PART 3 JOB AIDS

RNP AR APCH JOB AID

APPLICATION TO CONDUCT RNP AR APCH OPERATIONS

1. Introduction

This Job Aid was developed to provide operators, and inspectors with guidance on the process to be followed in order to obtain an RNP AR APCH approval for approaches flown to an RNP minima. It should be used as an aid for the approval process but frequent reference to the ICAO PBN Manual (DOC 9613) and PBN Operational Approval Handbook will be required. Volume II, Part C, Chapter 6 contains detailed guidance on the implementation of RNP APCH.

2. Purpose of the Job Aid

2.1 To give operators and inspectors information on the main RNP AR APCH reference documents.

2.2 To provide tables showing the contents of the application, the associated reference paragraphs, the place in the application of the operator where RNP AR APCH elements are mentioned and columns for inspector comments and follow-up on the status of various elements of RNP AR APCH.

3. Actions Recommended for the Inspector and Operator

3.1 At the pre-application meeting with the operator, the inspector reviews the "basic events of the RNP AR APCH approval process" described in Section 1 of this Job Aid, in order to provide an overview of the approval process events.

3.2 The inspector reviews this Job Aid with the operator in order to establish the form and content of the RNP AR APCH approval application.

3.3 The operator uses this Job Aid as a guide to collect the documents of the RNP AR APCH application.

3.4 The operator inserts in the Job Aid references showing in what part of its documents are the RNP AR APCH elements located.

3.5 The operator submits the Job Aid and the application to the inspector (with the required documents).

3.6 The inspector indicates in the Job Aid whether an item is in compliance or needs corrective action.

3.7 The inspector informs the operator as soon as possible when a corrective action by the operator is required.

3.8 The operator provides the inspector with the revised material when so requested.

3.9 The MCAA provides the operator with the operational specifications (air operators) or a letter of authorization (others), as applicable, when the tasks and documents have been completed.

APPLICATION TO CONDUCT RNP AR APCH

SECTION 1 - INFORMATION ON THE IDENTIFICATION OF AIRCRAFT AND OPERATORS

NAME OF THE OPERATOR: _____ is applying for RNP AR APCH Operations Approval.

Aircraft manufacturer, model, and series	Aircraft Registration (required only if installed equipment varies between model and series)	List relevant make and model of related navigation equipment

DATE OF PRE-APPLICATION MEETING _____

DATE ON WHICH THE APPLICATION WAS RECEIVED _____

DATE ON WHICH THE OPERATOR INTENDS TO BEGIN RNP AR APCH OPERATIONS _____

SECTION 2 – OPERATOR APPLICATION (ITEMS AND DOCUMENTS)

Item	Title of document	Indication of inclusion by the operator	Comments by the Inspector
1	**Airworthiness documents showing aircraft eligibility for RNP AR APCH.** AFM, AFM revision, AFM supplement, or Type certificate data sheet (TCDS) showing that the RNP navigation system is eligible for RNP AR APCH. or; Manufacturer statement. - Aircraft with a manufacturer statement documenting compliance *Note: The operator should indicate the lowest RNP capability for which approval is requested and provide relevant supporting documentation*.		
2	**Aircraft modified to meet RNP AR APCH standards.** Documentation on aircraft inspection and/or modification, if applicable. Maintenance records documenting the installation or modification of aircraft systems		
3	**Maintenance programme** • For aircraft with established maintenance procedures for RNP AR APCH systems, the list of references of the document or programme. • For recently installed RNP AR APCH systems, the maintenance procedures for their review.		
4	**Minimum equipment list (MEL) if applicable** showing provisions for RNP AR APCH systems.		

Item	Title of document	Indication of inclusion by the operator	Comments by the Inspector
5	**Training** Training programme for flight crews, flight dispatchers, and maintenance personnel as applicable.		
6	**Operating policies and procedures** Operations manual (OM) and checklists or sections to be attached to the application, corresponding to RNP AR APCH operating procedures and policies.		
7	**Navigation database** Details of the navigation data validation programme.		

