



| ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

A UN SPECIALIZED AGENCY



Lessons Learned from the RPAS Panel

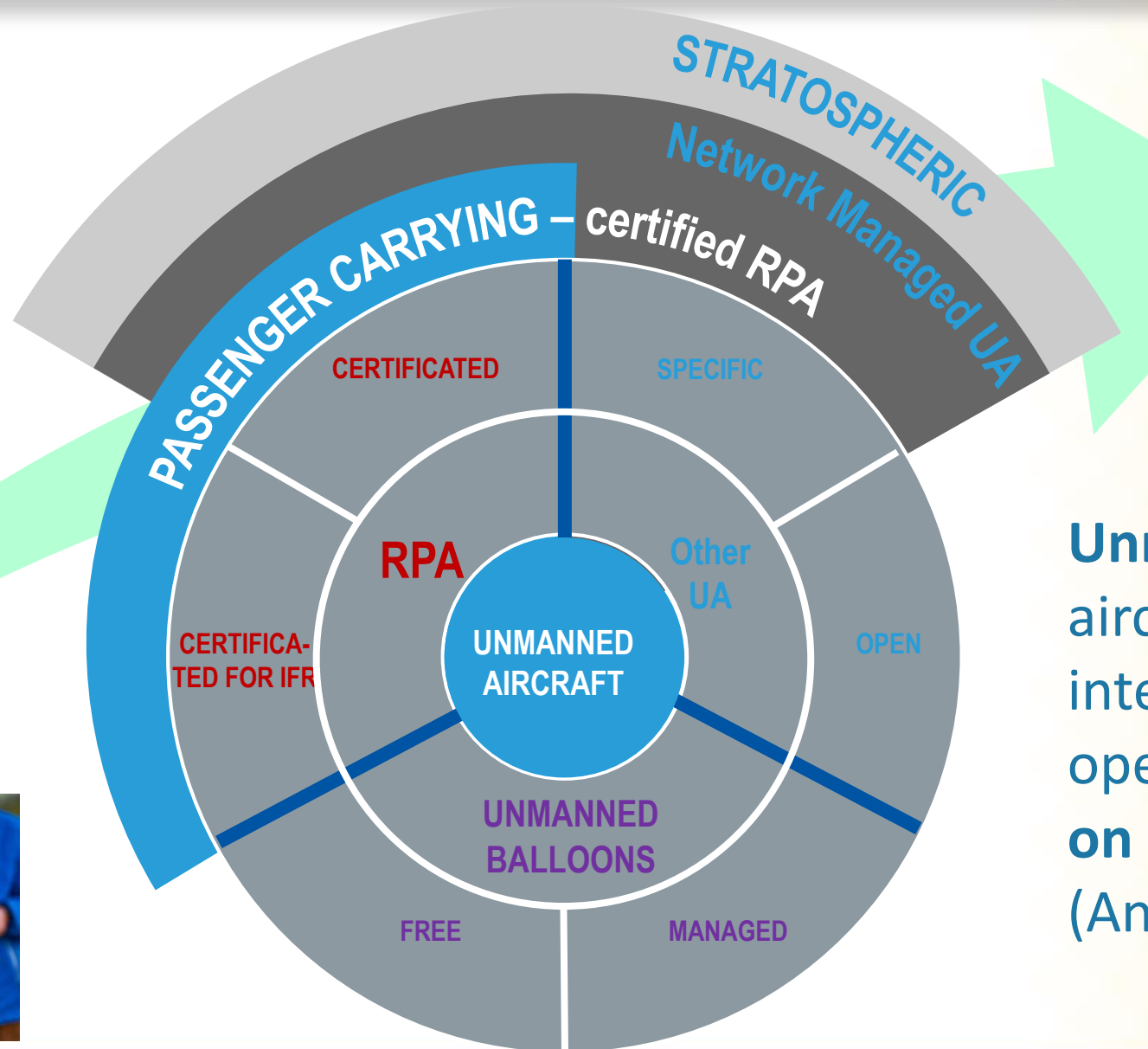
Leslie C, Ron V, Mike B, Frederic M,
Zia M, Randy W



