NATO STANDARD

AFPP-1

NATO SUPPLEMENT TO ICAO DOC 8168 VOLUME I –FLIGHT PROCEDURES

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NORTH ATLANTIC TREATY ORGANIZATION

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NORTH ATLANTIC TREATY ORGANIZATION (NATO)

NATO STANDARDIZATION OFFICE (NSO)

NATO LETTER OF PROMULGATION

23 June 2017

1. The enclosed Allied Flight Procedures Publication AFPP-1, Edition B, Version 1 NATO SUPPLEMENT TO ICAO DOC 8168 VOLUME I - FLIGHT PROCEDURES, which has been approved by the nations in the AIR TRAFFIC MANAGEMENT – COMMUNICATIONS, NAVIGATION AND SURVEILLENCE ADVISORY GROUP, is promulgated herewith. The agreement of nations to use this publication is recorded in STANAG 7199.

2. AFPP-1, Edition B, Version 1 is effective upon receipt and supersedes AFPP-1, Edition A, Version 1 which shall be destroyed in accordance with the local procedure for the destruction of documents.

4. This publication shall be handled in accordance with C-M(2002)60.

Edvardas MAŽEIKIS
Major General, LTUAF
Director, NATO Standardization Office

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RECORD OF RESERVATIONS

CHAPTER	RECORD OF RESERVATION BY NATIONS
Note: The reservations listed on this page include only those that were recorded at time of promulgation and may not be complete. Refer to the NATO Standardization Document Database for the complete list of existing reservations.	

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RECORD OF SPECIFIC RESERVATIONS

[nation]	[detail of reservation]
DEU	Section 2.6.2 (CAT II Approach Minima) These values do not correspond to the current EU regulations (965/2012 Annex V Part - SPA SPA.LVO), which are applicable for the German Armed Forces. Furthermore the description for CAT III a/b approaches are missing. The visibility values and decision heights according to EU-OPS are used in the flight operation of the German Armed Forces (currently Special Air Mission Wing MoD, in the future also ATW 62 (A400M) and possibly Navy Flying Command (P3-C after upgrade and Do-228 respectively). The values can be left as is; however, DEU will apply the requirements of the EU regulation 965/2012 for arrivals and departures procedures to conduct Low Visibility Operations (LVO) CAT II and CAT III
LVA	Latvia reserves rights to implement STANAG accordingly to airfield equipment, as an example - not to apply PAR or ARA
SVN	Public company Slovenia Control is in accordance with the provision of Air Navigation services the only provider of air traffic control services in Republic of Slovenia. All the conditions for the implementation of STANAG content will be satisfied only after the implementation of Operational Air Traffic (OAT) rules on the national level.
Note: The reservations listed on this page include only those that were recorded at time of promulgation and may not be complete. Refer to the NATO Standardization Document Database for the complete list of existing reservations.	

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TABLE OF CONTENTS

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CHAPTER 1 ADMINISTRATIVE

1.1. SCOPE

1.1.1. Criteria

Around the world there are different criteria on which instrument procedures are based. Most civil instrument procedures follow ICAO PANS-OPS. Still, there are national exceptions from PANS-OPS, e.g. exceptions from minimum segment length, maximum descend/climb gradients and other issues. Due to the evolving content of those exceptions, crews are invited to consult AIP GEN 1.7 of the applicable nation’s AIP when needed. See also www.ead.eurocontrol.int for access to national AIP information. Pilots may also find approaches designed according to different standards, such as USA's TERPS, NATO's MIPS or national unique criteria, e.g. France's MIAC 4.

1.1.2. AFPP-1 Background

For standardization, NATO has expressed the aim to move towards the ICAO standards for military flight operations. However, ICAO PANS-OPS are not particularily adapted to the unique manoeuvring capability many military aircraft have. To ensure our military forces receive the benefits of these capabilities during instrument flying, a team of air crew and procedure designers has been assembled, presently under the NATO Air Traffic Management Committee (ATMC) ATM group, to provide and maintain a set of criteria that is specially tailored for military aircraft instrument flight operations. This team - the Military Instrument Procedures Standardization Team (MIPST) - meets regularly to follow the work of ICAO and update this document (AFPP-1) as required.

1.1.3. AFPP-1 Purpose

This publication is a supplement to *ICAO Doc 8168 – Procedures for Air Navigation Services – Air Operations (PANS-OPS), Volume I –Flight Procedures*. It provides military unique procedural guidance for flight operations personnel and flight crew. Also it outlines some parameters on which the instrument procedures are based to illustrate the importance of adhering to the procedures described.

1.1.4. AFPP-1 Use

Throughout this document the reference to “PANS-OPS” applies to Volume I. A few references are also made to other documents, such as the procedure designer's handbook; *ICAO Doc 8168 -Procedures for Air Navigation Services – Air Operations*

(PANS-OPS), Volume II -Construction of visual and instrument flight procedures, as well as its military supplement, the AATCP-1.
NOTE: Although Volume II and AATCP-1 are referenced to in this publication, it is not the air crew's responsibility to be familiar with these documents.
PANS-OPS and AFPP-1 describe procedures and criteria for normal air operations. That means, for emergencies/abnormalities in IMC causing reduced aircraft performance, the aircraft must still be able to follow the published procedure, or separate contingency procedures must be available.

1. Supplemented/Additional Criteria. Chapters 2 through 8 describe military unique criteria not addressed in PANS-OPS, as well as criteria that differs from PANS-OPS. Where criteria in this publication are used instead of those in PANS-OPS, there will be a specific reference to the PANS-OPS paragraph concerned.

2. Terms and acronyms. Terms and acronyms are identified in Annex B -LEXICON or in PANS-OPS.

Table 1: Supplemented/Additional Criteria.

AFPP-1 Paragraph #	Criteria	AFPP-1 Page #
CHAPTER 2	**LANDING MINIMA**	2-1
2.2.	APPLICATION	2-1
2.3.	ALTITUDES/HEIGHTS	2-1
2.4.	PUBLICATION	2-3
2.5.	VISIBILITIES	2-4
2.6.	ILS CAT I/CAT II APPROACH MINIMA	2-6
2.7.	SAFE ALTITUDE 100 NM	2-7
CHAPTER 3	**DEPARTURES**	3-1
3.2.	VISUAL CLIMB OVER AIRPORT (VCOA)	3-1
3.3.	REDUCED TAKEOFF RUNWAY LENGHT PROCEDURE	3-2
CHAPTER 4	**ILS/(M)MLS**	4-1
4.2.	MISSED APPROACH GRADIENT	4-1
CHAPTER 5	**TACAN**	5-1
5.2.	TACAN FINAL APPROACH TRACK ALIGNMENT	5-1
5.3.	TACAN FINAL APPROACH CENTRE LINE INTERCEPT DISTANCE	5-1
CHAPTER 6	**HIGH PERFORMANCE MILITARY AIRCRAFT (HPMA)**	6-1
6.2.	LIMITATIONS	6-1
6.3.	GENERAL PARAMETERS	6-1

Table 1: Supplemented/Additional Criteria.

1.1.5. Related Documents

As introduced earlier in this chapter, documents AATCP-1 and ICAO Doc 8168 Vol II provide for more in-depth studies on procedure construction.

1.1.6. TERPS versus Pans-OPS and MIPS

TERPS philosophy regarding the constructing of procedures differs from that of ICAO PANS-OPS in several areas, which also affects the way procedures are to be flown, e.g. turn radius, visual manoeuvring, ILS, missed approach.
For aircrew that are used to only flying TERPS procedures, the following is worth noticing:

1. Aircraft Categories/Speeds.

Aircraft approach categories play a significant role in the design of PANS-OPS/MIPS instrument procedures. In addition to affecting final approach minima, PANS-OPS references maximum speeds by category for holding, departures and the initial and intermediate segments of instrument approaches.
Also the final approach speeds specified by category will be different from the TERPS procedure speeds.

The PANS-OPS references are as follows:

Turning departure speeds: PANS-OPS Part I, Section 3, Chapter 2, Table I-3-2-1.

