

SAB 18 (01-2023)

Agenda Item 5

Status of the eMCO and SiPO Programme (Extended Minimum-Crew Operations and Single Pilot Operations)

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14 March 2023

Your safety is our mission.

Content

- Background on eMCO and SiPO with focus on eMCO
- eMCO general principles
- Concepts of operations
- Approach to the global safety case
- Overview of on-going streams and activities
- Foreseen implementation timeline

Background

- ❑ 2017-2018: Interested OEMs entered Technical Advice Contracts (TAC) with EASA for Reduced Crew Operations (RCO)
- ❑ 2019: Launch of EASA Projects RCO (later renamed eMCO - Extended Minimum-Crew Operations) and SiPO (Single Pilot Operations)
- ❑ 2019: Technical discussions with OEMs in an “extended” certification environment start
- ❑ 2020-2021: Preliminary discussion with OEMs on SiPO
- ❑ 2022: EASA eMCO Research Project started (RES.0028)
- ❑ 2022-2023: eMCO Experts Group of interested stakeholders activities

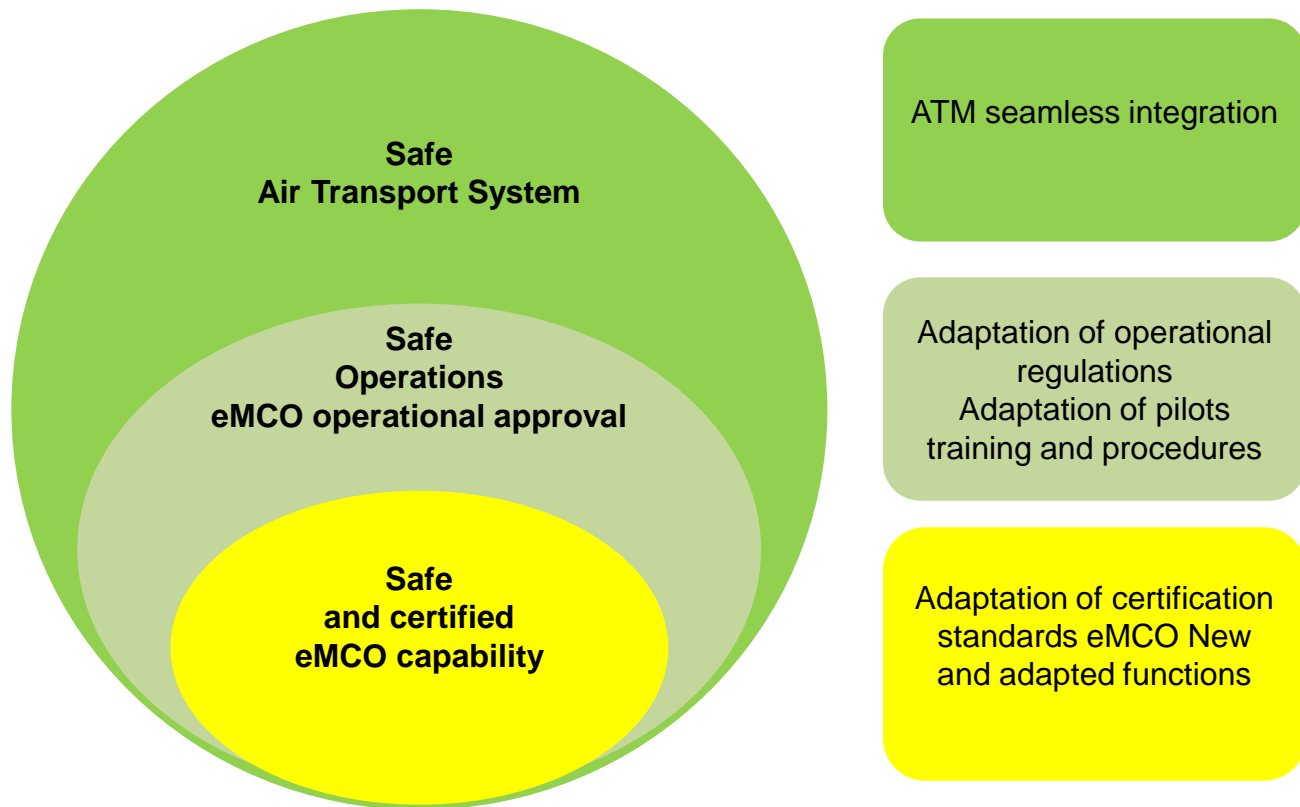
eMCO general principles

- Minimum Crew of 2 (or more) pilots from start-up to level-off at cruise altitude
- Minimum Crew of 1 pilot during the cruise phase of the flight
 - Other pilot(s) resting
 - Equivalent level of safety based on design features and training/OPS requirements
- Minimum Crew of 2 (or more) pilots from top-of-descent to parking and shut-down
- Potential future extension of FTL based on in-flight rest