YOU CAN'T BOIL THE OCEAN



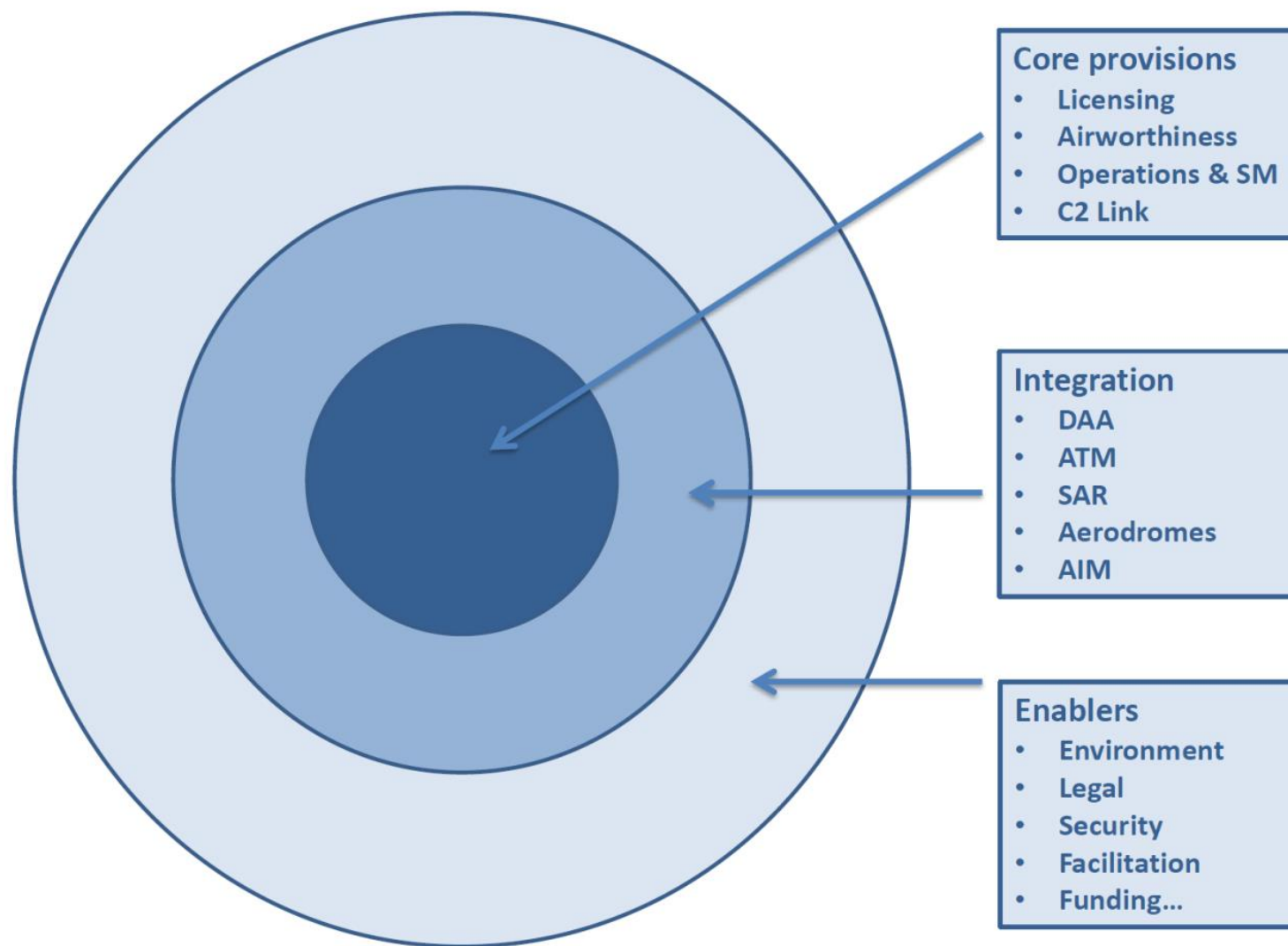
Unmanned aircraft terminology



Unmanned aircraft:
aircraft which is
intended to be
operated with **no pilot
on board**
(Annex 7, 2.2)

