

ANNEX B TO CD 1903AS

Comparison between current MOS and PANS standards for operations to parallel or near- parallel runways

Areas which may be of interest have been highlighted.

ANNEX B TO CD 1903AS - COMPARISON BETWEEN CURRENT MOS AND PANS STANDARDS FOR OPERATIONS TO PARALLEL OR NEAR-PARALLEL RUNWAYS

MOS	PANS-ATM	Explanation			
<p>10.4.2 Independent Parallel Approaches in IMC</p> <p>10.4.2.1 Independent parallel approaches may be conducted to parallel runways if:</p> <p>(a) the minimum distance between runway centrelines is 1 035 m; and</p> <p>(b) an ATS surveillance system and associated situation display system is in use which is demonstrably suitable for the particular independent parallel approach operation; and</p> <p>(c) for runways separated by less than 1 310 m, the ATS surveillance system required by paragraph (b) provides aircraft position prediction and deviation alert; and</p>	<p>6.7.3.2 REQUIREMENTS AND PROCEDURES FOR INDEPENDENT PARALLEL APPROACHES</p> <p>6.7.3.2.1 Independent parallel approaches may be conducted to parallel runways provided that:</p> <p>a) the runway centre lines are spaced by the distance specified in Table 6-1 (see Annex 14, Volume I) and the surveillance criteria contained in Table 6-1 are met:</p> <p>Table 6-1. ATS surveillance system criteria for different runway spacings</p> <table border="1" data-bbox="869 699 1697 1072"> <thead> <tr> <th data-bbox="869 699 1115 762">Runway centre line spacing</th> <th data-bbox="1115 699 1697 762">ATS surveillance system criteria</th> </tr> </thead> <tbody> <tr> <td data-bbox="869 762 1115 1072">Less than 1 310 m (4 300 ft) but not less than 1 035 m (3 400 ft)</td> <td data-bbox="1115 762 1697 1072"> <ul style="list-style-type: none"> • a minimum accuracy for an ATS surveillance system as follows: <ul style="list-style-type: none"> - for SSR, an azimuth accuracy of 0.06 degrees (one sigma); or - for MLAT or ADS-B, an accuracy of 30 m (100 ft); • an update period of 2.5 seconds or less, and • a high resolution display providing position prediction and deviation alert is available. </td> </tr> </tbody> </table>	Runway centre line spacing	ATS surveillance system criteria	Less than 1 310 m (4 300 ft) but not less than 1 035 m (3 400 ft)	<ul style="list-style-type: none"> • a minimum accuracy for an ATS surveillance system as follows: <ul style="list-style-type: none"> - for SSR, an azimuth accuracy of 0.06 degrees (one sigma); or - for MLAT or ADS-B, an accuracy of 30 m (100 ft); • an update period of 2.5 seconds or less, and • a high resolution display providing position prediction and deviation alert is available.
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		<p>Though more detailed, there is no effective difference between the MOS and PANS standards</p>			

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MOS	PANS-ATM	Explanation				
	<table border="1" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>Less than 1 525 m (5 000 ft) but not less than 1 310 m (4 300 ft)</p> </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> • an ATS surveillance system with performance specifications other than those above, but equal to or better than: <ul style="list-style-type: none"> - for SSR a minimum azimuth accuracy of 0.3 degrees (one sigma); or - for MLAT or ADS-B, a performance capability equivalent to or better than the SSR requirement can be demonstrated; • an update period of 5 seconds or less, and • when it is determined that the safety of aircraft operations would not be adversely affected. </td> </tr> <tr> <td style="vertical-align: top;"> <p>1 525 m (5 000 ft) or more</p> </td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • a minimum SSR azimuth accuracy of 0.3 degrees (one sigma), or for MLAT or ADS-B, a performance capability equivalent to or better than the SSR requirement can be demonstrated; and • an update period of 5 seconds or less. </td> </tr> </table> <p><i>Note 1. — Information pertaining to use of ADS-B and MLAT) and their system performance is contained in the Assessment of ADS-B and Multilateration Surveillance to Support Air Traffic Services and Guidelines for Implementation (Circ 326).</i></p> <p><i>Note 2. — Refer to Chapter 2, Section 2.6.2 f) on ADS-B implementation that envisages reliance upon a common source for surveillance and/or navigation.</i></p>	<p>Less than 1 525 m (5 000 ft) but not less than 1 310 m (4 300 ft)</p>	<ul style="list-style-type: none"> • an ATS surveillance system with performance specifications other than those above, but equal to or better than: <ul style="list-style-type: none"> - for SSR a minimum azimuth accuracy of 0.3 degrees (one sigma); or - for MLAT or ADS-B, a performance capability equivalent to or better than the SSR requirement can be demonstrated; • an update period of 5 seconds or less, and • when it is determined that the safety of aircraft operations would not be adversely affected. 	<p>1 525 m (5 000 ft) or more</p>	<ul style="list-style-type: none"> • a minimum SSR azimuth accuracy of 0.3 degrees (one sigma), or for MLAT or ADS-B, a performance capability equivalent to or better than the SSR requirement can be demonstrated; and • an update period of 5 seconds or less. 	
<p>Less than 1 525 m (5 000 ft) but not less than 1 310 m (4 300 ft)</p>	<ul style="list-style-type: none"> • an ATS surveillance system with performance specifications other than those above, but equal to or better than: <ul style="list-style-type: none"> - for SSR a minimum azimuth accuracy of 0.3 degrees (one sigma); or - for MLAT or ADS-B, a performance capability equivalent to or better than the SSR requirement can be demonstrated; • an update period of 5 seconds or less, and • when it is determined that the safety of aircraft operations would not be adversely affected. 					
<p>1 525 m (5 000 ft) or more</p>	<ul style="list-style-type: none"> • a minimum SSR azimuth accuracy of 0.3 degrees (one sigma), or for MLAT or ADS-B, a performance capability equivalent to or better than the SSR requirement can be demonstrated; and • an update period of 5 seconds or less. 					
<p>(d) a No-Transgression Zone (NTZ) at least 610 m wide:</p> <p style="padding-left: 20px;">(i) is established equidistant between the extended runway centrelines, beginning at the point where 1 000 ft vertical separation no longer exists between aircraft on adjacent extended runway centrelines, and ending at a point 0.5 NM beyond the farthest Departure End of Runway</p>	<p>6.7.3.2.1 g) a no transgression zone (NTZ) at least 610 m (2 000 ft) wide is established equidistant between extended runway centre lines and is depicted on the ATS surveillance system situation display;</p>	<p>No difference</p>				

