



SURVEY ON EUROPEAN UAS OPERATIONS & OPERATION RISK ASSESSMENT METHODS

CONCLUSIONS



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Acknowledgement: The survey respondents indicated in Annex 1 are wholeheardedly thanked for their contributions.

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SCOPE & PURPOSE

The objective of the UAS OPS and OPS RISK surveys is to:

- Consult only European drone operators (ECAC countries) conducting flight missions in order to increase the validity & pertinence of the results.
- Identify the European drone operator community to the regulatory and standards communities, as well as to itsself.
- Apply an operation centric approach (not make a distinction between on the drones used based on airframe type, size, mass, or propulsion).
- Identify the drone operators by:

a) Category of operation: Commercial and/or non-commercial

b) Type of operator: Corporate entity: Drone manufacturer & operator

Drone operator Flight school

Research organisation

Test & demonstration site management

U-Space service provider

Governmental entity: Drone operator

Drone research organisation

Academia

Non-governmental entity (NGO)

- Identify the market sectors where non-military drone operations are currently taking place (25 selections proposed).
- Identify the flight missions currently being conducted (33 selections proposed).
- Concentrate on flight missions with the following operational parameters:
 - a) VLOS, EVLOS & BVLOS
 - b) Flight Altitude: < 500 ft
 - c) Over densely and/or sparsely polpulated areas.
- Identify the evolution of the market sectors and the flight missions that are anticipated to take place in the near term (1 to 2 years starting on 1st January 2021).
- Indicate in which market sectors and for which flight missions BVLOS operations are anticipated to start or grow (and will require the application of operation risk analysis).
- Make a high level evaluation of the current comprehension and use of operation risk analysis methods.
- Based on the aforementioned points, identify & engage the drone operators with the expertise required to make a more
 detailed evaluation of the current use of SORA, and identify possibly associated difficulties, bottlenecks and gaps.
- Obtain information permitting to confirm the usefulness of the AW Drones "Open Standards Repository".
- Contribute to promoting awareness of the AW Drones Project with the European Drone Operator community.

	Overv	riew of the Scope & Purpose of the UAS OPS & OPS RISK	Surveys		
Designation	Applicability	Activity	Operation Parameters		
UAS OPS	Current Situation	Identify the market sectors where drone flight operations are currently taking place.	Control Distance: VLOS, EVLOS, BVLOS	D	E
	(in compliance with applicable regulation)	Identify the mission purposes of the flight operations currently taking place.	Flight Altitude: Below 500 ft (150 m)	r o n e	C A C
	Near Future 1-2 years	Identify the market sectors where drone flight operations that are anticipated to take place (new EU drone regulation).	above ground level Overflown Areas:	O p e	C o u
	Starting 1 Jan. 2021	Identify the mission purposes of the drone flight operations that are anticipated take (new EU Drone regulation).	Densely or sparsely populated areas		n t r
		high level feedback on current use of risk analysis f the respondents for participation in the OPS RISK Survey.	methods permitting the	o r s	e s
OPS RISK		etailed feedback on the current use of SORA / Standard Scend identify difficulties, bottlenecks & gaps.	narios / Predefined Risk		





UAS OPS SURVEY

RESPONDENTS

Total Quantity	247 from 22 countries
Countries (in order of quantity of respondents - between brackets)	France (64) Belgium (34) Germany (34) Netherlands (30) Spain (23) Italy (13) Switzerland (10) UK (10) Ireland (7) Poland (5) Finland (3) Austria (2) Slovakia (2) Ukraine (2) Bulgaria (1) Denmark (1) Estonia (1) Greece (1) Lithuania (1) Portugal (1) Romania (1) Serbia (1)
Quality	Drone Operator (nominally identified)
Category	Commercial Operators 188 Non-Commercial Operators 59
Туре	Corporate Entities (6 sub-types) 216 Governmental Entities 12 Research Organisation 5 Association Federation, Union, TechCluster 6 Academia 8

CURRENT SITUATION

GENERAL

- 1 Drone operations are taking place in all proposed Market Sectors (except "Policy Compliance & Obtaining Legal Proof").
- 2 All proposed Flight Missions are taking place.
- See Tables 1 4 & Graphs 1 & 3 in the Annex 2.

COMMENTS

Market Sectors

- 1 The 10 out of 25 Market Sectors with the highest drone activity represent 86% of the total.
- 2 The 10 out of 25 Market Sectors with the lowest drone activity represent 6% of all conducted operations.

Flight Missions

- 1 All proposed Flight Missions are taking place.
- 2 The 10 principal Flight Missions represent 68% of the total of all possible flight missions.

