

Advanced Surface Movement, Guidance and Control Systems (A-SMGCS)

Implementation Manual

Directorate Network Management

Advanced Surface Movement, Guidance and Control Systems (A-SMGCS) - Implementation Manual

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Abstract			
This manual is intended to support project managers/leaders and other involved parties of an implementation project for A-SMGCS technology and operations. It shall provide guidance on activities to be considered, depending on the local set-up of such an implementation project.			
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The following table identifies all management authorities who have successively approved the present issue of this document.

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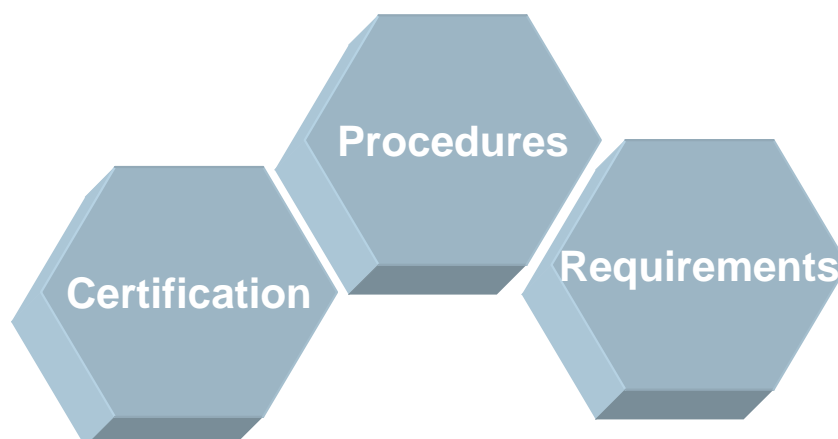
INTRODUCTION

This Implementation Manual is intended to provide guidance on the planning and organisation of an implementation project for A-SMGCS, and provide assistance on the different steps leading to the successful implementation of an A-SMGCS System, regardless of the organisation responsible for leading the project.

The document structure is based on a modular concept currently consisting of the following six **Domains**:



Each **Domain** consists of a different number of **Activities** that should be taken into account when conducting the implementation. Such activities would be for example:



Certain **Activities** will appear under several **Domains**, highlighting the interrelation between the different Domains and actors. They will also address similar **Sub-Activities** per **Domain** from different perspectives as well as unique sub-activities for only one Domain.

For providing a hands-on instrument, the level of **Sub-Activities** is composed of a dedicated

working sheet per activity identified. It includes a number of sub-activities to be conducted and considered but also provides for expansion based on local decision and requirements. It is printable and may be used as guidance for each project member conducting a dedicated task.

The **Sub-Activity** sheet also provides for a linkage to other **Domains** involved in a certain **Activity**, being easily traceable by the colour-coding used for the **Domain** layer as shown by the example below:

Technology

TEC - Requirements						Notes
<div><div>➔ Translate operational requirements into functional requirements</div><div>➔ Identify basic system layout</div><div>➔ Identify if actual systems or its components are eligible for migration/integration into the new system</div><div>➔ Define requirements regarding linkage to and/or from other systems (e.g. FDPS, DMAN, AGL, etc)</div><div>➔ Evaluate and define technical requirements</div><div>➔ Evaluate and define electrical requirements</div><div>➔ Evaluate and define IT requirements</div><div>➔ Evaluate and define HSE (Health, Safety and Environment) requirements</div><div>➔ Establish technical documentation</div><div>➔ Evaluate and list regulatory requirements in relation to the functional/technical requirements</div><div>➔ Request advise from REG on regulatory aspects</div><div>➔ Verify at regular basis if updates on standards, rules, regulations and specifications are available</div></div>						
Linked Domains						
<div>PM</div>	<div>OPS</div>		<div>REG</div>	<div>CER</div>		

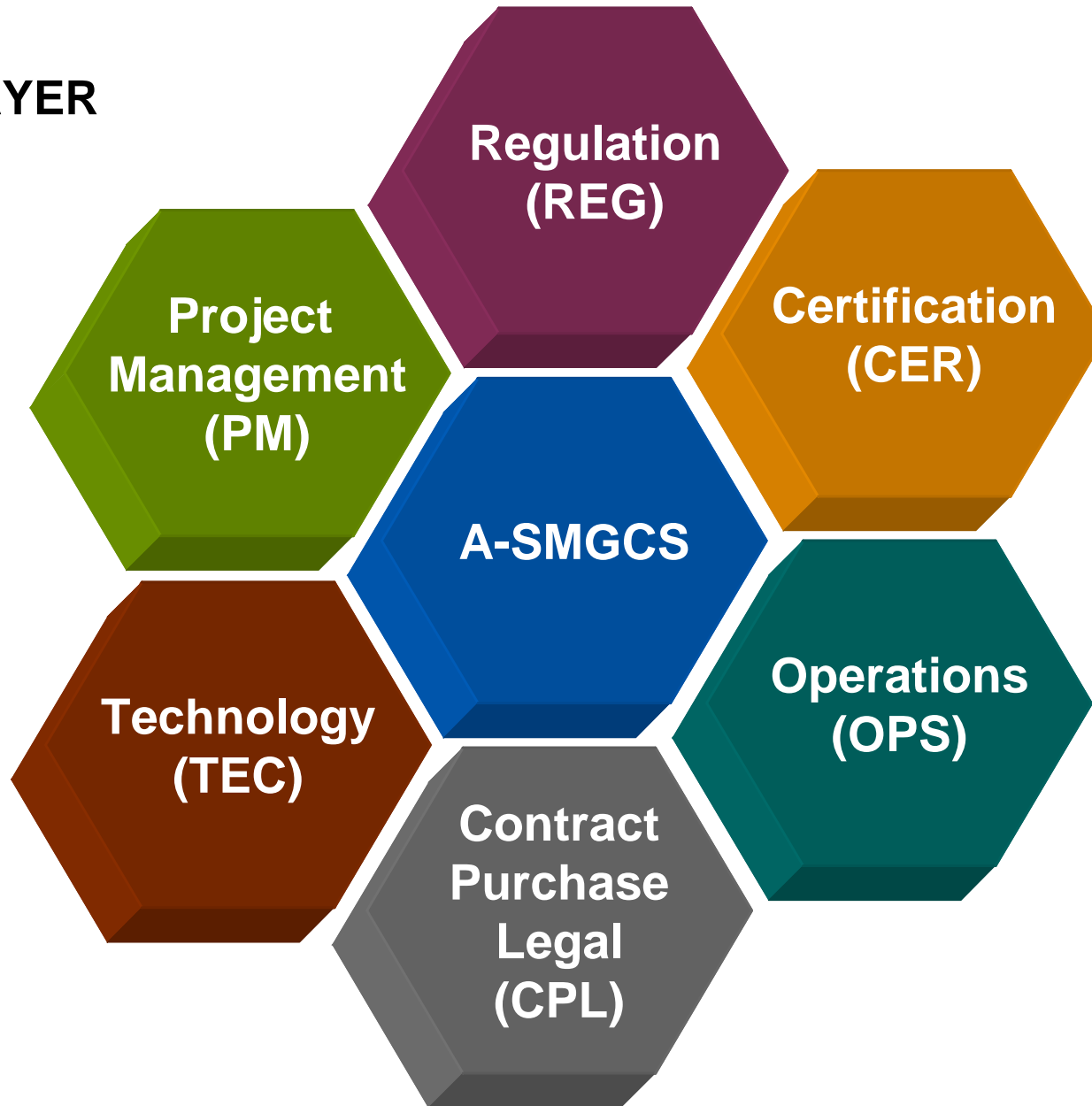
A selected group of stakeholders, composed of persons with practical experience on this kind of implementation project, was requested to review and provide feedback on the structure and contents of the manual.

