The current study pathway of the reskilling single pilot assumes that he/she has already the theoretical knowledge and practical skills of any licensed commercial pilot (ATPL/A). He/she is already able to fly large aircraft that transport many passengers. The study pathway will describe which additional knowledge and skills he/she needs to become a single pilot. It is assumed that SPO will occur on a different type of aircraft and will require a specific type rating. Moreover, the reskilling single pilot is already a captain in a major airline. Thus, he already has the knowledge and skills related to the specific functions of this status, as cabin crew and passenger management. Therefore, the study pathway of the reskilling single pilot is the same as the one of the new entrant single pilots, except for elements concerning the status of the captain.

PROFESSIONAL COMMERCIAL PILOT: Reskilling to single pilot on board		
FORMAL TRAINING		
	Main Topic	**Description of content**
Theoretical Training: Learning Courses and Instruction required to being ex. Pilot	Theoretical knowledge about the new automated systems specific of SPO	- Description of the functioning - Logic - Rules - Failure modes - Context of utilization
	Theoretical knowledge about the systems of the new type of aircraft	- Description of the functioning - Logic - Rules - Failure modes - Context of utilization
	Theoretical knowledge about the procedures related to the new type of aircraft	- Description of the procedures - Context of use - Prioritizing rules - Philosophy of use
	Theoretical knowledge of specific human factors issues related to automation pitfalls	- Mode errors: when the pilot is not aware of the mode in which the automated system is functioning - Complacency and over-reliance: tendency to trust excessively automation - “Out of the loop” phenomenon: with reduction of situation awareness - “Clumsy” automation: when automation adds complexity to a task
	Theoretical knowledge of procedures of communication with the ground pilot	- Phraseology associated to communications between onboard pilot and ground pilot - Allocation of roles and responsibilities between onboard pilot and ground pilot

	Main Topic	Description of content
Practical Training: All the hands-on training, which can include simulation, on-site training, supervision flying…	Simulation training on the specific type of aircraft simulator	- Checklists for simulated flight and operations - Flight training preparation - Interaction with automated systems and ground pilot - Decision making - Situation awareness - Briefing and debriefing with ground pilot or instructor - Emergency simulation - Hand-eye coordination - Simulations of high workload situations
	Real flight training on the specific type of aircraft with supervisor on-board	- Operational procedures - Application of theoretical knowledge - Interaction with automated systems and ground pilot - Decision making - Situation awareness - Briefing and debriefing with ground pilot or instructor - Hand-eye coordination - Pre-flight preparation and inspection - Flight in abnormal conditions - Landing, missed approach - Ends with the “release” of the single pilot
	Real flight training on the specific type of aircraft with supervisor on ground	- Operational procedures - Application of theoretical knowledge - Interaction with automated systems and ground pilot - Decision making - Situation awareness - Briefing and debriefing with ground pilot or instructor - Hand-eye coordination - Pre-flight preparation and inspection - Flight in abnormal conditions - Landing, missed approach

TECHNICAL COMPETENCES					
Competence	**Competence Description**	**Knowledge**	**Skill**	**Level**	**Preliminary Training Topics**
Name	***Short competence description***	***The individual should have knowledge of…***	***With this skill someone should be capable of….***	***Beginner Intermediate Advanced***	***How to acquire the skill?***
Aircraft Flight Path Management, manual control	Control the aircraft flight path through manual flight, including appropriate use of flight management system(s) and flight guidance systems	- Systems functioning laws (including flight control laws: normal, abnormal, direct…). - Breakdown modes and consequences - Interactions between systems	-Control the aircraft manually with accuracy and smoothness as appropriate to the situation -Detect deviations from the desired aircraft trajectory and takes appropriate action -Contain the aircraft within the normal flight envelope -Control the aircraft safely using only the relationship between aircraft attitude, speed and thrust -Manage the flight path to achieve optimum operational Performance -Maintain the desired flight path during manual flight whilst managing other tasks and distractions -Select appropriate level and mode of flight guidance systems in a timely manner considering phase of flight and workload -Effectively monitor flight guidance systems including engagement and automatic mode transitions	Intermediate or advanced	Simulator and real flights with a focus on following training topics: - Flight path monitoring Human performance and limitations
Application of procedures	Identify and apply procedures in accordance with published operating instructions and applicable regulations, using the appropriate knowledge	-Pre-requisites to procedures. -Level of priority of procedures. -The logic/philosophy behind each procedure. -Possibility to delegate the procedure to the ground pilot or to the system	-Identify the source of operating instructions -Follow SOPs unless a higher degree of safety dictates an appropriate deviation -Identify and follow all operating instructions in a timely manner -Correctly operate aircraft systems and associated equipment -Comply with applicable regulations -Apply relevant procedural knowledge -Always check his/her actions (close-loop procedure)	Intermediate or advanced	Studying, learning and practising on dedicated computer assisted training, with a focus on following training topics: - Operational procedures for ground pilots - Air law