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(DER); and (ii) is depicted on the relevant situation display; and		
(e) the aircraft are making straight-in approaches; and (f) Instrument Landing System (ILS) approaches are being conducted to both runways; and	<p>6.7.3.2.1 b) the instrument approach procedures that align the aircraft with the extended runway centre line are any combination of the following:</p> <ol style="list-style-type: none"> 1) a precision approach procedure; or 2) except as provided in 6.7.3.2.1.b 3), an approach with vertical guidance (APV) designed using the RNP AR APCH specification where: <ol style="list-style-type: none"> i) the RNP value for B, and the RNP value for C, if that segment of the approach is within the horizontal separation minimum of a parallel approach, does not exceed one-quarter of the distance between runway centre lines (A), (Figure 6-1 refers); and ii) the RNP value for B, and the RNP value for C, if that part of the approach is within the horizontal separation minimum of a parallel approach, does not exceed (A-D)/2, (Figure 6-1 refers); or 3) an APV procedure designed using either the RNP APCH or RNP AR APCH navigation specification, provided that: <ol style="list-style-type: none"> i) an appropriate, documented safety assessment has shown that an acceptable level of safety can be met; ii) operations are approved by the appropriate ATS authority (Note 1. refers); and iii) the instrument approach is demonstrated to protect the NTZ from infringement during normal operations. <p><i>Note 1.— The demonstration of the safety of an APV procedure designed using either RNP APCH or RNP AR APCH navigation specification during simultaneous approaches may consider: the collision risk from normal and residual (not mitigated) atypical errors; likelihood of ACAS nuisance alerting during normal operations; wake hazard; monitoring and available levels of system automation; data base management; flight management system input and related crew workload; impacts of meteorological conditions and other environmental factors; training and published ATC break-out procedures.</i></p>	Proposal allows, in addition to straight-in ILS approaches, any form of precision approach (ie GLS or MLS), RNP-AR or APV procedure.

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	<p><i>Note 2. — For examples of the approach types and scenarios applicable to 6.7.3.2.1 b) see Manual on Simultaneous Operations on Parallel or Near-Parallel Instrument Runways (SOIR) (Doc 9643), Table 2-2 and Appendix C.</i></p> <p>The diagram illustrates the vertical and horizontal separation requirements for parallel or near-parallel instrument runways. It shows two approach paths: an RNP Approach (top) and an ILS Approach (bottom). Key parameters include: <ul style="list-style-type: none"> RNP (C): RNP value for the RNP approach. RNP (B): RNP value for the ILS approach. NOZ: Normal Operating Zone, shown as a shaded area around the runway. NTZ (D): No Transgression Zone, a 610 m (2000') vertical buffer zone between the RNP and ILS approaches. Distance between centre lines (A): The horizontal distance between the centerlines of the two runways. Text annotations specify: 'The NTZ extends from the point where vertical separation is reduced to the nearer runway threshold' and 'The NOZ extends from the point where aircraft are established on their final approach course or track to the runway threshold'. </p> <p>Figure 6-1 Distance between centre lines, NTZ and NOZ.</p>	
<p>(g) a minimum of 1 000 ft vertical or 3 NM surveillance separation is provided until aircraft are established on the ILS localiser course; and</p>	<p>6.7.3.2.5 A minimum of 300 m (1 000 ft) vertical separation or, subject to ATS surveillance system capabilities, a minimum of 5.6 km (3.0 NM) horizontal separation shall be provided until aircraft are established:</p> <ul style="list-style-type: none"> a) inbound on the final approach course or track; or b) on an RNP AR APCH approach in accordance with 6.7.3.5; and c) within the normal operating zone (NOZ). 	<p>No difference except to account for potential use of other forms of final approach guidance</p>
<p>h) when aircraft are established on the ILS localiser course — a minimum of 1 000 ft vertical separation or 2 NM surveillance separation is provided between aircraft on adjacent localiser until the higher aircraft reaches the ILS PRM glide path intercept point; and</p>	<p>No equivalent</p>	<p>This is a unique Australian requirement. The ICAO standards have never had an equivalent. The current MOS requirement would no longer apply</p>