Two important principles were introduced as an outcome of the review group's evaluation of the manual:

- ➔ Activities and sub-activities are not numbered on purpose. This to avoid the impression that a specific order and sequence needs to be respected during the execution of the implementation project;
- ➔ Activities and respective sub-activities can be added, deleted, or altered at the airport's discretion, as required.

With regard to the previous remarks, the possible dependencies and interdependencies between different sub-activities are indicated through the representation of the Domain icons in the field 'Linked Domains' and maintained at this level on purpose.

DOMAIN LAYER



ACTIVITY LAYER








Project Management

PM - Stakeholder Analysis	Notes
<ul style="list-style-type: none"> ➔ Identify the individuals/groups to be involved in the project set-up ➔ Analyse the role of involved individuals/groups ➔ Identify the stages of the project at which the selected individuals need to be involved ➔ Divide between internal and external stakeholders (e.g. internal departments, external focal points, NSA/Regulator) ➔ Define a strategy on how to involve the selected people/organisations ➔ Develop a communication plan (define arguments to overcome blocking points and to find supporters, adopt language/content according to the hierarchical level) ➔ Develop a matrix of supporting and blocking factors 	
<u>Linked Domains</u>	
<div> <div></div> <div>OPS</div> <div>TEC</div> <div>REG</div> <div>CER</div> <div>CPL</div> </div>	

Project Management

PM - Stakeholder Commitment		Notes			
<div>➔ Secure and maintain commitment from (internal) senior management for required and identified resources in written</div> <div>➔ Secure and maintain commitment from (external) senior management for the identified individuals with the support of own senior management, where required</div> <div>➔ Ensure that middle and lower management is informed about decisions and commitments to ensure that required resources are made available</div>					
Linked Domains					
	<div>OPS</div>	<div>TEC</div>	<div>REG</div>	<div>CER</div>	<div>CPL</div>

Project Management

PM - General	Notes
<ul style="list-style-type: none"> ➔ Create a project management plan (PMP) ➔ Secure regular update and maintenance of the PMP ➔ Establish and maintain a project schedule ➔ Define a schedule for project meetings ➔ Set-up a selection board with all partners (operational, technology and finance) for reviewing and selecting offers ➔ Establish a list on who is entitled to sign-off contracts, contract amendments, deliverables and invoices (in case of a multi organisational project take co-signing into account) ➔ Define the required amount of the support of those individuals and develop a justification ➔ Develop a Work Break-down Structure (WBS) ➔ Bring all parties together for explaining the dependencies and interdependencies on a regular basis ➔ Secure buy-in by making all parties involved understanding their respective role and contribution ➔ Secure that the defined operational requirements are agreed and signed-off by all parties involved ➔ Define the project objectives 	
<u>Linked Domains</u>	
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Project Management

PM - Operations	Notes
<ul style="list-style-type: none">➔ Identify individuals acting as facilitator > build the core team➔ Develop a timeline to be presented to operational staff and explaining the stages of the project and involvement of operational staff➔ Secure that OPS identifies the operational requirements➔ Secure that TEC identifies the functional requirements and develops the specifications➔ Ensure that the most recent guidance material is available and used (with support of REG and CER)➔ Secure that TEC and OPS are identifying contingency/redundancy needs➔ Support TEC in developing a package for testing, validation and site acceptance activities➔ Task OPS to develop a training package➔ Secure that OPS supports contract management	
<u>Linked Domains</u>	
	<div><div>OPS</div><div>TEC</div><div>REG</div><div>CER</div><div>CPL</div></div>

Project Management

PM - Contract/ Purchase/ Legal	Notes
<ul style="list-style-type: none"> ➔ Determine the available budget ➔ Task CPL to establish the procurement process ➔ Task CPL to establish the required legal support ➔ Task CPL to establish the contract management (cooperation between CPL/ PM/ TEC/ OPS) ➔ Secure that CPL is involved in the change management process 	
<u>Linked Domains</u>	
<div> <div></div> <div>OPS</div> <div>TEC</div> <div></div> <div></div> <div>CPL</div> </div>	

