectations. See Appendix C in the 7100.41 for typical stakeholder groups.

Familiarize with current operations

- ✓ Become familiar with existing traffic flows and procedures (S.O.P.).
- ✓ Review current conventional procedures and check with ATC facilities and the Flight Procedures Team (FPT) for any conventional or special procedures planned or under development. The conventional and special procedures could affect the PBN design or implementation and the environmental process.

Baseline Analysis Report	
PTT#	<i>PTT auto assigned number</i>
Project Type and Name	<i>Insert project name from PTT, procedures, and type</i>

- ✓ Check existing procedures to identify the Initial Approach Fixes (IAFs) and missed approaches. These may be used for RNP AR.
- ✓ Become familiar with fleet mix and equipage. Evaluate the percent of aircraft that can use PBN procedures.
- ✓ Become familiar with basic Letters of Agreement (LOA) provisions such as handoff altitudes, transfer of control and communications.
- ✓ Check for existing noise abatement agreements at the airport. The ATC facility or Airport Authority should have the information.
- ✓ For RNP AR, identify the IAFs on an en route IFR Low chart to see how the IAFs fit into the airway infrastructure.
- ✓ Obtain maps of airspace showing sector boundaries from ATC. Check with Aeronautical Information Services (AJV-5) to prevent unnecessary boundary crossings on the procedure or missed approach.
- ✓ Document and include information in the BAR.

Prepare baseline analysis and conceptual proposed procedures

- ✓ For RNP AR, determine if CAT D is required, or just CATs A-C.
- ✓ If STARs are being developed, check to see if RNP procedures should be included in the project. For RNP AR, determine if there are any existing RNAV STARs at the airport to connect with the RNP ARs.
- ✓ Determine if the facility wants the STAR(s) designed to serve all airport runways and/or multiple airports.
- ✓ For RNP AR, insure the missed approach will not interfere with procedures at any other airports in the vicinity.
- ✓ Determine if there is MITRE wind data for the airport. Always contact MITRE through the PBN Policy & Support Group POC.
- ✓ Request the industry representative performance data for conventional procedures and optimized RNAV procedures.
- ✓ Consider improvements from reduced level off using optimized profile descent (OPD) and improved departure efficiency.
- ✓ Compare track miles for conventional procedures and RNAV procedures.
- ✓ Consider non-tangible benefits such as reduced pilot/controller communication.
- ✓ Develop efficient concept procedures in TARGETS.
- ✓ Coordinate with RAPT, IAW FAAO 8260.58 US Standards for Performance Based Navigation Instrument Procedure Design - to establish priority and consensus, then insure a publication date that allows sufficient time for procedure development.
- ✓ Check with the FPT for a date to submit completed procedures. For larger projects, the 174-days production cycle is not adequate, check with AVN to determine.

Baseline Analysis Report	
PTT#	PTT auto assigned number
Project Type and Name	Insert project name from PTT, procedures, and type
Airport Name	Insert airport name
Airspace Class	Insert airspace class
Proponent Justification	Insert proponent justification from IFP Gateway
Mission Statement <input type="checkbox"/> Safety <input type="checkbox"/> Facility/System Benefit <input type="checkbox"/> User Benefit <input type="checkbox"/> Other	Mission statement concisely states project goals
Analysis to be incorporated into Baseline Analysis Report (BAR)	
Dashboard derived data (current year):	Airfield usage <i>(frequency of operations)</i> High: 650+ average operations per day Moderate: 351-650 average operations per day Low: 151-350 average operations per day Minimal: 150 or less average operations per day Insert "Operation Summary" Image from PBN Dashboard (use the insert picture function). The image can also be attached.
	Current equipage capability <i>(Part 121 RNP AR/All IFR RNAV1)</i> <input type="radio"/> High: >30% / >98% <input type="radio"/> Moderate: 20-30% / <input type="radio"/> Low <20% / <90% Insert "Equipped Capability by Operator Type" Image from PBN Dashboard (use the insert picture function). The image can also be attached.
	Usage statistics of current procedures
	Insert "RNAV Arrival (STAR) Usage" Image, "RNAV Conventional Departure (SID) Usage" Image, from PBN Dashboard (use the insert picture function). The image can also be attached.
	Time in level flight and track mileage statistics of procedure to be replaced/modified Insert "Time/Distance in Level Flight" Image from PBN Analyst Dashboard (use the insert picture function). The image can also be attached.

