

6. RISK AND MITIGATION ACTIONS

6. Risks and Mitigation Actions

The following tables have been developed by SDM in order to present those risks with higher relevance to the successful, synchronized and timely implementation of the Deployment Programme and the overall PCP, which are known as Risks at Programme Level. Some of the risks included in this Chapter might look like targeted at a single AF. However, the reason for this inclusion is their transversal nature and their potential capacity to endanger the successful Programme implementation.

These risks have been identified building on the lessons learnt during the elaboration of the DP2016, and on the outputs of the coordination between SDM and both operational and non-operational stakeholders.

Risks and Mitigation Actions are presented in the following tables, which highlight:

- High level definition of the risk;
- Indication of their potential impact on the PCP implementation and probability of occurrence. Each element will be scored Very Low, Low, Medium, High or Very High, based on the qualitative assessment of the SDM experts. This will help characterize the overall risk in the table below;
- Major objectives likely to be impacted;
- Main consequences and/or impacts;
- Mitigation actions to be implemented by the SDM and/or other stakeholders.

The SDM has liaised directly with those stakeholders identified as potential candidates to undertake mitigation actions and will continue to do so during the Programme implementation. In parallel SDM is also working with SJU in order to ensure that the high level risks in the DP connects well with the risks in the ATM MP for what concerns implementation.

		Impact				
Risk	Probability	Very Low	Low	Medium	High	Very High
		Very High Low Level Risk	High Medium Level Risk	Medium High Level Risk	Low High Level Risk	Very Low Medium Level Risk
	Very High	Low Level Risk	Medium Level Risk	High Level Risk	High Level Risk	High Level Risk
	High	Low Level Risk	Medium Level Risk	Medium Level Risk	Medium Level Risk	Medium Level Risk
	Medium	Low Level Risk	Low Level Risk	Low Level Risk	Low Level Risk	Low Level Risk
	Low	No Risk	No Risk	No Risk	No Risk	No Risk
	Very Low	No Risk	No Risk	No Risk	No Risk	No Risk

Fig. 49 – DP Risks: Probability/Impact Matrix

Risk n.1 – Implementation Delay			High Level Risk
Objectives affected by the risks	Timely PCP implementation, timely release of associated benefits		
Impact	Probability	Medium	
Consequences / Impacts	The gap analysis showed that there are families that are not implemented or just partially implemented in the PCP geographical scope. The impact of the late implementation of the Families identified as high relevance could lead to a potential delay of the overall PCP implementation. Furthermore, in some cases the deployment of pre-requisites is lagging behind, with potential impacts on the subsequent investment end dates. The analysis has been performed taking into consideration all projects awarded to CEF Call 2015, as some implementation initiatives submitted in CEF Call 2015 that have not been awarded with funding by INEA might be postponed or even cancelled by operational stakeholders. If this situation occurs, the timely delivery of performance benefits would be delayed accordingly. Additionally, late or missed investment could also have a negative impact on other stakeholder categories		
Mitigation Actions			
To be performed by SESAR Deployment Manager		Proposed to be performed by other Stakeholders	
On-going: - Strong promotion of the Deployment Programme together with dedicated local face to face meetings between SDM and “concerned stakeholders” and/or group/platform of stakeholders (e.g. at airport level). Stress also at local level the need to close the gaps in the high readiness families as a priority; - Strong promotion and information initiatives in order to emphasize the need to proceed with the deployment of pre-requisites and enablers for the Pilot Common Project; - Preparation and distribution of information packages to the operational stakeholders to support/facilitate the submission of the IPs both at technical and financial/administrative level; - Support/facilitate the submission of proposals through a dedicated and timely process (anticipated as much as feasible) on Indications of Interest; - Facilitation of stronger local partnership between the operational stakeholders in preparation for the upcoming CEF calls; - Request demonstration of local coordination with other relevant stakeholders by projects leaders prior to projects submission to CEF calls; - Enhancement of the transversal approach and buy in among airspace users, airports and ANSPs; - Synchronisation / coordination activity on identified projects by SDM;		To be performed: DG MOVE to ensure that future calls take place in order to maintain a flow of IPs throughout CEF timeframe and to support full PCP implementation (including its pre-requisites).	