Approach, circling and missed approach speeds: PANS-OPS Part I, Section 4, Chapter 1, Tables I-4-1-1 and I-4-1-2.

Holding speeds: PANS-OPS Part I, Section 6, Chapter 1, Table I-6-1-1.

Holding speeds (Helicopter): PANS-OPS Part I, Section 6, Chapter 1, Table I-6-1-2.

Helicopter only speeds: PANS-OPS Part I, Section 8, Chapter 3, Table I-8-3-1.

HPMA (High Performance Military Aircraft): The MIPS use a separate set of speeds for the unique HPMA category. AFPP-1, Chapter 6, Tables 6.2 and 6.3 show the speeds for HPMA. Chapter 6 also provides a set of HPMA parameters for universal use.

2. Track.

Obstacle clearance in PANS-OPS/MIPS procedures is provided under the assumption that pilots will maintain the depicted ground track.

3. Bank Angle.

Unless otherwise specified, PANS-OPS approach procedures are based on average achieved bank angle of 25° or the bank angle giving a rate of turn of 3°/sec, whichever is less.

For departures and missed approach, PANS-OPS procedures are based on an average achieved bank angle of 15°. MIPS procedures generally are the same as PANS-OPS, but VCOA departures are based on 23° bank angle.

The bank angle for HPMA is 30° for all segments.

4. Established on Course.

PANS-OPS defines “established on course” as being within half full-scale deflection for a VOR/DME or ILS (localizer) and within ± 5° of the required final bearing for an NDB. MIPS applies the same deflection tolerance flying a TACAN as PANS-OPS applies for flying a VOR/DME approach.

Do not consider the aircraft to be established on course until within these limits. PANS-OPS/MIPS obstacle clearance surfaces assume that the pilot does not normally deviate from the centre line more than one-half scale deflection after being established on track. Despite the fact that there is a range of “acceptable” variation, every attempt must be made to fly the aircraft on the course centre line and on the glide path. Allowing a more than half-scale deflection (or a more than half-scale fly-up deflection on glideslope) combined with other system tolerances could place the aircraft near the edge or at the bottom of the protected airspace where loss of protection from obstacles can occur.

5. Omnidirectional Departures.

The PANS-OPS “Omnidirectional Departure” is somewhat similar to the TERPS “Diverse Departure”; a departure procedure without any track guidance provided.
An important difference is that an Omnidirectional Departure may be published even though obstacles penetrate the 2.5% Obstacle Identification Surface (OIS). PANS-OPS then provides the procedure designer the following options for publishing departure restrictions.

a. Standard case.

Where no obstacles penetrate the 2.5% OIS, normally no departure restrictions will be published. Upon reaching 400 feet above Departure End of Runway (DER), a turn in any direction may be initiated.

b. Specified turn altitude.

The procedure may dictate a climb to a specified altitude, where an omnidirectional turn safely can be made.

c. Specified climb gradient.

The procedure may specify a minimum climb gradient of more than the standard 3.3% to an altitude before turns are permitted.

d. Sector departure.

The procedure may identify sectors for which either a minimum turn altitude or a minimum climb gradient is specified. (e.g. “Climb in sector 180°- 270° to 2000 feet before commencing a turn).

6. Departures with track guidance.

PANS-OPS uses the term Standard Instrument Departure (SID) to refer to departures using track guidance. Minimum climb gradients above the standard 3.3% may apply.

For turning departures:

PANS-OPS protection area is based on using an average bank angle of 15° for the departure turn. Where a departure route requires a track change of more than 15°, a turning departure is constructed.
Turns may be specified at an altitude/height, at a fix or overhead a facility.
If an obstacle prohibits turns before the departure end of the runway or prior to reaching an altitude/height, a turning point or a minimum turn altitude/height will be specified. Tracks to be flown and radials/bearings to be intercepted will also be specified.

Speed restrictions:

If restricted below the standard maximum speeds, the restricted speeds should be published by category or by a general note. For example, the procedure may be annotated “Departure limited to CAT C aircraft” or “Departure turn limited to 185 kt IAS maximum”. You must comply with the speed limit published on the departure to remain within protected airspace. If you require a higher speed for safe aircraft performance, ATC may approve the higher speed or assign an alternative departure procedure.

7. Departure: Runway End Crossing Height.

For PANS-OPS, the origin of the Obstacle Identification Surface (OIS) begins at 16 ft above the DER.

8. TERPS Low Altitude Approaches.

PANS-OPS does not distinguish between low and high altitude procedures. PANS-OPS Part I, Section 4, Chapter 3 describes how to enter and fly the different manoeuvres and entries in the initial approach segment.

Differences from TERPS:

A PANS-OPS reversal procedure does not permit a TERPS holding pattern/racetrack entry. Instead, PANS-OPS will specify the track to be flown. So there will be no PANS-OPS procedure depicted with a "barb" symbol depicting turn side.

PANS-OPS reversal: Pilots may only enter from a track ± 30° of outbound track and must be established on the specified outbound track to start descent.

PANS-OPS base turn: Pilots may enter from a track ± 30° of outbound track, extended up to the reciprocal of the inbound track. They must be established on the specified outbound track to start descent.

PANS-OPS racetrack (also different from PANS-OPS holding):
Pilots may only proceed outbound on the 30° offset entry track for maximum 1 minute 30 seconds. After this time, turn to a heading parallel to the outbound track for the remainder of the outbound time.
If the outbound time is only 1 minute, the time on the 30° offset track shall be 1 min also.
After a parallel entry proceeding to final, the holding course must be intercepted after the inbound turn instead of flying direct to the facility.

9. Circling Procedures.

PANS-OPS circling protected airspace is typically larger than TERPS and the obstacle clearance is higher. PANS-OPS maximum circling speeds related to category are also higher than TERPS.
An example: For aircraft CAT D, PANS-OPS circling maximum speed is 205 kt IAS, while TERPS circling has a maximum speed directly related to the category definition, which for CAT D is 165 kt IAS.

Also, one important distinction to make is between the terms “runway environment” and “airport environment.” While circling using a PANS-OPS designed procedure, pilots must maintain visual contact with the runway environment throughout the entire circling manoeuvre.
TERPS procedures only require pilots to maintain visual contact with the airport environment while circling to land, but cannot descend out of the circling MDA until the runway environment is in sight.
The PANS-OPS protection area is based on using an average bank angle of 20° for the turn to final.
For HPMA, the circling criteria are stated in this document (AFPP-1) Chapter 6, Paragraph 621.

10. Holding.

Differences from TERPS:

The PANS-OPS holding entry procedures are mandatory. Timing, distances and limiting radials must be complied with. Enter the holding pattern based on the heading relative to

the three entry sectors depicted in PANS-OPS Part I, Section 6, Chapter 1, Paragraph 1.4. The margins on each sector dividing line is ±5°.
Upon reaching the holding fix, follow the appropriate procedure according to entry sector.
Bank angle must not be reduced for wind corrections. The bank angle used in PANS-OPS should be 25° or a rate of 3°/sec, whichever is less. For HPMA, use a bank angle of 30° during holding.

Timing is made on the outbound leg.

Attempt to maintain the track by allowing for known winds and applying corrections to heading and timing during entry and while flying in the holding pattern.

A radial or a DME value may be published to limit the outbound track.

11. Transition Altitude/Level.

Transition altitude is the altitude in the vicinity of an aerodrome at or below which the vertical position of an aircraft is determined from the altimeter set to QNH. Transition altitude is normally specified for each airfield by the country in which the airfield exists. Transition altitude will not normally be below 3000 ft Height Above Aerodrome (HAA) and must be published on the appropriate charts.

Transition level is the lowest flight level available for use above the transition altitude. Transition level is usually communicated to the aircraft together with the descent/approach clearances. The transition layer (area between the transition altitude and transition level) may also be supplied by ATC via the ATIS or during arrival. VFR flight levels may be used on some places, e.g. FL 045.