SECTION 3 – GUIDE FOR DETERMINING RNP AR APCH AIRCRAFT ELIGIBILITY

Item	Topics	Reference paragraphs ICAO Doc 9613 Vol II Part C 6	Location in the Documents of the operator	Comments
1	**Aircraft and system requirements**			
	Aircraft eligibility determined through demonstration of compliance against relevant airworthiness criteria.	6.3.2.6		
	Aircraft complies with FAA AC 20-129 or equivalent (Barometric VNAV)	6.3.3		
	Aircraft complies with FAA AC 20-130 or AC 20-138 or equivalent (GNSS)	6.3.3		

Item	Topics	Reference paragraphs ICAO Doc 9613 Vol II Part C 6	Location in the Documents of the operator	Comments
	Aircraft is equipped with system to monitor its achieved navigation performance, and to identify, for the pilot, whether the operational requirement is or is not being met during an operation (e.g. "Unable RQ Nav Performance - RNP", "GPS Primary Lost")	6.3.3.1.5		
	Automatic reversion to an alternate RNAV sensor if the primary RNAV sensor fails.	6.3.3.2.6		
	Aircraft barometric VNV system temperature compensated (optional)	6.3.3.2.8		
2	**Displays**	6.3.3.3.1.3		
	Aircraft displays required information (*General Requirements*)	6.3.3.3.1.3 (a) to (o)		
	Continuous display of deviation. The navigation system must provide the capability to continuously display to the pilot flying, on the primary flight instruments for navigation of the aircraft, the aircraft position relative to the RNP defined path (both lateral and vertical deviation). The display must allow the pilot to readily distinguish if the cross-track deviation exceeds the navigation accuracy (or a smaller value) or if the vertical deviation exceeds 22 m (75 ft) (or a smaller value).	6.3.3.3.1.3.(a)		
	Display of deviation. The navigation system must provide a numeric display of the vertical deviation with a resolution of 3 m (10 ft) or less, and the lateral deviation with a resolution of 0.01 NM or less. *Where the display of lateral deviation does not provide a resolution of 0.01NM or less, a limitation may be placed on the lowest useable RNP consistent with the ability of the flight crew to monitor deviation from track.*	6.3.3.3.1.3.(m)		
3	**Navigation Database**			
	The aircraft navigation system must use an on-board navigation database which can receive updates in accordance with the AIRAC cycle and allow retrieval and loading of RNP AR APCH procedures into the RNP system. The on-board navigation database must be	6.3.3.3.1.5		

Item	Topics	Reference paragraphs ICAO Doc 9613 Vol II Part C 6	Location in the Documents of the operator	Comments
	protected against flight crew modifications of the stored data.			
	The aircraft must provide a means to display the validity period of the on-board navigation database to the flight crew.	6.3.3.3.1.6		
4	**Requirements for RNP AR approaches with RF legs**	**6.3.3.3.2**		
	Most RNP AR APCH capable aircraft have the capability to execute RF legs, however approval may be given to operators of aircraft without this capability limited to RNP AR approaches which do not include RF legs			
	The navigation system must have the capability to execute leg transitions and maintain tracks consistent with an RF leg between two fixes.	6.3.3.3.2.1		
	The aircraft must have an electronic map display of the selected procedure	6.3.3.3.2.2		
	The FMC, the flight director system and autopilot must be capable of commanding a bank angle up to 25 degrees above 121 m (400 ft) AGL and up to 8 degrees below 121 m (400 ft) AGL.	6.3.3.3.2.3		
	Upon initiating a go-around or missed approach (through activation of TOGA or other means), the flight guidance mode should remain in LNAV to enable continuous track guidance during an RF leg.	6.3.3.3.2.4		
5	**Requirements for RNP AR Approaches to less than RNP 0.3**	6.3.3.3.3		
	Consideration should be made for the application of the following requirements for all RNP AR approaches (i.e. including RNP 0.3) especially in areas of significant terrain.			
	No single point of failure. Aircraft fitted with duplicated navigation and guidance equipment... *Most RNP AR APCH capable aircraft are equipped with duplicated systems which meet this requirement*.	6.3.3.3.3.1		