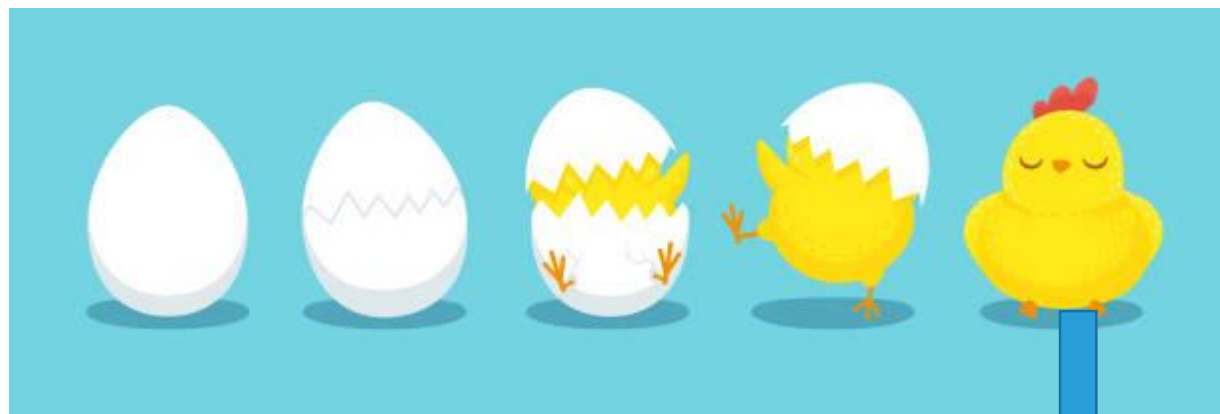


Other ICAO work

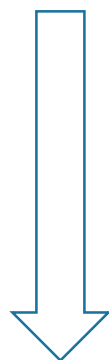


- **Core provisions for international air navigation**
- Additional **requisites** for safe **international** navigation
- **Other ICAO work** to integrate RPAS into int'l aviation

From Inception to Present



RPAS
Panel



UAS Study
Group

Evolution of RPAS Panel

RPASP Activities

WG 1	Airworthiness 2018 10 work programme items
WG 2	Communications 2020 10 work programme items
WG 3	Detect and Avoid 2020 12 work programme items
WG 4	Licensing 2018 2 work programme items
WG 5	Operations 2018 & 2020 11 work programme items
WG 6	ATM 2020 9 work programme items
WG 7	HITS 2020 4 work programme items

*Coordination
&
Collaboration*

ICAO Expert Groups

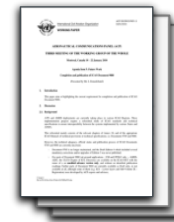
Flight Operations
Aerodromes
ATM Operations
Separation & Airspace Safety
Search and Rescue (SAR)
Personnel Competency
Human Performance
Airworthiness
Legal
Communications
Environmental
Surveillance
Aviation Security
Flight Recorders
Safety Management
Frequency Spectrum
ATM Req. & Performance

