Deployment Scenario Title	Next generation AMAN for a 4D environment
Deployment Scenario Description	Next generation AMAN for a 4D environment: this aims to extend the arrival planning horizon, and to incorporate increasingly complex and high-density environments in which en-route sectors serve more than one airport or more than one TMA, using advanced ground support tools and automation, including with regard to airspace constraints (speed and level restrictions, wind and temperature information). The solution also involves looking at highly integrated airports within the wider context of balancing demand and capacity across the network, and in relation to sharing data between systems.
Essential Operational Change	Airport and TMA performance
Maturity	In development phase: Key R&D Activities

Applicable Operating Environment			
Airport	Terminal Airspace	En-Route	Network

Timeline																				
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035

Performance Contribution of the DS				
Capacity	Safety	Environment	Cost-efficiency	Operational efficiency

Stakeholders affected (at least one enabler to be deployed)						
ANSP		AO		AU		Network Manager
Civil	Military	Civil	Military	Civil	Military	
TWR, APP, ENR, SWIM, AIS, MET	TWR, APP, ENR, AIS, MET, SWIM	APT Operator	APT Operator	Scheduled, BA Fixed, BA Rotorcraft, GA, FOC	Transport, Fighter, WOC	Network Manager

SESAR Solutions			
Solution Code	Solution Title	Solution Description	Related Elements
PJ.01-01	Extended Arrival Management with overlapping AMAN operations and interaction with DCB and CTA	Extended Arrival Management with overlapping AMAN operations and interaction with DCB integrates...	SOL PJ OI DS EOC ICAO
PJ.01-W2-01	Next generation AMAN for 4D environment	This key R&D activity will provide enhancements to the arrival management systems and...	PJ DS EOC

Operational Improvement Steps			
OI Step Code	**OI Step Title**	**OI Step Description**	**Related Elements**
TS-0109	Controlled Time of Arrival (CTA) in high density/complexity environment	The CTA (Controlled Time of Arrival) is an ATM imposed time constraint on a defined point...	SOL OI EN DS ICAO
TS-0305-B	Arrival Management Extended to En-Route Airspace - impact of overlapping AMAN operations for En Route ATC	En-Route sectors are expected to contribute to the arrival sequencing towards multiple TMA...	SOL OI EN DS
TS-0315	Arrival Management Systems integrated with DCB	To improve the overall efficiency of arrival and airport operations, the Arrival Management...	SOL EN DS

Enablers						
Required/ Optional	**New/ Inherited**	**Develop/ Use**	**Enabler Code**	**Enabler Title**	**Enabler Description**	**Related Elements**
🔒			A/C-11	Flight management and guidance for improved single time constraint achievement (CTA/CTO)	Flight management and guidance for improved control loop on a single time constraint (Controlled...	STK OI EN DS
🔒			BTNAV-STD-02	Navigation Performance in ICAO provisions for Enhanced CTA	Update of Doc 4444 PANS-ATM and PBN Manual Doc 9613 for enhanced CTA	OI EN DS
🔒			A/C-31a	Controller pilot data link communication (CPDLC) compliant with ATN baseline 2 (FANS 3/C)	Data link exchange for ATN/VDL2 baseline 2 (FANS 3/C) i.e. for Departure Clearance,...	STK OI EN DS
🔒			REG-0100	Regulatory Provisions for Datalink Extension (DLS II)	Interoperability of data link systems, constituents and associated procedures deployed in a...	OI EN DS PCP
🔒			A/C-37a	Downlink of trajectory data according to contract terms (ADS-C) compliant to ATN baseline 2 (FANS 3/C)	Downlink of trajectory data (waypoints or pseudo waypoints with associated constraints and/or...	STK OI EN DS PCP
🔒			AGDLS-ATC-AC-14d	New SPR for data link exchange of instructions or clearances related to CTA allocation (4DTRAD)	On-going work of WG78/SC214	OI EN DS
🔒			AGDLS-ATC-AC-15d	New IOP for data link exchange of instructions or clearances related to CTA allocation (4DTRAD)	On-going work of WG78/SC214	OI EN DS
🔒			REG-0100	Regulatory Provisions for Datalink Extension (DLS II)	Interoperability of data link systems, constituents and associated procedures deployed in a...	OI EN DS PCP
🔒			AGDLS-ATC-AC-14d	New SPR for data link exchange of instructions or clearances related to CTA allocation (4DTRAD)	On-going work of WG78/SC214	OI EN DS
🔒			AGDLS-ATC-AC-15d	New IOP for data link exchange of instructions or clearances related to CTA allocation (4DTRAD)	On-going work of WG78/SC214	OI EN DS

