



SORA: The good, the bad and the ugly

Basics of SORA: Specific Operations Risk Assessment

There are a lot of methods to allow or disallow a drone flight. SORA was developed as a process to estimate the risk of an operation and have Input to a risk-based authorization process.

Specific Operations

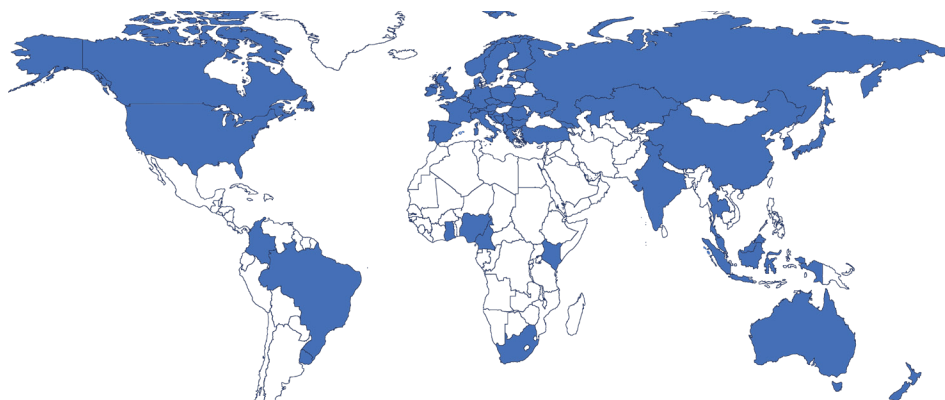
SORA delivers an output for a specific operation: A set of one or more flights with similar operational parameters (flight path, environment, ...)

Risk Assessment

SORA output is a numerical value (SAIL, Safety Assurance and Integrity Level) that is an estimation of the risk an operation poses to people and aircraft

How did SORA come to be?

- SORA is a recommendation by JARUS (Joint Authorities for Rulemaking on Unmanned Systems)
- JARUS has no binding authority – voluntary adoption by National Aviation Authorities (esp. EU, Canada, Australia, Malaysia, Brazil, some others)
- JARUS functionally led by EU countries NAAs, US FAA and CAAC

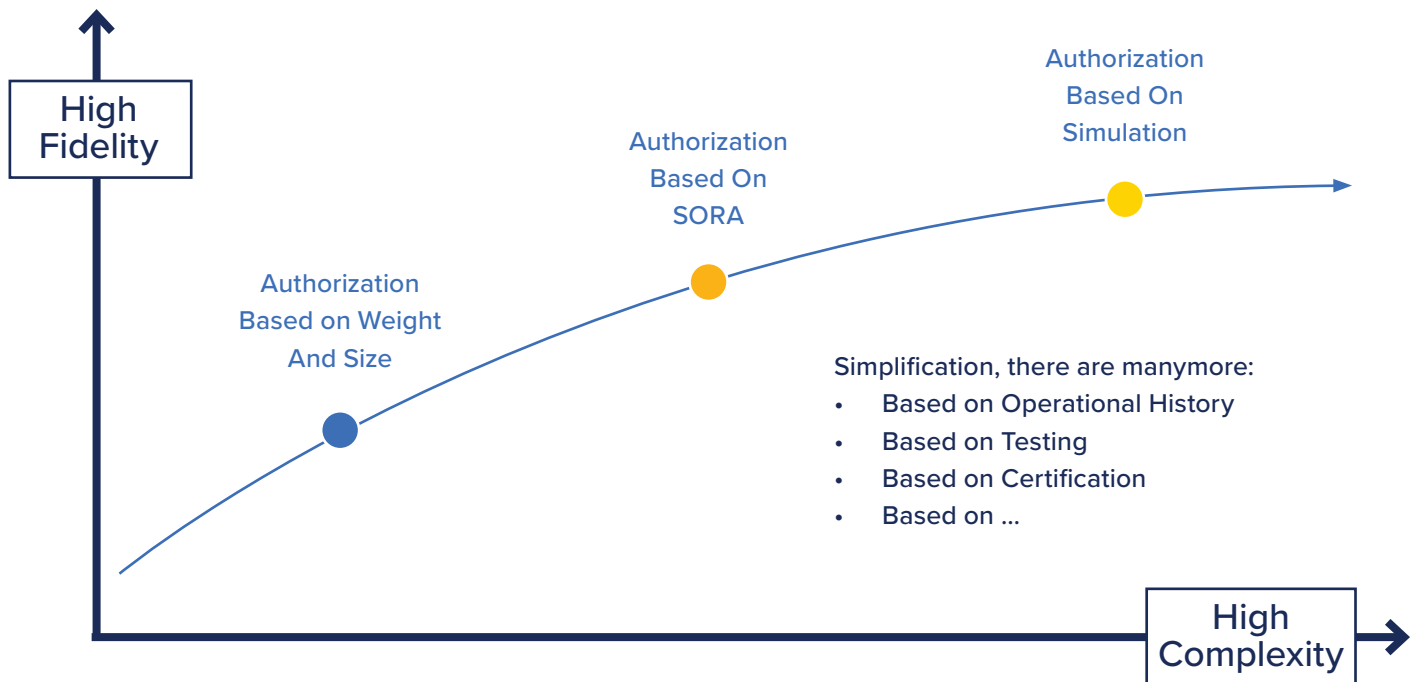




The SORA process (simplified)



How can you estimate risk in general?