Item	Topics	Reference paragraphs ICAO Doc 9613 Vol II Part C 6	Location in the Documents of the operator	Comments
	Go-around guidance. Aircraft fitted with TOGA to NAV function *If the aircraft does not provide this capability, the operator must be limited to the conduct of approaches with straight segments prior to and after the DA (Refer para 6.3.3.3.3.3 (a).* *Where the flight guidance system does not remain in LNAV, operators may be approved if the flight crew is able to engage LNAV guidance on flight director or autopilot by 121 m (400 ft) AGL. (refer para 6.3.3.3.3.(b)*	6.3.3.3.3.3		
	Loss of GNSS. After initiating a go-around or missed approach following loss of GNSS, the aircraft must automatically revert to another means of navigation that complies with the navigation accuracy. *Typically RNP AR APCH capable aircraft meet this requirement by reversion to IRS navigation.*	6.3.3.3.3.4		
6	**Requirements for approaches with missed approach less than RNP 1.0**	**6.3.3.3.4**		
	Consideration should be made for the application of the following requirements for all RNP AR approaches especially in areas of significant terrain. Typically aircraft with RNP AR APCH capability meet the requirements for missed approach less than RNP 1.0.			
	No single point of failure. Aircraft fitted with duplicated navigation and guidance equipment... *Most RNP AR APCH capable aircraft are equipped with duplicated systems which meet this requirement*.	**6.3.3.3.4.1**		
	Go-around guidance. Aircraft fitted with TOGA to NAV function *If the aircraft does not provide this capability, the operator must be limited to the conduct of approaches with straight segments prior to and after the DA (Refer para 6.3.3.3.3.3 (a).* *Where the flight guidance system does not remain in LNAV, operators may be approved if the flight crew is able to engage LNAV guidance on flight director or autopilot by 121 m (400 ft) AGL. (refer para 6.3.3.3.3.(b)*	6.3.3.3.4.3		
	Loss of GNSS. After initiating a go-around or missed approach following loss of GNSS, the aircraft must automatically revert to another means of navigation that complies with the	6.3.3.3.4.4		

Item	Topics	Reference paragraphs ICAO Doc 9613 Vol II Part C 6	Location in the Documents of the operator	Comments
	navigation accuracy *Typically RNP AR APCH capable aircraft meet this requirement by reversion to IRS navigation.*			

SECTION 4 - PROCEDURES FOR RNP AR APCH OPERATIONS

Item	Operating Procedures	Reference paragraphs ICAO Doc 9613 Vol II Part C 6	Location in the Documents of the operator	Comments
	Note: If the operator has not previously qualified for RNP APCH LNAV or LNAV/VNAV then it is recommended that Section 4 of the RNP APCH Job Aid is also applied.			
1	**Pre-flight considerations**			
	Minimum equipment list (MEL). The operator's MEL developed/revised to address the equipment requirements for RNP AR APCH instrument approaches.	6.3.4.1.1		
	Autopilot and flight director. Operator's procedures require the use of an autopilot or flight director driven by the RNP system for RNP AR APCH procedures with navigation accuracy less than RNP 0.3 or with RF legs... *Typically operators and manufacturers require the use of autopilot for all RNP AR APCH operations. The use of flight director is considered acceptable in the case of an unserviceable autopilot provided the required FTE limitations are observed.*	6.3.4.1.2		

Item	Operating Procedures	Reference paragraphs ICAO Doc 9613 Vol II Part C 6	Location in the Documents of the operator	Comments
	Dispatch RNP assessment. The operator uses an RNP availability prediction program.	6.3.4.1.3		
	Navaid exclusion. Operator procedures to exclude navaid facilities in accordance with NOTAMs (e.g. DMEs, VORs, localizers). *Navaid exclusion may be required by the manufacturer to ensure that RNP accuracy is maintained.*	6.3.4.1.4		
	Navigation database currency. Operator procedures to confirm that the navigation database is current.	6.3.4.1.5		
2	**In-flight considerations**	**6.3.4.2**		
	Modification of the flight plan. Operator procedures for loading and modification of published RNP AR APCH procedures.	6.3.4.2.1		
	Required list of equipment. Operator has determined the required list of equipment for conducting RNP AR APCHs or alternate methods to address in-flight equipment failures prohibiting RNP AR APCHs (e.g. a quick reference handbook).	6.3.4.2.2		
	RNP management. Operating procedures to ensure the navigation system uses the appropriate navigation accuracy throughout the approach	6.3.4.2.3		
	GNSS updating. Procedures to verify GNSS updating is available prior to commencement of approach.	6.3.4.2.4		
	Radio updating. Where implemented, procedures for use of DME/DME updating as a reversionary mode during the approach or missed approach.	6.3.4.2.5		