	▪ Close correlation between requests for payment by the implementation projects to SDM and their effective transmission to INEA by SDM. For not awarded projects, SDM has organized dedicated meetings and/or established communication flows in order to ascertain why a project was not awarded and to check whether it can be successfully submitted within next CEF Calls. SDM has also liaised with the operational stakeholders in order to check if the investments will be carried on, postponed and/or cancelled. The monitoring of the progress of the projects will be however carried out through the overall SDM Monitoring Exercise.
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Risk n.2 – PCP Implementation out of SESAR Deployment FPA			High Level Risk
Objectives affected by the risks	PCP Benefits		
Impact	High	Probability	Medium
Consequences / Impacts	Within its current mandate, SDM should prioritize its effort to monitor the progress of implementation only for those projects awarded through SESAR deployment FPA. Should a significant part of PCP be implemented outside SESAR deployment FPA and not properly monitored by SDM, this could lead to incomplete picture of PCP's implementation status and to an impact on overall performances analysis.		
Mitigation Actions			
To be performed by SESAR Deployment Manager		Proposed to be performed by other Stakeholders	
On-going: SDM is performing a monitoring exercise within the framework of the DP 2016 elaboration for all the Families of the Programme with the support of the operational stakeholders: this exercise engages and both stakeholders already involved in the SESAR FPA and stakeholders which have not submitted Implementing Projects so far and therefore are outside SESAR FPA. That is to keep track of all implementation initiative, both within and beyond the CEF framework and the SDM coordination. The approach followed by SDM and consulted through the Stakeholders Consultation Platform has resulted into an overall view of PCP deployment status in Europe. The report will be produced annually and embedded in each DP release, as part of the DP Monitoring View.		To be performed: EC to take formal actions to facilitate the gathering of monitoring data by SDM, especially from operational stakeholders outside FPA.	

Risk n.3 – Failure to adequately achieve full military involvement			Medium Level Risk
Objectives affected by the risks	Full and timely PCP implementation, associated benefits		
Impact	High	Probability	Low
Consequences / Impacts	The lack of adequate military involvement, both at European and local level, could lead to an insufficient buy in of the military community and to a “backlog” concerning the necessary investments in line with PCP and DP priorities.		
Mitigation Actions			
To be performed by SESAR Deployment Manager		Proposed to be performed by other Stakeholders	
Completed	▪ The single communication channel between SDM and EDA has been reinforced in order to facilitate and accelerate dialogue with the military authorities; ▪ Cooperative Arrangement with EDA has been signed on 29th June 2015; ▪ The cooperation with EDA on several streams of activity has been enhanced, e.g. EDA representatives are directly involved in the development of the Deployment Programme.		
On-going:	▪ Continue to liaise with EDA to further facilitate local coordination between the local civil stakeholders (level 3) and the military authorities; ▪ Continue to support EDA in the promotion of the PCP and the DP amongst military authorities; ▪ Identify and highlight the areas where military projects can be expected in the context of DP 2016 and subsequent versions; ▪ Support the civil and military implementing partners with proposed processes enabling the local civil/military coordination.		
	On-going: EDA to continue with the promotion of the PCP amongst military authorities. Military authorities to submit projects to CEF calls (starting with an Indication of Interest), according to the context set by DP 2016 and subsequent versions.		