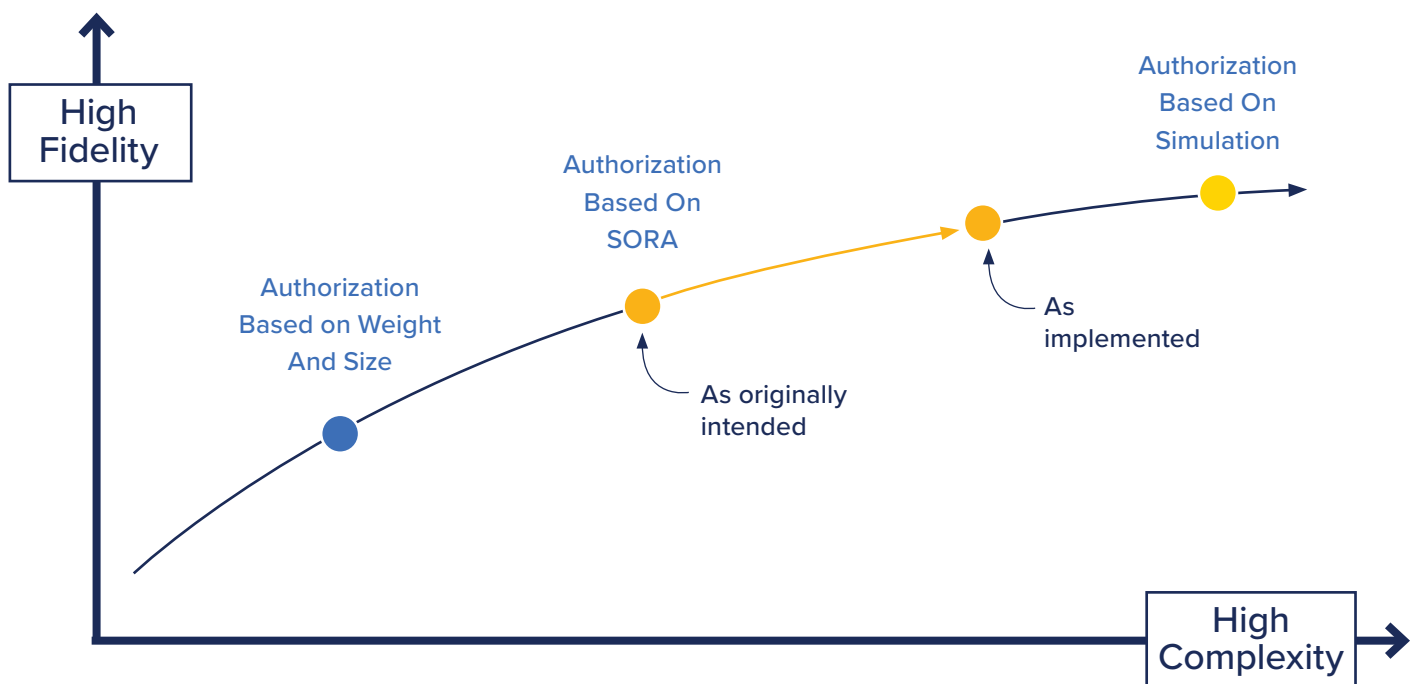




SORA: The Good

- On a high-level the steps of SORA are what you need to estimate operational risk – no more, no less
- Flexibility allows very complex missions
- Small drones, large drones, VLOS, BVLOS, (a)typical airspaces, ...
- Enhances safety for less experienced operators as they are guided through a structured process
- Transparent both for the authority and the applicant, more of a guided discussion than a real application in some countries

How can you estimate risk in general?





SORA: The bad

- High amount of specialists needed to cope with applications on authority side
- No ramp-up for applicants, successful operational history not part of the process
- Same base process but large differences in implementation (globally, within the EU & even within some countries)
- Flexibility leads to complexity, even for lower risk operations: time-consuming and resource-intensive process (applications even for simple operations can easily reach 50 pages)

SORA: The ugly

- Risk scale in practice is not well used: SAIL I – VI but even after 4 years only 1 SAIL III operation in Germany
- P9: Tools intended to speed up process (Pre-defined Risk Assessments, Standard Scenarios) not as functional & convenient as intended
- Some operations that have been flown without incidents not economically possible anymore
- Based on as of yet unverified assumptions and mathematical models
- Complexity hides uncertainty: Simple systems are inherently safe – complexity may hide risks instead of uncovering them

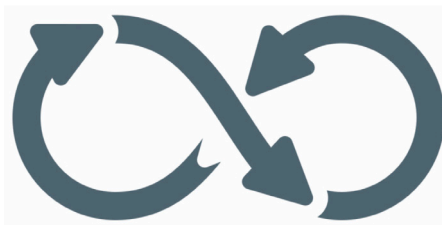


First authorized SAIL III operation in Germany by Koerschulte

Let's take one step back

- SORA is, in its core, a good process but has evolved into high complexity
- Long-term in Europe NAAs want >90% of complex operations to use Pre-Defined Risk Assessments (first results unpromising)
- Operations with higher complexity may need a complex risk estimation to match, but process complexity should match operational complexity – and be applied iteratively instead of at once:

Risk
Approximation



Risk
Verification



What do we want to achieve with SORA?

- ✓ We want to keep risk at acceptable levels.
- ✓ Within Wakanda Beyond, multiple ways of authorization have been discussed.
- ✓ Safety by design, even for authorization processes.
- ✓ Away from people & at altitudes where no other aircraft fly – authorization necessary?
- ✓ Strategic deconfliction through drone corridors, vertical separation, mandatory transponderschemes.
- ✓ SORA may still be used for new applicants or highly complex (risky) missions but it should not be the one tool to rule them all.

Points for consideration

- What are core strengths of SORA?
- Are there are situations where SORA should be used?
- Are there situations where an alternative approach is more efficient?
- What is the balance between approximation and demonstration of safety?
- What are signs that an authorization process works well,
 - from an authority point of view?
 - from an operator point of view?
 - from a societal point of view?