The vertical position of an aircraft at or below transition altitude shall be expressed in altitude (QNH/QFE). Vertical position at or above the transition level shall be expressed in terms of flight levels according the altimeter setting 1013.2 hPa. When passing through the transition layer, vertical position shall be expressed in terms of flight levels when climbing and in terms of altitudes (QNH/QFE) when descending.

After a descent/approach clearance has been issued to an altitude/height below transition level and the descent is initiated, the QNH/QFE may be set while still above transition level, and the vertical positioning of the aircraft may be by reference to altitude (QNH or QFE as appropriate) provided that level flight above the transition altitude is not indicated or anticipated, ref. PANS-OPS Vol I, Part III - Section 1, Chapter 2, Paragraph 2.4.3. As an example, this will enable formation flights to set QNH/QFE prior to entering IMC.

1.1.7. Word meanings

Word meanings as used in this manual:

1. **Shall** means mandatory.
2. **Should** means recommended.
3. **May** means optional.

1.2. NON-STANDARD PROCEDURES

The standards contained in PANS-OPS and this publication are based on reasonable assessment of the factors that contribute to errors in aircraft navigation and manoeuvring. They are designed primarily to assure that safe flight operations for all users result from their application.
The dimension of the obstacle clearance areas are influenced by the need to provide for a smooth, simply computed progression to and from the enroute system.
Every effort is made to formulate procedures in accordance with these standards; however, peculiarities of terrain, navigation information, obstacles, defense against hostile threats or traffic congestion may require special consideration where justified by operational requirements.
In such cases, non-standard procedures that deviate from these criteria may be approved, provided they are fully documented and an equivalent level of safety exists.
A non-standard procedure is not a substandard procedure, but is one that has been approved after special study or the deviation has demonstrated that no derogation of safety is involved.
The appropriate national authority is the approving authority for non-standard procedures.
Military procedures that deviate from standards because of operational necessity and in which an equivalent level of safety is NOT achieved includes a cautionary note to identify the hazard and shall be marked accordingly, e.g. “MILITARY USE ONLY” and also, when applicable, ”NON-STANDARD”.

1.3. COORDINATION

1. Notice to Airmen (NOTAM).

A NOTAM to change minima may be issued in case of emergencies; e.g. facility outages, facility out of tolerance conditions, new construction that penetrates critical surfaces, etc. NOTAMs shall also be issued when:

a. a supporting facility is added and a significant change in minima will result, or

b. a procedure segment altitude is modified as the result of construction or terrain.

Due to the complexity in its nature, an entirely new procedure shall not be issued by NOTAM text alone, except where special military requirements dictate.

The responsible Air Traffic Control facility shall be advised of the required NOTAM action prior to issuance and normal coordination shall be effected as soon as practicable.

1.4. PUBLICATION

1.4.1. Procedure Identification

As long as different criteria exists, the procedure publisher in some way should communicate to the flight crew which criteria the procedure is designed by, so they will know which parameters/restrictions to adhere to during procedure execution.

International procedure publications should therefore identify the basic design criteria, either for the whole publication, or for each separate procedure. If using publications for which criteria identification does not exist, the flight crew must ensure they establish how to fly the procedure to remain within the construction criteria.
Identification of procedure design criteria could be as follows:

1. PANS-OPS.

Procedures developed using PANS-OPS design criteria only. These procedures shall be flown according to PANS-OPS Vol I.
Naming convention for PANS-OPS procedures: Ref. Volume I, Part I, Section 4, Chapter 8, Paragraph 8.5, Procedure naming for arrival and approach charts.

2. MIPS.

Procedures developed using PANS-OPS with additional/supplemental design criteria from AATCP-1, e.g HPMA procedures. These procedures shall be flown according to PANS-OPS Vol I and AFPP-1.
Naming convention for MIPS procedures: Normally the ICAO PANS-OPS naming convention applies, also for MIPS procedures. Exceptions are listed below:

NOTE: Procedure identification for helicopters, see Chapter 8.

a. High altitude procedures.

This belongs to a TERPS naming convention, and will therefore be removed in the future. For those procedures still existing, the identification may be prefixed “HI-”, e.g. HI-TACAN RWY 05.

b. HPMA procedures.

Where HPMA procedures are published, the procedure identification shall be prefixed with the letters “HPMA”, e.g. HPMA TACAN RWY 05. (See also Chapter 6).

c. DME required procedures.

ICAO PANS-OPS naming convention identifies a procedure where DME is required for final approach or missed approach with a note on the procedure, i.e. "DME required". Several procedures are still using the TERPS naming convention, which instead of a note identifies the need for DME in the procedure name, e.g. VOR/DME, ILS/DME.
There will be a gradual change to only using the ICAO PANS-OPS naming convention.

c. Surveillance Radar Approaches.

Although many nations still use the name Approach Surveillance Radar (ASR) for non-precision radar approaches, ICAO uses the term Surveillance Radar Element (SRE), and the procedure name then will be “SRA”, e.g. SRA RWY 04.

3. TERPS.

For procedures in nations other than USA/Canada, generally, if the procedure is identified "TERPS", that means the procedure has been designed following criteria in the APATC-1(A) procedure design handbook. In a transition period, some procedures will have this identification until they are redesigned to new criteria.

4. NATIONAL.

Some nations have a special set of criteria for their procedures. If there are significant deviations from PANS-OPS not covered by the above mentioned criteria, the procedure could be marked "NATIONAL". Planning to fly such procedures, the flight crew must consult the national regulations or the national AIP (GEN 1.7).
The deviations may be found at www.ead.eurocontrol.int.

CHAPTER 2 SUPPLEMENTED/ADDITIONAL MILITARY CRITERIA -LANDING MINIMA

2.1. SCOPE

The landing minima calculations described in this chapter are applied to any instrument procedures developed in accordance with ICAO Doc 8168 Vol II and AATCP-1 (published as MIPS). Take-off minima will be set according to national regulations.

2.2. APPLICATION

The minima specified in this chapter are the lowest that can be used for planning/flying for the type of navigational facility and available lighting systems concerned. Each nation may regulate additions to these minima to be used by their aircrews based on aircrew training and aircraft/facility equipment status.

1. The elements of minima are:

   a. Decision Altitude/Height (DA/DH) and Minimum Descent Altitude/Height (MDA/MDH.

   b. Visibility/RVR.

   In addition, a ceiling value normally will be published.
   Where a ceiling is not specified, the height of the straight-in DA/MDA above the threshold elevation/Touchdown Zone Elevation (TDZE) (or aerodrome elevation in circling approaches), rounded to the higher 100 ft should be used for planning purposes.

2. Additional minima may be specified in separate directives published by the national authority.

2.3. ALTITUDES/HEIGHTS

The following terms can be found in PANS-OPS Volume I, Part I, Section 1, Chapter 1, Definitions: .

- Obstacle Clearance Altitude/Height (OCA/OCH)

- Minimum Descent Altitude/Height (MDA/MDH)
- Decision Altitude/Height (DA/DH)

In addition, DH/MDH may be expressed relative to threshold or touchdown zone elevation (TDZE).

2.3.1. DA/DH for Straight-in Approach

For approaches with lateral and vertical guidance, the DA/DH provides the minimum required clearance over obstacles in the final approach segment. Also the DA/DH relates to the missed approach areas, as it will be set high enough to ensure protection for obstacles while executing the missed approach.

Where the missed approach surface is penetrated, a higher than the standard minimum missed approach climb gradient may be published. Where this is the case, the procedure shall be published with two or more sets of minima; one set for the standard minimum climb gradient and the other set(s) for the higher missed approach climb gradient(s).

Aircrew must ensure they can comply with the missed approach climb gradient related to the specific minima they use for approach, also considering reduced aircraft performance following an abnormal/emergency situation.

2.3.2. MDA/MDH for Straight-in Approach

Same applicability as in 2.3.1, except there is no vertical guidance in the final approach segment.

