| SESAR | | Active | | | | APT | | | | |
|-------|-----|--------|-----|-----|-------|------------|---------|-----|-----|-----|
| AOP10 | | | | | Time- | Based Sepa | aration | | | |
| REG | ASP | MIL | APO | USE | INT | IND | NM | MET | AIS | USP |

Subject matter and scope

Time-based separation (TBS) consists in the separation of aircraft in sequence on the approach to a runway using time intervals instead of distances. It may be applied during final approach by allowing equivalent distance information to be displayed to the controller taking account of prevailing wind conditions. Radar separation minima and Wake Turbulence Separation parameters shall be integrated to provide guidance to the air traffic controller to enable time-based spacing of aircraft during final approach that considers the effect of headwind.

A TBS system that provides in real-time the separation to apply between two aircraft needs to be fed by:

- the aircraft sequence to anticipate aircraft specific speed management and to define the time separation required for a given wake category pair, and:
- the wind profile, approximately 10 minutes before landing, to define the separation on final approach.

These require respectively the development of an easily usable sequencing tool and a now casting technology based upon merging wind profile measurement and heuristic techniques.

NOTE FOR MILITARY AUTHORITIES: It is the responsibility of each military authority to review this Objective IN ITS ENTIRETY and address each of the SLoAs that the military authority considers RELEVANT for itself. This has to be done on top and above of the review of "MIL" SLoAs which identify actions EXCLUSIVE to military authorities.

Applicability Area(s) & Timescale(s) See list of airports in MP Level 3 Implementation Plan - Annexes **Applicability Area** Timescales: From: By: Applicable to: Initial operational capability 01/01/2015 Applicability Area Full operational capability 31/12/2023 Applicability Area References **European ATM Master Plan** OI step -[AO-0303]-Time Based Separation for Final Approach - full concept AERODROME Enablers -APP ATC 156 REG-0514 STD-065 -ATC-17 WXYZ-002 Covered by SLoA(s) in another objective Covered by SLoA(s) in WXYZ-Not covered in the Legend: WXYZ-001 003 Implementation Plan this objective Objective covering the enabler 777 Applicable legislation -none-**Essential Operational Changes** Airport and TMA performance **SESAR Solution**

European Plan for Aviation Safety

#64 - Time Based Separation

Deployment Programme

ICAO GANP - ASBUs

WAKE-B2/7

- none -

Time based wake separation minima for arrival based on leader/follower static pair-wise

| AOP10 | Time-Based Separation |
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Operating Environments

Airport
Terminal Airspace

Stakeholder Lines of Action (SLoAs)

| SloA ref. | Title | From | Ву |
|-------------------------------------|--|--------------------------------|-------------------------|
| AOP10-REG01 | Publish TBS operations procedures in national aeronautical information publications | 01/01/2015 | 01/01/2024 |
| AOP10-ASP01 | Ensure AMAN system is compatible with TBS support tool | 01/01/2015 | 01/01/2024 |
| AOP10-ASP02 | Modify CWP to integrate TBS Support tool with safety nets | 01/01/2015 | 01/01/2024 |
| AOP10-ASP03 | Local MET info with actual glide-slope wind conditions to be provided into TBS Support tool | 01/01/2015 | 01/01/2024 |
| AOP10-ASP04 | TBS Support tool to provide automatic monitoring and alerting of non-conformant behaviours, infringements, wrong aircraft | 01/01/2015 | 01/01/2024 |
| AOP10-ASP05 | Implement procedures for TBS operations | 01/01/2015 | 01/01/2024 |
| AOP10-ASP06 | Train controllers (Tower and Approach) on TBS operations | 01/01/2015 | 31/12/2024 |
| AOP10-USE01 Description of finalis | Train flight crews on TBS operations sed and deleted SLoAs is available on the eATM Portal @ https://www.eatmportal.eu/worki | 01/01/2015 ing/depl/essip_o | 01/01/2024 bjectives |

Expected Performance Benefits

Safety:

More consistent separation delivery on final approach.

Capacity:

Improved aircraft landing rates leading to increased airport throughput. Reduction of holding times and stack entry to

touchdown times leading to reduced delays.