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<p>(i) a minimum of 3 NM surveillance separation is provided between aircraft on the same ILS localizer course unless increased longitudinal separation is required due to wake turbulence; and</p>	<p>6.7.3.2.6 Subject to ATS surveillance system capabilities, a minimum of 5.6 km (3.0 NM) horizontal separation, or 4.6 km (2.5 NM) as prescribed by the appropriate ATS authority, shall be provided between aircraft on the same final approach course or track unless increased longitudinal separation is required due to wake turbulence or for other reasons.</p> <p><i>Note 1. — See Chapter 8, 8.7.3.2 and 8.7.3.4.</i></p> <p><i>Note 2. — An aircraft established on the final approach course or the final approach track is separated from another aircraft established on an adjacent final approach course or track provided neither aircraft penetrates the NTZ as depicted on the situation display.</i></p>	No difference
<p>(j) the missed approach track for 1 approach diverges by at least 30 degrees from the missed approach track of the adjacent approach; and</p>	<p>6.7.3.2.1 c) the nominal tracks of the missed approach procedures diverge by at least 30 degrees;</p>	No difference
<p>(k) when vectoring an aircraft to intercept the ILS localiser course — the final vector:</p> <p style="padding-left: 20px;">(i) enables the aircraft to intercept the ILS localizer course at an angle not greater than 30 degrees; and</p> <p style="padding-left: 20px;">(ii) provides at least 1 NM straight flight prior to ILS localiser course intercept; and</p>	<p>6.7.3.2.4 When vectoring to intercept the, final approach course or track, the final vector shall meet the following conditions:</p> <p>a) enable the aircraft to intercept at an angle not greater than 30 degrees;</p> <p>b) provide at least 1.9 km (1.0 NM) straight and level flight prior to final approach course or track intercept; and</p> <p>c) ...</p>	No difference
<p>(l) the aircraft are cleared to descend to the appropriate glide path intercept altitude soon enough to provide a period of level flight to dissipate excess speed; and</p>	<p>6.7.3.2.4 When vectoring to intercept the, final approach course or track, the final vector shall meet the following conditions:</p> <p>a) ... ;</p> <p>b) ... ; and</p> <p>c) enable the aircraft to be established on the approach track final approach course or track, in level flight for at least 3.7 km (2.0 NM) prior to intercepting the glide path or vertical path for the selected instrument approach procedure.</p>	A difference in that the PANS standard specifies the length of the level segment; whereas the existing MOS standard has no specific distance.

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(m) the pilot is advised, if required, of the altitude to be maintained until the ILS PRM glide path intercept point; and	6.7.3.2.7 When assigning the final heading to intercept the final approach course or track, the runway shall be confirmed, and the aircraft shall be advised of: a) its position relative to a fix on the final approach course or track; b) the altitude to be maintained until established on the final approach course or track, to the glide path or vertical path intercept point; and c) if required, clearance for the appropriate approach.	A difference is that the altitude to be maintained would have to be specified rather than it being an optional advice. Relative position information and clearance for approach are existing standard conventions
(n) the aircraft are established on the respective aerodrome control frequency and monitoring the relevant PRM frequency no later than 2 NM prior to the higher ILS PRM glide path intercept point.	6.7.3.2.1 j) if no dedicated radio channels are available for the controllers to control the aircraft until landing: 1) transfer of communication of aircraft to the respective aerodrome controller's channel is effected before either of the two aircraft on adjacent final approach tracks intercepts the glide path or vertical path for the selected instrument approach procedure; and 2) the controller(s) monitoring the approaches to each runway are provided with the capability to override transmissions of aerodrome control on the respective radio channels for each arrival flow.	A difference is that there would be no minimum distance before frequency transfer, rather this would require ATC to transfer the aircraft before either of the aircraft intercepts the glide path.
No equivalent MOS standard.	6.7.3.2.1 d) an obstacle survey and evaluation is completed, as appropriate, for the areas adjacent to the final approach segments;	No equivalent Part 172 MOS standard. However, an equivalent provision applies under CASR Part 173 design requirements. Under the proposed changes, the ICAO standard would become the Australian standard for CASR Part 172 purposes.
10.3.2.2 Whenever parallel runway operations are in progress, pilots must be notified by inclusion of such advice and an expectation of the type of approach or departure on the ATIS.	6.7.3.2.1 e) aircraft are advised as early as possible, of the assigned runway, instrument approach procedure and any additional information considered necessary to confirm correct selection; ... 6.7.3.2.3 As early as practicable after an aircraft has established	No difference. However there is no proposal to omit 10.3.2.2, because it has application for Independent and Dependent

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	<p>communication with approach control, the aircraft shall be advised that independent parallel approaches are in force. This information may be provided through the ATIS broadcasts.</p> <p>...</p> <p>6.7.3.4.1 e) aircraft are advised that approaches are in use to both runways (this information may be provided through the ATIS);</p>	Parallel Visual Approaches
No equivalent MOS standard.	<p>6.7.3.2.1 f) the final approach course or track, is intercepted by use of:</p> <ol style="list-style-type: none"> 1) vectoring; or 2) a published arrival and approach procedure that intercepts with the IAF or IF; <p>6.7.3.2.1 h) the approaches are monitored by:</p> <ol style="list-style-type: none"> 1) a separate monitoring controller for each runway; or 2) a single monitoring controller for no more than two runways, if determined by a safety assessment and approved by the appropriate ATS authority (6.7.3.2.2 refers); <p>6.7.3.2.1 i) monitoring ensures that when the 300 m (1 000 ft) vertical separation is reduced:</p> <ol style="list-style-type: none"> 1) aircraft do not penetrate the depicted NTZ; and 2) the applicable minimum longitudinal separation between aircraft on the same course, or MLS final approach track final approach course or track, is maintained; and <p>6.7.3.2.2 States conducting safety assessments to enable the monitoring of not more than two runways by a single controller (6.7.3.2.1.h refers) should review factors such as, but not limited to: complexity, times of operation, traffic mix and density, arrival rate, available levels of system automation, availability of back-up systems, impacts of meteorological conditions and other environmental factors.</p>	No equivalent MOS standard. Under the proposed changes, the ICAO standard would become the Australian standard.