2.3.3. MDA/MDH for Circling Approach

The MDH for circling is calculated by comparing the required circling OCH with the minimum values in the Table 1 below. The higher of these values will be the published circling MDH (not lower than the DH/MDH of the preceding approach flown). Then the MDA is established by adding the aerodrome elevation and rounding up to the nearest 10 ft.

	Aeroplane category				
	A	B	C	D	E
MDH (ft)	400	500	600	700	800
Minimum meteorological visibility (m)	1500	1600	2400	3600	3600

Table 1: Minimum visibility and MDH for circling vs aeroplane category

NOTE: HPMA has separate criteria for circling. See chapter 6 in this document for details on this.

2.3.4. Continuous Descent Final Approach (CDFA)

See PANS-OPS Volume I, Part I, Section 4, Chapter 1, para. 1.7.2.

CDFA is a technique for flying the final approach segment of a non-precision approach (NPA) as a continuous descent, to a published minimum altitude[1].
The CDFA technique is preferred by civil operators and regulators, as it simplifies the final segment of the NPA by incorporating techniques similar to those used when flying a precision approach procedure.
However, for military operations, an operational advantage may be achieved by, or aircraft/aircrew equipment may necessitate the NPA to be flown as, a stepdown descent (dive-and-drive) technique.
Therefore the technique chosen for flying an NPA remains optional for military operations.

[1] NOTE: Addressing this minimum altitude, some publishers use the term DA/DH instead of MDA/MDH. Unlike the DA/DH on a precision approach procedure which accounts for descent below the DA/DH during transition to a missed approach, that is not the case for a CDFA DA/DH.
Descent below the CDFA DA/DH does not guarantee obstacle clearance.
When executing missed approach, the aircraft shall not descend below the published CDFA DA/DH.
A pilot technique to avoid descending through the CDFA DA/DH is by adding a buffer (e.g. 50 feet) to the minimum.

Crew members should receive training specific to the aircraft type, the installed flight guidance and navigation system, and on how to utilize the system when using the CDFA technique for applicable approach profiles.

2.3.5. Procedure Altitude vs. Segment Minimum Altitude

See PANS-OPS Volume I, Part I, Section 4, Chapter 8, para. 8.4.9.

For non-precision approaches, some publishers use a grey shaded area in the profile view. The altitudes published in this area provide only minimum obstacle clearance in each segment (MOCA).
These Segment Minimum Altitudes (SMA) should not be confused with the procedure altitudes, which should be adhered to under normal operations.

Although the SMA provides obstacle clearance, descending to these altitudes may cause airspace/environmental/noise abatement issues and/or degraded/loss of final course guidance.

2.4. PUBLICATION

Published minima values will be:

1. For precision approach procedures and Approaches with Vertical guidance (APV), normally exact values (rounded up to the nearest ft).
The published DA/DH shall be equal to or higher than the OCA/OCH, and for CAT I approaches the DH shall not be lower than 200 ft.

2. For non-precision approach procedures, rounded up to the nearest 10 ft.
If the published MDA/MDH refers to TDZE a note on the procedure normally will inform of this.

NOTE 1: When published, ceiling values will be rounded to the next higher 100 ft increment.

NOTE 2: Where restrictions exists that prohibit certain aircraft categories from making the instrument approach to the airport, the term “NA” (Not Authorized) will be entered for the applicable category in the procedure's minima section.

2.5. VISIBILITIES

2.5.1. Establishment of Visibility Minima

a. Straight-in Approach. Following prerequisites (all) shall be fulfilled for establishing straight-in minima :

(1) Precision approach and Approach with Vertical Guidance (APV):

(a) Alignment criteria for final approach course relative to the runway centre line must be met. Maximum 15° offset for CAT AB and 5° for CAT CD.

(b) Glide path angle must be equal to or less than 4.5° for Cat AB and 3.77° for CAT CD.

(2) Non-precision approach:

(a) Alignment criteria for final approach course relative to the runway centre line must be met. Maximum 15° offset for CAT AB and 5° for CAT CD.

(b) Nominal descent angle must be ≤ 4.5° for Cat AB and ≤ 3.77° for CAT CD.

(c) If MAPt is defined by timing only, the maximum distance FAF-THR is 8 NM.

NOTE: If the above criteria are not met, the approach minima can still be published, but with a higher value than the minimum.

b. Circling Approach.
The visibility for circling approaches is derived from the highest values of Figure 1 or the associated straight-in approach procedure.

2.5.2. Visibility vs. approach lighting

Minimum visibility allowed for the approach depend on what lighting facilities are present and in use. Approach lighting systems allow a reduction in the visibility required, as the system extends visual cues to the approaching pilot and makes the runway environment apparent with less visibility than when such lighting is not available. The different approach lighting systems are described in Table 2.

OPS Class of Facility	Length, configuration and intensity of approach lights
FALS (full approach lighting system)	ICAO: Precision approach CAT I Lighting System (HIALS ≥ 720m) distance coded centreline, Barrette centreline
IALS (intermediate approach lighting system)	ICAO: Simple approach lighting system (HIALS 420 -719 m) single source, Barrette
BALS (basic approach lighting system)	Any other approach lighting System (HIALS, MIALS or ALS 210 - 419 m)
NALS (no approach lighting system)	Any other approach lighting system (HIALS, MIALS or ALS < 210 m) or no approach lights

Table 2: Approach lighting systems

NOTE: The procedure should note the required (higher) visibility, or amount to be added, for those occasions when parts or all of the approach lighting system is out of service.

2.5.3. RVR of less than 750 m

An RVR of less than 750 m may be used:

1. for Category I approach operations to runways with FALS (see Figure 2), RTZL and RCLL provided that the DH is not higher than 200 ft; or

2. for Category I approach operations to runways without RTZL and RCLL when using an approved Head-Up Display Landing System (HUDLS), or equivalent approved system, or when conducting a coupled approach or flight-director-flown approach to a DH equal to or greater than 200 ft. The ILS must not be promulgated as a restricted facility; or

3. for APV approach operations to runways with FALS, RTZL and RCLL when using an approved HUD.

2.5.4. Single pilot operations

The minimum RVR for single pilot operations is in principle 800 m.

1. A published RVR of less than 800 metres may be used for Category I approaches provided approval by the national authority and any of the following is used at least down to the applicable DH:

    a. a suitable autopilot, coupled to an ILS or MLS which is not promulgated as restricted; or

    b. an approved HUDLS (including, where appropriate, EVS), or equivalent approved system.

2. Where Runway Touchdown Zone Lights (RTZL) and/or Runway Centreline Lights (RCLL) are not available, the minimum RVR will not be less than 600 m.

3. An RVR of less than 800 metres may be used for APV operations to runways with FALS, RTZL and RCLL when using an approved HUDLS, or equivalent approved system, or when conducting a coupled approach to a DH equal to or greater than 250 ft.

2.6. ILS CAT I/CAT II APPROACH MINIMA

2.6.1. CAT I Approach Minima

Provided that CAT I or equivalent approach lighting system and Runway Visual Range (RVR) equipment is installed, the lowest CAT I DH/RVR values are 200 ft/550 m. When RVR equipment is not available/serviceable the lowest CAT I DH/visibility that may be approved are 200 ft/0.8 km.

2.6.2. CAT II Approach Minima

CAT II procedures are intended for precision instrument approach and landing operations with a DH not lower than 100 ft and RVR not less than 350 m. The lowest CAT II DH/RVR values are 100 ft/350 m.
See Table 3 for lowest authorized CAT II minima allowed for DH values greater than 100 ft.

NOTE: CAT II aircrew qualifications. CAT II procedures require special authorization from the appropriate military authority. ICAO Annex 10 Vol. I Chapter 3 and Annex 14 Vol. I Chapter 5 contain regulations, equipment and facilities to carry out CAT II operations.
Aircrew qualifications shall be granted by the appropriate military authority.

Category II minima	
Decision Height	RVR for Aeroplane Cat A-D auto-coupled to below DH (Note 1)
100 ft – 120 ft	350 m
121 ft – 140 ft	400 m
141 ft and above	450 m

Table 3: Lowest CAT II Minima.

