![skill-UP logo]

The current study pathway of the new entrant 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 small aircraft that transport few passengers. The study pathway will describe which additional knowledge and skills he/she needs to become a single pilot on a more powerful aircraft that transport many passengers.

NEW ENTRANT SINGLE PILOT: Skilling		
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 about cabin crew and passenger management	- Cabin crew management - Passenger management - Company policies on abnormal procedures

	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 take 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 follows 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 of the relevant information available and anticipate 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 skills	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 demonstrate 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, construct, 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