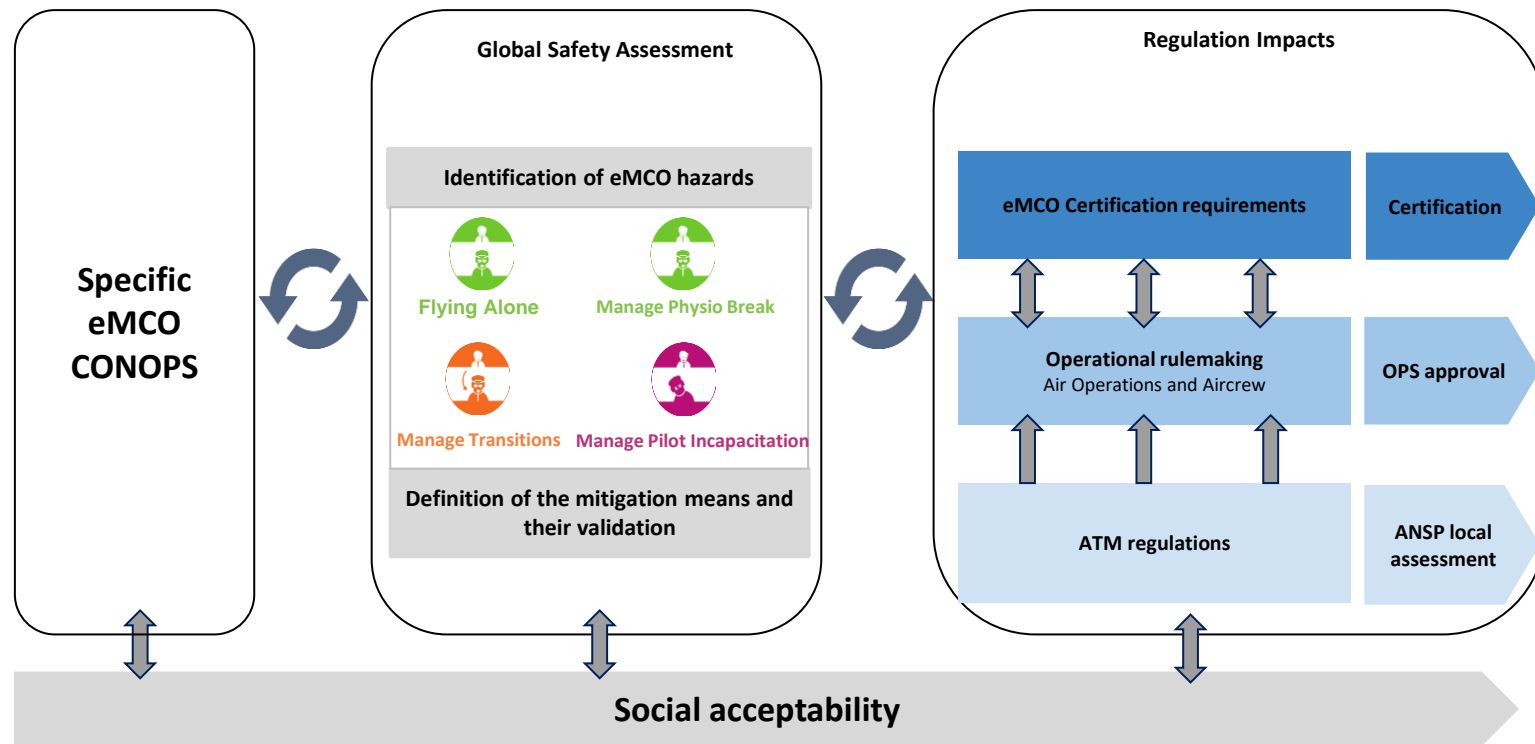
eMCO concepts of operations - OEMs

- State-of-the-art design with specific design features supporting eMCO
- Crew monitoring function required for operations to detect incapacitation
- Pilot resting in crew-bunk outside the cockpit or in the cockpit pilot seat (fully flat)
- Physiological breaks considered depending on the concept
- Sleep inertia (30 minutes) considered for incapacitation and failure cases

eMCO safe integration in current system



eMCO safe integration in current system



Approach to the global safety case 1/2

Main assumptions

- **Safety objective: equal or better than today's two-pilot operations**
- Minimum duration of sleep inertia (SI): 30 minutes
 - Exploring allowed cockpit tasks under SI. Demonstration on pilot cognitive abilities required
- Minimum licensing and experience level
- Minimum medical certificate: Class 1 with no limitations (some limitations may be considered at a later stage)
- Operations limited to cruise phase (minimum altitude FL200)
- Specific Operator authorization (Part-SPA) foreseen with training, CRM and OPS provisions