Baseline Analysis Report

PTT#	<i>PTT auto assigned number</i>
Project Type and Name	<i>Insert project name from PTT, procedures, and type</i>

Impact to other procedures and airports	Other significant interest items worthy of affecting consideration <i>Example: VORs to be decommissioned, airspace re-alignment, etc.</i>
	<i>Insert comments here. You may also attach additional information.</i>
	Conceptual procedures developed in TARGETS <ul style="list-style-type: none"> Run simulation to determined level of benefit, if any, for track miles and/or time in level flight Note any other derived benefits (flow patterns, etc.)
	<i>Insert comments and TARGETS depiction here. You may also attach additional information.</i>
	Environmental <ul style="list-style-type: none"> See FAAO 7400.2, Chapter 32 Consult with Service Center Environmental Specialist Determine level of review needed (pre-screening filter, screening document, etc.) Consider potential environmental issues or concerns Determine level of expected requirement (Environmental Impact Statement, CatEX, etc.) Other potential environmental issues concerns
	<i>Insert results here. You may also attach additional information.</i>
	Expectation of additional SMS requirement due to airspace and/or criteria deviation
<i>Insert comments here. You may also attach additional information.</i>	

PBN Project Schedule Considerations		Yes	No	Tasks	Duration (days)
	Does this project require Criteria Waivers (1.2.4.5.1)?	<input type="checkbox"/>	<input type="checkbox"/>		
	Does this project require ATC Operational Waivers (1.2.4.5.2)?	<input type="checkbox"/>	<input type="checkbox"/>		
	Does this project require Rulemaking? (1.2.4.7)?	<input type="checkbox"/>	<input type="checkbox"/>		
	Does this project require Airspace Changes?	<input type="checkbox"/>	<input type="checkbox"/>		

Baseline Analysis Report

PTT#	<i>PTT auto assigned number</i>
Project Type and Name	<i>Insert project name from PTT, procedures, and type</i>

Any additional significant information:

Insert potential risks (schedule, cost, technical) comments here. You may also attach additional information.



CWG Recommendation	<input type="radio"/> Proceed <input type="radio"/> Do Not Proceed	<i>Insert comments here.</i> <i>You may also attach additional information</i>
Signatures - PBN Project Co-Leads		
<div style="margin-bottom: 20px;"> <div style="font-size: 2em; font-weight: bold; margin-bottom: 5px;">X</div> <div style="border-top: 1px solid black; width: 200px; margin: 0 auto;"></div> <div style="font-size: 0.8em; margin-top: 5px;">Project Co-lead (OSG)</div> </div> <div> <div style="font-size: 2em; font-weight: bold; margin-bottom: 5px;">X</div> <div style="border-top: 1px solid black; width: 200px; margin: 0 auto;"></div> <div style="font-size: 0.8em; margin-top: 5px;">Project Co-Lead (Article 48)</div> </div>		

Baseline Analysis Report	
PTT#	<i>PTT auto assigned number</i>
Project Type and Name	<i>Insert project name from PTT, procedures, and type</i>

AJV-14 Management BAR:	
<i>Insert AJV-14 Management Considerations</i>	
AJV-14 Management Approval:	<input type="radio"/> Concur <input type="radio"/> Non-Concur
<div>X</div> <div>AJV-14 Management</div>	

Attachment 3. Flight Simulator Worksheet and Instructions.

(1) Operator Name:					
(2) Procedure Name:		(3) Date:			
(4) Type (e.g., CARJ/F):		(5): LNAV/VNAV Engage Point:			
(6) FMC/GPS Manufacturer:		(7) FMC/GPS Software Version:			
(8) Initial Wind Setup:					
TASK	Run 1	Run 2	Run 3	Run 4	Run 5
(9) Rwy and En Route Transition					
(10) Max allowable Takeoff Wt. of A/C:					
(11) Takeoff Thrust used:					
(12) Max Surface Tailwind (SID only):					
(13) Temperature (ISA):					
(14) Type of Guidance:					
(15) Navigation Source:					
(16) Other:					
(17) Remarks:					
(18) Completed by:			(19) Phone Number:		

(20) Attach a print out of the FAA LEG TYPE coding and a copy of the lateral and vertical track from the procedure flown.

Figure 7. Flight Simulator Worksheet

[illegible]

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FLIGHT SIMULATOR WORKSHEET GUIDELINES.