Flight Envelopes

- 1 VLOS & EVLOS flights represent 59% of all flight missions.
- 2 BVLOS flights (besides VLOS & EVLOS) represent 41% of all flight missions.

Flight Zones

1	Flight missions flown only over densely populated areas	9%
2	Flight missions flown only over sparsely populated areas	45%
3	Flight missions over densely & sparsely populated areas	46%

CONCLUSIONS

- 1 The replies demonstrate a wide recognition of the perceived potential benefits of drone use (*commercial* & *non-commercial*) by corporate and governmental operators.
- 2 The replies are indicative of an immature & budding market and illustrate the Market Sectors where drone-related job creation is starting to taking place.





NEAR-FUTURE (1-2 YEARS)

GENERAL

- 1 It is anticipated that drone flight operations will be conducted in all proposed Market Sectors.
- 2 All proposed Flight Missions will be taking place.
- See Tables 5-8 & Graphs 2 & 4 in the Annex 2.

Principal Market Sectors - Evolution

		Current Near-Future Growth			Other Growth Sectors		
1	Construction & Real Estate	13,31%	9,77%	-27%	Heritage Site & Historical		
2	Maintenance (All sectors)	11,94%	11,92%	stable	Monument Managementt	+ 63%	
3	Aerial Photography, Audio-Visual				Insurance	+ 17%	
	Production, Advertising	11,63%	12,09%	+ 4%	Miscellaneous - Air Show	+ 9%	
4	Security & Law Enforcement	8,11%	8,10%	stable	Policy Compliance &		
5	Research & Science	7,39%	8,02%	+ 9%	Obtaining Legal Proof	+100%	
6	Agriculture, Fishery, Forestry	6,85%	8,61%	+25%	Remote Ops - Non-Sensing	+ 23%	
7	Public Services & Safety	6,56%	6,29%	- 4%	Remote Ops - Sensing	+ 20%	
8	Environmental Protection &				Transport	+ 53%	
	Wildlife Conservation	6,15%	5,10%	-17%	Utility Companies	+ 16%	
9	Flight Training / Instruction	5,43%	6,06%	+12%			
10	Cinema & TV Industry	4,27%	3,23%	-24%			
	Mining & Exploration	3,84%	3,37%	-12%			
	Total	85,48%	82,56%				

Principal Flight Missions - Evolution

		0	Name France		011 0	4	
		Current	Near-Futu	re Growth	Other Growth Sectors		
1	Aerial Photography &				Deterring	+ 85%	
	Film/Video Footage	14,48%	12,49%	-14%	Dispensing	+ 19%	
2	Inspection	11,16%	10,59%	- 5%	Identification	+ 19%	
3	Surveying	7,12%	7,10%	Stable	Search & Rescue	+ 33%	
4	Monitoring	6,75%	7,53%	+12%	Sky Painting	+123%	
5	Observation	5,60%	5,48%	- 2%	Sky Writing	+ 61%	
6	Localisation	5,51%	5,79%	+ 5%	Special Purpose	+ 8%	
7	Measuring	5,26%	5,62%	+ 7%	Spraying	+294%	
8	Testing	5,21%	4,73%	- 9%	Transport - Goods	+ 39%	
9	Broadcasting	3,73%	2,73%	-27%	Transport - Persons	+ 38%	
10	Validation	3,31%	4,35%	+31%	Water Bombing	+100%	
	Mapping	2,91%	3,47%	+19%			
		Total 71	,04%	69,88%			

COMMENTS

Market Sectors

- 1 It is anticipated that the percentage of drone flight operations taking place in the 10 principal current Market Sectors will decrease from 86% to 79%, which indicates that there is more activity in the other Market Sectors.
- 2 "Aerial Photography, Audio Visual Production, Advertising" has exchanged first position with "Construction & Real Estate". "Mining & Exploration" has replaced "Cinema & TV Industry" in the tenth position.
- 3 The activity volume in the following Market Sectors is anticipated to change as indicated:

 Maintenance Stable

Construction & Real Estate»

 Agriculture, Fishery, Fish Farming, Forestry + 26% Security & Law Enforcement» Research & Science + 9%

Public Services & Safety» Stable

Flight Training & Instruction»

+ 12%

Environmental Protect. & Wildlife Conserv. - 17%

Flight Missions

- 1 The quantity of flight missions represented by the top ten is anticipated to remain stable.
- 2 The designation of the anticipated ten most conducted flight missions is relatively stable. However, it is foreseen that "Broadcasting" will be replaced by "Mapping".