Products

Working Papers



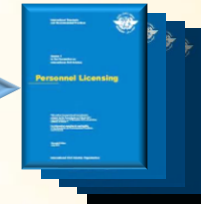
Amendment Proposals



RPAS Manual Updates



Deliverables



**Annexes 1, 2, 7, 8,
10, 11, 12 & 14**

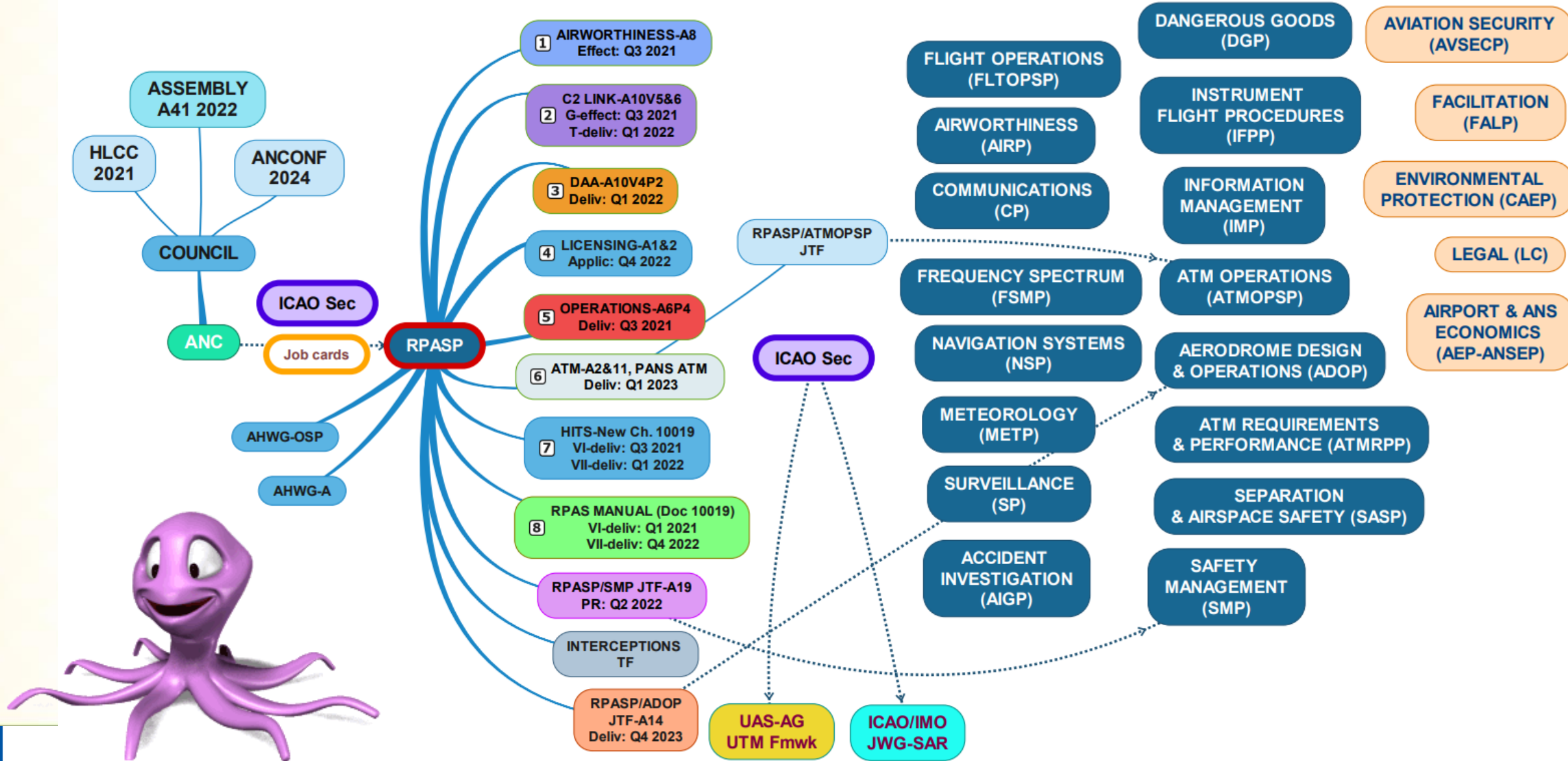


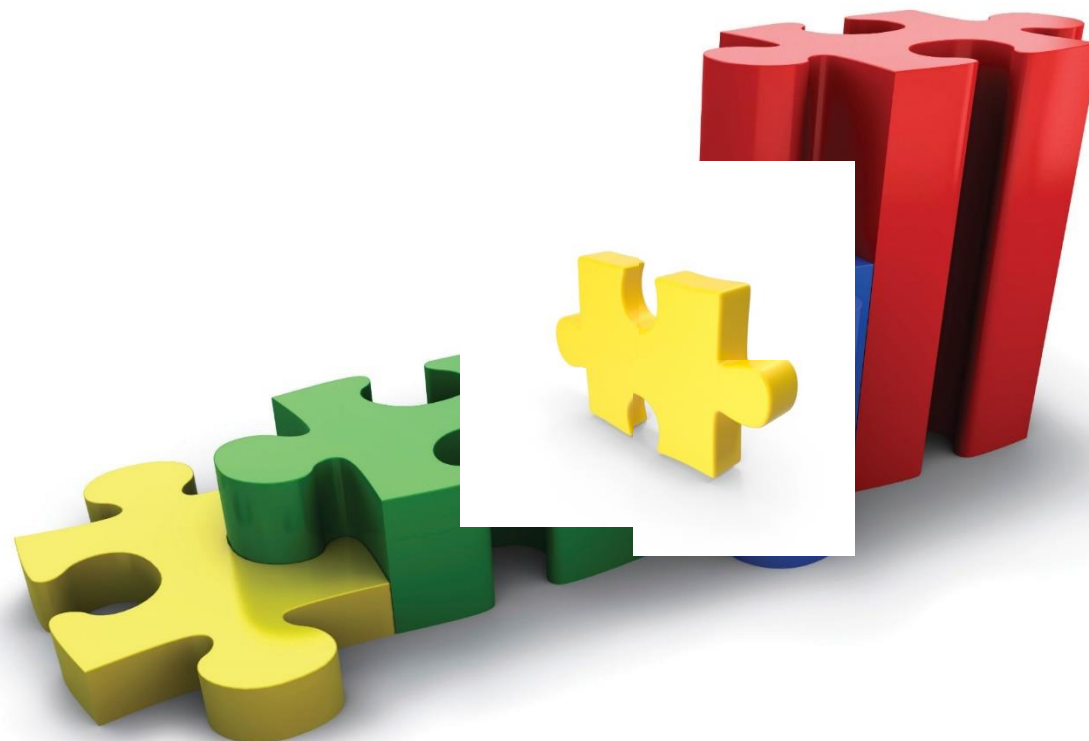
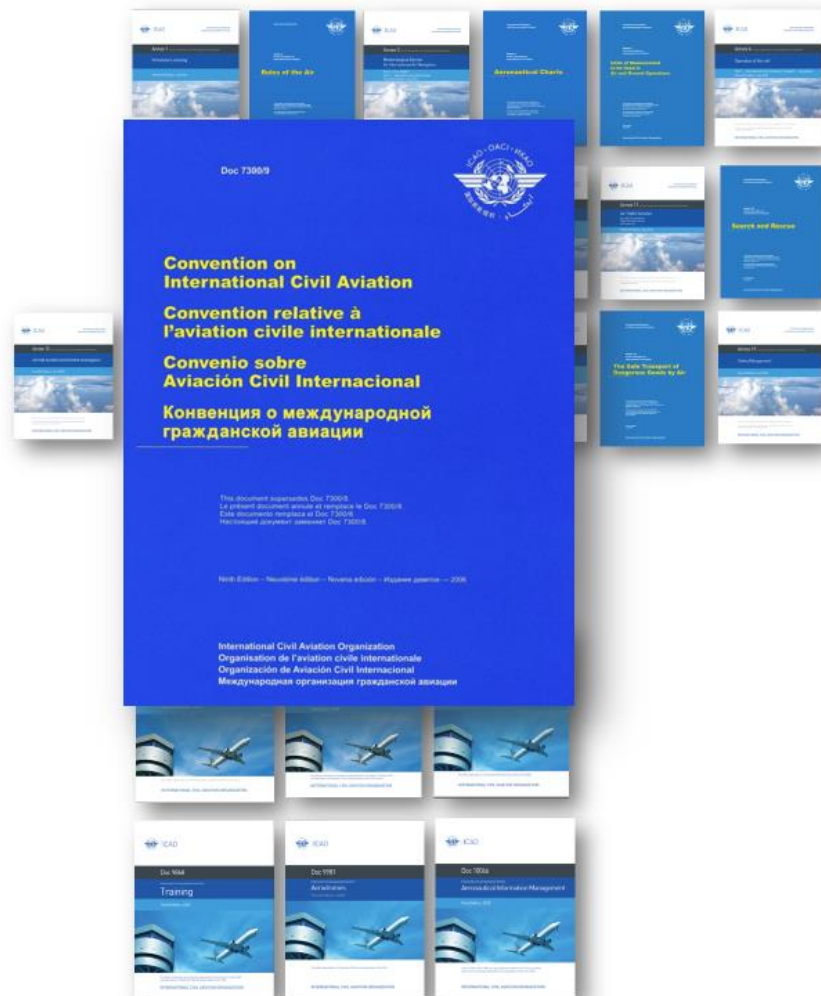
Annex 6, Part IV



PANS ATM

Current RPAS Panel





Job Card Status

11

Job Cards for:

- Licensing
- Airworthiness
- Communications
- DAA
- ATM
- RPAS Operations
- Aerodromes

RPASP.002.06		RPASP Communications 2022
Source	RPASP/10	
Problem Statement	There is an increasing demand for RPAS operators to be able to operate in non-segregated airspace and at aerodromes. Provisions of the Chicago Convention apply, however they cannot be implemented as written for manned aviation. States, industry and operators need SARPs and related guidance on how to safely and efficiently address RPAS.	
Specific Details	RPAS - Initial SARPs on communications, including command and control, for adoption in 2020 and related guidance. Significant changes to the existing communications infrastructure are necessary to operate RPA in non-segregated airspace.	
Needs Analysis		
Expected Benefits	Provide States with a global framework for regulation of RPAS communication requirements for command and control (C2), ATC and other necessary communications.	
Proposed Metric		
Reference Documents	Annex 2 — Rules of the Air, Annex 6 — Operation of Aircraft, Annex 8 — Airworthiness of Aircraft, Annex 10 — Aeronautical Telecommunications, Annex 17 — Security, Doc 10019 — Manual on Remotely Piloted Aircraft Systems and Doc 9750 — Global Air Navigation Plan.	
Initial Impact Assessment	Impact to States	
	Impact to Industry	
	Additional Info.	
	Other	
Primary Group:	Expert	Remotely Piloted Aircraft Systems Panel (RPASP)
Project Team	Project Manager	
	Project Team Members	

Problem Statement

There is an increasing demand for RPAS operators to be able to operate in non-segregated airspace and at aerodromes. Provisions of the Chicago Convention apply, however they cannot be implemented as written for manned aviation. States, industry and operators need SARPs and related guidance material on how to safely and efficiently address RPAS.