Project Management

PM - Certification	Notes
<ul style="list-style-type: none"> ➔ Task CER to identify required certification steps on operational level and identify, which steps need to be fulfilled ➔ Task CER to identify required certification steps on technical level and identify, which steps need to be fulfilled ➔ Bring both parties together and identify a common step-by-step approach to achieve overall system certification ➔ Ensure that relevant cases are built (e.g. Safety, Human Factors, Environment, etc) ➔ Secure that the new system is integrated in the Safety and Security Management Systems 	
<u>Linked Domains</u>	



Project Management

PM - Technology						Notes	
<div><div>➔ Secure that OPS is sufficiently involved in identifying the functional requirements</div><div>➔ Task TEC to develop a package for testing, validation and site acceptance activities</div><div>➔ Task TEC and OPS to identify contingency/ redundancy needs</div><div>➔ Assure contribution of TEC to the call for tender process</div><div>➔ Task TEC to support the contract management (cooperation between CPL/ PM/ TEC/ OPS)</div><div>➔ Secure that TEC has the required regulatory input for certification</div><div>➔ Task TEC to develop a training package for system maintenance</div><div>➔ Task TEC to support the development of a training package for OPS</div></div>							
<div>Linked Domains</div>							
		<div>TEC</div>					

Project Management

<i>PM - Reporting</i>	Notes
<ul style="list-style-type: none"> ➔ Create milestones and management decision points ➔ Establish a reporting methodology and secure agreement of all relevant parties (especially external) 	
<u>Linked Domains</u>	
	<div>      </div>

Project Management

PM - Change Management	Notes
<ul style="list-style-type: none"> ➔ Develop and establish an appropriate risk management activity ➔ Develop and establish a change request process ➔ Develop and establish a non-conformance cost management (NCC) ➔ Secure the contribution of all relevant actors in the change management process ➔ Develop a transition plan from current procedures and technology towards the new system 	
<u>Linked Domains</u>	
<div> <div></div> <div>OPS</div> <div>TEC</div> <div></div> <div>CER</div> <div>CPL</div> </div>	

Project Management





PM - Quality Management	Notes
<ul style="list-style-type: none"> ➔ Establish a Quality Management Plan (QMP) for internal activities and processes in accordance with the Quality Management Handbook (QMH) of your organisation ➔ Secure with external parties that quality management is effectively demonstrated ➔ Identify the areas of the project where quality assurance is key ➔ Secure the contribution of all relevant actors in the quality management process 	
<u>Linked Domains</u>	
<div> <div></div> <div>OPS</div> <div>TEC</div> <div>REG</div> <div>CER</div> <div>CPL</div> </div>	



Operations

<i>OPS - Requirements</i>	Notes
<ul style="list-style-type: none"> ➔ Develop the operational requirements for the A-SMGCS ➔ Assess which requirements are essential and which are non-essential. Evaluate potential impact of identified requirements not being realised ➔ Establish an evaluation and change process in case of limitations (e.g. budget/ technical/ ergonomics) 	
<u>Linked Domains</u>	
<div> <div>PM</div> <div></div> <div>TEC</div> <div>REG</div> <div>CER</div> <div>CPL</div> </div>	

Operations

<i>OPS - Technology</i>	Notes
<ul style="list-style-type: none"> ➔ Provide TEC with the operational requirements ➔ Support identification of functional requirements ➔ Support identification of technical requirements ➔ Identify any limitations in using this system ➔ Ensure that the technical solution meets the defined operational requirements ➔ Define a service level for restoration of degraded system services ➔ Collect recent operational documents and guidance material for reference in support of TEC ➔ Support the development of the technical contingency and redundancy requirements ➔ Define a minimum equipment list being essential for the operations for degraded modes of operation (redundancy and potential failures). 	
<u>Linked Domains</u>	
<div> <div> PM</div> <div></div> <div> TEC</div> <div> REG</div> <div> CER</div> <div></div> </div>	




Operations

OPS - Licensing						Notes
<div>➔ Identify what category of license and/or endorsement is required</div> <div>➔ Match the current licenses/endorsements against the requirement and identify gaps</div> <div>➔ Ensure that operational staff in question is trained according to the requirement</div>						
<div>Linked Domains</div> <div><div>PM</div><div></div><div></div><div>REG</div><div>CER</div><div></div></div>						





Operations

<i>OPS - Training</i>	Notes
<ul style="list-style-type: none"> ➔ Identify the staff that requires training ➔ Define the training modules for the different user groups, e.g. TWR, Approach, Apron, vehicle drivers ➔ Consult with the relevant training department(s) and identify what kind of training material is required (e.g. technical part and operational part) ➔ Identify the groups/ individuals to support the training package (e.g. TEC, supplier, etc) ➔ Develop training plans in cooperation with the relevant training department(s) ➔ Identify if part of the training package needs to be provided by the supplier ➔ Establish a core team being involved in the training activities 	
<u>Linked Domains</u>	
<div> <div>PM</div> <div></div> <div>TEC</div> <div>REG</div> <div>CER</div> <div></div> </div>	

Operations

<i>OPS - Phraseology</i>	Notes
<ul style="list-style-type: none"> ➔ Consult documentation related to phraseology, e.g. ICAO ➔ Identify appropriate standard phraseology to be applied for the use of A-SMGCS ➔ Address required changes in the training package 	
<u>Linked Domains</u>	
	
	
	





Operations

OPS - Procedures						Notes
<ul style="list-style-type: none">➔ List current operational procedures➔ Consult documents (e.g. ICAO)/ operational manuals/ AIP➔ Adapt existing and/or develop new operational procedures for the use of A-SMGCS and feed them into the Safety case, if so required➔ If changes are applicable ensure that certification requirements are considered➔ Update relevant documentation (e.g. AIP, operational manuals, safety management manuals, etc)➔ Notify affected airport partners (e.g. ground handlers, aircraft operators) on changing or new procedures➔ Define contingency procedures➔ Implement and publish transponder operating procedures➔ Address required changes on procedures in the training package						
<u>Linked Domains</u>						
						