Approach to the global safety case 2/2

→ Normal eMCO operations during cruise

- Possible reduction in situation awareness
- Threat and error management
- Single-pilot decision making process robustness
- Effects on fatigue of single pilot shifts
- CRM for single pilot operations

→ Abnormal conditions and failure management

- Threat and error management
- Workload management in abnormal conditions
- Increased workload and focus on failure management
- Pilot incapacitation
- Failure resolution and decision making

→ ATM integration (pilot flying incapacitation)

Research in support of the safety case

Research Project RES.0028 funded by Horizon Europe (included in EPAS) with objectives:

→ Assess:

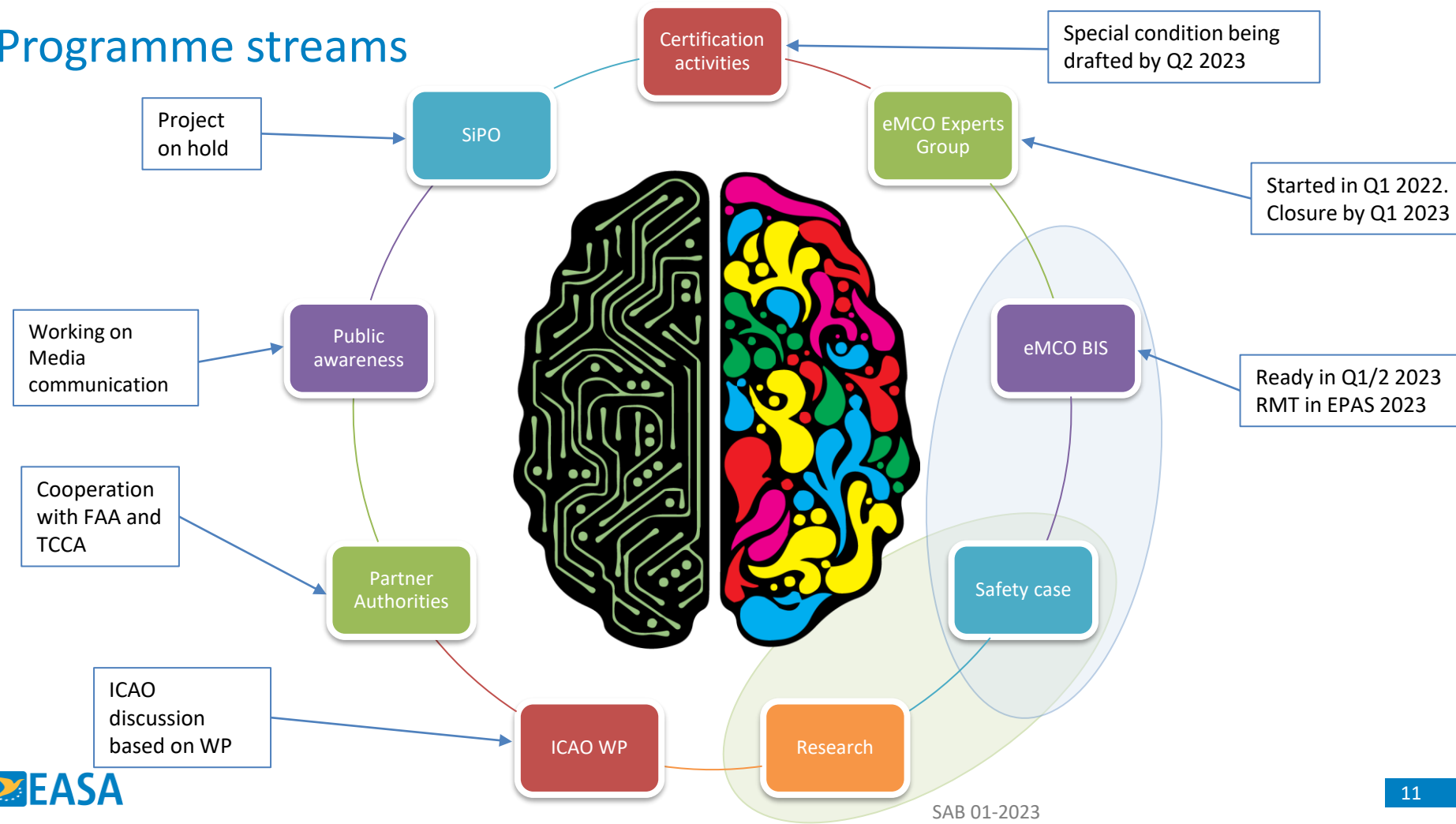
- cockpit configuration changes and Develop baseline risk assessment framework
- risks in nominal operations
- failure conditions management (single-pilot)
- sleep inertia duration and effects on performance
- incapacitation of the pilot flying
- the impact of eMCO on pilot fatigue and boredom
- physiological break solutions