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<p>10.4.2.2 Radar monitoring approaches.</p> <p>Regardless of weather conditions, aircraft must be radar monitored as being established on the ILS localiser course until:</p> <p>(a) for runways separated by greater than 1,525 M: (i) visual separation is applied; or (ii) the aircraft is 1 NM or less from the runway threshold.</p> <p>(b) for runways separated by less than 1,525 M: (i) visual separation is applied; or (ii) the aircraft reports the approach lights in sight; or (c) the aircraft has landed; or (d) in the event of a missed approach, the aircraft is 0.5 NM beyond the DER.</p>	<p>6.7.3.2.8 All approaches regardless of meteorological conditions shall be provided with flight path monitoring using an ATS surveillance system. Control instructions and information necessary to ensure separation between aircraft and to ensure aircraft do not enter the NTZ shall be issued.</p> <p><i>Note 1.— The primary responsibility for navigation on the final approach course or track rests with the pilot. Control instructions and information are therefore issued only to ensure separation between aircraft and to ensure that aircraft do not penetrate the NTZ.</i></p> <p><i>Note 2.— For the purpose of ensuring an aircraft does not penetrate the NTZ, the aircraft is considered to be the centre of its position symbol. However, the edges of the position symbols representing aircraft executing parallel approaches are not allowed to touch (see Chapter 8, 8.7.2).</i></p> <p>...</p> <p>6.7.3.2.11 Flight path monitoring using an ATS surveillance system shall not be terminated until:</p> <p>a) visual separation is applied, provided procedures ensure that both controllers are advised whenever visual separation is applied;</p> <p>b) the aircraft has landed, or in case of a missed approach, is at least 1.9 km (1.0 NM) beyond the departure end of the runway and adequate separation with any other traffic is established.</p> <p><i>Note.— There is no requirement to advise the aircraft that flight path monitoring is terminated.</i></p>	<p>The proposal is that ATS would have to monitor the approach until:</p> <ul style="list-style-type: none"> • Visual separation is applied • The aircraft has landed, or • For a missed approach, the aircraft is at least 1NM beyond the departure end of runway (DER). <p>This is a more stringent monitoring requirement because the existing standard also allows monitoring to be discontinued:</p> <ul style="list-style-type: none"> • for runways separated by 1525m or less — if the aircraft reports the approach lights in sight or • is 0.5NM beyond the DER; or • for runways separated by more than 1525m (not applicable at Sydney) — the aircraft is 1 NM or less from the runway threshold.
<p>10.4.2.3 When the radar indicates a track will penetrate the NTZ, ATC must advise the aircraft of the deviation.</p>	<p>6.7.3.2.9 When an aircraft is observed to overshoot the turn-on or to continue on a track which will penetrate the NTZ, the aircraft shall be instructed to return immediately to the correct track.</p>	<p>No difference</p>
<p>10.4.2.4 When an aircraft is observed penetrating the NTZ, that aircraft and affected aircraft on the adjacent localiser course will be issued with appropriate heading and altitude instructions to</p>	<p>6.7.3.2.10 When an aircraft is observed penetrating the NTZ, the aircraft on the adjacent final approach course or track shall be instructed to immediately climb and turn to the assigned altitude/height and heading (break-out procedures) in order to avoid the deviating aircraft. Where parallel approach</p>	<p>No difference</p>