Flight Envelopes

It is anticipated that the quantity of operators conducting operations with the following Flight Envelopes will change as indicated:





- 26%

Stable

Only VLOS - 44%
 VLOS & EVLOS + 17%
 Only EVLOS - 12%
 Only BVLOS + 16%
 EVLOS & BVLOS - 15%

VLOS & EVLOS & BVLOS + 66%

Flight Zones

- 1 The quantity of drone operators concentrating on operations over densely populated areas is anticipated to remain stable.
- 2 Logically, the anticipated decrease (- 27%) of drone operators concentrating only on flight operations over sparsely populated areas will translate into an increase (+ 27%) of drone operators conducting operations over <u>both</u> densely and sparsely populated areas.

CONCLUSIONS

- 1 The survey respondents anticipate an evolution from VLOS & EVLOS flights to BVLOS flights (61%), but VLOS & EVLOS flights will continue to be of interest for a significant number of applications (39%).
- 2 Consequently, the use of safety risk analysis methods will become increasingly important to a steadily growing number of drone operators.
- 3 This increase in BVLOS flights will create an increase in demand for services from flight training schools (+12%) and flight training sites.

SAFETY RISK ANALYSIS METHODS

GENERAL

See review of survey results in Table 9 in the Annex 2.

COMMENTS

- 1 The extistance of the SORA is generally known, but only 53% of the respondents indicate they have read SORA.
- 2 76% of the respondents indicate that they have read the English edition, and 24% indicate that they have read an edition translated into their national language.

 Note: The question should be asked if unreliable/inaccurate web-based translations have been used?.
- 3 36% of the respondents indicated that the SORA guidelines have been translated into their national language by their National Aviation Authority (NAA). However, consultation with the relevant NAAs has brought to light that none of them have translated the SORA guidelines into their native languages.
- 4 In most cases, the respondents obtained the SORA guidelines from a source other than EASA, JARUS or their NAA.
- 5 49% of the respondents indicate that they master the SORA terminology.
- 6 64% of the respondents state that they understand the SORA methodology.
- 7 35% of the respondents state they currently use SORA, but only 23% state they have submitted a SORA to their NAA.
- 8 The respondents currently carry out an operation safety risk assessment by means of:

A process approved by their NAA
 56%
 A national standard scenario
 12%

A Predefined Risk Assessment (PDRA)
 "Another method"
 23%

9 14% of the respondents use an independent third party to undertake their safety risk assessments, namely

Qualified Entities
 26%
 Notified Bodies
 3%

NAA-approved organisations/consultants 31%
 Organisations/consultants not approved by NAA (31%)

10 92% of all respondents indicated that an online tool to guide them through the establishment of a SORA would be of interest to them and 65% of them preferred to have this tool in their national language.

CONCLUSIONS

- 1 The SORA guidelines are currently only used by a relatively small minority of the European drone operators.
- 2 The knowledge of and experience with SORA permitted to qualify only 14% of the UAS OPS respondents to receive an invition to contribute to the OPS RISK survey. Only 8% actually completed the survey.
- 3 The use of risk assessment methods other than SORA (*e.g. nationally approved processes, national standard scenarios, predefined risk assessment*) currently has the preference of the majority of the drone operators.
- 4 The availability of the SORA guidelines in the national European national languages will, without any doubt, make the SORA methodology more accessible and understandable to many more operators, which would increase its use.
- 5 The current situation (SORA is only available in English no official nor courtesy translations have been made by any NAA) does not give the operators in each EU Member State an equal opportunity to understand and use the SORA guidelines, as the English language is not evenly mastered in all EU countries.





OPS RISK Survey

RESPONDENTS

Total Quantity	Invited: Replied:	Invited (after qualification): 34 (14% of the total) 20 (8% of the total) from 12 countries						
Countries (in order respondents - between	,	Poland 2 France 1 Germany 1 Ir	Bulgaria 2 reland 1 JK 1					
Quality		Drone Operator (nominally identified)						
Category			'5% !5%					
Туре		Corporate Entity - Drone Manufacturer & Operator Corporate Entity - Flight School Corporate Entity - Research 1	55% 5% 5%					
		Governmental Entity - Drone Operator 1	0%					

GENERAL

- 1 The very low amount of (*pre-qualified*) respondents (8% of the total) clearly indicates that SORA is not widely understood & used.
- 2 National Standard Scenarios (STS) and Predefined Risk Assessment (PDRA) and "other means" seem to be the preferred operation safety risk assessment methods.
- See Table 10 in the Annex 2.