Risk n.4 – Failure to provide required standards and regulations on time			High Level Risk
Objectives affected by the risks	Timely PCP implementation, associated benefits		
Impact	High	Probability	Medium
Consequences / Impacts	Some of the families necessary for the full PCP implementation are not ready yet for deployment as indicated by their planned completion date of V3-phase (Pre-Industrial Development & Integration of E-OCVM – European Operational Concept Validation Methodology) and/or not covered by appropriate standards (ESOs and EUROCAE responsibilities), specifications and dedicated means of compliance (EASA responsibility). This issue could lead to a non-harmonized deployment, a lack of interoperability, integration problems and consequently to the need of reinvestments at a later stage to upgrade the deployed solutions to the required standards. Ultimately, this could lead to impossibility to go operational and deliver the expected benefits.		
Mitigation Actions			
To be performed by SESAR Deployment Manager		Proposed to be performed by other Stakeholders	
Completed: SDM has signed the Cooperative Arrangement with EUROCAE in March 2016.		On-going: Relevant stakeholders to refer to and use existing standards and regulatory material and/or updated material to the most possible extent to avoid new rulemaking and/or standardisation tasks.	
On-going: Continue to reinforce the synergies with: ▪ SJU for the prioritization of the validation exercises and the Large Scale Demonstrations; ▪ EASA, EUROCAE and European Standardization Organizations to align their work programmes with the deployment priorities, as identified in the European Standardisation Rolling Development Plan (RDP); ▪ EASCG as the main coordination body for relevant standardisation activities, bringing together all relevant organisations; ▪ Manufacturing industry and operational stakeholders to seek their assistance in contributing to the timely development of the necessary standards and marketing of the necessary hardware and software; ▪ ICAO for standards and recommended practices, to ensure their timely provision as well as the alignment of their content with the deployment priorities.		To be performed: EUROCAE members to adequately promote and provide resources to the working groups involved in the development of the required standards. EC to promote stronger commitment by key players for timely delivery and necessary funding to bodies involved in critical development of standards and regulation to secure necessary resources.	

Indeed, SDM is working closely with the SJU, EASA and EUROCAE in order to ensure alignment of their work programmes with the Deployment Programme needs and avoid implementation delays.

With respect to ICAO SARPs and guidance material, SDM will work closely with the members of ICAO working groups nominated by European States, under the guidance of EC and in close cooperation with SJU.

SDM is also strengthening the cooperation with the operational stakeholders via the SCP, involving and updating them on the monitoring of the delivery-status and progress of SDM's mitigation actions.

SDM is also connecting key players in specific working groups and workshops to foster cooperation and find solutions to issues linked to delays in standardization and industrialisation.

To be performed:

Study and prepare a proposal to facilitate and encourage the participation of operational stakeholders on high-priority regulation activities by relevant EUROCAE WGs. SDM will work, under the guidance of EC and in close cooperation with SJU, with those members of ICAO working groups which have been nominated by European States.

A Cooperative Arrangement with EASA is going to be signed as well as several Cooperative Arrangements with Manufacturing Industry.

Risk n.5 – Failure to ensure global interoperability			Medium Level Risk
Objectives affected by the risks	Harmonized PCP implementation, associated benefits		
Impact	Medium	Probability	Medium
Consequences / Impacts	The consequences of the lack of global interoperability are the potential misalignment for avionics and/or processes between the different aviation regions in the world (e.g. between SESAR / NextGen, as the ATM modernisation programmes), potential misalignment between the different avionics vs. ground systems and amongst ground systems themselves. The potential impact could be: - Civil and military Airspace users having to buy, certify, install, maintain, train and carry redundant systems; - Increased costs and workload for civil and military airspace users, as well for airports and ANPSs; - Additional costs due to misalignments could overshadow operational benefits and efficiencies. This risk is strongly linked to the Risk n. 4.		
Mitigation Actions			
To be performed by SESAR Deployment Manager		Proposed to be performed by other Stakeholders	
Completed: SDM has appointed an International Relations Manager to handle this specific risk. On-going: SDM and SJU coordinate with FAA (NextGen and ATO) under the EU/US MoC on this specific topic to ensure adequate actions in securing requirements and timelines of major ATM operation & technical changes through alignment of Master Plan and Deployment Programme with NextGen Implementation Plan. With respect to ICAO activities on global harmonisation, SDM is working closely with the members of the ICAO working groups nominated by European States as required, under the political guidance of EC and in close cooperation with SJU, to ensure timely and content alignment with the European deployment priorities. Special focus is being given to European deployment alignment with ICAO GANP/ASBUs update activities. Furthermore, SDM is seeking assistance from the manufacturing industry (notably airborne equipment manufacturers) on the issue of global interoperability and alignment of industrialization and deployment roadmaps.		On-going: SJU with SDM promoting SESAR requirements based on full life cycle view, towards FAA/NextGen and ICAO GANP/ASBU activities. To be performed: Relevant stakeholders to adequately promote the SESAR deployment needs to the working groups involved on European and global level. EC to promote interoperable and synchronized mandates, with the US and globally. High priority to be given on Data Link Systems and Surveillance systems implementation strategies.	

