



Joint Authorities for  
Rulemaking on Unmanned  
Systems

# **Specific Operation Risk Assessment as an Effective Tool to Authorize Drone Operations**

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# Baseline Documents Releases by JARUS

JARUS (Joint Authorities for Rulemaking on Unmanned Systems) is a voluntary global cooperation of **65+ aviation authorities** supported by an Industry Stakeholder Body

**JARUS OPS Cat B** is a model UAS regulation developed by WG Operations for a Specific Operations Category

**JARUS SORA** (Specific Operations Risk Assessment) is a development of WG-SRM

Download at [www.jarus-rpas.org](http://www.jarus-rpas.org)

# Specific UAS Operations Regulations

## What do Specific Regulations have in common?

- A risk assessment forms the basis of all further technical, organisational and training objectives for a drone operation.
- BVLOS operations, no upper weight limit for aircraft.

## What is the need?

- A standardised way of performing these Risk Assessments
- A common approach across countries to define and manage the hazards of drone operations

## What is the opportunity?

- Methodologies are out there and ready to use.
- Apply the methods and find out how they satisfy your needs!

# SORA Basics

## SORA

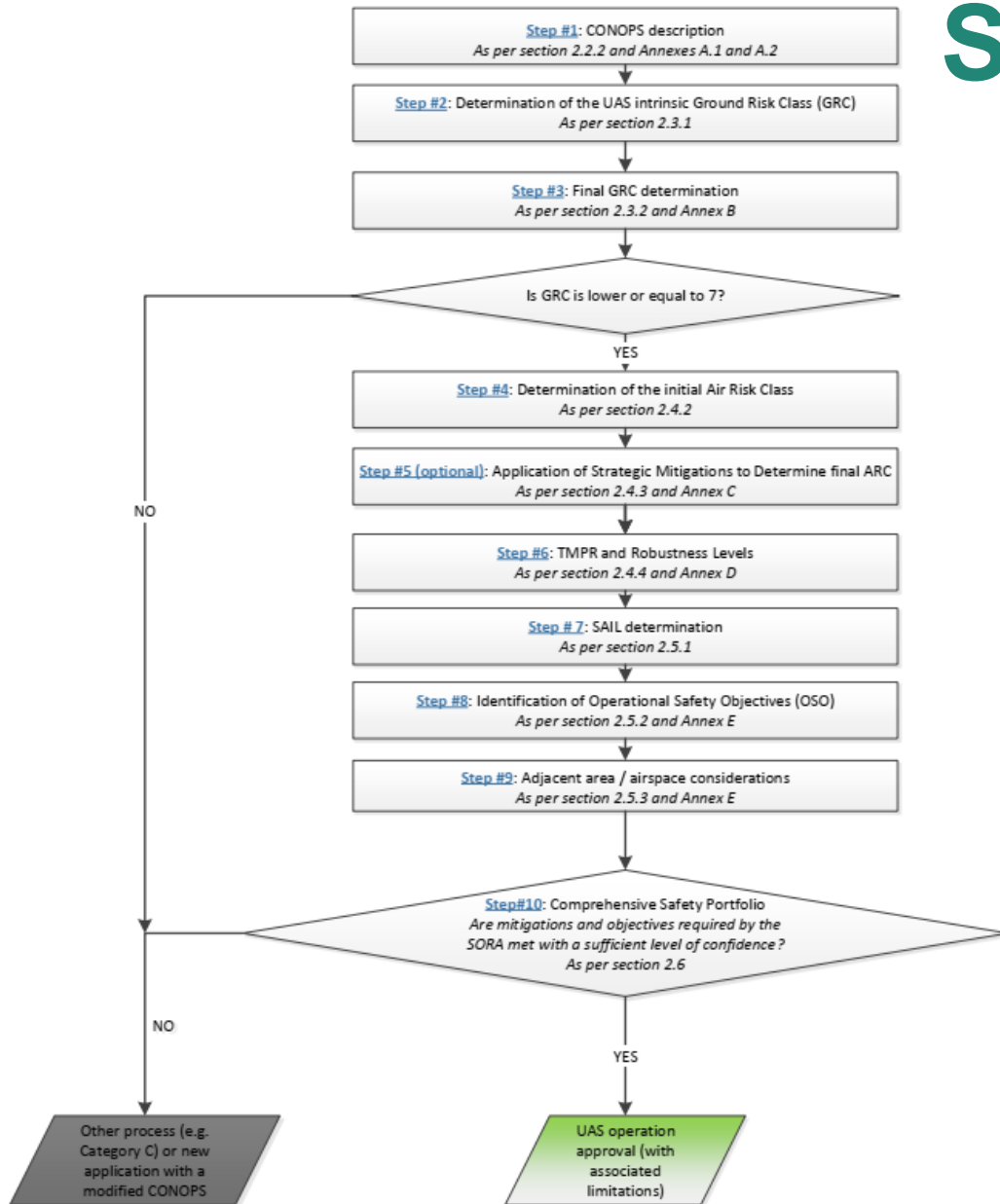
... stands for “Specific Operation Risk Assessment”