These instructions are for completing the simulator worksheet by Lead Industry Representative personnel. This worksheet may be used by any operator involved in the development of procedures. Once completed, a copy of the worksheet must be distributed to the WG for review.

BLOCK 1. OPERATOR NAME. Enter the name of the airline/facility conducting the simulation.

BLOCK 2. PROCEDURE NAME. Enter the RNAV procedure name (e.g., PAIGE RNAV Five Departure).

BLOCK 3. DATE. Enter the date simulations were accomplished.

BLOCK 4. TYPE. Enter the aircraft type and equipment suffix (e.g., CARJ/F).

BLOCK 5. LNAV/VNAV ENGAGE POINT. For Standard Instrument Departures (SID), enter the point at which LNAV/VNAV is engaged (as specified in operator operations manual).

BLOCK 6. FMC/GPS MANUFACTURER. Enter the FMC or GPS Stand-Alone manufacturer's name (e.g., Honeywell, Smiths, etc.).

BLOCK 7. FMC/GPS SOFTWARE VERSION. Enter the FMC or GPS Stand-Alone software version.

BLOCK 8. INITIAL WIND SETUP. Use historical wind data when available. If historical wind data is not available, use in-flight Tailwind of 30 knots at 1,000 feet and increase by 10 knots, every 2,000 feet until reaching 80 knot tailwinds. Record the wind used in Block 8.

BLOCK 9. RUNWAY AND EN ROUTE TRANSITION FLOWN. Enter the runway and en route transition flown.

BLOCK 10. MAX ALLOWABLE TAKEOFF WT. OF AIRCRAFT. Enter the takeoff weight – Fly procedures at maximum allowable takeoff weight.

BLOCK 11. TAKEOFF THRUST USED. Enter the takeoff thrust used – List either the reduced or the maximum takeoff setting used (Max allowable per conditions).

BLOCK 12. MAX SURFACE TAILWIND. Enter the surface tailwind – Initiate takeoff with 10 kt tailwind component.

BLOCK 13. TEMPERATURE ISA. Enter the ISA temperature – Fly the procedure at Average Max Summer temperature for the airport and use indicated climb gradients.

BLOCK 14. TYPE OF GUIDANCE. Enter the type of flight guidance used. The preferred flight guidance is the autopilot. List others if used (e.g., Flight director or CDI).

BLOCK 15. NAVIGATION SOURCE. Not required for PBN.

BLOCK 16. OTHER. Enter any work group-specified conditions (e.g., crosswind component).

BLOCK 17. REMARKS. Enter any remarks about the procedure design or flyability.

BLOCK 18. COMPLETED BY. Enter the name of the person completing the form.

BLOCK 19. PHONE NUMBER. Enter an appropriate contact phone number of the person completing the form.

BLOCK 20. ATTACHMENT. Attach a print out of the LEG TYPE coding and lateral/vertical track for each run flown.

BLOCK 21. PROCEDURE NAME. This block should be identical to Block 2.

BLOCK 22. RUN NUMBER. Enter the sequential number of this run. Blocks 21 through 27 should be completed for each run.

BLOCK 23. WAYPOINT NAME. Enter the name of waypoint passed by the aircraft (Complete sheet for each run completed).

BLOCK 24. ALTITUDE. Enter the aircraft altitude as it passes the waypoint listed in Box 21.

BLOCK 25. AIRSPEED/GROUNDSPEED. Enter the aircraft air/ground speed as it passes the waypoint listed in Block 23.

BLOCK 26. TURN ANTICIPATION DISTANCE. Enter the aircraft turn anticipation distance passing the waypoint listed in Box 21.

BLOCK 27. WIND. Enter the wind direction and velocity as the aircraft passes the waypoint listed in Block 23.

Attachment 4. Post Implementation Analysis Report Template.

Post Implementation Analysis Report (PIAR)			
Project Name	<i>Insert project name from PTT. Include procedures and types.</i>		
PTT #	<i>PTT auto-assigned number</i>	Date	<i>mm/dd/yyyy</i>

The post implementation analysis, required in Phase 5 (Post Implementation Monitoring and Evaluation) of FAA Order 7100.41 *Performance Based Navigation (PBN) Implementation Process*, is intended to verify that new procedures and/or routes have met the objectives stated in the Baseline Analysis Report (BAR) and to collect relevant Lessons Learned. It is composed of quantitative data collected from all affected facilities as well as information collected throughout post implementation monitoring. This report documents those findings in an official Post Implementation Analysis Report (PIAR). A minimum of 4 months of data is needed for completion of the PIAR.