COMMENTS

- 1 There is consensus amongst all respondents relative to the interest of having a Light UAS Operator Certificate (LUC).
- 2 85% of the respondents indicated being conversant in English and understanding the SORA terminology.
- 3 On average, 91% of the respondents indicated to be aware of the requirements in their country relative security, privacy & data protection, environmental protection, and the use of the radio frequency spectrum.
- 4 55% of the respondents have drawn up a ConOps, used national standard scenarios and conducted a SORA.
- 5 On average, 70% of the respondents indicate that they can conduct a SORA for each of their missions and are capable of applying GRC and ARC miligations.
 - Note: The respondents have a minimal understanding of the application of standards.
- 6 25% of the respondants have used a Predefined Risk Assessment, and only 10% have used an EU standard scenario.
- 7 20% of the respondents indicate that they can detect other aircraft in uncontrolled airspace.
- 8 80% of the respondents indicate that they report drone incidents.
- 9 Practically all respondents use third parties when required by the OSOs.
- 10 In the context of SORA, the respondents indicate use of the following standards:

EUROCAE	25%	ICAO	20%	EUROCONTROL	20%	ASD-STAN	15%	CEN	10%
ISO	10%	ANSI	5%	ETSI	5%	RTCA	5%	Other	40 %.

- 11 The responents indicate that they have experienced difficulties with the following:
 - Showing compliance with the safety objectives due to an absence of standards (or knowledge of the standards)
 - Operational Safety Objectives (OSOs)
 Strategic mitigations
 Technical information to be obtained from the drone manufacturer
 88%
- 12 The respondents indicated that their operations were associated with:

SAIL 1	20%	SAIL 2	40%	SAIL 3	25%	SAIL 4	5%
SAIL 5	5%	SAIL 6	5%	SAIL 7	5%	Not known	55%

13 The respondents indicated that they can currently demonstrate compliance up to the following levels:

SAIL 1 15% SAIL 2 35% SAIL 3 20% SAIL 4 20% SAIL 5 10% SAIL 6 5% SAIL 7 5% Not known **45%**





40%

CONCLUSIONS

- 1 Whereas English is the "lingua franca" of the European and international aviation community, this is not the case in the European drone operator community (constituted by a majority of micro companies & SMEs/SMIs). There are wide variations in the English language competencies between the drone operators in the EU Member States. This situation could lead to unequal opportunities for drone operators in different countries, which in turn could have a negative influence on the sector's job creation potential.
 - Note: The EU drone regulation does not impose a minimal level of English competency.
- 2 The possibility to access EU airspace should be equal for all qualified drone operators in all EU Member States. However, this is not the case when a large segment of the European drone operator community cannot grasp and comprehend the Acceptable Means of Compliance (AMCs) (e.g. SORA), because they have not been translated into the EU national languages. It is standard EASA procedure that the translation of AMCs into the national EU languages is left up to the discretion of the NAAs.
 - Note: If such documents are not made available to drone operators in their national languages, this could negatively impact the development of the EU drone market, as well as its job creation potential.
 - In an ideal situation, making the referred to documents available in the EU national languages would be taken on by the national drone associations, but unfortunately they lack the resources for this task.
- 3 The NAAs of the EU Member States do not have the resourses (and possibly, in some cases, the translators with the necessary competence) to undertake the task of translating AMCs, Guidance Material (GM) and other critical documents (e.g. the "Easy Access Rules for UAS") into their national language(s).
- 4 The same difficulty will arise concerning the access to and comprehension of the required standards, as most Standard Developing Organisations (SDOs) only publish standards in English.
- 5 In view of the aforementioned, it is anticipated that the use of independent third parties to conduct SORAs, and apply GRC mitigation & ARC mitigation strategies, will increase.
- 6 The aforementioned reinforces the potential for online tools (*in the EU languages*) to facilitate the safety risk analysis procedures for drone operators.
- 7 An additional reason for the anticipated increase in the demand for services by independent third parties (*Qualified Entities / Conformity Assessment Bodies / Notified Bodies*) is that the volume of work involved in the fields relative to Training, Airworthiness, Operations Manual qualification can only in some rare cases be taken on by the NAAs.
- 8 Currently, the actual use of standards is minimal. The necessity to use standards will increase with the increase of drone operations in the specific category. Independent third parties can be expected to have access to the required standards, which implies that their clients (*drone operators*) would not have to purchase the standards from the SDOs.
- 9 The identication by drone operators of the standards applicable (*partially or in their totality*) to a specific mission, is currently problematic for all drone operators in the context of:
 - Showing compliance with the safety objectives of a specific mission 40%
 - Operational Safety Objectives (OSOs)
 100%
 - Strategic mitigations 88%

Note: The standards applicable to the open category are currently expected by December 2021.