Operations

OPS - Testing					Notes
<div><div>➔ Evaluate overall operational acceptability of the system</div><div>➔ Agree and confirm on time slots for all testing activities required</div><div>➔ Establish a core team to be involved in the different test phase and validation activities</div><div>➔ Contribute to the factory acceptance test (FAT)</div><div>➔ Contribute to the site acceptance test (SAT)</div><div>➔ Perform to the operational acceptance test</div><div>➔ Document the results from the operational acceptance test for the certification process</div></div>					
<div>Linked Domains</div>					
<div><div>PM</div></div>		<div><div>TEC</div></div>		<div><div>CER</div></div>	





Operations

<i>OPS - Regulation</i>	Notes
<ul style="list-style-type: none"> ➔ Verify the regulatory requirements with the supervisory authority ➔ Identify European norms and specifications, if applicable ➔ Identify national standards ➔ Identify ICAO global and regional standards and recommendations ➔ Identify EASA Safety Requirements, if applicable ➔ Consult EUROCONTROL guidance material 	
<u>Linked Domains</u>	
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Operations

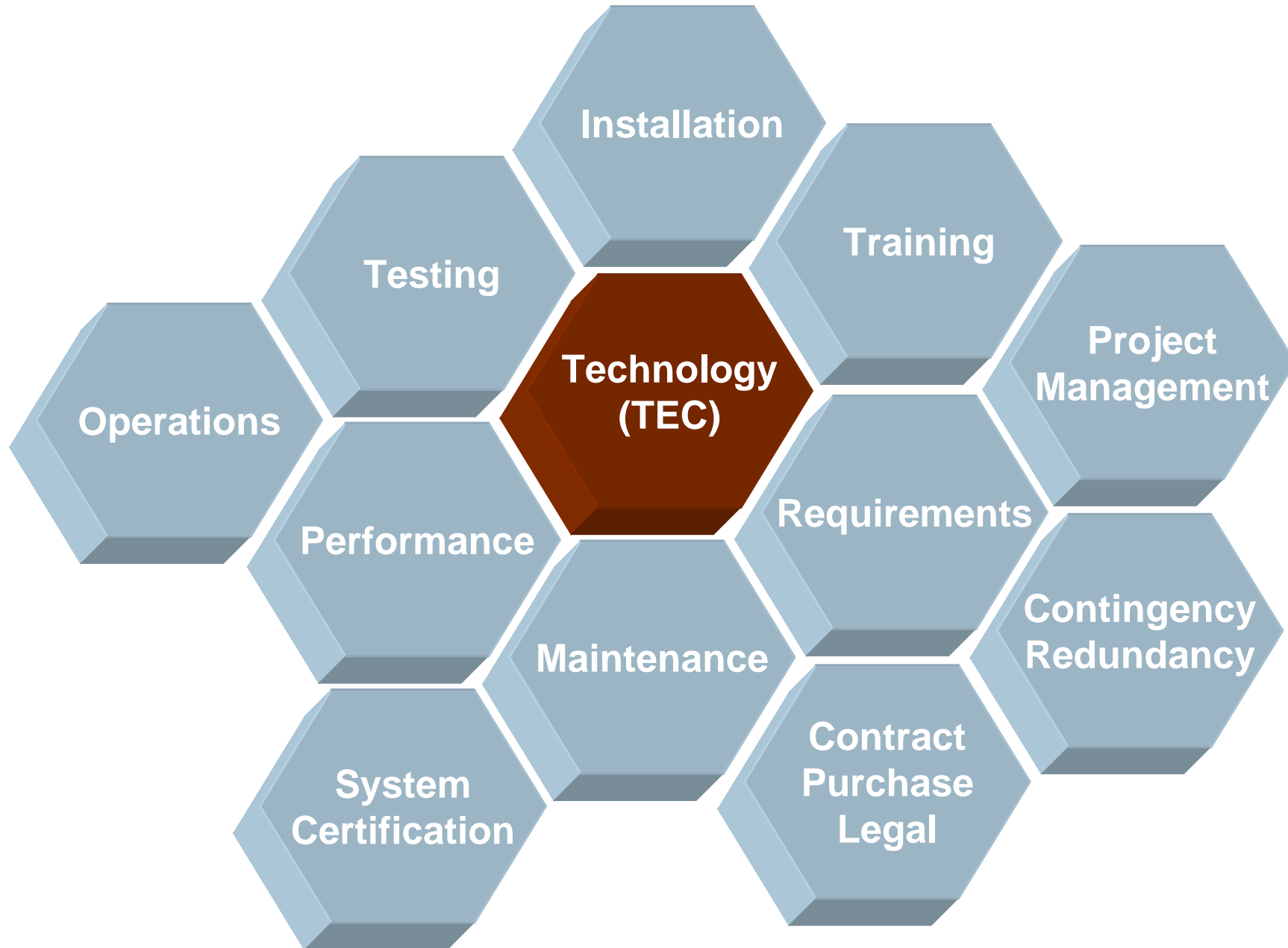
OPS - Project Management						Notes
<ul style="list-style-type: none">➔ Identify timelines/ risks from the operational perspective➔ Support contract management➔ Contribute to project reporting➔ Contribute to project meetings➔ Contribute to change management➔ Assist to the selection process of eligible members of the project core team						
<u>Linked Domains</u>						
						

Operations





<i>OPS - Certification</i>	Notes
<ul style="list-style-type: none"> ➔ Identify the contribution of OPS within the certification process ➔ Identify the necessary steps for achieving the certification ➔ Collect all relevant documentation/ evidence of the operational part of the system required for the certification process ➔ Ensure support in building the Safety and the Human Factors Case ➔ Ensure that you are provided with the results of the certification process 	
<u>Linked Domains</u>	
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Operations