NOTE 1: The automatic flight control system must be used all the way down to a height which is not greater than 80% of the applicable DH. Thus airworthiness requirements may, through minimum engagement height for the automatic flight control system, affect the DH to be applied.

2.7. SAFE ALTITUDE 100 NM

A safe altitude should be established within a 100 NM radius from the the aerodrome reference point (ARP). There will be one common altitude for the entire area. A safe altitude provides at least 984 ft obstacle clearance in non-mountainous areas[1], but if the circle covers mountainous areas[1], the obstacle clearance is increased to 1969 ft. The altitudes are rounded to the next higher 100 ft-increment, as appropriate and identified on the procedure as “SAFE ALTITUDE 100 NM”. In some instances also referred to as “Emergency Safe Altitude”.

[1] NOTE: The ICAO definition of “mountainous area” is where the changes of terrain elevation exceed 3000 ft within a distance of 10 NM.

CHAPTER 3 ADDITIONAL MILITARY CRITERIA -DEPARTURES

3.1. GENERAL

The procedure parameters described in this chapter may be used in addition to those departure procedures described in PANS-OPS.

NOTE: A note will be promulgated that the procedure is restricted to military/NATO aircraft with national approval to fly such procedures under day and/or night conditions.

3.2. VISUAL CLIMB OVER AIRPORT (VCOA)

3.2.1. General

VCOA is a departure option for an IFR aircraft, operating in meteorological conditions equal to or greater than the specified visibility and ceiling, to visually conduct climbing turns over the airport to the published “climb to” altitude from which to proceed with the instrument portion of the departure. VCOA procedures are developed to avoid obstacles greater than 4.8 km from the departure end of the runway as an alternative to complying with climb gradients greater than 3.3% (200 ft/NM).

VCOA is a procedure that requires a thorough study of the aerodrome and surroundings as well as significant pre-departure planning. It is also worth noting that some obstacles may be inside the visibility radius and may not be continuously visible during the procedure. Pilots must maintain constant situational awareness throughout the procedure to preclude an unsafe position in relation to any obstacles within the Visual Climb Area (VCA). 250 kt IAS is the standard airspeed.

3.2.2. Basic area

A VCA over the airport is constructed using the Aerodrome Reference Point (ARP) or on-airport navaid as the centre of a circle. (See Figure 1)

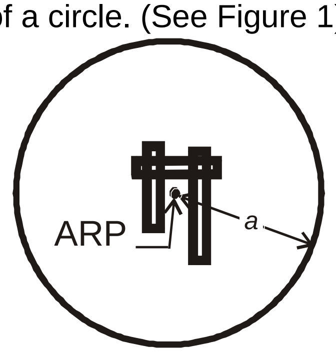

Figure 1. VCA.
a=Remain within distance (as published).

3.2.3. Omnidirectional VCOA

Turns in any direction will be possible after reaching the defined altitude on this procedure. A visual climb within the VCA must be performed up to this altitude.

3.2.4. Departure Routes

Where VCOA omnidirectional departure is not feasible, a departure route from the VCA may be published.

3.2.5. Published Annotations

To stress that this is a visual procedure, the annotation will include the words “climb in visual conditions”.
Also, it specifies an altitude to cross a fix/location over the airport, followed by routing and altitude instructions to the enroute system. The aircrew shall advise ATC prior to execution.

VCOA instruction example: “Obtain ATC approval for VCOA when requesting IFR clearance. RWY 09; for climb in visual conditions, cross Olson airport at or above 6000 ft before proceeding on course. Remain within 4.0 NM of Olson airport during climb in visual conditions.”

3.2.6. Ceiling and visibility

The ceiling published is the 100 ft increment above the "climb to" altitude over the VCA. Obstacles inside the VCA are subject to see-and-avoid manoeuvres. Obstacles outside the VCA may be avoided by publishing an altitude that must be attained inside the VCA over a specified fix or identifiable point.

3.3. REDUCED TAKEOFF RUNWAY LENGTH PROCEDURE

Limiting the available length of the departure runway during take-off is an option that can be used to reduce departure climb gradients. Use of this option requires approval of the appropriate military authority, and should be clearly addressed on the procedure.

CHAPTER 4 SUPPLEMENTED/ADDITIONAL MILITARY CRITERIA –ILS/(M)MLS

4.1. SCOPE

This chapter addresses the supplemented criteria for ILS and (M)MLS) procedure construction.

4.2. MISSED APPROACH GRADIENT.

PANS-OPS, Part I, Section 4, Chapter 6, Paragraph 6.1.7, Missed approach gradient. For CAT I precision approaches (ILS/(M)MLS), a required missed approach climb gradient in excess of 5% (2.86°) (304 ft/NM) may be published at certain locations. The minima associated with these higher gradients will be marked as “NON-STANDARD”. These procedures shall be approved by national authorities.

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CHAPTER 5 SUPPLEMENTED/ADDITIONAL MILITARY CRITERIA –TACAN

5.1. SCOPE

This chapter addresses the criteria for TACAN procedure construction.

5.2. TACAN FINAL APPROACH TRACK ALIGNMENT.

PANS-OPS Vol II states that for straight-in approaches, the maximum angle between final approach track and RWY centre line is 30° for CAT A/B, and 15° for other categories.
MIPS straight-in TACAN procedures may be offset up to 30° for all categories.

5.3. TACAN FINAL APPROACH CENTRE LINE INTERCEPT DISTANCE.

PANS-OPS Vol II states that the final track must intercept RWY centre line minimum 1400 m before RWY threshold. (Helicopters 400 m).
MIPS straight-in TACAN procedures may intercept RWY centre line at RWY threshold.

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CHAPTER 6 SUPPLEMENTED/ADDITIONAL MILITARY CRITERIA –HIGH PERFORMANCE MILITARY AIRCRAFT (HPMA)

6.1. SCOPE

This chapter specifies criteria for instrument flying by those aircraft defined by national authority as HPMA. To qualify for HPMA, the aircraft shall meet the requirements specified in this chapter. The specific HPMA-criteria replaces, amends or provides criteria in addition to PANS-OPS and other chapters in this document.

6.2. LIMITATIONS.

An aircraft may be defined as "limited HPMA-capable", depending on its total weight from fuel, configuration etc. To fly procedures marked "HPMA", the aircraft shall, as a minimum, adhere to the gradients, segment speeds, bank angle and transition time specified. National authorities will, with regard to aircraft weight, ambient temperature and aerodrome elevation, determine under which conditions, their aircraft can fly procedures marked HPMA.

Also, specific HPMA procedures may set performance restrictions higher than for general HPMA, e.g. departure procedures may specify climb gradients higher than 8.75%. Although the aircraft may be defined as HPMA, ultimately the pilot in command will be responsible for ensuring the aircraft can fly the actual procedure.

6.3. GENERAL PARAMETERS

HPMA shall be capable of flying an instrument procedure with the following parameters (while adhering to the segment speeds):

1. Departure procedures, minimum climb performance: 8.75% (5.0°) (532 ft/NM).

2. Initial segment descent gradient: 1000 ft/NM.

3. Bank angle: Minimum 30° for all segments, with a bank angle establishment time of maximum 5 sec.

4. Maximum aircraft dimensions for ILS: wing span 30 m and glide path antenna to wheel base maximum 6 m.

5. Height loss during precision approach transition to missed approach: Maximum 100 ft.

7. Missed approach climb gradient: 6.0% (3.43°) (365 ft/NM), with a transition time from level flight to the required climb gradient of maximum 10 sec.

NOTE: For aircraft performance requirements, all HPMA are contained within one aircraft category.

Segment or fix of turn location	*Speed (IAS)*	*Bank angle*	*Bank establishment Time (seconds)*	*Pilot reaction Time (seconds)*
Departure	350 kt	30°	5	3
Holding	300 kt	30°	5	3
Initial approach – reversal and racetrack procedures	300 kt	30°	5	3
Initial approach –DR track procedures	300 kt	30°	5	3
IAF, IF FAF	Table 6.2/6.3	30°	5	3
Missed approach	Table 6.2/6.3	30°	5	3
Visual manoeuvring using prescribed track	220 kt	30°	N/A	N/A
Circling	220 kt	30°	N/A	N/A

Table 1: Turn Construction Parameters.