✓	9908	New ICAO Manual (###)	Develop technical manual related to C2 link including RLP concept (Manual on C2 Link)		On-schedule	Q4 2023	Dec 2023	Dec 2023
✓	1498	Annex 6 - Part IV	Develop a process to allow communication service providers (CSPs) to support the C2 link. This could include approval / acceptance of, and ongoing oversight of C2 link service providers		Re-scheduled	Q1 202 19 ²⁴	Jul 202 24 ²⁵	Nov 2026
		<u>Annex 10, Volume VI, Part II</u>	<u>Develop SARP amendment proposals for Annex 10, Volume VI, Part II that cover the RLP and C2CSP concepts as well as the C2 Link technical solutions.</u>			<u>Q1 2022</u>	<u>Nov 2025</u>	<u>Nov 2026</u>

NEW >>

		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
Meetings		PPAC P/17 (13-18/06) 06			PPAC P/18 (19-20/06)	PPAC P/19 (21-22/06)		04.1	PPAC P/20 (23-24/06) 04.1	PPAC P/21 (25-26/06)	06/2023??	PPAC P/22 (27-28/06)	PPAC P/23 (29-30/06)		PPAC P/24 (1-2/07)	PPAC P/25			PPAC P/26	PPAC P/27			PPAC P/28	PPAC P/29			PPAC P/30	PPAC P/31	04.2	PPAC P/32	
AMC Session		2.06	2.07		2.08	2.09	2.10		2.11	2.12	2.13		2.14	2.15	2.16	2.17	2.18	2.19	2.20	2.21	2.22	2.23	2.24	2.25	2.26	2.27	2.28	2.29	2.30	2.31	2.32
Annex 1 and PAND TRO	01/06/2018								Applicability																						
Annex 2	Delivered PPAC P/17 (13-18/06) 06	Adoption		Effective																											
Annex 2 coming out of Annex 2 in special	Delivered PPAC P/17 (13-18/06) 06	Adoption		Effective																											
Annex 30 C2 (or Annex 30 RPA)	Delivered PPAC P/17 (13-18/06) 06	Adoption		Effective																											
Annex 30 RPA					Delivered								Delivered																		
Annex 6				Delivered		PP							PP	Adoption		Effective															
Annex 2 coming out of Annex 6 in special				Delivered		PP							PP	Adoption		Effective															
Annex 30 coming out of Annex 6 in special				Delivered		PP							PP	Adoption		Effective															
PAND-Q PR									Delivered				PP					PP													
Annex 32	Delivered PPAC P/19 (21-22/06)				Delivered			PP					PP	Adoption		Effective															
Safety Subregulation Manual													Delivered																		

RPA/Annex/Menu	Notes	2021				2022				2023				2024				2025				2026				2027				2028				
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4					
Annexings		PPAC P/17 (13-18/06) 06				PPAC P/18 (19-20/06)		PPAC P/19 (21-22/06)	04.1	PPAC P/20 (23-24/06) 04.1			PPAC P/21 (25-26/06)	06/2023??	PPAC P/22 (27-28/06)	PPAC P/23 (29-30/06)			PPAC P/24 (1-2/07)	PPAC P/25			PPAC P/26	PPAC P/27			PPAC P/28	PPAC P/29			PPAC P/30	PPAC P/31	04.2	PPAC P/32
AMC version		2.06	2.07		2.08	2.09	2.10	2.11	2.12	2.13	2.14	2.15	2.16	2.17	2.18	2.19	2.20	2.21	2.22	2.23	2.24	2.25	2.26	2.27	2.28	2.29	2.30	2.31	2.32	2.33	2.34	2.35	2.36	
Annex 30 C2 (or Annex 30 RPA)										Delivery		PP					PP							Adoption		Effective								
Manual 1 on C2 (or Annex 30 RPA)															Delivery																			
Annex 30 C2												PP					PP							Adoption		Effective								
Annex 30 RPA													PP											Adoption		Effective								
Annex 3												PP					PP							Adoption		Effective								
Annex 4												PP					PP							Adoption		Effective								
Annex 3A												PP					PP							Adoption		Effective								
Annex 32												PP					PP							Adoption		Effective								
PAND-Q PR												PP					PP							Approval										
PAND-Q PR												PP					PP							Approval										
EPAC Manual 1				Delivery																														
Annex 3A																																		
PAND-Q Annexes																								PP										
PAND-Q Annexes																								PP										
or endocrine Design Manual 1																																		
Supportive services Manual																																		
Support Manual 1																																		