- 10 Obtaining the required technical information from drone manufacturers is currently problematic for most (88%) of the drone operators. Manufacturers simply do not answer requests, or refuse to give the information.
- 11 Practically all respondents indicate they have encountered difficulties with: Complying with OSOs
 - Strategic mitigations

- 12 On the average, 50% of the respondents do not know:
 - To what SAIL level their drone operations are associated.
 - Up to what SAIL level they can demonstrate compliance.
- 13 80% of the respondants consider that the detection of other aircraft in uncontrolled airspace (< 500 ft) is currently impossible.





Concluding Remarks

- 1 The drone operators expect drone flight missions to increase in all market sectors. This increase is principally foreseen for BVLOS missions in the specific category. To make this possible and maintain, if not increase, the current volume of jobs in these market sectors, the following will have to be improved:
 - Grasp and comprehension of the applicable operational risk analysis methods;
 - Availability & acceptance of: → Independent third parties; and/or
 - ♦ Online tools to facilitate the safety risk analysis procedures;
 - Availability & comprehension of the required standards;
 - Availability of the required technical information from the relevant drone manufacturers/ distributors;
 - Detection of other aircraft in uncontrolled airspace.
- 2 The AW Drones' "Drone Standards Information Portal" will facilitate the identification of applicable standards, which is going to be useful to:
 - English speaking drone operators, but also, and especially, for:
 - "Independent third parties" (Qualified Entities / Conformity Assessment Bodies / Notified Bodies), which will probably be growing in importance.





ANNEX 1

SURVEY RESPONDENTS (Contribbuting Operators)

@ye.filmsbretagne-vidéos.fr France Belgium Actibot Dany Starck Belgium Belgium Actibot Belgium Gomany Gomany Gomany Condrone by DProds Belgium Gomany				
Actua Drone France ALRA Energy Ireland Part Parace Parace AEA Energy Ireland Parace AEA Energy Ireland Parace Aeria Pictures France Aeria Pictures France Aeria Pictures Parace Aeria Pictures Denmark Aero Enterprise Austria Aeromedias France Aero-Rylvis France Picture Parace Aribus Defence and Space Aribus Defence and Spac	@ye.filmsbretagne-vidéos.fr	France	Dany Starck	Belgium
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Geo Infra	Netherlands	Realizacja Obrazu Marcin Kules	Poland
Geodron Solutions	Spain	Rijkswaterstaat	Netherlands
Georesearch Forschungsgesellschaft	Austria	Rijkswaterstaat	Netherlands
GEOsat	Germany	RM Drones	Spain
GeoTech	Belgium	Roberto Pavoni	Italy
GeoZICHT - Drone Projecten	Netherlands	Rohner Bedachungen & Spenglerei	Switzerland
Germandrones	Germany	Rotterdam Brands and more	Netherlands
Goldy Aviations	Belgium	RPAS Services	Netherlands
Gran Sasso Science Institute	Italy	Rusca	Italy
Grijs Groen Advies	Netherlands	Rutger Lamers Fotoreportages	Netherlands
HD for YOU	Belgium	SATS	Finland
Heijdens Karwei Producties	Netherlands	SBB CFF FFS - Swiss Federal Railways	Switzerland
Heliseo SAGL	Switzerland	Scandrone	France
Henri Coanda Labs	Italy	SDIS - Service Départemental	
Hit & Run	Belgium	d'Incendie et de Secours 11	France
Hivebotics	France	SDIS - Service Départemental	
Holding The Drones	Netherlands	d'Incendie et de Secours 58	France
Hubschrauberzentrum	Germany	Seateam Aviation	France
IAV	Germany	Securitas Belgium	Belgium
ID2MOVE	Belgium	Shetland Flyer Aerial Media	UK
ILT - Human Environment & Transport	_ 0.g.u	Siemens	Germany
Inspectorate	Netherlands	Silent Wings	Germany
Insensiv	Germany	Silesian Aviation Cluster	Poland
Instadrone Pau	France	Sky4D	Belgium
Interconsulting	Italy	Skycorp	Estonia
ISE	Spain	SkyFun	Belgium
KEMEA	Greece	Skyledrone	Netherlands
Knuckles5	Ukraine	Skyline	Italy
Koetter Group	Germany	Snowdrop UAS	UK
Kolordrone	France	SOTREFI	Belgium
Kopter-Profi	Germany	Space53	Netherlands
Kragten	Netherlands	Space Factory	Spain
Lancs Fire Service	UK	Sport Turf Consulting	Italy
Leica Geosystems	Germany	Star Engineering	France
Leitek Innovative Solutions	Portugal	Stichting Kenniscentrum Reeën	Netherlands
Leondron	Spain	STRABAG	Germany
Liebenau Gebäude- & Anlagenservice	Germany	SupAirVision	France
Live Emotions Studio	Belgium	SVZD - Swiss Federation of Civil Drones	Switzerland
Logiroad	France	Tech Drone Audiovisual Services	Spain
Luchtbeeld.nl	Netherlands	Technical University of Košice	Slovakia
Lukas	France	Techn. Hochschule Ostwestfalen-Lippe	Germany
LZCreation	Belgium	Télépilote	France
Martin Detry	Belgium	Tethered Drone Systems	UK
Martin Keydel - Aerial Karlsruhe	Germany	Thales Avionics	France
MB-Drones	Netherlands	Thales AVS	France
MD Drone	Belgium	Thrust Intelligent UAV Systems	Lithuania
Minute Drone	France	Thyssengas	Germany
National Aviation University	Ukraine	Tomedia	Belgium
Neva Aerospace	France	UAS Consulting	Belgium
NLR - Netherlands Aeropace Centre	Netherlands	UAV Navigation	Spain
NOI Techpark	Italy	UAV Works Group	Spain
Oasis	UK	Universal Drone	France
Oceansport Limited	Ireland	Universität Rostock	Germany
Office National des Forêts	France	Université de Liège	Belgium
OO-Drones	Belgium	Unmanned Systems Bulgaria	Bulgaria
Origin Stories	Netherlands	Vecteur Tech	France
Paisajes Gallegos	Spain	Visiodrone	Belgium
Pascal Themans Productions	Belgium	VisioFly	France
Perlaux Graphics	Belgium	Visual Sky	Switzerland
Phoenix Aerial	Italy	Webinfomd	Belgium
Pilgrim Technology	France	Yannick Andrea	Switzerland
Pix-D	Belgium	Zangano	Spain
PixxelAIR	Germany	Zenit Drones	Spain
PJF Drone	Spain	Zetta Drones	France
Prodrones	France	Zipline	France
1 TOUTOTION	1 101100	Lipiillo	1 101100