NOTE: For departures, where operationally required to avoid obstacles, reduced speeds as low as 465 km/h (250 kt) IAS may be used, provided the procedure is annotated “Departure turn limited to ___ km/h (kt) IAS maximum”.

6.4. DEPARTURES

Obstacle Identification Surface (OIS) is a sloping surface used by the procedure designer to identify obstacles in the departure area. The OIS gradient is 7.95%. For straight departures the origin of the OIS is 16 ft above the Departure End of Runway (DER). For omnidirectional departures several OIS are considered.

Procedure Design Gradient (PDG) for HPMA is standard 8.75% (5°) (532 ft/NM). The PDG starts at the same point as the OIS, 16 ft above the DER. If the OIS is penetrated, the PDG will be increased to clear the obstacle by 0.8% in relation to its distance from DER. The higher climb gradient and the altitude to which the increased gradient extends will be posted on the procedure.

For low, close-in obstacles requiring an increased climb gradient to 200 ft or less above DER, the obstacle(s) will be identified on the procedure by position and height, but no climb gradient will be published.

6.5. ARRIVAL AND APPROACH

6.5.1 HPMA speeds

Aircraft category	Range of speeds for holding, initial approach, reversal, racetrack, intermediate segment	Range of final approach speeds	Max speed visual manoeuvring (circling)	Max speed missed approach	
				Intermediate	Final
HPMA	250/300	90/185	220	300	350

Table 2: HPMA Speeds (IAS) for Procedure Calculations in Knots (kt)

NOTE: For missed approach, where operationally required to avoid obstacles, reduced speeds as low as 250 kt may be used, provided the maximum speed is clearly noted on the procedure.

6.5.2. Final approach segment

The maximum descent gradient for non-precision HPMA procedures is 6.5% (3.7°) (395 ft/NM). (PANS-OPS states that for non-precision approaches with FAF, the maximum descent gradient is 6.5% for CAT A/B, and 6.1% for CAT C,D and E.)

6.5.3. Missed approach segment

1. Initial phase. Initial phase starts at the earliest MAPt and terminates at the Start of Climb (SOC) point. A pilot reaction time of 3 seconds and a time for aircraft transition to climb of 10 seconds is incorporated to determine the distance from the latest MAPt to the SOC.

Climb gradient and MOC: See figure 1.

2. Intermediate phase. A procedure may specify a missed approach turn (track change more than 15°) when at least 164 ft obstacle clearance is obtained and can be maintained with minimum climb gradient.

The minimum (standard) required missed approach climb gradient is 6.0% (3.4°) (365 ft/NM).

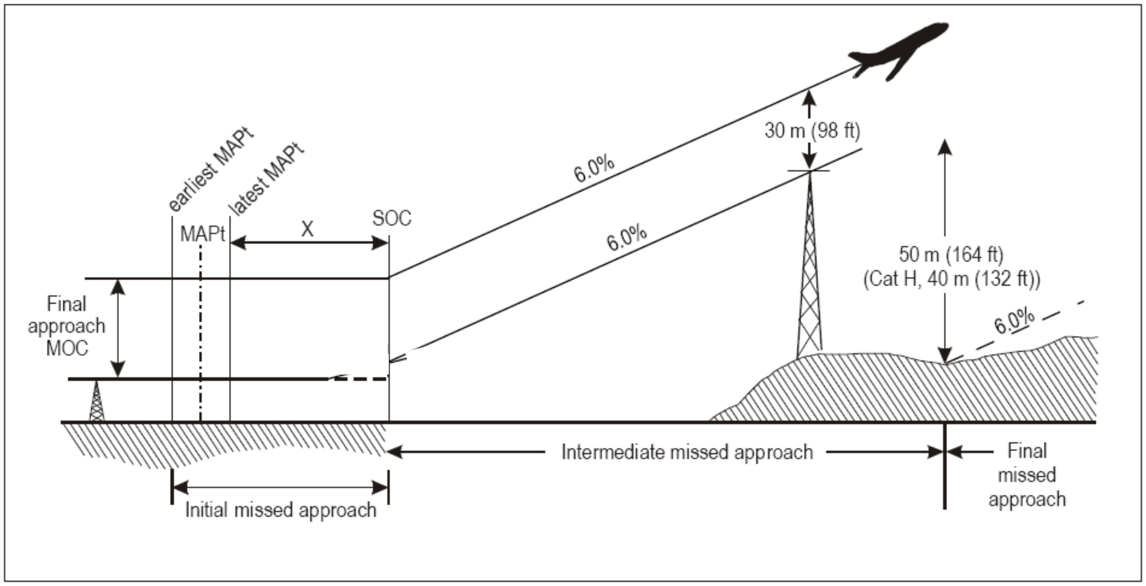

Figure 1. Obstacle Clearance for Missed Approach Phases (Gradients Specified for a Non-Precision Approach).

6.6. VISUAL MANOEUVRING (CIRCLING).

The visual manoeuvring (circling) radii are drawn around the thresholds on the applicable runway(s) and joined with tangents to the arcs. The radius value depends on the aerodrome elevation. It will be 3.55 NM for an aerodrome at sea level, and 3.65 NM for a 1000 ft elevation aerodrome.

The circling protection area is calculated with the following parameters:

- *Speed:* max 220 kt IAS
- *Bank angle*: 30°

Obstacle clearance for circling areas:

Aircraft category	*Minimum obstacle clearanceft*	*Minimum OCH above AD elevft*	*Minimum visibility km*
HPMA	300	550	3.2

Table 3: MOC and OCA/H for Visual Manoeuvring (Circling) Approach

NOTE: for visual manoeuvring using *prescribed tracks*, the corridor width for procedure design is 6890 ft each side of track. Maximum airspeed is 220 kt IAS.

6.7. CHARTING

The term “HPMA” will be added for the procedure name, e.g. “HPMA ILS RWY 30”.

6.8. CONVENTIONAL PROCEDURES

6.8.1. ILS.

1. Aircraft dimensions. Maximum aircraft dimensions are assumed to be the following:

Aircraft category	*Wing Span (m)*	*Vertical distance between the flight paths of the wheels and the GP antenna (m)*
HPMA	30	6

Table 4: Aircraft Dimensions for ILS Approach.

2. Precision segment. The height loss during a missed approach manoeuvre from an ILS (or any precision) approach results from the error of the altimeter along with the the vertical distance lost during transition to climb. For HPMA the compensation for height loss is 100 ft for pressure altimeters.

6.8.2. PAR.

PAR-procedures are designed according to AATCP-1. See chapter 7.

6.9. HPMA UNIVERSAL PARAMETERS

Many instrument procedures do not identify by which criteria they are constructed, making it difficult for the pilot to determine how to fly the procedure correctly.

This paragraph provides a set of parameters for use by HPMA aircraft. All parameters described must be adhered to. Unless the procedure specifically states deviations, following these maximum speeds, minimum climb gradients and bank angle will keep the aircraft within the protected areas for the applicable aircraft category.

If familiar with the specific criteria by which the procedure is constructed, and the procedure is marked accordingly, the pilot may elect to follow these parameters when flying the procedure.

Following these parameters a CAT E aircraft could use CAT D minima when flying Pans-Ops procedures. Aircraft CAT E shall not fly TERPS procedures designed for CAT D aircraft with the parameters below.

Departure	Holding, Initial approach, Intermediate segment	High altitude initial approach	Final approach	Circling	Missed approach
300	250	300	185	220/165*	300

Table 5: Universal Maximum Segment Speeds (kt IAS) for HPMA.