→ Preliminary risk identification for SiPO

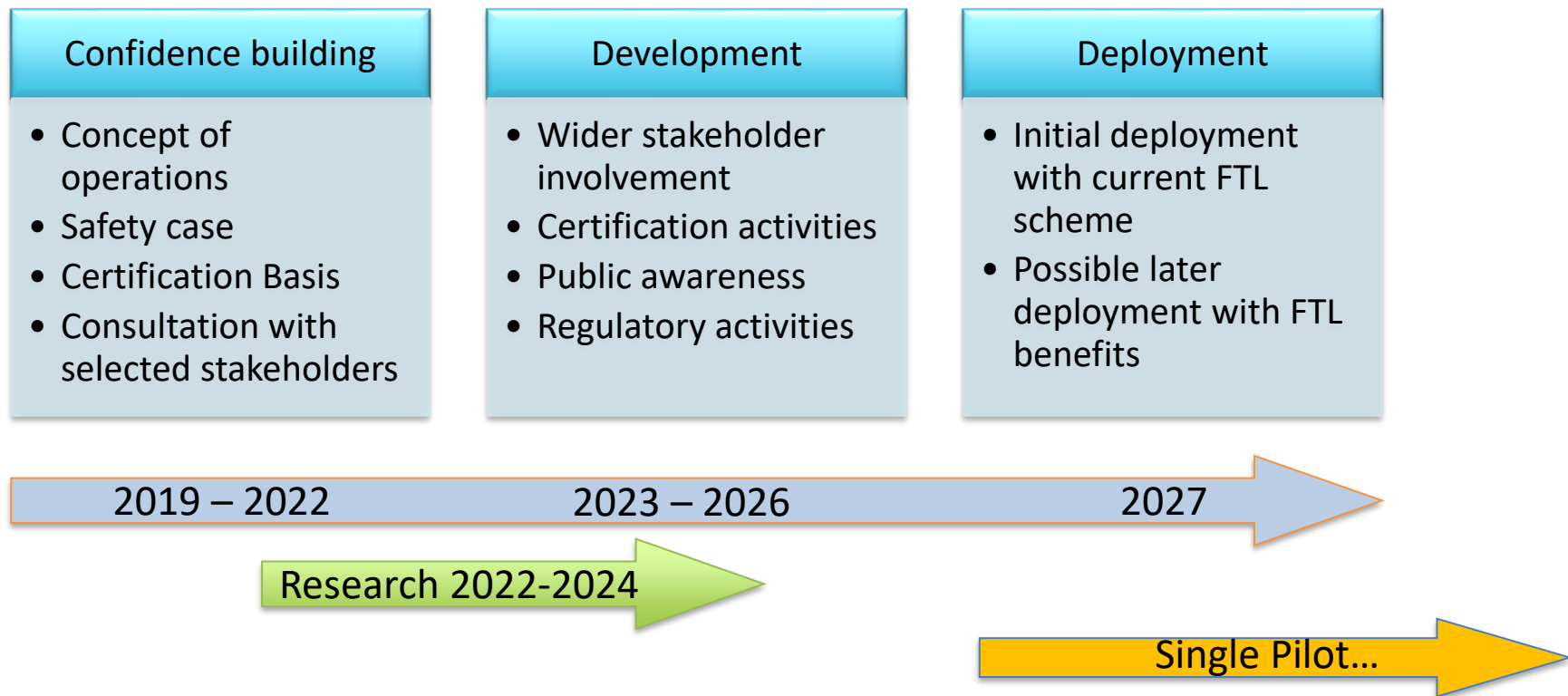
→ Consolidate assessment results and recommendations

→ Communication, Dissemination, Knowledge-sharing, Stakeholder involvement

Programme streams



eMCO Implementation timeline



Thank you for your attention

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