OPS - Transition Management						Notes
<div><div>➔ Develop a transition schedule</div><div>➔ Develop the transition Safety Case</div><div>➔ Develop the transition procedure</div><div>➔ Establish a core team being involved in the transition process</div><div>➔ Create a management decision point for transition to the new system</div></div>						
<div>Linked Domains</div> <div><div><div>PM</div></div><div></div><div><div>TEC</div></div><div><div>REG</div></div><div><div>CER</div></div><div></div></div>						





Technology

TEC - System Certification					Notes
<ul style="list-style-type: none">➔ Collect and analyse applicable standards➔ Collect and analyse applicable specifications➔ Ensure that the documentation on supplier conformance to applicable standards and specifications is available➔ Support the development of the system certification process➔ Conduct a full system certification for the technical part➔ Support in building the local Safety and Human Factors Case➔ Compile a list of applicable A-SMGCS regulation➔ Compile a list of applicable A-SMGCS rules➔ Verify at regular basis if updates on standards, rules, regulations, and specifications are available					
<u>Linked Domains</u>					
					





Technology

TEC - Contingency & Redundancy					Notes
<ul style="list-style-type: none">➔ Establish contingency and redundancy procedures for technical staff➔ Define redundancy and availability for each system component and for the overall system➔ Develop technology risk scheme➔ Support the development of OPS contingency and redundancy procedures					
<u>Linked Domains</u>					
					

Technology

TEC - Contract/ Purchase/ Legal	Notes
<ul style="list-style-type: none"> ➔ Support the call for tender process on technical issues ➔ Support the contract management on technical issues for potential maintenance contract with the supplier ➔ Document the maintenance requirements ➔ Document the spare parts requirements ➔ Define and document the warranty requirements 	
<u>Linked Domains</u>	
	





Technology

TEC - Requirements	Notes
<ul style="list-style-type: none"> ➔ Translate operational requirements into functional requirements ➔ Identify basic system layout ➔ Identify if actual systems or its components are eligible for migration/integration into the new system ➔ Define requirements regarding linkage to and/or from other systems (e.g. FDPS, DMAN, AGL, etc) ➔ Evaluate and define technical requirements ➔ Evaluate and define electrical requirements ➔ Evaluate and define IT requirements ➔ Evaluate and define HSE (Health, Safety and Environment) requirements ➔ Establish technical documentation ➔ Evaluate and list regulatory requirements in relation to the functional/technical requirements ➔ Request advise from REG on regulatory aspects ➔ Verify at regular basis if updates on standards, rules, regulations and specifications are available 	
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<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  PM </div> <div style="text-align: center;">  OPS </div> <div style="text-align: center;">  REG </div> <div style="text-align: center;">  CER </div> </div>	

Technology

TEC - Installation						Notes							
<div><div>➔</div> Perform a local survey</div> <div><div>➔</div> Contribute to the reception of delivered equipment</div> <div><div>➔</div> Develop a siting plan for the respective systems</div> <div><div>➔</div> Monitor compliance to the HSE Plan</div> <div><div>➔</div> Conduct periodic installation progress meetings</div> <div><div>➔</div> Assure that appropriate installation schedules, documentation and design are developed and regularly reviewed</div>													
<div>Linked Domains</div> <table><tr><td><div><div>PM</div></div></td><td><div><div>OPS</div></div></td><td></td><td></td><td></td><td></td><td></td></tr></table>							<div><div>PM</div></div>	<div><div>OPS</div></div>					
<div><div>PM</div></div>	<div><div>OPS</div></div>												



Technology

TEC - Maintenance						Notes
<ul style="list-style-type: none">➔ Define maintenance service levels➔ Provide technical support to operations➔ Define warranty requirements➔ Define spare parts policy➔ Develop and establish maintenance procedures➔ Ensure that the appropriate maintenance tools are available➔ Collect applicable maintenance standards and norms➔ Define required supplier support after warranty period➔ Ensure that maintenance is performed in accordance to HSE (Health, Safety and Environment) requirements➔ Ensure that maintenance is performed in accordance with quality assurance and control➔ Ensure that qualified technical staff is available and appropriately trained for maintaining the system						
<u>Linked Domains</u>						
						




Technology

TEC - Operations				Notes	
<div><div>➔</div> Agree and develop the transition schedule</div> <div><div>➔</div> Establish the fault reporting process and documentation</div> <div><div>➔</div> Establish a change management process</div> <div><div>➔</div> Provide technical support to the development of operational requirements</div> <div><div>➔</div> Define data recording and extraction requirements for accident and incident investigation</div> <div><div>➔</div> Support to simulator training activities</div> <div><div>➔</div> Collect system design and layout requirements from OPS</div> <div><div>➔</div> Assist OPS in the development of the transition plan</div>					
<div>Linked Domains</div>					
<div><div>PM</div></div>	<div><div>OPS</div></div>		<div><div>REG</div></div>	<div><div>CER</div></div>	




Technology

TEC - Performance	Notes
<ul style="list-style-type: none"> ➔ Define and elaborate requirements for replay of recorded A-SMGCS data ➔ Define requirements for archiving operational data ➔ Define requirements for archiving maintenance data ➔ Establish a system performance measuring process ➔ Define system performance measuring tools 	
<u>Linked Domains</u>	
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Technology

TEC - Project Management					Notes				
<ul style="list-style-type: none">➔ Contribute to the definition of system components➔ Contribute to the definition of the system concept➔ Contribute to the final turnover (handover to OPS) documentation➔ Provide input to the master project plan➔ Support the stakeholder analysis➔ Provide support in obtaining internal stakeholder commitment➔ Contribute to project status meetings➔ Contribute to the project reporting➔ Contribute to the change management processes➔ Assist to the selection process of eligible members of the project core team and project resources➔ Contribute to the Safety Management System➔ Contribute to the Security Management System									
<u>Linked Domains</u>									
									

