

Anlage – SORA – zum Antrag Betriebsgenehmigung

(SORA gem. AMC 1 zu Artikel 11)

Attachement – SORA - Application for operational authorization

(SORA acc. to AMC 1 Article 11)

1 Ground Risk Class

1.1 Bodenrisiko - Intrinsic UAS ground risk class (GRC)				
UAS	1m <700J	3m <34kJ	8m <1084kJ	> 8m >1084kJ
Betriebsbereich <i>Area of Operation</i>				
VLOS/BVLOS controlled ground area	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>
VLOS sparsely populated area	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
BVLOS sparsely populated area	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
VLOS populated area	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	8 <input type="checkbox"/>
BVLOS populated area	5 <input type="checkbox"/>	6 <input type="checkbox"/>	8 <input type="checkbox"/>	10 <input type="checkbox"/>
VLOS assembly of people	7 <input type="checkbox"/>			
BVLOS assembly of people	8 <input type="checkbox"/>			

Typische kinetische Energie bei Einschlag <i>Typical kinetic energy expected</i>	kJ + Formel (<i>kJ+employed formula</i>)
Anmerkungen zur Initial GRC und zum Betriebsbereich am Boden <i>Remarks</i>	

1.2 Risikominimierungsmaßnahmen Boden - Mitigations for final GRC determination			
Maßnahme (Mitigation)	(Robustness)	Angewendete Maßnahmen und Verfahren <i>List the specific mitigations</i>	Referenz im OM <i>Cross-Reference</i>
M1 Strategic mitigations for ground risk	<input type="checkbox"/> None 0 <input type="checkbox"/> Low -1 <input type="checkbox"/> Medium -2 <input type="checkbox"/> High -4		
M2 Effects of ground impact are reduced	<input type="checkbox"/> Low 0 <input type="checkbox"/> Medium -1 <input type="checkbox"/> High -2		
M3 An emergency response plan (ERP) is in place	<input type="checkbox"/> Low +1 <input type="checkbox"/> Medium 0 <input type="checkbox"/> High -1		

1.3 Final GRC	
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2 Air Risk

2.1 Betroffene Lufträume <i>Airspaces</i>	<input type="checkbox"/> G <input type="checkbox"/> E	<input type="checkbox"/> C
2.2 Betroffene Flugplätze im OPS Volume oder angrenzend <i>airports/heliports in the operation environment</i>	<u>ICAO-Kennung / Identifier im OPS Volume</u>	<u>ICAO-Kennung / Identifier angrenzend (adjacent to the ops volume)</u>
2.3 Initial ARC (sh. AMC 1 zu Artikel 11 Nr. 2.4.2. Figure 4 — ARC assignment process)	<input type="checkbox"/> ARC-a	<input type="checkbox"/> ARC-b
2.4 Strategische Minimierungsmaßnahmen (gem. Annex C geografisch, zeitlich, exposure) List the operational restrictions and air risk strategic mitigations and a cross-reference to the appropriate chapter and page(s) in the OM.	<u>Maßnahmen (specific mitigations)</u>	<u>Referenz im OM (Cross-Reference)</u>
	<input type="checkbox"/> ARC-c	<input type="checkbox"/> ARC-d

<p>2.5 Betriebsabsprache mit ANSP / Flugplatz falls zutreffend <i>consultation ANSP / airport operator (if applicable)</i></p>	<p><u>Maßnahmen / Absprachen(<i>specific mitigations</i>)</u></p>	<p><u>Referenz im OM</u> <u>(<i>Cross-Reference</i>)</u></p>
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<p>2.6 Residual ARC</p>	<p><input type="checkbox"/> ARC-a</p>	<p><input type="checkbox"/> ARC-b</p>	<p><input type="checkbox"/> ARC-c</p>	<p><input type="checkbox"/> ARC-d</p>
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VLOS / EVLOS [2.7] oder BVLOS [2.8]

2.7 VLOS - EVLOS	VLOS <input type="checkbox"/>	EVLOS <input type="checkbox"/>	Referenz im OM Cross-Reference
2.7.1 De-confliction Scheme Checklisten, Verfahren, die angewendet werden, um bemannten Luftverkehr auszuweichen.	<u>Maßnahmen (specific mitigations)</u>		
2.7.2 Ergänzende Maßnahmen z. B. ADS-B Receiver/Transmitter, FLARM Receiver/Transmitter, Anticoll. Light, Flightradar24 etc. <i>Additional mitigations</i>	<u>Maßnahmen (specific mitigations)</u>		
2.7.3 EVLOS - Kommunikationsverfahren zwischen Pilot:in + Beobachter:innen <i>Procedures for communication between RP and Observers</i>			

2.8 BVLOS OPS only!

2.8 BVLOS -TMPR Level (gem. Annex D)	n/a <input type="checkbox"/>	low <input type="checkbox"/>	medium <input type="checkbox"/>	high <input type="checkbox"/>	Referenz im OM Cross-Reference
2.8.1 Detection Volume	Altitude: _____ m - _____ m von (lower limit) bis (upper limit)		Horizontal Radius: _____ m		