Item	Operating Procedures	Reference paragraphs ICAO Doc 9613 Vol II Part C 6	Location in the Documents of the operator	Comments
	Approach procedure confirmation. Flight crew procedures to confirm that the correct procedure has been selected.	6.3.4.2.6		
	Track deviation monitoring. Operator procedures to limit cross-track deviation to not more than +/- ½ navigation accuracy	6.3.4.2.7		
	Vertical Deviation (Final Approach). Operator procedures to limit vertical deviation in the final approach segment to +/- 22m (75ft).	6.3.4.2.8		
	Missed approach. Operator procedures for conduct of a missed approach if lateral or vertical deviation limits are exceeded.	6.3.4.2.9		

Item	Operating Procedures	Reference paragraphs ICAO Doc 9613 Vol II Part C 6	Location in the Documents of the operator	Comments
	Procedures with RF legs. Operator procedures to ensure flight crews are familiar with requirements for conducting approaches with RF legs.	6.3.4.2.11		
	Temperature compensation. For operators of aircraft equipped with approved temperature compensation system, procedures permitting flight crews to disregard temperature limits on an RNP AR APCH.	6.3.4.2.12		
	Altimeter setting. Flight crew procedures to verify that the current airport local altimeter is set prior to the final approach fix (FAF). Use of remote altimeter setting not permitted.	6.3.4.2.13		
	Altimeter cross-check. Flight crew procedures to complete an altimetry cross-check ensuring both pilots' altimeters agree within 30 m (±100 ft) prior to the FAF but no earlier than the IAF. Note. — This operational cross-check is not necessary if the aircraft automatically compares the altitudes to within 30 m (100 ft) (see also 6.3.3.3.1.3, Displays, (n) Display of barometric altitude).	6.3.4.2.14		
	Non-standard climb gradient. Where the operator plans to use the DA associated with a non-standard missed approach climb gradient, procedures to ensure the aircraft will be able to comply with the published climb gradient for the planned aircraft loading, atmospheric conditions and operating procedures	6.3.4.2.16		
	Engine-out procedures. Demonstration of acceptable flight technical error with one engine inoperative to conduct RNP AR APCHs.	6.3.4.2.17		
	TOGA to NAV fitted or approved operating procedures to ensure that in a go-around LNAV guidance is engaged such that the aircraft remains within the required cross-track deviation limits.	6.3.4.2.19		

Item	Operating Procedures	Reference paragraphs ICAO Doc 9613 Vol II Part C 6	Location in the Documents of the operator	Comments
	Go-around during RF turn. Flight crew procedures and training to address the impact on navigation capability and flight guidance if the pilot initiates a go-around while the aircraft is in an RF turn. s.	6.3.4.2.20		
	Contingency procedures — failure while en route. Flight crew procedures to assess the impact of equipment failure on an RNP AR APCH and take appropriate action...	6.3.4.2.22		
	Contingency procedures — failure on approach. Operator's contingency procedures to address failure conditions on approach.	6.3.4.2.23		
3	**Navigation Database**			
	Operator has nominated the responsible manager for the data updating process.	6.3.6.1.1		
	Operator has documented process for accepting, verifying and loading navigation data into the aircraft.	6.3.6.1.2		
	Operator's data process placed under configuration control.	6.3.6.1.3		
	Initial data validation. The operator has a procedure to validate every RNP AR APCH procedure before flying the procedure in instrument meteorological conditions (IMC) to ensure compatibility with their aircraft and to ensure the resulting path matches the published procedure.	6.3.6.1.4		
	Data updates. The operator has a process for comparing each data update to validated procedure data.	6.3.6.1.5		
	Data suppliers. The operator obtains data from a supplier holding a Letter of Acceptance (LOA) for processing navigation data.	6.3.6.1.6		

Item	Operating Procedures	Reference paragraphs ICAO Doc 9613 Vol II Part C 6	Location in the Documents of the operator	Comments
4	**Flight Operational Safety Assessment (FOSA)**			
	Operator has completed a FOSA	6.4		