Operational Efficiency:

Cost Efficiency:

-

Environment:

Reduced emissions due to reduced holding times and stack entry to touchdown times.

Security:

Detailed SLoA Descriptions

| | Dotailou 020/ Docomptione | | | | | |
|-------------------------|--|-----------------------|---------------------------|--|--|--|
| AOP10-REG01 | Publish TBS operations procedures in national aeronautical information publications | From: 01/01/2015 | By: 01/01/2024 | | | |
| Action by: | National Supervisory Authorities (NSAs) | | | | | |
| Description & purpose: | Publish TBS operations procedures in national aeronautical information publications | | | | | |
| Supporting material(s): | SJU - SESAR Solution 64: Data Pack for Time Based Separation | | | | | |
| | Url: https://www.sesarju.eu/sesar-solutions/time-based-separation | | | | | |
| | EUROCONTROL - SPEC-167 - EUROCONTROL Specification for Time Approach - Edition 1.0 / 02/2018 | Based Separation (TBS | S) support tool for Final | | | |
| | Url: https://www.eurocontrol.int/publication/eurocontrol-specification-time-based-separation-tbs-support-tool-final-approach | | | | | |
| | EUROCONTROL - GUID-187 - EUROCONTROL Guidelines on Time-Based Separation (TBS) for Final Approach - Edition 1.0 / 05/2021 | | | | | |
| | Url: https://www.eurocontrol.int/publication/eurocontrol-guidelines-time-based-separation-tbs-final-approach | | | | | |
| Finalisation criteria: | 1 - TBS operations procedures are published in national aeronautical information publications. | | | | | |
| | | From: | By: | | | |
| AOP10-ASP01 | Ensure AMAN system is compatible with TBS support tool | 01/01/2015 | 01/01/2024 | | | |
| Action by: | ANS Providers | ' | | | | |
| Description & purpose: | Ensure that the flight data processing and AMAN systems are compatible with the TBS support tool for the visualisation of the final approach separation or spacing, and are able to switch between time and distance based wake turbulence radar separation rules. Switching from TBS to Distance Based Separation (DBS) is necessary to cover contingency and other locally-driven requirements. The TBS support tool and associated CWP shall also calculate headwind independent time based separation to be used by the Arrival manager between arriving aircraft and display it on controller displays to support reduced, time-based separation for aircraft on final approach. | | | | | |