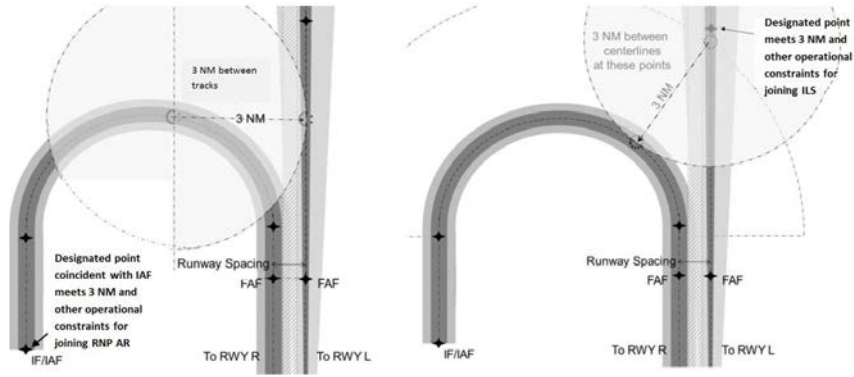
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resolve the conflict. Where either aircraft is 1 NM or less from the runway threshold, it may be allowed to continue its approach and land if provided with traffic information on the relevant aircraft.	obstacle assessment surfaces (PAOAS) criteria are applied for the obstacle assessment, the monitoring controller shall not issue the heading instruction to the aircraft below 120 m (400 ft) above the runway threshold elevation, and the heading instruction shall not exceed 45 degrees track difference with the final approach course or track.	
10.4.2.5 Independent parallel approaches to parallel runways spaced less than 1,525 M must be suspended during periods of severe weather such as thunderstorms, windshear, turbulence, downdrafts, or crosswinds which might increase ILS localiser course deviations to an unacceptable level of deviation alerts.	<p>6.7.3.3 SUSPENSION OF INDEPENDENT PARALLEL APPROACHES TO CLOSELY-SPACED PARALLEL RUNWAYS</p> <p>Independent parallel approaches to parallel runways spaced by less than 1 525 m between their centre lines shall be suspended under certain meteorological conditions, as prescribed by the appropriate ATS authority, including wind shear, turbulence, downdrafts, crosswind and significant meteorological conditions such as thunderstorms, which might otherwise increase deviations from the final approach course or track to the extent that safety may be impaired.</p> <p><i>Note 1.— The increase in final approach track deviations would additionally result in an unacceptable level of deviation alerts being generated.</i></p> <p><i>Note 2.— Guidance material relating to meteorological conditions is contained in the Manual on Simultaneous Operations on Parallel or Near-Parallel Instrument Runways (SOIR) (Doc 9643).</i></p>	No difference
No equivalent MOS standard.	<p>6.7.3.5 DETERMINATION THAT AN AIRCRAFT IS ESTABLISHED ON RNP AR APCH</p> <p>6.7.3.5.1 In addition to the requirements specified under 6.7.3.2, for the purposes of applying 6.7.3.2.5 b), an aircraft conducting an RNP AR APCH procedure is considered to be established for the entire approach procedure after the IAF/IF provided that:</p> <p>a) the aircraft confirms that it is established on the RNP AR APCH procedure prior to a designated point, the location of such point to be determined by the appropriate ATS authority;</p> <p>b) the designated point shall be positioned on the RNP AR APCH to</p>	This is a new standard that would apply only if RNP AR APCH procedures are implemented for independent parallel approach operations.

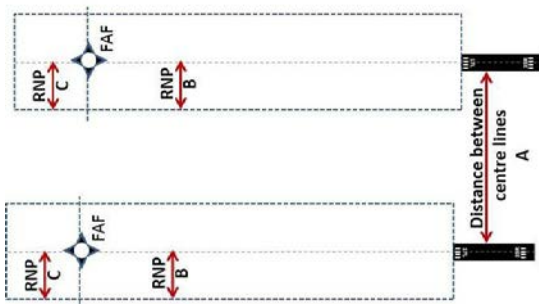
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	<p>ensure the applicable horizontal separation minimum (e.g. 5.6 km (3 NM)) from the adjacent approach procedure (Figure 6-6 refers). The designated point may normally be coincident with the IAF; and</p> <p>c) to facilitate the application of the procedure, the designated point shall be readily apparent to the approach and monitoring controllers. The designated point may be depicted on the situation display.</p> <p>6.7.3.5.2 Appropriate wake turbulence separation shall be applied between aircraft on the same approach.</p> <p>6.7.3.5.3 If, after reporting that it is established on the RNP AR APCH procedure, the aircraft is unable to execute the procedure, the pilot shall notify the controller immediately with a proposed course of action, and thereafter follow ATC instructions (e.g. break-out procedure).</p> <p><i>Note.— Break-out procedures are described in Manual on Simultaneous Operations on Parallel or Near-Parallel Instrument Runways (SOIR) (Doc 9643).</i></p> <p>6.7.3.5.4 In circumstances where a break-out procedure becomes necessary during the application of the independent parallel approach procedure (for example, an aircraft penetrating the NTZ), the controller may issue climb and/or heading instructions to an aircraft established on an RNP AR APCH.</p> <p>6.7.3.5.5 To support a break-out instruction, an obstacle assessment shall be completed.</p> <p><i>Note: — Guidance on obstacle assessment is provided in the Manual on Simultaneous Operations on Parallel or Near-Parallel Instrument Runways (SOIR) (Doc 9643).</i></p> <p>6.7.3.5.6 Break-out procedures shall be prescribed in the AIP and local instructions.</p> <p>6.7.3.5.7 The monitoring controller shall protect the NTZ, in</p>	