Specific AI and automation knowledge related to the automated systems used in the single pilot aircraft	Know how and when to trigger or disable automation	-the use, benefits and consequences of the automated systems and AI used in the single pilot aircraft -the limitations of AI and automation	-Use efficiently the automated systems and relieve his workload	Advanced	Studying and learning + simulator and real flight practice, with a focus on following training topics: - use of specific and AI automated systems - simulation of breakdown of specific AI and automated systems
KEY BEHAVIOURAL SKILLS AND COMPETENCES					
Competence	**Competence Description**	**Knowledge**	**Skill**	**Level**	**Preliminary Training Topics**
Name	***Short competence description***	***The individual should have knowledge of…***	***With this skill someone should be capable of….***	***Beginner Intermediate Advanced***	***How to acquire the skill?***
Situation awareness	Perceive and comprehend all the relevant information available and anticipates what could happen that may affect the operation	-Theoretical model of situation awareness -Factors affecting situation awareness: workload, stress…	-Manage his/her activity and select adequate options (search of missing information or diverting to fall back decision)	Intermediate or advanced	Studying and learning with a focus on following training topics: - Human performance and limitations - Flight path monitoring
Problem Solving and Decision-Making	Accurately identify risks and resolves problems. Use the appropriate decision-making processes	-Theoretical models of decision making in complex situations (e.g., naturalistic decision making) -Consequences of workload, stress, and fatigue on quality of decisions	-Seek accurate and adequate information from appropriate sources -Identify and verify what and why things have gone wrong -Employ proper problem-solving strategies -Persevere in working through problems without reducing safety -Use appropriate and timely decision-making processes -Set priorities appropriately -Identify and consider options effectively	Intermediate or advanced	Studying and learning with a focus on following training topic: Human performance and limitations

Communication	Demonstrate effective oral, non-verbal, and written communications, in normal and non-normal situations	-Theoretical knowledge on communication with remote operators -Importance of context sharing	-Ensure the recipient is ready and able to receive the information. -Select appropriately what, when, how and with whom to Communicate -Convey messages clearly, accurately, and concisely -Confirm that the recipient correctly understands important Information -Listen actively and demonstrates understanding when receiving Information -Ask relevant and effective questions -Adhere to standard radiotelephone phraseology and procedures -Accurately read and interpret required company and flight Documentation -Accurately read, interpret, constructs, and respond to datalink messages in English	Intermediate or advanced	Role play, games, simulations, and real flights with a focus on following training topics: - VFR and IFR communication - Human performance and limitations
Workload Management	Manage available resources efficiently to prioritize and perform tasks in a timely manner under all circumstances	-Aviation psychology (human overload and underload, fatigue, and stress management, etc.) -Threat and error management -Time management / planning -Multi-tasking strategies	- Maintain self-control in all situations - Plan, prioritize, and schedule tasks effectively - Manage time efficiently when carrying out tasks - Offer and accept assistance and ask for help early - Review, monitor, and cross-check actions conscientiously - Verify that tasks are completed to the expected outcome - Manage and recover from interruptions, distractions, variations, and failures effectively - Perform all the above for one or more aircraft with a single on-board pilot	Intermediate or advanced	Simulations and/or games with a focus on following training topic: - Human performance and limitations