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| C | C.II.I. OF CAR Columbia CA. Data Dadi for Time Decad Consertion | | | | | | |
| Supporting material(s): | SJU - SESAR Solution 64: Data Pack for Time Based Separation | | | | | | |
| | Url: https://www.sesarju.eu/sesar-solutions/time-based-separation EUROCONTROL - SPEC-167 - EUROCONTROL Specification for Time Based Separation (TBS) support tool for Final Approach - Edition 1.0 / 02/2018 | | | | | | |
| | Approach - Edition 1.0 / 02/2018 Url : https://www.eurocontrol.int/publication/eurocontrol-specification-time-based-separation-tbs-support-tool-final- | | | | | | |
| | approach EUROCONTROL - GUID-187 - EUROCONTROL Guidelines on Time-Based Separation (TBS) for Final Approach - Edition 1.0 / 05/2021 | | | | | | |
| | Url: https://www.eurocontrol.int/publication/eurocontrol-guidelines-time-based-separation-tbs-final-approach | | | | | | |
| TM Master Plan elationship: | [AERODROME-ATC-17]-Airport ATC tool to Support Time-Based Separation in Final Approach [APP ATC 156]-ATC System to Support Time-Based Separation in Final Approach | | | | | | |
| inaliaatian aritaria. | | TAPPIOACH | | | | | |
| Finalisation criteria: | 1 - FDPS and AMAN system are compatible with the TBS support tool 2 - CWP is modified to display headwind independent time based separation 3 - TBS support tool is able to calculate headwind independent time based separation | | | | | | |
| | | From: | Ву: | | | | |
| AOP10-ASP02 | Modify CWP to integrate TBS Support tool with safety nets | 01/01/2015 | 01/01/2024 | | | | |
| ction by: | ANS Providers | | | | | | |
| escription & purpose: | Modify the controller working position (CWP) to integrate the new TBS s traffic controller, in order to calculate TBS distance respecting minimum conditions. | | | | | | |
| supporting material(s): | SJU - SESAR Solution 64: Data Pack for Time Based Separation | | | | | | |
| | Url: https://www.sesarju.eu/sesar-solutions/time-based-separation | | | | | | |
| | EUROCONTROL - SPEC-167 - EUROCONTROL Specification for Time Based Separation (TBS) support tool for Final Approach - Edition 1.0 / 02/2018 | | | | | | |
| | Url: https://www.eurocontrol.int/publication/eurocontrol-specification-time-based-separation-tbs-support-tool-final-approach | | | | | | |
| | EUROCONTROL - GUID-187 - EUROCONTROL Guidelines on Time-Based Separation (TBS) for Final Approach - Edition 1.0 / 05/2021 | | | | | | |
| | Url: https://www.eurocontrol.int/publication/eurocontrol-guidelines-time-l | based-separation-tb | s-final-approach | | | | |
| inalisation criteria: | 1 - CWP is modified to integrate the new TBS support tool with safety ne | ets. | | | | | |
| 10040 10000 | Local MET info with actual glide-slope wind conditions to be | From: | By: | | | | |
| AOP10-ASP03 | provided into TBS Support tool | 01/01/2015 | 01/01/2024 | | | | |
| | provided into TBS Support tool | 01/01/2015 | 01/01/2024 | | | | |
| action by: | provided into TBS Support tool ANS Providers | | | | | | |
| Action by: Description & purpose: | provided into TBS Support tool ANS Providers To feed local meteorological (MET) information providing actual glide slo | | | | | | |
| action by: Description & purpose: | provided into TBS Support tool ANS Providers To feed local meteorological (MET) information providing actual glide sld SJU - SESAR Solution 64: Data Pack for Time Based Separation | | | | | | |
| Action by: Description & purpose: | provided into TBS Support tool ANS Providers To feed local meteorological (MET) information providing actual glide sld SJU - SESAR Solution 64: Data Pack for Time Based Separation Url: https://www.sesarju.eu/sesar-solutions/time-based-separation EUROCONTROL - SPEC-167 - EUROCONTROL Specification for Time | ope wind conditions | to the TBS support tool. | | | | |
| Action by: Description & purpose: | ANS Providers To feed local meteorological (MET) information providing actual glide slot SJU - SESAR Solution 64: Data Pack for Time Based Separation Url: https://www.sesarju.eu/sesar-solutions/time-based-separation EUROCONTROL - SPEC-167 - EUROCONTROL Specification for Time Approach - Edition 1.0 / 02/2018 Url: https://www.eurocontrol.int/publication/eurocontrol-specification-time | ope wind conditions Based Separation | to the TBS support tool. (TBS) support tool for Final | | | | |
| Action by: Description & purpose: | ANS Providers To feed local meteorological (MET) information providing actual glide slot SJU - SESAR Solution 64: Data Pack for Time Based Separation Url: https://www.sesarju.eu/sesar-solutions/time-based-separation EUROCONTROL - SPEC-167 - EUROCONTROL Specification for Time Approach - Edition 1.0 / 02/2018 Url: https://www.eurocontrol.int/publication/eurocontrol-specification-time approach EUROCONTROL - GUID-187 - EUROCONTROL Guidelines on Time-B | e Based Separation | to the TBS support tool. (TBS) support tool for Final- | | | | |