According to Section 7-2-7 of the 7100.41 Order, Co-Leads gather data from the affected air traffic facilities including dependent surveillance location/track information (radar site), radar track data, issues/anomalies, etc. (Facilities are responsible for collecting those elements as well as tracking any operational incidents and/or design concerns/mitigations.) Monitoring must include a review of data from:

- Aviation Safety Action Program (ASAP)
- Air Traffic Safety Action Plan (ATSAP)
- Memorandum of Receipt (MOR)
- Emergency Order of Revocation (EOR)
- Pilot Deviation (PD) reports (FAA Form 8020-17 and FAA Form 8020-18)
- Aviation Safety Information Analysis and Sharing (ASIAS) Program

Data is collected during the monitoring period and compared to goals set in the BAR. As such, the PIAR should include the following elements from the BAR:

- Qualitative data of implemented operations from the dashboard (specifically, compare Usage Statistics from Baseline Procedures to Post Implementation Procedures)
- Published procedures and routes
- Actual benefits (include comparisons of aircraft usage, distance flown, level-off data, duration of flight on procedure, etc.)
- Constraints that negatively affected benefits. (These may include constraints previously identified in the BAR or those that were unexpected.)

Post Implementation Analysis Report (PIAR)			
Project Name	Insert project name from PTT. Include procedures and types.		
PTT #	PTT auto-assigned number	Date	mm/dd/yyyy
Airport Name	Insert airport name		
Airspace Class	Insert airspace class		
Observation Period	Start Date: mm/dd/yyyy	End Date: mm/dd/yyyy	
Mission Statement Objectives Met			
From Approved BAR			
Paste copy of Mission Statement from the approved BAR			
Objectives Met Through Implementation			
Discuss items in the Mission Statement that were addressed and resolved over the life of the project. This may include metrics such as safety, facility/NAS benefit (workload, capacity), user benefit, efficiency, etc.			
Track Data Analysis			
<ul style="list-style-type: none"> Use baseline and post implementation simulation runs to compare level of benefit, if any, for track miles and/or time in level flight Note any other derived benefits (flow patterns, etc.) from implementation. 			
Procedures developed in TARGETS			
Insert analysis and comments here. Additional information, including TARGETS depictions or chart images, may be attached.			
Actual Tracks Flown			
Obtain these tracks from the affected Air Traffic Facility and run them through a TARGETS simulation in order to compare with baseline simulation data.			
PBN Dashboard Derived Data: Comparison to Baseline Analysis Report			
Usage statistics of baseline procedure(s) compared to implemented procedure(s)			
Insert post implementation "RNAV Arrival (STAR) usage" image and/or "RNAV Conventional Departure (SID) Usage" image from PBN Dashboard (use the insert picture function). The image may also be attached.			
Time in level flight and track mileage statistics of baseline procedure(s) compared to implemented procedure(s)			
Insert post implementation "Time/Distance in Level Flight" Image from PBN Analyst Dashboard (use the insert picture function). The image may also be attached.			

Post Implementation Analysis Report (PIAR)			
Project Name	Insert project name from PTT. Include procedures and types.		
PTT #	PTT auto-assigned number	Date	mm/dd/yyyy
<div>+</div> <div>Post Implementation Analysis</div> <div>Quantifiable Benefit Data Demonstrated</div> <div>Insert comprehensive post implementation analysis, demonstrating measureable improvements to the NAS.</div> <div>Implementation Monitoring Observations of Significant Interest</div> <div>Describe significant findings or constraints identified during implementation monitoring. Include relevant data collected from ASAP, ATSAP, MOR, EOR, PD reports, ASIAs, and other sources. Documentation may be attached.</div> <div>Lessons Learned</div> <div>List any efficiencies identified during the procedure design stage that would be relevant to subsequent projects.</div> <div>□</div>			
<div>Other Supporting Data</div> <div>Additional Information (as applicable)</div> <div>Enter in any additional information relevant to the implementation of this project.</div> <div>Comments</div> <div>Enter in any additional comments regarding the project.</div> <div>Attachments</div> <div>List all attachments referenced in this PIAR, including forms, charts, analyses, etc.</div>			

Post Implementation Analysis Report (PIAR)

Project Name	<i>Insert project name from PTT. Include procedures and types.</i>		
PTT #	<i>PTT auto-assigned number</i>	Date	<i>mm/dd/yyyy</i>