BVLOS - OPS

TMPR-Tabelle	Angaben gem. Annex D <i>Criteria acc. Annex D</i>	Umsetzung <i>Implementation</i>	Referenz im OM <i>Cross-Reference</i>
2.8.2 Detect	<u>TMPR Criteria</u>		
	<u>Level of integrity</u>		
	<u>Level of assurance</u>		

2.8.3 Decide	<u>TMPR Criteria</u>		
	<u>Level of integrity</u>		
	<u>Level of assurance</u>		

2.8.4 Command	<u>TMPR Criteria</u>		
	<u>Level of integrity</u>		
	<u>Level of assurance</u>		

2.8.5 Execute	<u>TMPR Criteria</u>		
	<u>Level of integrity</u>		
	<u>Level of assurance</u>		

2.8.6 Feedback Loop	<u>TMPR Criteria</u>		
	<u>Level of integrity</u>		
	<u>Level of assurance</u>		

3 Sail (specific assurance and integrity level)

3.1 Final GRC	
3.2 Residual ARC	<input type="checkbox"/> Arc-a <input type="checkbox"/> Arc-b <input type="checkbox"/> Arc-c <input type="checkbox"/> Arc-d
3.3 SAIL Level	<input type="checkbox"/> I <input type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV <input type="checkbox"/> V <input type="checkbox"/> VI

SAIL determination				
Final GRC	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			

4 Angrenzende Gebiete (adjacent areas)

Nur auszufüllen, wenn zutreffend (specify only if applicable)!

4.1 Angrenzende Gebiete an das OPS Gebiet <i>Adjacent Areas</i>	<input type="checkbox"/> Menschenansammlungen <i>Assemblies of people</i> <input type="checkbox"/> Arc-d
4.2 OPS Volume befindet sich in dicht besiedeltem Gebiet <i>(OPS Volume in populated area)</i>	<input type="checkbox"/> M1 – Minimierung angewendet <i>M1 – Mitigation has been applied</i> <input type="checkbox"/> OPS in controlled ground area

Wurde eine Checkbox angeklickt werden weitere technische Anforderungen an das UAS (enhanced containment) gestellt.

4.3 Enhanced containment	<u>Umsetzung (Implementation)</u>	<u>Referenz im OM (Cross-Reference)</u>

5 Operational Safety Objectives (OSOs)

OSO #	Robustness				Angaben gem. Annex E <i>Criteria acc. Annex E</i>	Umsetzung <i>Implementation</i>	Referenz im OM <i>Cross-Reference</i>
	O	L	M	H			
1 Ensure the UAS operator is competent and/or proven	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Level of integrity</u>		
					<u>Level of assurance</u>		

2 UAS manufactured by competent and/or proven entity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Level of integrity</u>		
					<u>Level of assurance</u>		

3 UAS maintained by competent and/or proven entity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Level of integrity</u>		
					<u>Level of assurance</u>		

<u>4</u> UAS developed to authority recognised design standards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Level of integrity</u>		
					<u>Level of assurance</u>		

5 UAS is designed considering system safety and reliability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Level of integrity</u>		
					<u>Level of assurance</u>		

6 C3 link performance is appropriate for the operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Level of integrity</u>		
					<u>Level of assurance</u>		

7 Inspection of the UAS (product inspection) to ensure consistency with the ConOps	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Level of integrity</u>		
					<u>Level of assurance</u>		

<p>8 / 14 / 21</p> <p>Operational procedures are defined, validated and adhered to</p> <p>11</p> <p>Procedures are in-place to handle the deterioration of external systems supporting UAS operations</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p><u>Level of integrity</u></p>		
					<p><u>Level of assurance</u></p>		

<p><u>9 / 15</u> Remote crew trained and current and able to control the abnormal situation</p> <p><u>22</u> The remote crew is trained to identify critical environmental conditions and to avoid them</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Level of integrity</u>		
					<u>Level of assurance</u>		

<p>10 Safe recovery from a technical issue</p> <p>12 The UAS is designed to manage the deterioration of external systems supporting UAS operations</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Level of integrity</u>		
					<u>Level of assurance</u>		

13 External services supporting UAS operations are adequate for the operation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Level of integrity</u>		
					<u>Level of assurance</u>		

16 Multi-crew coordination	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Level of integrity</u>		
					<u>Level of assurance</u>		

17 Remote crew is fit to operate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Level of integrity</u>		
					<u>Level of assurance</u>		

18 Automatic protection of the flight envelope from human error	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Level of integrity</u>		
					<u>Level of assurance</u>		

19 Safe recovery from human error	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Level of integrity</u>		
					<u>Level of assurance</u>		

20 A human factors evaluation has been performed and the human machine interface (HMI) found appropriate for the mission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Level of integrity</u>		
					<u>Level of assurance</u>		

23 Environmental conditions for safe operations are defined, measurable and adhered to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Level of integrity</u>		
					<u>Level of assurance</u>		

24 UAS is designed and qualified for adverse environmental conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Level of integrity</u>		
					<u>Level of assurance</u>		