ANNEX 2

UAS OPS - CURRENT SITUATION

Table 1 - Principal Market Sectors				Table 2 - Principal Flight Missions			
1	Construction & Real Estate	13,31%	1	Aerial Photography &			
2	Maintenance	11,94%		Film / Video Footage	14,48%		
3	Aerial Photography, Audio-Visual Production,		2	Inspection	11,16%		
	Advertising	11,63%	3	Surveying	7,12%		
4	Security & Law Enforcement	8,11%	4	Monitoring	6,75%		
5	Research & Science	7,39%	5	Observation	5,60%		
6	Agriculture, Fishery, Fish Farming, Forestry	6,85%	6	Localisation	5,51%		
7	Public Services & Safety	6,56%	7	Measuring	5,26%		
8	Environmental Protection & Wildlife Conservation	6,15%	8	Testing	5,21%		
9	Flight Training / Instruction	5,43%	9	Broadcasting	3,73%		
10	Cinema & TV Industry	4,27%	10	Validation	3,31%		
Jointly representing 86% of the total				ointly representing 68% o	of the total		

Table 3 - Flight Envelopes		Table 4 - Flight Zones			
VLOS	48,26%	Densely Populated	8,84%		
EVLOS	2,05%	Sparsely Populated	45,07%		
BVLOS	10,51%	Densely & Sparsely Populated	46,09%		
VLOS & EVLOS	8,62%				
VLOS & BVLOS	10,41%				
EVLOS & BVLOS	0,67%				
VLOS & EVLOS & BVLOS	19,49%				
In percentag	e of the total of t	he flight operations conducted			

UAS OPS - NEAR-FUTURE (1-2 years)