Project Co-Lead Signatures

OSG Co-Lead Name	<u>mm/dd/yyyy</u> Date
Article 48 Co-Lead Name	<u>mm/dd/yyyy</u> Date

AJV-14 Comments

Provides opportunity for AJV-14 to comment on the project.	
AJV-14 Signature	
<div style="display: flex; justify-content: space-between; align-items: flex-end; padding-top: 20px;"> <div style="border-top: 1px solid black; width: 60%;"></div> <div style="border-top: 1px solid black; width: 35%; text-align: center;"> <i>mm/dd/yyyy</i> Date </div> </div>	
<div style="display: flex; justify-content: space-between; align-items: flex-end; padding-top: 20px;"> <div style="border-top: 1px solid black; width: 60%;"></div> <div style="border-top: 1px solid black; width: 35%; text-align: center;"> <i>mm/dd/yyyy</i> Date </div> </div>	

Attachment 5. Project Tracking Tool Overview.

Purpose.

The purpose of this attachment is to identify the data retained in the Project Tracking Tool (PTT). The development, review, and implementation of PBN procedures and routes is monitored through the PTT. It is a project management tool for PBN working groups to view real-time progress of all PBN projects.

The PTT is designed to follow the process defined in this order. It includes an archival function for the project documents. This tool keeps a log of all actions, including the date, time, and name of user entering or modifying the information. All of these features are required to satisfy the Safety Risk Management Document (SRMD).

Information Required by Phase in the PTT.

Phase 1: Preliminary Activities	
Project proponent's contact information	Name and contact information
Applicable project and route information	Procedure or route type Navigation Performance type Airport Amendment identification Runway information Service area
Mission statement	Describes the project and its goals
Proposed Start/End Dates Actual Completion Dates	CWG Establishment Notional Routes/Procedures Development Baseline Analysis Baseline Analysis Report (BAR) Submission CWG Consensus on the completion of Phase 1 Lessons Learned Review
Attachments	IFP gateway request email IFP gateway request email attachments BAR Initial Review Form (IRF) List of CWG Members

Phase 2: Design Activities	
Proposed Start/End Dates Actual Completion Dates	Flight Simulations Air Traffic Simulations DME/DME Assessment Initial environment review Waiver/Safety Initial Assessment Project Risk Assessment Prototype Design Post Prototype Design Work Consensus on the completion of Phase 2
Assessment Results Attachments	List of FWG Members Distribution Package FWG Meeting Minutes (with list of attendees) RAPT Consensus Form TARGETS Files Flight Simulations Worksheets Risks and Mitigations* Waiver/Safety Initial Assessment Waivers* SMS Assessment* Initial environment Review* Air Traffic Simulations* DME/DME Assessment*

* During the Baseline Analysis, CWG members will decide if these activities are applicable or not. If applicable, the required documentation is listed in the 'Attachment' section for each phase. If not, the PTT requires that the user check the 'N/A' box.

Phase 3: Development and Operational Preparations	
Proposed Start/End Dates Actual Completion Dates	Rulemaking Activities Routes and Procedures Design and QA Flight Inspection Routes and Procedures Added to NFDC Website ATC Notification Operator Notification ARTCC Automation Updates Terminal Automation Updates Flight Planning System Updates Video Maps Updates Confirm Navigation Database and Chart Consistency Go Team Establishment
Assessment Results Attachments	List of Go-Team Members Full Working Group (FWG) Members FWG Meeting(s) Minutes (with list of attendees) RAPT Submission Implementation Strategy Plan Rulemaking Additional SMS Study*

* During the Baseline Analysis, CWG members will decide if these activities are applicable or not. If applicable, the required documentation is listed in the 'Attachment' section for each phase. If not, the PTT requires that the user check the 'N/A' box.

Phase 4: Development and Operational Preparations	
Proposed Start/End Dates Actual Completion Dates	Flight Trials Operational Preparation Completion Confirmation Issues/Potential Hazards addressed Routes and Procedures Chart Routes and Procedures Implementation
Phase 5: Post Implementation Preparations	
Proposed Start/End Dates Actual Completion Dates	Go-Team Review Post Implementation Analysis Post Implementation Analysis Report (PIAR) Project Complete
Assessment Results Attachments	End of Day Report Initial Usage Issues Operational Incidents Mitigations Strategies Implemented Air Traffic Facility Identified Issues/Anomalies Lessons Learned Review PIAR

Attachment 6. Lessons Learned Database Overview.