Risk n.6 – Misalignment between CEF co-funding profile and readiness for implementation				High Level Risk
Objectives affected by the risks	Timely PCP implementation, associated benefits			
Impact	High	Probability	Medium	
Consequences / Impacts	Given, on the one hand, the uncertainty regarding CEF co-funding availability after CEF calls 2015, and on the other hand the outcomes from the gap analysis as laid down in the DP2016, clearly stating the need for more IPs, it would be premature to say that SESAR deployment has been concluded with CEF calls 2015. Significant investment needs remain in order to complete PCP implementation. Additionally, DP 2016 confirms that, still in 2016, not all families in the DP are ready for implementation. Some families might even require 2-3 years before they can be classified as high readiness for implementation by SDM. The conjunction of both constraints could lead to a significant time gap in PCP implementation due to the need to wait, after 2015-2016, until next financial period (2021-2027) to resume PCP implementation.			
Mitigation Actions				
To be performed by SESAR Deployment Manager		Proposed to be performed by other Stakeholders		
On-going: SDM informed the EC about the importance of grants as a mean to secure the network benefits associated to the implementation of the PCP. They should continue in the critical period 2017-2020.	To be performed: Align co-funding profile (calls and available co-funding) to foreseeable evolution of families’ readiness for implementation, ensuring smooth implementation of PCP throughout the whole CEF period. This option would require EC to take action to secure part of the SESAR deployment co-funding beyond CEF midterm review in 2017.			

Risk n.7 – Misalignment between DP and operational stakeholders’ investment plans			Medium Level Risk
Objectives affected by the risks	Timely PCP implementation, associated benefits		
Impact	Medium	Probability	Low
Consequences / Impacts	Investment plans of operational stakeholders are not yet aligned with DP/PCP needs. This could happen due to an insufficient awareness of the regulation and funding opportunities or simply because not willing to invest (different business priorities). As a consequence, this could result in a lack of IPs submitted to INEA under SDM coordination as well as a general lack of deployment initiatives that could jeopardize the full and timely PCP implementation.		
Mitigation Actions			
To be performed by SESAR Deployment Manager		Proposed to be performed by other Stakeholders	
On-going: SDM has directly contacted stakeholders to stress the importance of aligning their internal investment plans with gaps described in DP2015. SDM continues with the engagement of implementation partners at executive level to raise their awareness on the importance of DP realisation and on the opportunity to obtain CEF co-funding in order to facilitate their compliance with PCP Regulation. SDM has started the promotion of PCP/DP priorities at local level and initiated a dedicated Indications of Interest Exercise in June.			
To be performed Annex C and the Chapter 5 of this document contain a list of all gaps per each of the countries included within the PCP geographical scope, as defined by the Regulation (EU) n. 716/2014 and by the Deployment Programme			