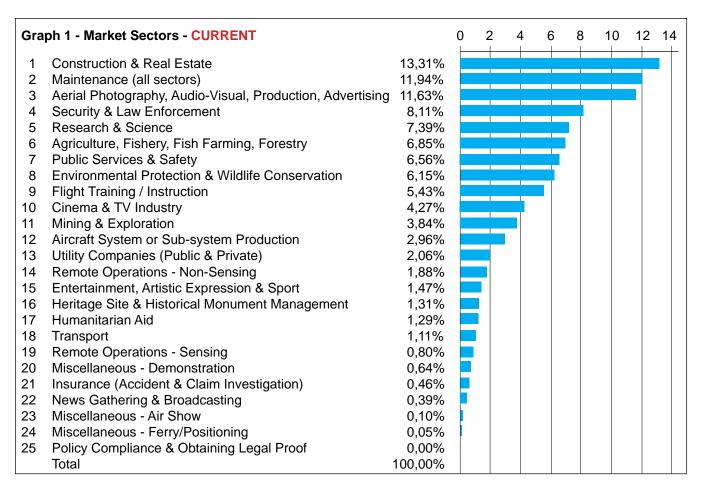
Table 5 - Principal Market Sectors				Table 6 - Principal Flight Missions				
1	Aerial Photography, Audio-Visual,		1	Aerial Photography &				
	Production, Advertising	12,09%		Film/Video Footage	12,49%			
2	Maintenance	11,92%	2	Inspection	10,59%			
3	Construction & Real Estate	9,77%	3	Monitoring	7,53%			
4	Agriculture, Fishery, Fish Farming, Forestry	8,61%	4	Surveying	7,10%			
5	Security & Law Enforcement	8,10%	5	Localisation	5,79%			
6	Research & Science	8,02%	6	Measuring	5,62%			
7	Public Services & Safety	6,29%	7	Observation	5,48%			
8	Flight Training / Instruction	6,06%	8	Testing	4,72%			
9	Environmental Protection & Wildlife Conservation	5,10%	9	Validation	4,35%			
10	Mining & Exploration	3,37%	10	Mapping	3,47%			
Jointly representing 79% of the total			J	ointly representing 67%	of the total			

Table 7 - Flight Envelopes		Table 8 - Flight Zones			
VLOS	27,12%	Densely Populated	8,79%		
EVLOS	1,81%	Sparsely Populated	32,97%		
BVLOS	12,20%	Densely & Sparsely Populated	58,24%		
VLOS & EVLOS	10,06%				
VLOS & BVLOS	15,59%				
EVLOS & BVLOS	0,57%				
VLOS & EVLOS & BVLOS	32,66%				