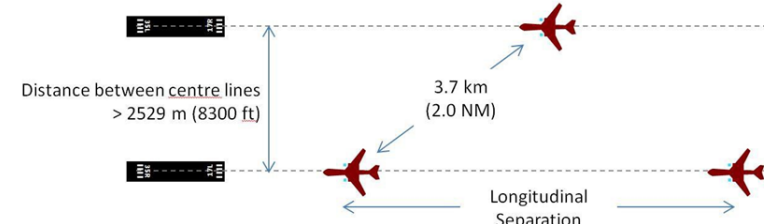
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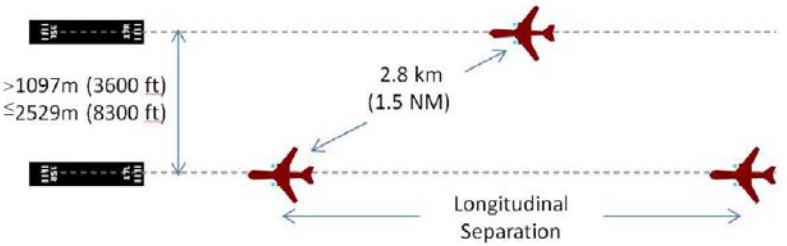
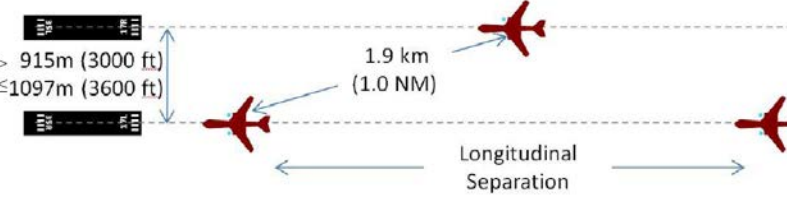
MOS	PANS-ATM	Explanation
	<p>accordance with 6.7.3.2.1 i).</p>  <p>Figure 6-6. 'Established on RNP AR APCH' Concept (RNP AR APCH/Precision approach with 3 NM Separation minimum example)</p>	
<p>10.4.3 Dependent Parallel Approaches in IMC</p> <p>10.4.3.1 Dependent parallel approaches may be conducted to parallel runways with centre-lines separated by more than 915 M provided that:</p>	<p>6.7.3.4 REQUIREMENTS AND PROCEDURES FOR DEPENDENT PARALLEL APPROACHES</p> <p>6.7.3.4.1 Dependent parallel approaches may be conducted to parallel runways provided:</p> <p>a) the runway centre lines are spaced by 915 m (3 000 ft) or more (see Annex 14, Volume I);</p>	<p>No difference</p>
<p>(a) the aircraft are making straight-in approaches;</p> <p>(b) instrument landing system (ILS) approaches are being conducted on adjacent runways;</p>	<p>6.7.3.4.1 d) the instrument flight procedures that align the aircraft with the extended runway centre line are any combination of the following:</p> <ol style="list-style-type: none"> 1) a precision approach procedure; 2) an APV procedure designed using the RNP AR APCH navigation specification, provided that the RNP value for B, and the RNP value for C if that segment of the approach is within the horizontal separation minimum of a parallel approach, does not exceed one-quarter of the distance between runway centre lines (A) (Figure 6-2 refers); and 3) an APV procedure designed using the RNP AR APCH navigation specification that does not meet the provisions in d) 2) or an RNP APCH, 	<p>Proposal allows, in addition to straight-in ILS approaches, any form of precision approach (ie GLS or MLS), RNP-AR or APV procedure.</p>

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MOS	PANS-ATM	Explanation
	<p>provided that:</p> <ul style="list-style-type: none"> i) an appropriate, documented safety assessment has shown that an acceptable level of safety can be met; and ii) operations are approved by the appropriate ATS authority (Note 1. refers). <p><i>Note 1.— The demonstration of the safety of an APV procedure designed using either RNP APCH or RNP AR APCH navigation specification during simultaneous approaches may consider: the collision risk from normal and residual (not mitigated) atypical errors; likelihood of ACAS nuisance alerting during normal operations; wake hazard; monitoring and available levels of system automation; data base management; flight management system input and related crew workload; impacts of meteorological conditions and other environmental factors; training; and published ATC break-out procedures.</i></p> <p><i>Note 2.— For examples of approach types and scenarios that meet the requirements of 6.7.3.4.1 d), see Manual on Simultaneous Operations on Parallel or Near-Parallel Instrument Runways (SOIR) (Doc 9643) Table 2-3 and Appendix C.</i></p>  <p>The diagram illustrates two parallel runways. Each runway has a dashed rectangular area representing the RNP APCH or RNP AR APCH navigation specification. The distance between the centre lines of the two runways is labeled 'A'. The RNP value for each runway is labeled 'B'. The RNP value for the final approach segment is labeled 'C'. The FAF (Final Approach Fix) is marked on each runway.</p> <p>Figure 6-2 — RNP value and distance between centre lines</p>	
<p>(c) a minimum of 1,000 FT vertical or 3 NM radar separation is provided between aircraft during the turn-on to parallel ILS localiser courses;</p>	<p>6.7.3.4.2 A minimum of 300 m (1 000 ft) vertical separation or a minimum of 5.6 km (3.0 NM) horizontal separation shall be provided between aircraft until established on the final approach courses or tracks of parallel approaches.</p>	<p>No difference</p>

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MOS	PANS-ATM	Explanation
<p>(d) aircraft established on the same ILS localiser course are radar separated by a minimum of 3 NM unless increased longitudinal separation is required due to wake turbulence;</p>	<p>6.7.3.4.3 The minimum horizontal separation to be provided between aircraft established on the same final approach course or track shall be 5.6 km (3.0 NM) or 4.6 km (2.5 NM) as prescribed by the appropriate ATS authority, unless increased longitudinal separation is required due to wake turbulence.</p> <p><i>Note.— See Chapter 8, 8.7.3.2 and 8.7.3.4</i></p>	<p>No difference</p>
<p>(e) successive aircraft on adjacent ILS localiser courses are separated by a minimum of 2 NM by radar; and</p>	<p>6.7.3.4.4 The minimum horizontal separation to be provided diagonally between successive aircraft on adjacent final approach courses or tracks shall be:</p> <p>a) 3.7 km (2.0 NM) between successive aircraft on adjacent final approach courses or tracks more than 2 529 m (8 300 ft) apart (Figure 6-3); or</p> <p>b) 2.8 km (1.5 NM) between successive aircraft on adjacent final approach courses or tracks more than 1 097 m (3 600 ft) but not more than 2 529 m (8 300 ft) apart. (Figure 6-4); or</p> <p>c) 1.9 km (1.0 NM) between successive aircraft on adjacent final approach courses or tracks more than 915 m (3 000 ft) but not more than 1 097 m (3 600 ft) apart. (Figure 6-5).</p> <div style="text-align: center;">  </div> <p>Figure 6-3. Diagonal separation for distance between centre lines greater than 2 529m (8 300 ft)</p>	<p>Proposed standard is allows closer spacing (1NM vs 2NM) between adjacent aircraft than is currently allowed by the MOS</p>