- 1. Purpose.** The purpose of the Performance Based Navigation (PBN) Lesson Learned database is to capture and retain best practices, issues, and resolutions to issues identified during the procedure publication lifecycle. Lessons will be integrated throughout the project lifecycle with a review of the Lesson Learned database occurring at the beginning of each phase, and an opportunity to capture lessons throughout the entire process.
- 2. Management Oversight.** The Lesson Learned database is managed by the PBN Program Management Office, AJV-14. All access requests must be submitted to AJV-14 for approval.
- 3. Process.** Work groups will review the Lesson Learned database at the beginning of a project and the start of each phase. Previous lessons are reviewed for, but not limited to, relevance to the respective phase, type of project, and geographical area. The PBN work groups will review these lessons and incorporate them into the process where applicable.
- 4.** If an issue comes up, the PBN work groups will reference the Lesson Learned database for a similar situation and solution. If one does not exist, the PBN co-lead will create a new Lesson Learned entry.
- 5.** When creating a Lesson Learned entry, the following fields must be entered, if applicable:
 - a.** Subject.
 - b.** Working Group Name.
 - c.** Description.
 - d.** Category.
 - e.** Procedure Type.
 - f.** PBN Phase.
 - g.** Additional Recipients that should be notified upon modification.
 - h.** Add attachments.
- 6. Resolution.** Periodically AJV-14 will review the lesson learned entries for accuracy and correctness, solutions, and process improvement. If a solution or answer is identified, AJV-14 will integrate the lesson into the process. Once the lesson learned has been integrated into the process, AJV-14 will retire the Lesson Learned.

Attachment 7. FAA Order 7100.9E Changes.

1. **Purpose.** The order previously covered both PBN criteria and policy guidance. In an effort to align the content of this order with the appropriate authority, the portions of this order which cover policy and processes are now covered by FAA JO 7100.41A. The remaining portions which pertain to criteria fall under the jurisdiction of the Flight Standards Service and are anticipated to be included in future updates of the appropriate 8260 series documents. The following table lists the affected paragraphs which have been either removed or replaced by sections of FAA JO 7100.41A as follows:

FAA JO 7100.9E	FAA JO 7100.41A
6. Procedures 6.a thru 6.a.(3)(b)	Section II 1(b) thru 1(d); Section III 1.1;
7. Roles and Responsibilities 7.a.(1) ; 7.a.(3) thru 7.a.(8) (<i>Air Traffic Control Facilities</i>)	Section III 2.6(b), 2.7(b), 2.7(c), 3.4(d), 3.5(a), 3.6(a), 3.7(c), 5.4(b), 5.5(b) Appendix A. 8.a thru 8.b(5)
7.a.(2)	Removed
7.b.(2) thru 7.b.(11) (<i>Service Center Operations Support Group</i>)	Section III 1.1, 1.3(c), 1.4(b), 1.5(a), 2.4(a), 2.5(a), 2.6(d), 2.7(e), 2.7(g), 3.4(a), 3.4(b), 3.7(d), 4.3(a), 5.4(a), 5.5(c), 5.6(a) Appendix A. 3.a thru 3.c(6), 5.a thru 5.b(9)
7.c.(1) thru 7.c.(4) (<i>PBN Working Groups</i>)	Section III 1.4(a), 2.5(c), 2.7(a), 3.5(c), 3.7(a), 5.5(a)
7.d.(1) thru 7.d.(9) (<i>Flight Procedures Team</i>)	Section III 1.3(a), 1.3(c)(4), 1.3(c)(5), 1.3(c)(8), 1.5(a)(4) Appendix A. 5.b(6) thru 5.b(9)
7.e.(1) thru 7.e.(3) (<i>Flight Standards Regional NextGen Branch (RNGB) Manager</i>)	Removed
7.f.(1) thru 7.f.(8) (<i>Aeronautical Information Services, AJV-5</i>)	Section III 2.6(c), 3.4(c) Appendix A. 6.a thru 6.b(4)
7.g.(1) thru 7.g.(5) (<i>National Flight Data Center</i>)	Removed
7.h.(1) thru 7.h.(2) (<i>PBN Policy and Support Group, AJV-14</i>)	Section II 1.c, Section III 1.1, 1.3(d), 1.5(b), 5.2, 5.6(b) Appendix A. 10.a thru 10.b(6)
7.i.(1) thru 7.i.(2) (<i>Flight Inspection Services</i>)	Removed