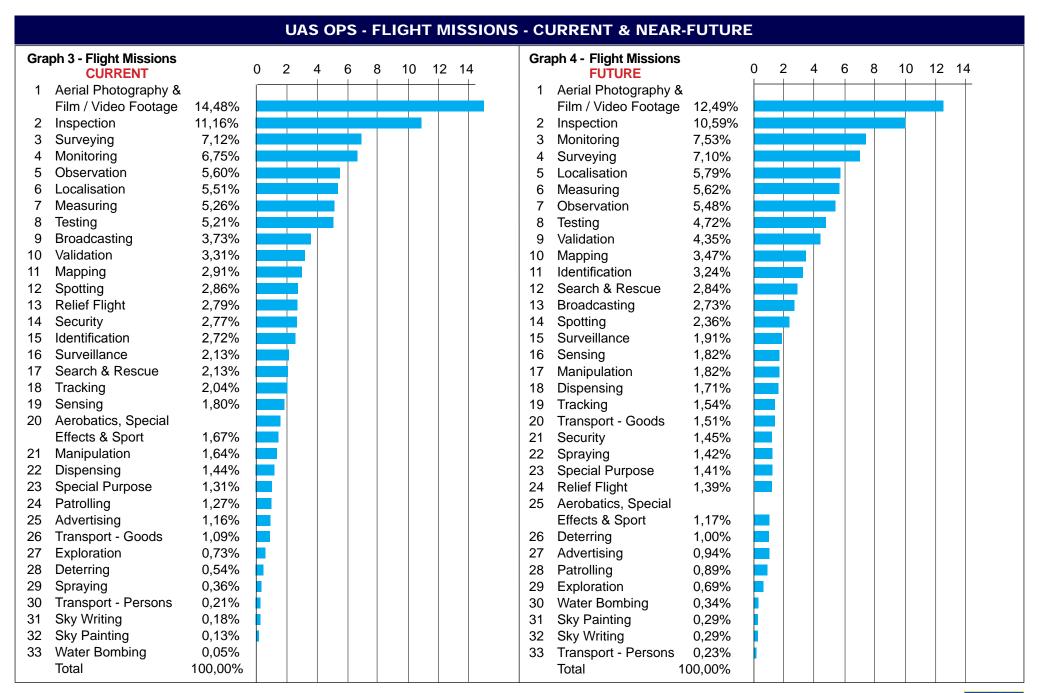
UAS OPS - MARKET SECTORS - CURRENT & NEAR-FUTURE













UAS OPS - SAFETY RISK ASSESSMENT

Table 9 - Review of Respondent Replies (in % of the total)							
Has heard of SORA: Knows what SORA is: Possesses an electronic copy: - Has read the English version: - Has read a translated edition: Has obtained the SORA guidelines from: - EASA web site:	76% 24% 17%	81% 69% 45%	Uses safety risk assessment method (other - Process approved by its NAA: - National standard scenario - Predefined Risk Assessment (PDRA) - Other means: Uses a third party to produce safety risk assessment.	56% 12% 7% 23%	,		
- JARUS web site: - Its NAA web site: - Another source: Its NAA has translated SORA:	3% 11% 59%	37%	Type of third party used: - Qualified Entity: - Notified Body: - Organisation/Consultant • NAA-approved:	26% 3% 31%			
Its NAA is in process of translating: Does not understand the SORA terminolo Understands the SORA methodolgy: Currently uses SORA: Has submitted a SORA to its NAA:	gy:	33% 51% 64% 35% 25%	 Not-NAA approved: Would favor an online tool to produce SOR. Desired language of online SORA tool: National languange: English is acceptable: 	31% A: 66% 34%	92%		

OPS RISK SURVEY

Table 10 - Review of Respondent Replies (in % of the total)									
Company/organisation: - Has a LUC: 20%			Entities allowed to authorize drone operations based on SORA:						
- Plans to apply for a LUC: 20%			- Qualified Entity - Training - Qualified Entity - Airworthiness			40% 30%			
		85%	- Qualified Entity - Ops Manual					45%	
			ody - Training:	0%					
All SORA-related terms are understood: 85%				ly - Airworthiness		5%			
Is aware of requirements applicable to:					dy - Ops Manual			5%	
- Security: 85%			- Notified Boo	5%					
- Privacy & data protection:	100%			dy - Airworthines			15%		
- Environmental protection:	95% 85%		- Notified Boo				15%		
- Use of radio frequency spectrum:	65%			ervice Provider -		5%	4007		
Has already:			- U-Space Service Provider - Airworthiness - U-Space Service Provider - Ops Manual				10%	15%	
- Drawn up a ConOps:	55%				•				
 Used a national standard scenario: Used an EU Standard Scenario (STS): 	55% 10%				opment Organisa	ation d	o you	use	
- Used a Predefined Risk Assessment:	25%			emonstrate coi	mpliance:	050/			
- Conducted a SORA:	55%		- EUROCAE - ICAO	1		25% 20%			
	0070		- EUROCON	ITPOI		20%			
Is capable of: - Conducting a SORA for each mission:	70%		- ASD-STAN	_		15%			
- Applying GRC mitigation strategies:	76% 76%		- CEN	•		10%			
- Applying ARC mitigations						10%			
ARC mitigation measures - Application of standards produced by:		- ANSI			5%				
- RTCA SC-228:	15%	eu by.	- ETSI			5%			
- EUROCAE WG-105:	15%		- RTCA			5%			
- ASD-STAN:	10%		- Other 40%						
Detection of other aircraft in the operational airspace volume:			Has encountered difficulties to show compliance with						
- ADS-B:	45%	Jiaiiio.	required safety	y objectives du	e to lack of stand	lards:	4	-0%	
- FLARM:	10%		Has encountered difficulties relative to the following:						
- Transponder:	15%		- Operational Safety Objective (OSO) 10						
- 4G/5G-based solution:	20%		- Strategic mitigations			88%			
 Web-based tracking system: 	40%		- Technical drone information (manufacturer) 88%						
- Other:	35%		Drone operation	ons associated	to SAIL level:				
Can detect all other air traffic in uncontrolled airpsace: 20%		- SAIL 1	20%	- SAIL 5	5%				
Drone incidents are reported:		80%	- SAIL 2	40%	- SAIL 6	5%			
Third parties used when required by the OS	:O·		- SAIL 3	25%	- SAIL 7	5%			
- National Aviation Authority (NAA):	75%		- SAIL 4	15%	- Not known	55%			
- Organisation approved by NAA:	20%		Currently compliance can be demonstrated up to S					rel:	
- Organisation not approved by NAA:	5%		- SAIL 1 15% - SAIL 5 10%						
- None:	20%		- SAIL 2	35%	- SAIL 6	5%			
			- SAIL 3 - SAIL 4	20% 20%	- SAIL 7 - Not known	5% 45%			
			- SAIL 4	∠0%	- NOUKHOWN	45%			









EUROPEAN UAS OPERATIONS & OPERATION RISK ASSESSMENT METHODS



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