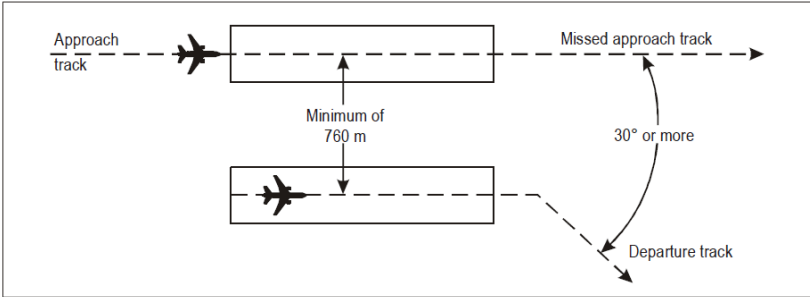
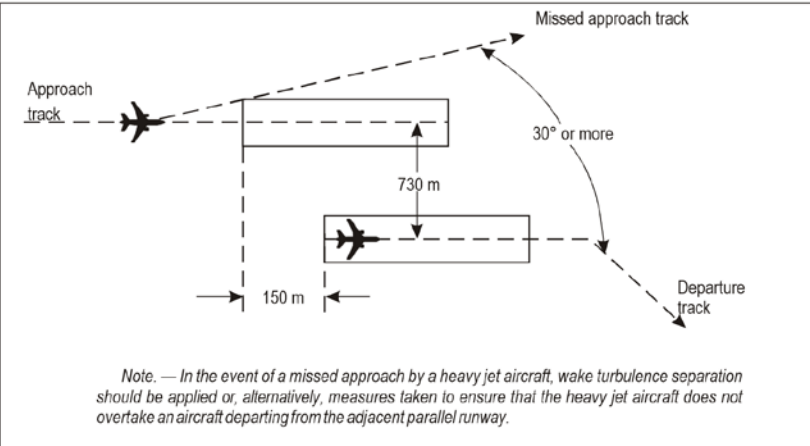
MOS	PANS-ATM	Explanation
	 <p>Figure 6-4. Diagonal separation for distance between centre lines greater than 1 097 m (3 600 ft) but less than or equal to 2 529 m (8 300 ft)</p>  <p>Figure 6-5. Diagonal separation for distance between centre lines greater than 915 m (3 000 ft) but less than or equal to 1 097 m (3 600 ft)</p> <p><i>Note.— Further detail is provided in appendices E and F to The Manual on Simultaneous Operations on Parallel or Near-Parallel Instrument Runways (Doc 9643) regarding the rationale and demonstration of safety of reduced diagonal separations</i></p>	
<p>(f) the missed approach track for one approach diverges by at least 30 degrees from the missed approach track of the adjacent approach.</p>	<p>6.7.3.4.1 f) the nominal tracks of the missed approach procedures diverge by at least 30 degrees; and</p>	
<p>No equivalent MOS standard.</p>	<p>6.7.3.4.1 b) the final approach course or track is intercepted by use of:</p> <ol style="list-style-type: none"> 1) vectoring; or 2) a published arrival and approach procedure that intercepts with the 	<p>In addition to intercepting the final approach course or track by vectoring, the proposal is to</p>

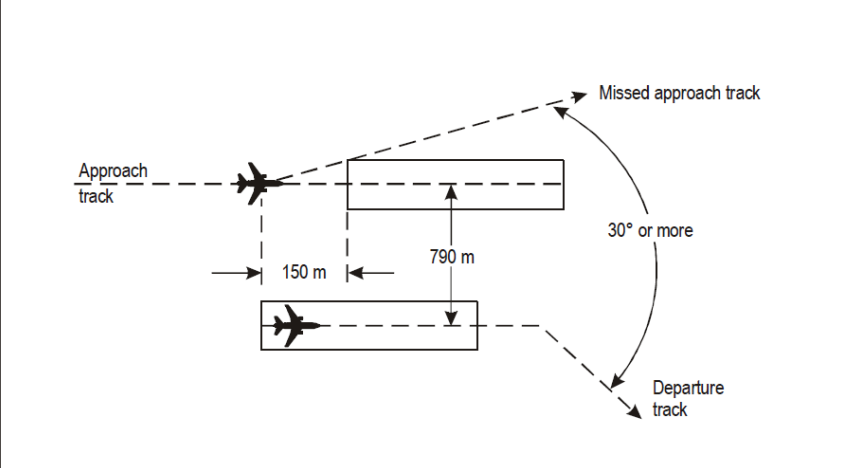
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MOS	PANS-ATM	Explanation
	<p>IAF or IF;</p> <p>6.7.3.4.1 c) an ATS surveillance radar system with a minimum SSR azimuth accuracy of 0.3 degrees (one sigma), or for MLAT or ADS-B a performance capability equivalent to or better than the SSR requirement can be demonstrated and update period of 5 seconds or less is available;</p> <p>6.7.3.4.1 g) approach control has a frequency override capability to aerodrome control.</p>	<p>allow the aircraft to own navigate to final by use of a published arrival and approach procedure.</p> <p>For 6.7.3.4.1 c) and 6.7.3.4.1 g), there is no equivalent MOS standard. Under the proposed changes, the ICAO standard would become the Australian standard.</p>
<p>10.4.4 Independent Parallel Departures</p> <p>10.4.4.1 Independent departures may be conducted provided:</p>	<p>6.7.2.2 REQUIREMENTS AND PROCEDURES FOR INDEPENDENT PARALLEL DEPARTURES</p> <p>Independent IFR departures may be conducted from parallel runways provided:</p>	
<p>No equivalent MOS standard.</p>	<p>a) the runway centre lines are spaced by a minimum distance of 760 m (2 500 ft) (see Annex 14, Volume I);</p>	<p>No equivalent MOS standard. However, there is no aerodrome in Australia where Independent parallel IFR departures take place and the parallel runways are less than 760m apart.</p>
<p>(a) ATC instructions permit the courses of the respective aircraft to diverge by at least 15 degrees immediately after take-off; and</p>	<p>b) the nominal departure tracks diverge by at least:</p> <ol style="list-style-type: none"> 1) 15 degrees immediately after take-off; or 2) 10 degrees where <ol style="list-style-type: none"> i) both aircraft are flying an RNAV or RNP instrument departure; and ii) the turn commences no more than 3.7 km (2.0 NM) from the departure end of the runway; 	<p>The proposed standard allows the equivalent of the existing standard, yet is more flexible if circumstances exist as mentioned in 6.7.2.2 b) 2).</p>
<p>(b) the radar is capable of identifying the</p>	<p>c) a suitable ATS surveillance system capable of identification of the</p>	<p>No difference</p>