Departure procedures : Minimum climb gradient: 5.0° / 8.75% / 532 ft/NM

Bank angle for all turns: 30°

Bank establishing time: 5 sec from level flight to a 30° bank angle

Initial approach segment: Max descent gradient 1500 ft/NM

Final approach segment: LOC: half scale deflection
TACAN/VOR: ±5°

Missed approach segment: Minimum climb gradient 3.43° (6.0%) (365 ft/NM)

* CAUTION: CAT D aircraft circling procedures designed according APATC-1(A) (old TERPS criteria) provide a protection area with a radius of not more than 2.3 NM around each threshold. This requires the speed to be limited to maximum 165 kt IAS during circling to remain safely within this protected airspace.

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CHAPTER 7 SUPPLEMENTED/ADDITIONAL MILITARY CRITERIA –PRECISION APPROACH RADAR (PAR)

7.1. SCOPE.

PAR information provided in this chapter covers the military PAR criteria agreed by the ratifying nations. National reservations may apply, as stated in STANAG 7199.

7.2. SYSTEM COMPONENTS.

A PAR system consists of a precision approach radar facility that meets the requirements for the operating agency.

7.3. INOPERATIVE COMPONENTS.

Failure of azimuth and range information renders the entire PAR inoperative. When the glide slope feature becomes inoperative, the PAR reverts to a non-precision approach system and non-precision minima apply.

7.4. LOST COMMUNICATION PROCEDURES.

The PAR procedure shall include instructions for the pilot to follow in the event of a loss of communications with the radar controller. Alternate lost communications procedures shall be established for use where multiple approaches are authorized.

7.5. SLOPE.

1. Glide Slope Angle. The standard glide slope angle is 3°. Angles less than 2.5° or more than 3.5° shall not be established without the authorization of the approving authority.

2. Glide Slope Threshold Crossing Height. The standard threshold crossing height is 50 ft.

7.6. DECISION HEIGHT.

For PAR the Decision Height shall be no lower than 200 ft above the touchdown zone or threshold elevation.

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CHAPTER 8 SUPPLEMENTED/ADDITIONAL MILITARY CRITERIA -HELICOPTERS

8.1. GENERAL.

The procedure parameters described in this chapter are in addition to and are used in conjunction with those described in PANS-OPS and Chapter 2 of this document.

8.2. TERMINOLOGY.

The following terms are peculiar to helicopter procedures and are defined as follows:

1. HAL. The height above a designated helicopter landing area used for helicopter instrument approach procedures.

2. Landing Area. Refers to the portion of the heliport or airport runway used or intended to be used for helicopter landing and take-off.

3. Touchdown Zone. That portion of the helicopter landing area or runway used for landing.

8.3. PROCEDURE IDENTIFICATION.

Helicopter only procedures shall bear an identification that includes the term “COPTER”. For example:
COPTER VOR 090, COPTER TACAN RWY 27

8.4. GENERAL CRITERIA

8.4.1. Application

These criteria are based on the unique manoeuvring capability of the helicopter at airspeeds not exceeding 90 kt on final approach and missed approach.
Ref. Volume I, Part I, Section 4, Chapter 1, TableI-4-1-2. Speeds for procedure calculations in knots (kt) [Helicopter].

8.4.2. Point-In-Space Approach

Where the center of the landing area is more than 2600 ft from the MAPt, an approach procedure to a point in space may be developed. In such procedures, the point in space is the missed approach point and, upon arrival at this point, helicopters shall proceed under visual flight rules to the landing area or conduct the specified missed approach procedure. The published procedure shall be noted accordingly and also should identify available landing areas in the vicinity by noting the course and distance from the MAPt to each selected landing area. The final approach course is normally aligned to provide for the most effective operational use of the procedure consistent with safety. Point-in-space approach procedures will not contain alternate minima. When final and missed approach speeds of less than 90 kt (CAT H) are used, the maximum speed will be annotated on the approach plate.

8.5. TAKE-OFF AND LANDING MINIMA

8.5.1. Application

The minima specified in this section apply to helicopter-only procedures.

In the minima section of the procedure plate, the category is identified as "H", followed by the abbreviated navaid and the final approach course heading. Example: H-PAR 085. If the procedure is designated to a runway, the runway number will be included, e.g. H-PAR RWY 30.

8.5.2. Altitudes

A Decision Height (DH) of 100 ft may be approved without approach lights.

8.5.3. Visibility

1. Straight-in Minima

   a. Non-precision Approaches. The minimum visibility required prior to applying credit for lights is associated with the HAL as specified in Table 1.

HAL (ft)	250-600	601-800	> 800
Visibility Minimum (km)	0.8	1.2	1.6

Table 1: Effect of HAL on Visibility Minima.

   b. Precision Approaches. The minimum visibility authorized prior to applying credit for lights is 0.8 km (RVR 800 m).

2. Point-in-Space Approaches. The minimum visibility required is 0.8 km. No credit for lights will be authorized unless an approved visual system is provided. Alternate minima are not authorized. Table 8-1 does not apply.

8.5.4. Visibility Credit

Where visibility credit for lighting facilities is allowed for fixed-wing operations, the same type credit should be considered for helicopter operations. The minimum visibility required may be reduced by 0.4 km where approved approach light systems are operative.

8.5.5. Take-off Minima

Helicopter take-off minima will be in accordance with the appropriate national regulations.

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CHAPTER 9 SUPPLEMENTED/ADDITIONAL MILITARY CRITERIA –PERFORMANCE BASED NAVIGATION (PBN)

(To be developed)

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ANNEX A - SAFETY CONSIDERATIONS

Introduction:
This Annex is intended for NATO Led Service Providers in implementing this STANAG at existing or planned airfields as well as during deployed operations.

It includes general considerations such as the suitability of the STANAG/AATMP for the required operations, currency with regard to edition number and amendments, applicability of related documents, nations ratifying and reservations.

Specific safety considerations are identified by the custodian of the STANAG/AATMP and national SMEs along with consequences and possible mitigations.

Custodian POC. For users to provide any comments and lessons learned: **Geir Gravdahl (Norway) mipsnorway@gmail.com**
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General:
In the implementation of any STANAG/AATMP, the NATO Led Service Provider should verify the items listed below using the NATO Standardization Organization (NSO) pass word protected Website https://nso.nato.int/nso/

A. Suitability	Review STANAG 7210 (AEP-68) *Guidance in the Selection of STANAGs for Deployed Operations, to determin*e if the STANAG/AATMP is suitable for the type of operation required.
B. Currency	Ensure that STANAG/AATMP Edition and any Amendments are the most current as shown on the NSA website.
C. Related Documents	Obtain related documents cited in the STANAG/AATMP and, in particular, review those documents where criteria as been adopted. STANAGs are available on the NSA Website whereas civilian documents, such as ICAO, may be available from your Aviation or Engineering Commands.
D. Implementation Status	Review the ratification status along with any reservations to the STANAG/AATMP on the NSA Website and, in particularly, the status for those for nations taking part in the operation.
E. Compliance	For existing airfield facilities and procedures, determine if they are in compliance with the criteria and standards specified in the STANAG/AAMTP.

Specific:
The safety considerations, consequences and possible mitigations listed below by the STANAG/AATMP Custodian assisted by Subject Matter Experts are by no means exhaustive or fully applicable to all environments or situations.

Full safety surveys in accordance with STANAG 4720 *NATO Standard for Air Traffic Management (ATM) Safety Management System (SMS)*, shall still be carried out.		
Safety Considerations	**Consequences**	**Possible Mitigations**
Confusion on which criteria procedure is based on	Procedure flown with wrong parameters with potential infringement on safety buffers. Most severe consequence could be CFIT or midair collision.	Criteria clearly marked on procedure (Ref STANAG 3970). Deviations from criteria, although specified in AIP GEN 1.7, could also be stated on the procedure or in the FLIP preface.