| escription & purpose: | ANS Providers To feed local meteorological (MET) information providing actual glide slot SJU - SESAR Solution 64: Data Pack for Time Based Separation Url: https://www.sesarju.eu/sesar-solutions/time-based-separation EUROCONTROL - SPEC-167 - EUROCONTROL Specification for Time Approach - Edition 1.0 / 02/2018 Url: https://www.eurocontrol.int/publication/eurocontrol-specification-time approach EUROCONTROL - GUID-187 - EUROCONTROL Guidelines on Time-B Edition 1.0 / 05/2021 | ppe wind conditions Based Separation Be-based-separation Based Separation (Tile | to the TBS support tool. (TBS) support tool for Finaltbs-support-tool-final- BS) for Final Approach - | | | | |
| escription & purpose: upporting material(s): | ANS Providers To feed local meteorological (MET) information providing actual glide slot SJU - SESAR Solution 64: Data Pack for Time Based Separation Url: https://www.sesarju.eu/sesar-solutions/time-based-separation EUROCONTROL - SPEC-167 - EUROCONTROL Specification for Time Approach - Edition 1.0 / 02/2018 Url: https://www.eurocontrol.int/publication/eurocontrol-specification-time approach EUROCONTROL - GUID-187 - EUROCONTROL Guidelines on Time-B Edition 1.0 / 05/2021 Url: https://www.eurocontrol.int/publication/eurocontrol-guidelines-time-lime-limes-times-time-limes-ti | e Based Separation e-based-separation ased Separation (Tilbased-separation-tb | to the TBS support tool. (TBS) support tool for Finaltbs-support-tool-final- BS) for Final Approach - | | | | |
| ection by: Description & purpose: Supporting material(s): | ANS Providers To feed local meteorological (MET) information providing actual glide slot SJU - SESAR Solution 64: Data Pack for Time Based Separation Url: https://www.sesarju.eu/sesar-solutions/time-based-separation EUROCONTROL - SPEC-167 - EUROCONTROL Specification for Time Approach - Edition 1.0 / 02/2018 Url: https://www.eurocontrol.int/publication/eurocontrol-specification-time approach EUROCONTROL - GUID-187 - EUROCONTROL Guidelines on Time-B Edition 1.0 / 05/2021 Url: https://www.eurocontrol.int/publication/eurocontrol-guidelines-time-1 - Local meteorological information providing actual glide slope wind co | ppe wind conditions Based Separation Be-based-separation (Tilebased-separation-tb | to the TBS support tool. (TBS) support tool for Fina -tbs-support-tool-final- BS) for Final Approach - | | | | |
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| Action by: Description & purpose: Supporting material(s): Finalisation criteria: AOP10-ASP04 Action by: | ANS Providers To feed local meteorological (MET) information providing actual glide slot SJU - SESAR Solution 64: Data Pack for Time Based Separation Url: https://www.sesarju.eu/sesar-solutions/time-based-separation EUROCONTROL - SPEC-167 - EUROCONTROL Specification for Time Approach - Edition 1.0 / 02/2018 Url: https://www.eurocontrol.int/publication/eurocontrol-specification-timapproach EUROCONTROL - GUID-187 - EUROCONTROL Guidelines on Time-B Edition 1.0 / 05/2021 Url: https://www.eurocontrol.int/publication/eurocontrol-guidelines-time-1 - Local meteorological information providing actual glide slope wind control-conformant behaviours, infringements, wrong aircraft | ppe wind conditions Based Separation Based-separation (Tilebased-separation-tb Conditions is fed into to the separation of the separati | to the TBS support tool. (TBS) support tool for Final- tbs-support-tool-final- BS) for Final Approach - s-final-approach he TBS support tool By: 01/01/2024 formant final approach | | | | |
| cition by: Description & purpose: Supporting material(s): Distribution criteria: AOP10-ASP04 Description & purpose: | ANS Providers To feed local meteorological (MET) information providing actual glide slot SJU - SESAR Solution 64: Data Pack for Time Based Separation Url: https://www.sesarju.eu/sesar-solutions/time-based-separation EUROCONTROL - SPEC-167 - EUROCONTROL Specification for Time Approach - Edition 1.0 / 02/2018 Url: https://www.eurocontrol.int/publication/eurocontrol-specification-time approach EUROCONTROL - GUID-187 - EUROCONTROL Guidelines on Time-B Edition 1.0 / 05/2021 Url: https://www.eurocontrol.int/publication/eurocontrol-guidelines-time-1 - Local meteorological information providing actual glide slope wind control meteorological information providing actual glide slope wind control-conformant behaviours, infringements, wrong aircraft ANS Providers To ensure that the TBS support tool provides automatic monitoring and airspeed behaviour, automatic monitoring and alerting of separation infri | ppe wind conditions Based Separation Based-separation (Tilebased-separation-tb Conditions is fed into to the separation of the separati | to the TBS support tool. (TBS) support tool for Finaltbs-support-tool-final- BS) for Final Approach | | | | |