Technology

TEC - Testing					Notes
<ul style="list-style-type: none">➔ Participate and witness the Factory Acceptance Test➔ Execute the Site Acceptance Test (technical and interface perspective)➔ Support the Operational Acceptance Test (evaluation of the system from an operational point of view before starting warranty period)➔ Perform trials (evaluate system stability and performance during a contractually agreed period)➔ Collect required test equipment and tools➔ Define and list environmental requirements during the different test phases / periods➔ Develop, plan and prepare test validation activities					
<u>Linked Domains</u>					
					

Technology




TEC - Training					Notes
<div><div>➔ Collect applicable standards</div><div>➔ Define and provide relevant documentation and/or software</div><div>➔ Define the level of training to be provided by the supplier for maintenance staff</div><div>➔ Develop training syllabi</div><div>➔ Support the OPS training package</div><div>➔ Identify appropriately qualified maintenance personnel eligible for training</div></div>					
<div>Linked Domains</div> <div><div><div>PM</div></div><div><div>OPS</div></div><div></div><div><div>REG</div></div><div><div>CER</div></div><div></div></div>					



Regulation

REG - Operations					Notes
<div><div>➔ Identify European and national regulation and norms being relevant for the operational part</div><div>➔ Identify all relevant ICAO and ICAO Regional material for the operational part</div><div>➔ Divide between mandatory and recommended provisions</div><div>➔ Verify the results with the Supervisory Authority</div><div>➔ Advise OPS on standards, norms, and regulation to be met</div></div>					
<div>Linked Domains</div>					
<div>PM</div>	<div>OPS</div>			<div>CER</div>	




Regulation

REG - Technology					Notes
<ul style="list-style-type: none">➔ Identify European and national regulation being relevant for the technical part, e.g.: EASA, EUROCONTROL, European Commission, if applicable in your State➔ Identify relevant Directives and cross-check applicability and/or potential national deviations with the Supervisory Authority➔ Identify relevant national norms➔ Advise TEC on standards, norms, and regulation to be met, for defining the functional requirements and specifications➔ Advise on the different entities that have to be taken into account (e.g. NSA for the system certification, potential other authorities for technical sub-parts of the system, as electronic devices, radar, redundancy supplies, etc)➔ Advise on interoperability requirements to be considered for certification					
<u>Linked Domains</u>					
					



Regulation

REG - Certification					Notes	
<div>➔ Identify all relevant ICAO global and regional material for the certification</div> <div>➔ Secure that relevant means of compliance are available for both, technology and operations</div> <div>➔ Identify if European or national norms are available as means of compliance</div> <div>➔ Identify additional material being relevant for the project, e.g. from EUROCAE</div>						
<div>Linked Domains</div>						
<div>PM</div>				<div>CER</div>		

Regulation

<i>REG - Project Management</i>	Notes
<ul style="list-style-type: none"> ➔ Advise PM and CPL on standards, norms, and regulation to be met, when defining the call for tender ➔ Advise on standards, norms, and regulation to be met when preparing the certification activity ➔ In case no standards are available, advise on other means of compliance to be considered ➔ Advise PM during interaction with the Supervisory Authority on certification issues ➔ Investigate potential impact on the aerodrome certification and advise PM ➔ Liaise with the legal department, where deemed necessary ➔ Assist to the selection process of eligible members of the project core team and project resources 	
<u>Linked Domains</u>	
	<div data-bbox="309 1771 454 1908"></div> <div data-bbox="454 1771 600 1908"></div> <div data-bbox="600 1771 745 1908"></div> <div data-bbox="745 1771 890 1908">  </div> <div data-bbox="890 1771 1035 1908">  </div>

Regulation

REG - Contract/ Purchase/ Legal						Notes
<ul style="list-style-type: none">➔ Identify European and national rules and regulation for preparing the invitation to tender➔ Identify relevant contract guidelines➔ Identify relevant rules and regulation related to procurement activities➔ Identify and advise on external and internal policy with relevance to the negotiation process						
<u>Linked Domains</u>						
						

Regulation

<i>REG - Change Management</i>	Notes
<ul style="list-style-type: none"> ➔ Even if you are sure that you have captured everything, check for updates, and new material that might be relevant and/or support the project ➔ Consult regularly the Official Journal of the EU http://eur-lex.europa.eu/en/index.htm ➔ Consult regularly the national publications (i.e. government, standardisation bodies) ➔ Consult regularly the State letters of ICAO ➔ Communicate to the relevant domain(s) in case of changes 	
<u>Linked Domains</u>	
<div> <div>PM</div> <div>OPS</div> <div>TEC</div> <div></div> <div>CER</div> <div>CPL</div> </div>	





Certification

CER - Technology						Notes
<div>➔ Advise which documents/material are relevant for technical guidance</div> <div>➔ Ensure that the system meets all certification requirements</div> <div>➔ Ensure availability of full documentation</div> <div>➔ In case further analysis/ changes are required, provide advice to TEC</div>						
<div>Linked Domains</div> <div><div>PM</div><div></div><div>TEC</div><div>REG</div><div></div><div></div></div>						




Certification

CER - Operations						Notes
<div>➔ Assess certification requirements for the introduction of new procedures</div> <div>➔ Identify the certification process and the certification requirements for operational aspects</div> <div>➔ Advise in case further analysis or changes are emerging during the certification process</div>						
<div>Linked Domains</div> <div><div>PM</div><div>OPS</div><div></div><div>REG</div><div></div><div></div></div>						

Certification

CER - Regulation						Notes
<ul style="list-style-type: none">➔ Identify persons responsible for regulatory issues within the organisations involved➔ Collect documentation relevant for certification➔ Identify relevant regulations to system certification➔ Identify existing and applicable implementing rules/Norms/Specifications➔ Ensure compliance with EU regulation where applicable➔ Assess the requirements for the integration into the Safety and Security Management Systems						
<u>Linked Domains</u>						
						