... provides a method to classify the risk properties of an individual drone Concept of Operations

... analyzes risk to third parties on the ground (Ground Risk Class) and in the air (Air Risk Class)

... derives an overall operation risk classifier (SAIL, Specific Assurance and Integrity Level)

... driven by SAIL specifies Technical, Operational and Training Safety Objectives



# Risk Assessment by Look-Up Tables and Flow Charts

## Charts

Intrinsic UAS Ground Risk Class				
Max UAS characteristics dimension	1 m / approx. 3ft	3 m / approx. 10ft	8 m / approx. 25ft	>8 m / approx. 25ft
Typical kinetic energy expected	< 700 J (approx. 529 Ft Lb)	< 34 KJ (approx. 25000 Ft Lb)	< 1084 KJ (approx. 800000 Ft Lb)	> 1084 KJ (approx. 800000 Ft Lb)
Operational scenarios				
VLOS/BVLOS over controlled ground area	1	2	3	4
VLOS in sparsely populated environment	2	3	4	5
BVLOS in sparsely populated environment	3	4	5	6

VLOS in populated environment
BVLOS in populated environment
VLOS over gathering of people
BVLOS over gathering of people

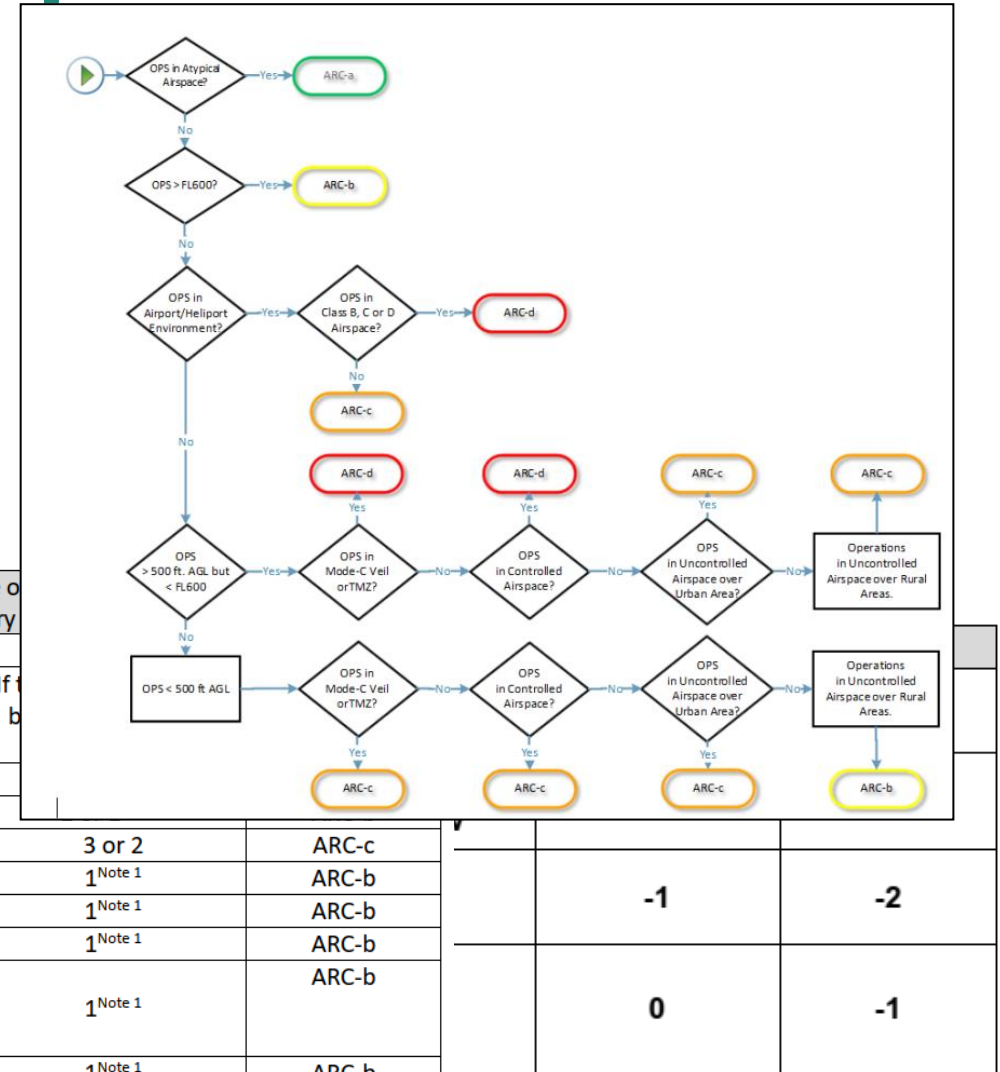
Final GRC	SAIL Determination			
	Residual ARC			
	a	b	c	d
≤2	I	II	IV	VI
3	II	II	IV	VI
4	III	III	IV	VI
5	IV	IV	IV	VI
6	V	V	V	VI
7	VI	VI	VI	VI
>7	Category C operation			

The density rating of manned aircraft, assessed on a scale of density and 5 representing a very