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MOS	PANS-ATM	Explanation
aircraft within 1 NM of the upwind end of the departure runway.	aircraft within 1.9 km (1.0 NM) from the end of the runway is available; and	
No equivalent MOS standard.	d) ATS operational procedures ensure that the required track divergence is achieved. <i>Note.— For further details refer to Circular 350, Guidelines for the Implementation of Reduced Divergence Departures.</i>	It is proposed ATS operational procedures would have to ensure that the required track divergence is achieved.
10.4.5 Independent Parallel Visual Approaches 10.4.5.1 Independent visual approaches may be conducted to parallel runways with centre-lines separated by at least 760 M provided that: ...	No ICAO equivalent	No proposal to omit the existing MOS provision for Independent Parallel Visual Approaches
10.4.6 Dependent Parallel Visual Approaches 10.4.6.1 Dependent visual approaches to parallel runways may be conducted in accordance with the procedures and requirements for visual approaches (see paragraph 12.2.4).	No ICAO equivalent	No proposal to omit the existing MOS provision for Dependent Parallel Visual Approaches
10.4.7 Segregated Parallel Operations in IMC 10.4.7.1 ILS Precision, radar and visual approaches may be conducted in segregated parallel runway operations in IMC provided that: (a) the centrelines are separated by more than 760 M;	6.7.3.6 REQUIREMENTS AND PROCEDURES FOR SEGREGATED PARALLEL OPERATIONS 6.7.3.6.1 Segregated parallel operations may be conducted on parallel runways provided: a) the runway centre lines are spaced by a minimum of 760 m (2 500 ft) (see Annex 14, Volume I); and	No difference
(b) the nominal departure track diverges immediately after take-off by at least 30 degrees from the missed approach track of the adjacent approach.	b) the nominal departure track diverges immediately after take-off by at least 30 degrees from the missed approach track of the adjacent approach (see Figure 6-7).	No difference

MOS	PANS-ATM	Explanation
<p>No equivalent MOS standard.</p>	<p>6.7.3.6.2 The minimum distance between parallel runway centre lines for segregated parallel operations may be decreased by 30 m for each 150 m that the arrival runway is staggered toward the arriving aircraft, to a minimum of 300 m (see Figure 6-8) and should be increased by 30 m for each 150 m that the arrival runway is staggered away from the arriving aircraft (see Figure 6-9).</p>  <p>Figure 6-7. Segregated parallel operations (see 6.7.3.6.1 b))</p>  <p><i>Note. — In the event of a missed approach by a heavy jet aircraft, wake turbulence separation should be applied or, alternatively, measures taken to ensure that the heavy jet aircraft does not overtake an aircraft departing from the adjacent parallel runway.</i></p> <p>Figure 6-8. Segregated parallel operations where runways are staggered (see 6.7.3.6.2)</p>	<p>The proposed ICAO standard provides more flexibility than the existing MOS standard.</p>

MOS	PANS-ATM	Explanation
	 <p>Figure 6-9. Segregated parallel operations where runways are staggered (see 6.7.3.6.2)</p> <p>6.7.3.6.3 The following types of approach procedures may be utilized in segregated parallel operations provided a suitable ATS surveillance system and the appropriate ground facilities conform to the standard necessary for the specific type of approach:</p> <ul style="list-style-type: none"> a) precision approaches and/or APV (RNP AR APCH, RNP APCH); b) surveillance radar approach (SRA) or precision approach radar (PAR) approach; and c) visual approach. <p><i>Note.— Guidance material is contained in the Manual on Simultaneous Operations on Parallel or Near-Parallel Instrument Runways (SOIR) (Doc 9643).</i></p>	
<p>10.4.8 Opposite Direction Parallel Runway Operations</p> <p>10.4.8.1 Simultaneous Opposite Direction</p>	<p>No ICAO equivalent</p>	<p>No proposal to omit the existing MOS provision for Opposite Direction Parallel Runway Operations</p>

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MOS	PANS-ATM	Explanation
Parallel Runway Operations (SODPROPS) may be conducted subject to the following conditions: ...		