Annex 19 Amendment 2 & SMM 5th Ed Timeline

YEAR	2020 - 2022	2023 - 2026
ICAO SM Provisions	<div> A19 Amdt 2 Proposal SMP endorsement <i>Q4 - 2021</i> </div>	<div> A19 Amdt2 Preliminary Review <i>Q1 - 2022</i> </div> <div> A19 Amdt2 Final Review <i>Q2 - 2023</i> </div> <div> A19 Amdt2 Adopted <i>Q1 - 2024</i> </div> <div> A19 Amdt2 Effective <i>Q3 - 2024</i> </div> <div> SMM 5thEd adv unedited <i>Q1 - 2024</i> </div> <div> SMM 5thEd published <i>Q3 - 2024</i> </div> <div> A19 Amdt2 Applicable <i>Q2/2026</i> </div>







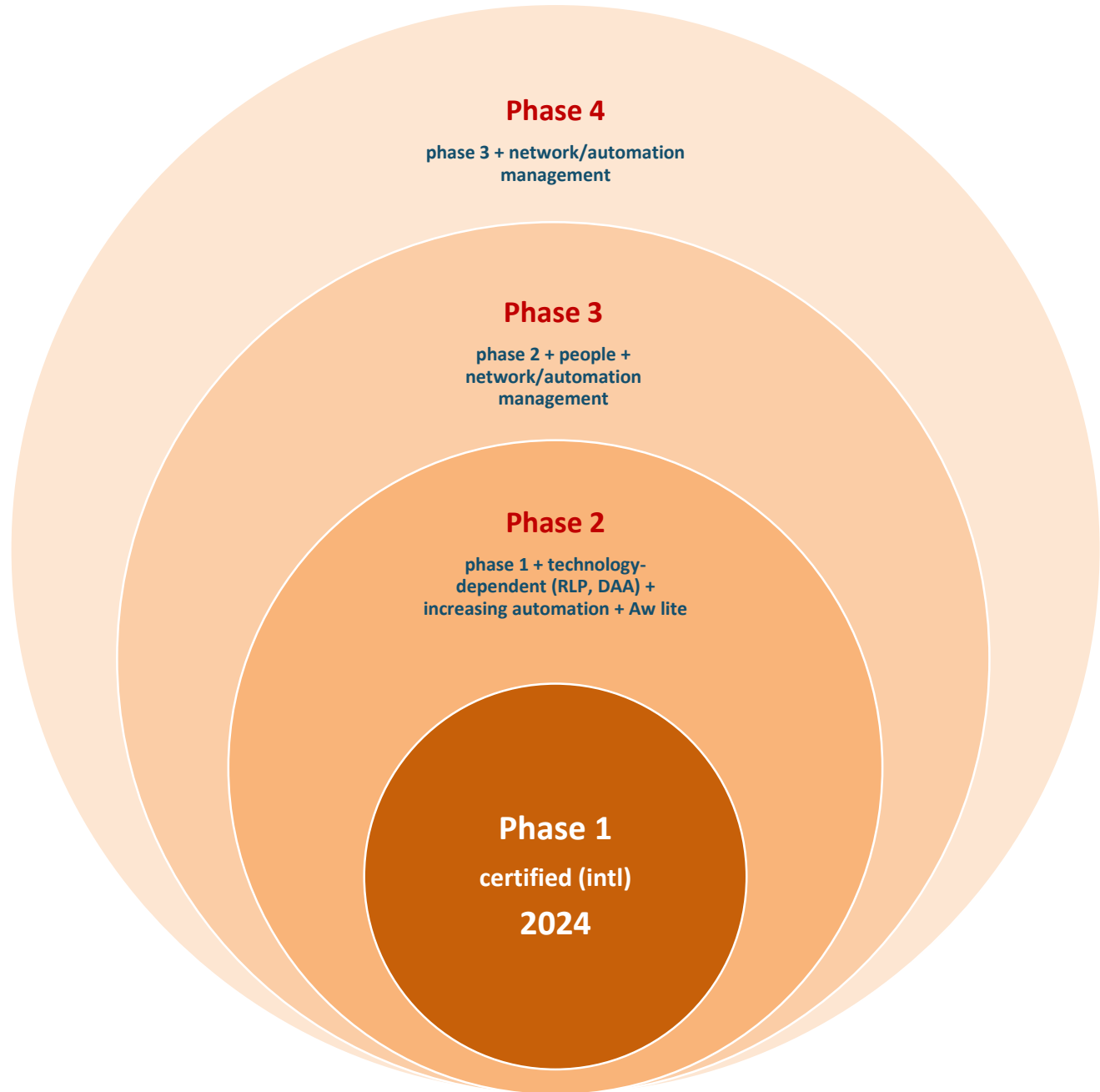
Where are we headed

17



Long-term strategic planning

- gradual introduction
- scalability
- State readiness