Risk n.8 – Late definition / failure to establish SWIM governance			Medium Level Risk
Objectives affected by the risks	Timely and harmonized PCP implementation, associated benefits		
Impact	High	Probability	Medium
Consequences / Impacts	Implementation of SWIM-technology could be delayed significantly and/or SWIM interoperability could be substantially impaired due to a lack of SWIM-governance in place.		
Mitigation Actions			
To be performed by SESAR Deployment Manager		Proposed to be performed by other Stakeholders	
Completed:	To be performed: Airports, ANSPs, Airspace users, Military and MET services to propose a common project related to SWIM Governance for CEF Call 2016.		
To be performed: Execution of the relevant actions in accordance to what detailed in the Action Plan reported in the published "SWIM Governance Strategy" document.			

Risk n.9 – Risk at overall AF6: Initial Trajectory Information Sharing			NEW RISK	Medium Level Risk
Objectives affected by the risks	Timely PCP implementation, associated benefits			
Impact	Medium	Probability	Medium	
Consequences / Impacts	DLS is an essential prerequisite to business trajectory (i4D in PCP and 4D later) which is the backbone of SESAR operational concept. In short, no DLS would mean no SESAR, no SESAR benefits and failure to achieve SES high level goals.			
Mitigation Actions				
To be performed by SESAR Deployment Manager		Proposed to be performed by other Stakeholders		
Completed: SDM has developed the “SDM Data-Link Service Implementation Strategy” which is now part of the Deployment Programme.		On-going: SJU - SDM are cooperating specifically on datalink to share and align validation results, deployment views and possible deployment approaches.		
To be performed: In addition to defining a deployment strategy, SDM will coordinate its execution as “DLS implementation project manager”. SDM will therefore act “in substitution” of a Technical Service of a potential future DLS provision organisation as long as not ready to take over.		To be performed: For 2016 CEF Call, the SDM strongly encourages the submission of implementation projects as described in chapter 4.7 of the “SDM Data-Link Service Strategy”.		

Risk n.10 – Late delivery of IOP SESAR Solutions			NEW RISK	Medium Level Risk
Objectives affected by the risks	Timely PCP implementation, associated benefits			
Impact	Medium	Probability	Medium	
Consequences / Impacts	The PCP regulation requires the provision of flight information exchanges through two different SWIM Technical Infrastructure (TI) profiles: • Yellow TI profile for Flight information exchanges which do not require real time performance; • Blue TI profile for the network intensive and real time exchanges of tactical Flight information data between ACCs and the Network Manager. The Blue profile is currently encountering some delays in its operational validation and consequently the update of ED 133 is being postponed until these validations are over. The initial IOP (iIOP) from SESAR 1 will serve as the basis for validating the PCP IOP standard which will be published in 2020 by EUROCAE as ED-133 Revision. The ED-133 update proposals will be provided by the SJU in the form of a deliverable. These deliverables will feed the work of EUROCAE WG-59 who will remain in charge of publishing ED-133 revision A in 2020.			
Mitigation Actions				
To be performed by SESAR Deployment Manager		Proposed to be performed by other Stakeholders		
On-going: Work in collaboration with SJU in order to monitor the on-going work, considering the priorities set by the PCP in terms of content and time, to synchronise the IOP validation and deployment roadmaps. Inform the SJU on deployment perspective and criticalities.		On-going: SJU has set up an IOP Task Force to mitigate the risk including a close monitoring of the new roadmap as follow: an initial IOP will be delivered end 2016 within SESAR 1 framework and the complementary R&D is integrated into SESAR 2020 for a delivery of the complete SESAR Solution in 2018. SJU will continue to inform SDM on the progress of these actions		
To be performed: Once the solution is ready, assess the industry's readiness for implementation.				