| Coction by: Description & purpose: Supporting material(s): Simplifying materials Cinalisation criteria: AOP10-ASP04 Action by: Description & purpose: | ANS Providers To feed local meteorological (MET) information providing actual glide slot SJU - SESAR Solution 64: Data Pack for Time Based Separation Url: https://www.sesarju.eu/sesar-solutions/time-based-separation EUROCONTROL - SPEC-167 - EUROCONTROL Specification for Time Approach - Edition 1.0 / 02/2018 Url: https://www.eurocontrol.int/publication/eurocontrol-specification-time approach EUROCONTROL - GUID-187 - EUROCONTROL Guidelines on Time-B Edition 1.0 / 05/2021 Url: https://www.eurocontrol.int/publication/eurocontrol-guidelines-time-1 - Local meteorological information providing actual glide slope wind con-conformant behaviours, infringements, wrong aircraft ANS Providers To ensure that the TBS support tool provides automatic monitoring and airspeed behaviour, automatic monitoring and alerting of separation infrithe wrong aircraft being turned on to a separation indicator. | ppe wind conditions Based Separation Based-separation (Tilebased-separation-tb Conditions is fed into to the separation of the separati | to the TBS support tool. (TBS) support tool for Final- tbs-support-tool-final- BS) for Final Approach - s-final-approach he TBS support tool By: 01/01/2024 formant final approach | | | | |
| Action by: Description & purpose: Supporting material(s): Finalisation criteria: AOP10-ASP04 Action by: Description & purpose: | ANS Providers To feed local meteorological (MET) information providing actual glide slot SJU - SESAR Solution 64: Data Pack for Time Based Separation Url: https://www.sesarju.eu/sesar-solutions/time-based-separation EUROCONTROL - SPEC-167 - EUROCONTROL Specification for Time Approach - Edition 1.0 / 02/2018 Url: https://www.eurocontrol.int/publication/eurocontrol-specification-time approach EUROCONTROL - GUID-187 - EUROCONTROL Guidelines on Time-B Edition 1.0 / 05/2021 Url: https://www.eurocontrol.int/publication/eurocontrol-guidelines-time-I - Local meteorological information providing actual glide slope wind co TBS Support tool to provide automatic monitoring and alerting of non-conformant behaviours, infringements, wrong aircraft ANS Providers To ensure that the TBS support tool provides automatic monitoring and airspeed behaviour, automatic monitoring and alerting of separation infri the wrong aircraft being turned on to a separation indicator. SJU - SESAR Solution 64: Data Pack for Time Based Separation | based Separation ased Separation ased Separation (Tilebased-separation-theoditions is fed into the production of the separation of the s | to the TBS support tool. (TBS) support tool for Final- tbs-support-tool-final- BS) for Final Approach - se-final-approach he TBS support tool By: 01/01/2024 formant final approach e monitoring and alerting for | | | | |
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| Action by: Description & purpose: Supporting material(s): Finalisation criteria: AOP10-ASP04 Action by: Description & purpose: | ANS Providers To feed local meteorological (MET) information providing actual glide slot SJU - SESAR Solution 64: Data Pack for Time Based Separation Url: https://www.sesarju.eu/sesar-solutions/time-based-separation EUROCONTROL - SPEC-167 - EUROCONTROL Specification for Time Approach - Edition 1.0 / 02/2018 Url: https://www.eurocontrol.int/publication/eurocontrol-specification-time approach EUROCONTROL - GUID-187 - EUROCONTROL Guidelines on Time-B Edition 1.0 / 05/2021 Url: https://www.eurocontrol.int/publication/eurocontrol-guidelines-time-Incomposed selection of the provide automatic monitoring and alerting of non-conformant behaviours, infringements, wrong aircraft ANS Providers To ensure that the TBS support tool provides automatic monitoring and airspeed behaviour, automatic monitoring and alerting of separation infringements in the wrong aircraft being turned on to a separation indicator. SJU - SESAR Solution 64: Data Pack for Time Based Separation Url: https://www.sesarju.eu/sesar-solutions/time-based-separation EUROCONTROL - SPEC-167 - EUROCONTROL Specification for Time Approach - Edition 1.0 / 02/2018 Url: https://www.eurocontrol.int/publication/eurocontrol-specification-time approach EUROCONTROL - GUID-187 - EUROCONTROL Guidelines on Time-B | ppe wind conditions Based Separation Based Separation (Tilebased-separation-theoditions is fed into the production of | to the TBS support tool. (TBS) support tool for Final- tbs-support-tool-final- BS) for Final Approach - is-final-approach he TBS support tool By: 01/01/2024 formant final approach e monitoring and alerting for (TBS) support tool for Final- tbs-support-tool-final- BS) for Final Approach - | | | | |