Enablers						
Required/ Optional	New/ Inherited	Develop/ Use	Enabler Code	Enabler Title	Enabler Description	Related Elements
🔒			AIMS-23	Enhanced digital data chain to ensure Aeronautical Information data provision to meet full 4D trajectory management requirements	Enhanced aeronautical information data provision chain enabling the provision of high quality...	STK OI DS
🔒			APP ATC 148	System Support For Controlled Time of Arrival (CTA)	The arrival manager is modified to be able to sequence and space arrival flights by use of CTA....	STK OI DS
🔒			APP ATC 158	Enhanced arrival management to cover ground holding at the departure aerodrome	Queue management processes including HMI upgraded to take account of longer time horizons and...	STK OI DS
🔒			APP ATC 162	AMAN Sequence build with integration of constraints applied for DCB/dDCB purposes	The Arrival Management sequence will integrate constraints applied for DCB/dDCB purposes,...	STK OI DS
🔒			BTNAV-STD-02	Navigation Performance in ICAO provisions for Enhanced CTA	Update of Doc 4444 PANS-ATM and PBN Manual Doc 9613 for enhanced CTA	OI EN DS
🔒			ER APP ATC 100	4D Trajectory Management by Synchronization of Air and Ground Trajectories through EPP	ATC system updates the planned trajectory with data contained in the EPP.	STK OI DS PCP
🔒			ER APP ATC 119	Air/Ground Datalink Communication/Protocols for i4D and Controlled Time of Arrival	Enhance the air/ground data communications to support the reception and transmission of messages...	STK OI EN DS PCP
🔒			REG-0100	Regulatory Provisions for Datalink Extension (DLS II)	Interoperability of data link systems, constituents and associated procedures deployed in a...	OI EN DS PCP
🔒			ER APP ATC 149a	Air-Ground Datalink Exchange to Support i4D - Extended Projected Profile (EPP)	Air/Ground datalink management is modified to support the acquisition of the EPP via ADS-C. The...	STK OI EN DS PCP
🔒			ER APP ATC 149b	Air-Ground Datalink Exchange to Support i4D - ETA min/max	Air/Ground datalink management is modified to support the acquisition of ETA min/max through ADS-C.	STK OI EN DS
🔒			REG-0100	Regulatory Provisions for Datalink Extension (DLS II)	Interoperability of data link systems, constituents and associated procedures deployed in a...	OI EN DS PCP
🔒			ER APP ATC 149c	Air-Ground Datalink Exchange to Support i4D - Controlled Time of Arrival/Overflight (CTA/CTO)	Air/Ground datalink management is modified to support the delivery of CTA/CTO using CPDLC.	STK OI EN DS
🔒			REG-0100	Regulatory Provisions for Datalink Extension (DLS II)	Interoperability of data link systems, constituents and associated procedures deployed in a...	OI EN DS PCP
🔒			ER APP ATC 160	ATC to ATC Flight Data Exchange Using The Flight Object	Implement ground-ground flight data exchange between ATC units through the use of Flight Object...	STK OI EN DS PCP

Enablers						
Required/ Optional	New/ Inherited	Develop/ Use	Enabler Code	Enabler Title	Enabler Description	Related Elements
🔒			ER ATC 158	Enroute ATC System Share and Display Sequencing Advisories from Multiple AMANs	The system integrates information of the Sequencing advisories from Multiple AMAN Systems and...	STK OI DS
🔒			ER ATC 163	Support to En-route delay absorption for cross-border implementation of arrival sequence	The system supports ATCO for smoother En-route delay absorption in C-ATSU prior to traffic being...	STK OI DS PCP
🔒			PRO-118	ATC Procedures for use of CTA across several AoRs	ATC Procedures developed for the use of CTA management involving protocol for coordinating with...	STK OI DS
🔒			REG-0100	Regulatory Provisions for Datalink Extension (DLS II)	Interoperability of data link systems, constituents and associated procedures deployed in a...	OI EN DS PCP
🔒			SWIM-APS-05a	Provision and Consumption of Flight Object Sharing services	Provision and Consumption of Flight Object Sharing services (In line with AIRM and ISRM)...	STK OI EN DS PCP S
🔒			SWIM-INFR-01a	High Criticality SWIM Services infrastructure Support and Connectivity.	Provision of the additional functionality needed by the individual Stakeholder to support their...	STK OI EN DS PCP
🔒			SWIM-NET-01a	SWIM Network Point of Presence	Provision of the individual stakeholder's point of presence onto the common/interconnected...	STK OI EN DS PCP
→			METEO-05c	Generate and provide MET information relevant for TMA and En-route related operations at short notice ('time to decision' between 3 minutes and 7days), including for low-level IFR operations.	The ATM-MET system is acquiring, generating, assembling and providing Meteorological (MET)...	STK OI EN DS
→			SWIM-SUPT-01a	SWIM Supporting Registry Provisions	Provision, by specific stakeholders, of Register functionality to support the use of SWIM...	STK OI EN DS PCP
→			SWIM-SUPT-03a	SWIM Supporting Security Provisions	Provision, by specific stakeholder(s) of functionality to support the use of Security Keys for...	STK OI EN DS PCP
→			SWIM-SUPT-05a	SWIM Supporting IP Network Bridging Provisions	Provision, by specific stakeholders, of the functionality to provide bridging between separate...	STK OI EN