Risk n.11 – Lack of product development			NEW RISK	Medium Level Risk
Objectives affected by the risks	Timely PCP implementation, associated benefits			
Impact	Medium	Probability	Medium	
Consequences / Impacts	The industrialisation decision for developing the expected capabilities may not be made by the manufacturers if an adequate return on investment is not envisaged, even if the standards are available. This might be the case, in particular, for airborne functions where a mandate is not put in place.			
Mitigation Actions				
To be performed by SESAR Deployment Manager		Proposed to be performed by other Stakeholders		
On-going: Activate cooperative arrangements and/or other means of cooperation with the Manufacturing Industry, in order to align expectations and share a common view of the capabilities required for deployment.				
To be performed: Identify alternative funding and financing mechanisms to support this development.				

Risk n.12 – Deployment of SESAR Solutions leads to unaddressed cyber-security vulnerabilities			NEW RISK	High Level Risk
Objectives affected by the risks	Timely PCP implementation, associated benefits			
Impact	High	Probability	Medium	
Consequences / Impacts	Contrary to the traditional ATM systems, that used to work as a network of bespoke systems, the level of automation and interoperability within ATM, besides the usage of COTS systems and open standards, has increased. Moreover, the interactions between traditional actors and also with new ones have also grown. These changes and technological improvements may, however, introduce vulnerabilities into the systems in the form of cyber-security risks, which is even more significant with the introduction of internet based solutions. As even low impact incidents could erode trust in the system, the implementation of internet based solutions. As delivered solutions are secure as a whole, thanks to a secure integration into operational ATM systems (including legacy systems), contributing as a result to a resilient European ATM system.			
Mitigation Actions				
To be performed by SESAR Deployment Manager		Proposed to be performed by other Stakeholders		
On-going:	DP2016 has identified those families which present a need of cybersecurity standards and regulations. The available cybersecurity standards and regulations can be found in Chapter 3 of this document.	To be performed: EC to ensure efforts on ATM cyber-security are coordinated, and assess policy options for strengthening cyber-security and resilience. SJU to establish principles and processes for ensuring that cyber-security and resilience is included appropriately within the SESAR work programme.		

Risk n.13 – Full Operational Capability misalignment			NEW RISK	Medium Level Risk
Objectives affected by the risks	Timely PCP implementation, associated benefits			
Impact	Medium	Probability	Medium	
Consequences / Impacts	Dependencies between Families may cause misalignment between their Full Operational Capability target dates. For example, whilst some sub-functionalities in AF2 are supposed to be implemented by 2024, they are also a pre-requisite for another AF/sub-AF to be deployed by 2021.			
Mitigation Actions				
To be performed by SESAR Deployment Manager		Proposed to be performed by other Stakeholders		
On-going: Identify dependencies amongst Families which may cause misalignment between their FOC target dates. Inform applicants about the consequences and SDM proposed mitigation strategies. Liaise with EC to present the results of the analysis and the possible impact on timely and full PCP deployment.				

Risk n.14 – Lack of buy-in of the DP 2016 from Operational Stakeholders			Medium Level Risk
Objectives affected by the risks	Timely PCP implementation, timely release of associated benefits		
Impact	High	Probability	Low
Consequences / Impacts	Lack of buy-in of DP 2016 would require negatively affect the level of engagement and involvement in the Deployment of the Pilot Common Project and in the overall ATM modernization effort. Such low engagement could result in lower investments (or no investments), thus affecting the overall implementation of the PCP.		
Mitigation Actions			
To be performed by SESAR Deployment Manager		Proposed to be performed by other Stakeholders	
In progress SDM has successfully set up the Stakeholder Consultation Platform in order to consult, involve and engage all operational stakeholders impacted by the Pilot Common Project regulation. Dedicated thematic sub-groups meeting and Steering Group meeting have been regularly met. During the consultation process, the DP 2016 Intermediate and Final Draft took on board most of the comments and suggestions formulated during the first and second consultation cycle. An additional cycle of consultation has been performed before the release of the final release of DP 2016 in September, in order to discuss and take on board comments coming from the operational stakeholders.			