Time-Based Separation

AOP10

| AOP10 | Time-Based Separation | |
|-------|-----------------------|---|
| | | ı |

| | | From: | Ву: | | | |
|-------------------------|--|-------------------------|---------------------|--|--|--|
| AOP10-ASP05 | Implement procedures for TBS operations | 01/01/2015 | 01/01/2024 | | | |
| Action by: | ANS Providers | | | | | |
| Description & purpose: | Implement procedures and practices to be used by the final approach controller for TBS operations. | | | | | |
| Supporting material(s): | SJU - SESAR Solution 64: Data Pack for Time Based Separation | | | | | |
| | Url: https://www.sesarju.eu/sesar-solutions/time-based-separation | | | | | |
| | EUROCONTROL - SPEC-167 - EUROCONTROL Specification for Time Based Separation (TBS) support tool for Final Approach - Edition 1.0 / 02/2018 | | | | | |
| | Url: https://www.eurocontrol.int/publication/eurocontrol-specification-timeapproach | e-based-separation-tbs- | support-tool-final- | | | |
| | EUROCONTROL - GUID-187 - EUROCONTROL Guidelines on Time-Based Separation (TBS) for Final Approach - Edition 1.0 / 05/2021 | | | | | |
| | Url: https://www.eurocontrol.int/publication/eurocontrol-guidelines-time-k | ased-separation-tbs-fin | al-approach | | | |
| Finalisation criteria: | 1 - Procedures for TBS operations are implemented operationally | | | | | |
| 4 O D 4 O A O D 0 O | Tarin a suta llara (Tanan and Anna a ab) an TDO anna diana | From: | Ву: | | | |
| AOP10-ASP06 | Train controllers (Tower and Approach) on TBS operations | 01/01/2015 | 31/12/2024 | | | |
| Action by: | ANS Providers | | | | | |
| Description & purpose: | Train Tower and Approach controllers on TBS operations. The final approach controller will be required to adopt procedures and practices to ensure that the variations in the distance spacing changes and time spacing changes on final approach are consistently managed. | | | | | |
| Supporting material(s): | SJU - SESAR Solution 64: Data Pack for Time Based Separation | | | | | |
| | Url: https://www.sesarju.eu/sesar-solutions/time-based-separation | | | | | |
| | EUROCONTROL - SPEC-167 - EUROCONTROL Specification for Time Based Separation (TBS) support tool for Final Approach - Edition 1.0 / 02/2018 | | | | | |
| | Url: https://www.eurocontrol.int/publication/eurocontrol-specification-time-based-separation-tbs-support-tool-final-approach | | | | | |
| | EUROCONTROL - GUID-187 - EUROCONTROL Guidelines on Time-Based Separation (TBS) for Final Approach - Edition 1.0 / 05/2021 | | | | | |
| | Url: https://www.eurocontrol.int/publication/eurocontrol-guidelines-time-b | ased-separation-tbs-fin | al-approach | | | |
| Finalisation criteria: | 1 - Final approach controllers are trained for TBS procedures and practic | es. | | | | |
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| AOP10-USE01 | Train flight crews on TBS operations | 01/01/2015 | 01/01/2024 | | | |
| Action by: | ANS Providers | | | | | |
| Description & purpose: | Train flight crews on TBS operations The flight deck will be required to adopt procedures and practices to ensure that the variations in the distance spacing changes and time spacing changes on final approach are consistently managed. | | | | | |
| Supporting material(s): | SJU - SESAR Solution 64: Data Pack for Time Based Separation | | | | | |
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| | Url: https://www.sesarju.eu/sesar-solutions/time-based-separation | | | | | |