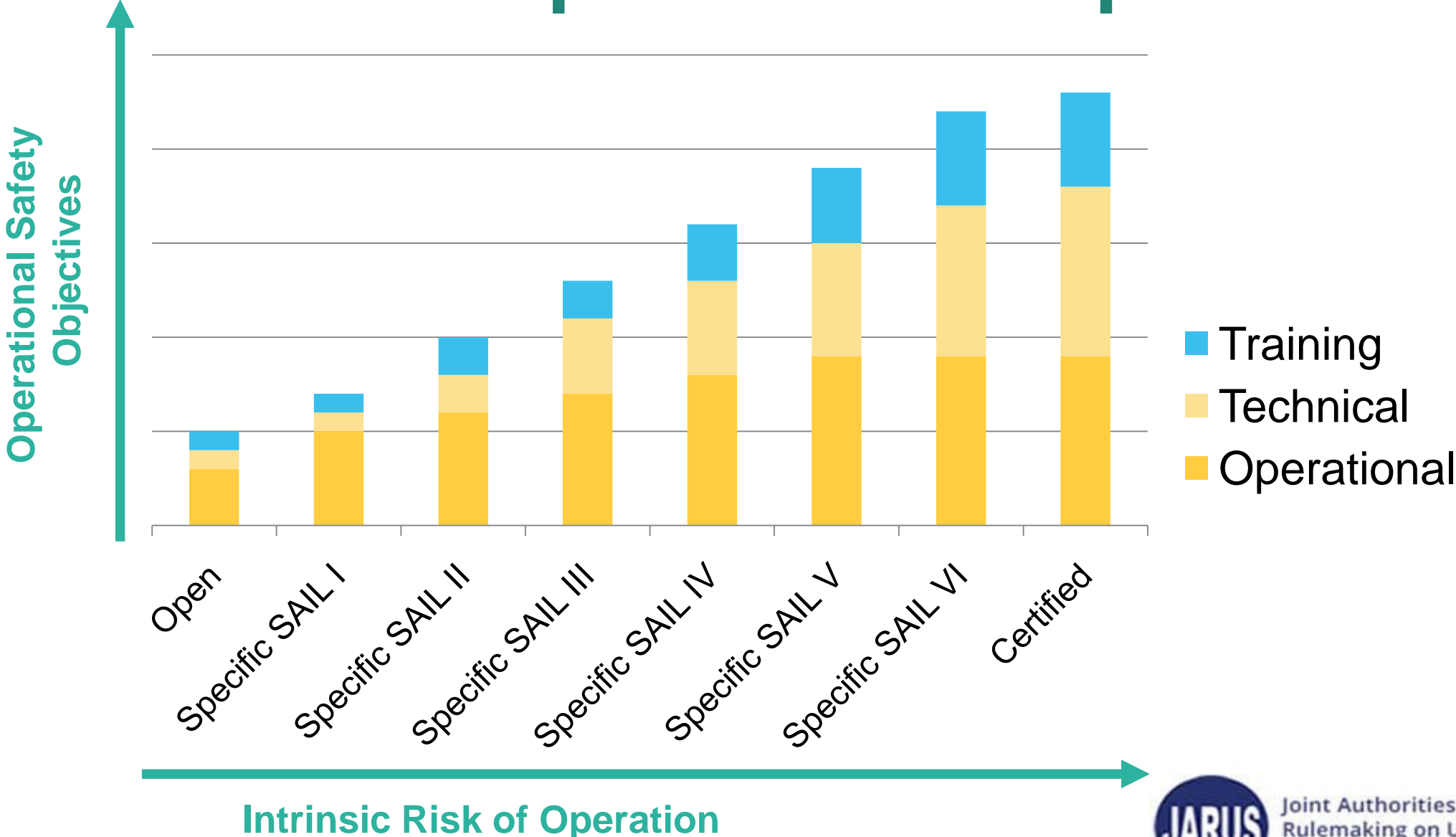
Column	A	B
AEC	Initial Generalised Density Rating for the environment.	Initial ARC
AEC 1 or; AEC 2	5	ARC-d
AEC 3	4	ARC-d
AEC 4	3	ARC-c
AEC 5	2	ARC-c
AEC 6 or; AEC 7 or; AEC 8	3	ARC-c
AEC 9	2	ARC-c

Note 1: The reference environment for assessing density is AEC 10 (OPS <500ft AGL over rural areas).

AEC10 and AEC 11 are not included in this table as any ARC reduction would result in ARC-a. An operator claiming reduction to ARC-a must demonstrate that all requirements defining Atypical or Segregated Airspace of Annex G, section 3.20(d) have been met.



# The SORA / Specific Risk Space



# SORA use across the world

## SORA 2.0 was released in 2019

Adopted by many aviation authorities (e.g. EASA, Transport Canada, CAAC, CASA Australia, Indonesia, ...)

EASA version of JARUS SORA is close to the original

Compatibility between SORA countries will allow cross-border operations in the future!

- Common market for manufacturers to meet SORA airworthiness requirements
- Common market for operators to provide global services.

# SORA development next steps

## SORA 2.5 is the next major release (2023)

- Includes a supporting mathematical ground risk model (Annex F)
- Major modifications to enable a better usability by improving wording and document organisation
- Corrections of exaggerations and inaccuracies in certain use cases

## SORA 3.0 (2024-2025)

- Focus on a more accurate air risk model, enabling better airspace integration
- Further improvements on usability
- Addition of implementing recommendations for authorities



# Summary

## **SORA...**

**... provides a common language and framework between operators and authorities**

**... standardizes the risk assessment for Specific UAS operations**

**... provides interfaces to ATM and UTM airspace management**

**... provides a risk classification framework for all sizes of aircraft and all airspaces**

**... effectively helps to bridge the gap between Open and Certified Operations Category**

**... will be constantly updated to reflect lessons learned**

**... plays a central role in simplifying cross border operations**