Certification

CER - Cases – Safety/HF						Notes
<ul style="list-style-type: none">➔ Identify Safety/HF experts eligible for this task➔ Identify guidance material/documents to support Safety Case/ Human Factors Case➔ Monitor the development of the cases➔ Highlight and advise issues/areas which require further analysis and/or changes						
<u>Linked Domains</u>						
						

Certification




CER - Project Management						Notes
<div>➔ Lead and monitor the certification process</div> <div>➔ Contribute to change management</div> <div>➔ Support reporting process</div> <div>➔ Contribute to the development of the project master plan</div> <div>➔ Assist to the selection process of eligible members of the project core team</div>						
Linked Domains						
<div>PM</div>						

Certification







CER - Change Management						Notes
<div>➔ Consult regularly with REG if something relevant has changed or is about to change impacting the certification</div> <div>➔ Advise TEC on certification requirements in case system changes are conducted</div> <div>➔ Advise OPS on certification requirements in case operational changes are to be implemented</div>						
<div>Linked Domains</div> <div><div><div>PM</div></div><div></div><div></div><div><div>REG</div></div><div></div><div></div></div>						




Contract/ Purchase/ Legal

CPL - Call for Tender						Notes
<ul style="list-style-type: none">➔ Develop generic tender documentation (e.g. 'Summary of Requirement')➔ Define and list the conditions of tender➔ Develop the conditions of contract➔ Develop the statement of work➔ Develop tender response schedules➔ Secure conformity of the ITT documentation with applicable standards and regulation➔ Issue an invitation to tender (ITT)➔ Analyse and respond to clarification requests➔ Determine the national/European format for publishing the contract notice (e.g. Common Procurement Vocabulary (CPV), Nomenclature commune des Unités Territoriales Statistique (NUTS) Code)➔ Develop the contract notice➔ Publish the contract notice						
<u>Linked Domains</u>						
						




Contract/ Purchase/ Legal

<i>CPL - Tender Negotiations</i>	Notes
<ul style="list-style-type: none"> ➔ Define required competences/skills for the members of the negotiation team ➔ Select negotiation team members ➔ Elaborate a list containing all items requiring further clarification from candidate suppliers ➔ Define the boundaries of the negotiation framework (i.e. what are the limits imposed by management decisions, corporate rules and regulations) ➔ Organise clarification session for each submitted bid ➔ Perform technical and commercial evaluation of each submitted tender ➔ Develop and keep up to date the Limits of Authority (LoA) documentation 	
<u>Linked Domains</u>	
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"></div> <div style="text-align: center;"></div> <div style="text-align: center;"></div> <div style="text-align: center;"></div> <div style="text-align: center;"></div> <div style="text-align: center;"></div> </div>	





Contract/ Purchase/ Legal

CPL - Procurement						Notes
<ul style="list-style-type: none">➤ Define contract award criteria➤ Appoint a supplier (contract launch)➤ Define the applicable terms and conditions➤ Align procurement of the A-SMGCS system to the organisation's internal procurement handbook/methodology or process➤ Verify if EU Regulations and/or Directives in relation to procurement are applicable and if so, are respected accordingly➤ Ensure that budget, timescales and requirements, being approved at managerial level, are respected						
<u>Linked Domains</u>						
						


Contract/ Purchase/ Legal

CPL - Contract Management						Notes
<ul style="list-style-type: none">➔ Select contract guidelines: e.g. Fédération Internationale des Ingénieurs-Conseils (FIDIC), Organisme de Liaison des Industries Métalliques Européennes (ORGALIME), National Authority, others➔ Ensure that all relevant legal aspects are covered in the contract➔ Compile a list of elements that must be part of the contract➔ Develop a policy on subcontracting						
<u>Linked Domains</u>						
						



Contract/ Purchase/ Legal

CPL - Legal						Notes
<ul style="list-style-type: none">➔ Define the framework of the supplier's liability➔ Develop internal strategy in case of breach of contract➔ Develop methodology for settlement of disputes➔ Manage warranty issues, delay and liquidated damages➔ Compile a list of all legal elements➔ Define the authorities of the key project members on legal issues related to the project/contract						
<u>Linked Domains</u>						
						

Contract/ Purchase/ Legal

CPL - Financial Management						Notes
<ul style="list-style-type: none">➔ Specify the type of accounts that could be considered for the contract (e.g. Escrow)➔ Compile a list of the required and/or mandatory Bonds (e.g. Performance bonds, Bid Bonds, Advance Payment Bonds, Warranty Bonds, ...)➔ Compile a list of the required or mandatory down payments, guarantees and retention money➔ Specify the policy related to currency and exchange rates➔ Develop financing mechanisms➔ Develop a financial Risk Management Process➔ Implement the endorsed financial Risk Management Process						
<u>Linked Domains</u>						
						

Contract/ Purchase/ Legal

CPL - Commercial Management						Notes
<ul style="list-style-type: none">➔ Determine the appropriate insurance schemes, both financial (e.g. Hermes Insurance) and others (e.g. CAR (Construction All Risk Insurance), EAR (Erection All Risk Insurance))➔ Define payment schedule(s) and related invoicing process➔ Define budget boundaries➔ Define shipment/transportation conditions➔ Compile a list of all taxes / customs / duties related directly and indirectly to the implementation project (at all stages)➔ Compile a list of all warranty related issues➔ Define a claim management strategy						
Linked Domains						
						

Contract/ Purchase/ Legal

CPL - Financial Reporting & Controlling						Notes
<div>➔ Develop an internal reporting and controlling schedule</div> <div>➔ Define appropriate accountancy practices (e.g. Generally Accepted Accounting Principles (GAAP)) according to organisational requirements</div>						
<div>Linked Domains</div>						
<div>PM</div>						

Contract/ Purchase/ Legal

CPL - Project Management						Notes
<div><div>➔</div><div>Contribute to the development of the Master Project Management Plan</div></div> <div><div>➔</div><div>Develop CTA (Cost Trend Analysis) tool and other project particular reporting and monitoring tools</div></div> <div><div>➔</div><div>Assist to the selection process of eligible members of the project core team and project resources</div></div> <div><div>➔</div><div>Establish a project reporting</div></div> <div><div>➔</div><div>Contribute to project status meetings</div></div> <div><div>➔</div><div>Support change management processes</div></div>						
<div>Linked Domains</div>						
<div><div>PM</div></div>						

GUIDANCE MATERIAL

The references in this section are a selection of the most relevant technical and operational documentation that is to be considered during the implementation activity for an A-SMGCS. It does not represent an exclusive list and requires regular verification if updated versions are available. The list of references is focussing on European and ICAO global level and does not contain relevant material at national level as those may differ from State to State.