ANNEX B - RELATED STANAGS AND DOCUMENTS

B.1. RELATED STANAGS (Number and Title)

3052 Aeronautical Briefing Facilities
3111 Airfield Marking Tone-Down
3158 Day Marking of Airfield Runways and Taxiways
3297 NATO Standards Aerodrome and Heliport ATS Procedures
3316 Airfield Lighting
3346 Marking and Lighting of Airfield Obstructions
3374 Flight Inspection of NATO Radio/Radar Navigation and Approach Aids – AEtP-1
3530 Radio and/or Navigational Aid Failure Procedures for Operational Air Traffic (OAT) Flights
3534 Airfield Lighting, Marking and Tone Down Systems for Non-Permanent/Deployed Operations
3619 Helipad Marking and Lighting
3634 Runway Friction and Braking Conditions
3685 Airfield Portable Marking
3697 Airfield Aircraft Arresting Systems
3711 Airfield Marking and Lighting Colour Standards
3758 Signals Used by Air Traffic Service Units for Control of Pedestrian and Vehicular Traffic in the Manoeuvering Area of Airfields
3759 NATO Supplement to ICAO Doc 8168-OPS/611, Volume II, For The Preparation of Instrument Approach and Departure Procedures –AATCP-1
3817 NATO Radiotelephony Phraseology (RTF) (AATCP-2)
3970 Content and Format of Flight Information Publication (FLIP) Terminal High/Low Instrument Approach Procedures, Instrument Departure Procedures and Aerodrome Diagrams/Layouts
7005 Exchange of Flight Information Publication (FLIP) Data
7008 Military Aviation Radio Telephony (R/T) Callsigns
7012 Minimum Radio Telephony (R/T) Aerodrome Departure Procedures
7025 Air Traffic Management and Control of Minimum Operating Strips (MOS) Operations
7104 Airfield Aircraft Arresting System Operating Procedures
7114 Helipad Clearance Plane Requirements
7131 Aircraft Classification Number (ACN)/ Pavement Classification Number (PCN) – AEP-46
7141 Airfield Clearance Planes

B.2. RELATED DOCUMENTS (Number and Title)

1. ICAO International Standards and Recommended Practices (SARPS):
    a. Annex 4 Aeronautical Charts,
    b. Annex 5 Units of Measurements
    c. Annex 10 Aeronautical Telecommunications, Vol I
    d. Annex 11 Air Traffic Services,
    e. Annex 14 Aerodromes, Volume I, Aerodrome Design and Operations
    f. Annex 14 Aerodromes, Volume II, Heliports
    g. Annex 15 Aeronautical Information Services.

2. ICAO Procedures for air navigation services (PANS) and related documents:
    a. Doc 4444-ATM/501 Air Traffic Management
    b. Doc 8126-AN/872 Aeronautical Information Services Manual
    c. Doc 8168-OPS/611 Volume I, Flight Procedures
    d. Doc 8168-OPS/611 Volume II, Construction of Visual and Instrument Flight Procedures
    e. Doc 8400-ABC ICAO Abbreviations and Codes
    f. Doc 8697-AN/889 Aeronautical Chart Manual
    g. Doc 9368-AN/911 Instrument Flight Procedure Construction Manual
    h. Doc 9674-AN/946, World Geodetic System –1984 (WGS-(84) Manual)

3. Joint Aviation Authorities: JAR-OPS 3

4. European Aviation Safety Agency (EASA): EU OPS 1

5. US Air Force Manual (AFMAN) 11-217 Vol 1 and Vol 3

ANNEX C - LEXICON

C.1. TERMS AND DEFINITIONS

1. Controlling obstacle:
The highest obstacle relative to a prescribed plane within a specific area for non-precision and circling approaches. The obstacle that results in the highest glide slope or Decision Altitude in precision approaches. The obstacle that results in the highest climb gradient for departures.
[ICAO Annex 14: 2004]
Not NATO Agreed

2. Gradient:
A slope expressed in ft/NM or % or as a ratio of the horizontal to the vertical distance. For example, 152 ft/NM = 2.5% = 40:1 (40 ft horizontally to 1 ft vertically).
[MIPST[1]: 2007]
Not NATO Agreed

3. Ground point of intercept:
A point in the vertical plane on the runway centre line at which it is assumed that the straight line extension of the glide slope intercepts the runway approach surface baseline.
[MIPST[1]: 2007]
Not NATO Agreed

4. Minimum obstacle clearance:
The vertical distance between the lowest authorized flight altitude and a prescribed surface within a specified area.
[MIPST[1]: 2007]
Not NATO Agreed

5. Mountainous area:
An area of changing terrain profile where the changes of terrain elevation exceed 900 m (3000 ft) within a distance of 18.5 km (10.0 NM).
[MIPST: 2007]
Not NATO Agreed

6. Touchdown zone elevation:
The highest runway centre line elevation in the touchdown zone (First 3000 ft after RWY THR).
[MIPST: 2007]
Not NATO Agreed

7. Visual descent point:
The visual descent point on the final approach course of a non-precision straight-in approach procedure from which normal descent from the OCH to the runway touchdown point may be commenced provided visual reference is established.
[MIPST: 2007]
Not NATO Agreed

C.2. ABBREVIATIONS

AATCP
Allied Air Traffic Control Publication (Formerly APATC)

AFPP
Allied Flight Procedures Publication

ALSF-1
Approach Light System With Sequenced Flashers - Category 1

ALSF-2
Approach Light System with Sequenced Flashers - Category 2

ARP
Aerodrome Reference Point

ASR
Airport Surveillance Radar

CG
Climb Gradient

DA
Decision Altitude

DCG
Desired Climb Gradient

DER
Departure End of Runway

DF
Direction Finding

DH
Decision Height
DR
Dead Reckoning

EU-OPS
European Union - Operations

FAF
Final Approach Fix

FAOCS
Final Approach Obstacle Clearance Surface

FAP
Final Approach Point

GPI
Ground Point Of Intercept

GS
Glide Slope

HAL
Height Above Landing

HIRL
High Intensity Runway Lights

HPMA
High Performance Military Aircraft

HUDLS
Head-UP Display Landing System

IAF
Initial Approach Fix

IAS
Indicated Air Speed

ICA
Initial Climb Area

ICAO
International Civil Aviation Organization

IF
Intermediate Fix

ILS
Instrument Landing System

km
Kilometre

km/h
Kilometres per Hour

kt
Knot

LDIN
Lead-In Lighting System

LOC
Localizer

m
Metre

MALS
Medium Intensity Approach Light System

MALSF
Medium Intensity Approach Light System with Sequenced Flashers

MALSR
Medium Intensity Approach Light System with Runway Alignment Indicator Lights

MAPt
Missed Approach Point

MDA
Minimum Descent Altitude

MDH
Minimum Descent Height

MIRL
Medium Intensity Runway Edge Lights
MLS
Microwave Landing System

MOC
Minimum Obstacle Clearance

MSL
Mean Sea Level

NA
Not Authorized

NATO
North Atlantic Treaty Organization

NAVAID
Navigational Aid

NDB
Non-Directional Beacon

NM
Nautical Miles

NOTAM
Notice To Airmen

OCA/OCH
Obstacle Clearance Altitude/Height

ODALS
Omni-Directional Approach Lighting System

OIS
Obstacle Identification Surface

PANS-OPS
Procedures for Air Navigation Services - Aircraft Operations

PAR
Precision Approach Radar

PBN
Performance Based Navigation

PDG
Procedure Design Gradient

RAIL
Runway Alignment Indicator Lights

REIL
Runway End Identifier Lights

RVR
Runway Visual Range

RWY
Runway

SALS
Short Approach Light System
SARPS
Standards And Recommended Practices
SOC
Start Of Climb

SMA
Segment Minimum Altitude
SRA
Surveillance Radar Approach
SSALF
Simplified Short Approach Lighting System with Sequenced Flashers
SSALR
Simplified Short Approach Lighting System with Runway Alignment Indicator Lights
SSALS
Simplified Short Approach Lighting System
STANAG
NATO Standardization Agreement
TACAN
Tactical Air Navigation
TDZE
Touchdown Zone Elevation
TORA
Take-Off Run Available
VCA
Visual Climb Area
VCOA
Visual Climb Over Airport
VOR
Very High Frequency Omnidirectional Radio Range
VSS
Visual Segment Surface

AFPP-1(B)(1)