- technological readiness
- public acceptance

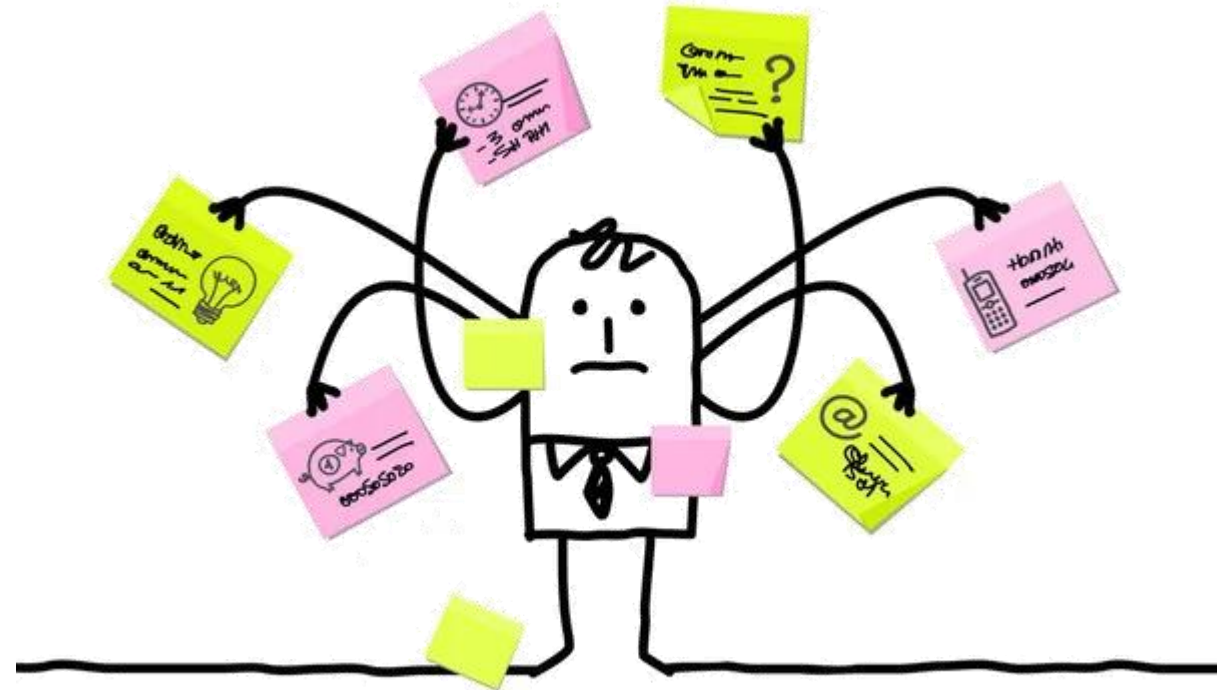


Considerations for the future

Everyone wants more!

Consider:

- Time,
- Resources,
- Money...
- Smaller UAS < 25KG
- Non-IFR
- Harmonizing cross border operations
- High seas
- Advanced Air Mobility



The Summary of Lessons

Divide the work...

International IFR RPAS

etc

Talk to EVERYONE

ICAO Panels

Implementing States

Industry

Stay in our lane...

Guard against scope creep

...And then divide it again

Annexes / PANS docs

Establish Trust

Asking is not getting

Past performance is proof

But keep an eye on other aspects.

Like cute kittens 😊

Q&A Time





Thank You!