- Ref. 1 EUROCONTROL definition of A-SMGCS Implementation Levels, Edition 1.2, 30/06/2010
- Ref. 2 A-SMGCS Level 1 Operational Concept and Requirements, Edition 2.1, 30/06/2010
- Ref. 3 EUROCONTROL Operational Concept and Requirements for A-SMGCS Level 2, Edition 2.1, 30/06/2010
- Ref. 4 EUROCONTROL Preliminary Safety Case for A-SMGCS Levels 1 and 2, Edition 2.1, 30/06/2010
- Ref. 5 EUROCONTROL Human Factor Case for A-SMGCS Levels 1 and 2, Edition 1.2, 30/06/2010
- Ref. 6 EUROCONTROL Proposed AIC text on Transponder Operating Procedure, last update 09/05/2007
- Ref. 7 ICAO Manual of Surface Movement Control and Guidance Systems (SMGCS) Doc 9476-AN/927 First Edition 1986
- Ref. 8 Community Specification - European Norm on A-SMGCS, Part 1, A-SMGCS Level 1, ETSI EN 303 213-1 V1.2.1 (2010-07)
- Ref. 9 Community Specification - European Norm on A-SMGCS, Part 2, A-SMGCS Level 2, ETSI EN 303 213-2 V1.1.1 (2010-10)
- Ref. 10 Community Specification - European Norm on A-SMGCS, Part 3, Deployed Cooperative Sensors, ETSI EN 303 213-3 V1.1.1 (2010-10)
- Ref. 11 Community Specification - European Norm (EN) on A-SMGCS, Part 4-1, Generic requirements for non-cooperative sensors, ETSI EN 303 213-4-1 V1.1.1 (2010-10)
- Ref. 12 Community Specification - European Norm (EN) on A-SMGCS, Part 4-2, Specific requirements for a deployed SMR sensor, ETSI EN 303 213-4-2 V1.1.1 (2010-10)
- Ref. 13 ICAO Manual on Advanced Surface Movement Control and Guidance Systems (A-SMGCS), Doc 9830, First Edition 2004
- Ref. 14 ICAO Annex 14 – Aerodrome Design and Operations, Volume I, Fifth Edition, July 2009

- Ref. 15 ICAO Doc 4444 – Procedures for Air Navigation Services (PANS) Air Traffic Management (ATM), Fifteenth Edition 2007
- Ref. 16 EUROCAE Minimum Aviation System Performance Specifications (MASPS) for A-SMGCS (Level 1 and 2), Edition ED-87B, January 2008, including ED-87B amendment No 1 of January 2009
- Ref. 17 EUROCAE Minimum Operational System Performance Specifications (MOPS) for Surface Movement Radar sensor systems for use in A-SMGCS, Edition ED-116, January 2004
- Ref. 18 ICAO Doc 7030 – European Supplementary Procedures, Fifth Edition 2008, working copy updated 15 March 2011
- Ref. 19 ICAO Doc 9870 Manual on the Prevention of Runway Incursions, First Edition, 2007
- Ref. 20 [EUROCONTROL Guidelines on conformity assessment](#)
- Ref. 21 EUROCONTROL specific guidance on conformity assessment with regards to surveillance systems: [List of EATMN objects and standards for the surveillance domain](#)

ABBREVIATIONS

AP	Airport Unit (Directorate Network Management)
AIP	Aeronautical Information Publication
AGL	Aerodrome Ground Lighting
A-SMGCS	Advanced Surface Movement, Guidance and Control System(s)
AT	Air Traffic Management Division (Centre of Expertise)
ATC	Air Traffic Control
ATCO	Air Traffic Control Officer
CAR	Construction All Risk Insurance
CER	Certification
CND	Cooperative Network Design (Directorate)
CAA	Civil Aviation Authority
CoE	Centre of Expertise
CPL	Contract/ Purchase/ Legal
CPV	Common Procurement Vocabulary
CTA	Cost Trend Analysis
DMAN	Departure Management System
EAR	Erection All Risk Insurance
EASA	European Aviation Safety Agency
EU	European Union
EN	European Norm
ETSI	European Telecommunications Standardisation Institute
EUROCAE	European Organization for Civil Aviation Equipment
EUROCONTROL	European Organisation for the Safety of Air Navigation
FAT	Factory Acceptance Test
FDPS	Flight Data Processing System
FIDIC	Fédération Internationale des Ingénieurs-Conseils (International Federation of Consulting Engineers)
GAAP	Generally Accepted Accounting Principles
HF	Human Factors
HSE	Health, Safety and Environment
ICAO	International Civil Aviation Organization
IT	Information technology
ITT	Invitation to Tender

NCC	Non-Conformance Cost
NSA	National Supervisory Authority
NUTS	Nomenclature commune des Unités Territoriales Statistique
OPS	Operations
ORGALIME	Organisme de Liaison des Industries Métalliques Européennes
PM	Project Management
PMP	Project Management Plan
REG	Regulation
RWY	Runway
SAT	Site Acceptance Test
SMGCS	Surface Movement, Guidance and Control Systems
TEC	Technology
WBS	Work Break-down Structure



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