

UAS operations in Brazil

ICAO/EASA Workshop



- Introduction
- Current rules
- Current situation
- Enforcement and Public Education
- Future developments and challenges

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Legal competence

- ANAC (National Civil Aviation Agency)
 - Aircraft design and production certification
 - Continuing airworthiness
 - Pilot licensing
 - Certification of operators
 - Operational rules
- DECEA (Airspace Control Department)
 - Rules for airspace use
 - Air traffic management
- ANATEL (National Telecommunications Agency)
 - Allocation of radiofrequency
 - Certification of telecommunication devices



- Ordinance DAC (1999) – Model aircraft operations
- AIC-N 29/09 (2009) – Access to airspace via NOTAM
- Decision 127 (2011) – Federal Police Department
- IS 21-002A (2011) – Experimental operations
- W



- Aerial photography
- Public security (surveillance and environmental protection)
- Agricultural (aerial survey, crop dusting)
- Infrastructure inspection (transmission lines, oil and gas, mining, etc)



Large demand and interest for BVLOS operations in non-populated/remote areas



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- **RBAC-E No. 94**
- Initial proposal submitted by ABIMDE (Brazilian Defense and Security Industries Association) on January 2013
- Two workshops open to all public
 - Sep 2013: São Paulo (classification and topics)
 - Feb 2014: São José dos Campos (concepts)
- Public consultation (3 Sept - 2 Nov 2015): 277 contributions
- Final rule on 3 May 2017



What and who can fly?

- **Applicability and terminology**
- *Model aircraft*: unmanned aircraft used for recreational purposes
- *Remotely-Piloted Aircraft (RPA)*: unmanned aircraft piloted from a remote pilot station for any purpose other than recreational

- **Classification of RPA**

- Class 1: MTOW above 150 kg;
- Class 2: MTOW below or equal to 150 kg and above 25 kg;
- Class 3: MTOW between 250g and 25 kg.

Due to its small hazard potential, there is almost no requirement for operating drones lighter than 250g.

IMPORTANT: Classification is only applicable for non-recreational users!



What and who can fly?

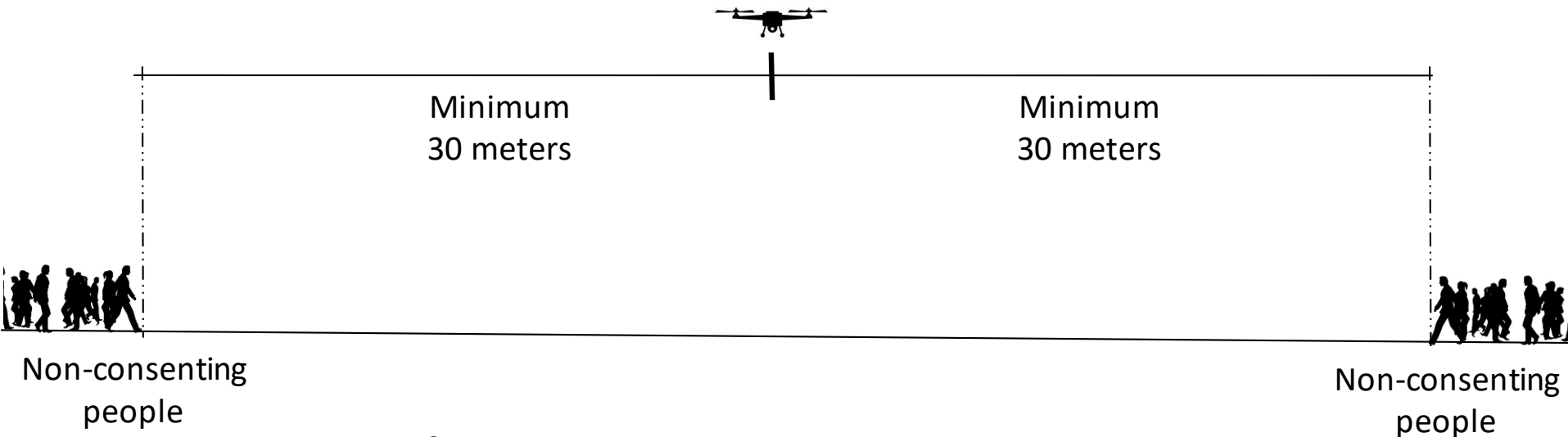
	Class 1 RPAS	Class 2 RPAS	Class 3 RPAS	Model aircraft
Aircraft registration	Traditional	Traditional	VLOS 400 feet: Inscription Other: Traditional	Inscription
Design approval or authorization	Yes	Yes (simplified)	Only for BVLOS or above 400 feet (simplified)	No
Minimum age for operation	18 y.o.	18 y.o.	18 y.o.	No
Operational risk assessment	Yes (IS E94-003)	Yes (IS E94-003)	Yes (IS E94-003)	No
Medical certificate	Yes (RBAC 67)	Yes (RBAC 67)	No	No
License and rating	Yes	Yes	Only for ops above 400 feet	Only for ops above 400 feet
Operation area	Distant from third parties (see more in “Where can you fly?”)			



What and who can fly?

	OPEN	SPECIFIC	CERTIFICATED
Applicability	Class 3 RPAS operating VLOS up to 400 feet	Class 2 RPAS and other Class 3 RPAS operations	Class 1 RPAS
Aircraft registration	Inscription (SISANT online tool)	Traditional	Traditional
Design evaluation	None	Design authorization (RBAC-E No. 94)	Type certification (RBAC No. 21)
Remote pilot license and rating	No	Required	Required
Medical certificate	No	Required only for operating Class 2 RPAS	Required
Public aerial service authorization	No	No	Required

Area distant from third parties



Non-consenting
people

Non-consenting
people

Not applicable if:

- MTOW below 250 grams. (E94.103(i))
- a mechanical barrier strong enough to isolate and protect uninvolved and non-consenting persons in case of an accident. (E94.3(a)(3))
- Operations by a public institution engaged in security, police, tax and customs inspection, to search for vectors of disease transmission, civil defense and/or firefighting or an operator in behalf of one of these. (E94.103(g))

Air Traffic rules (DECEA)

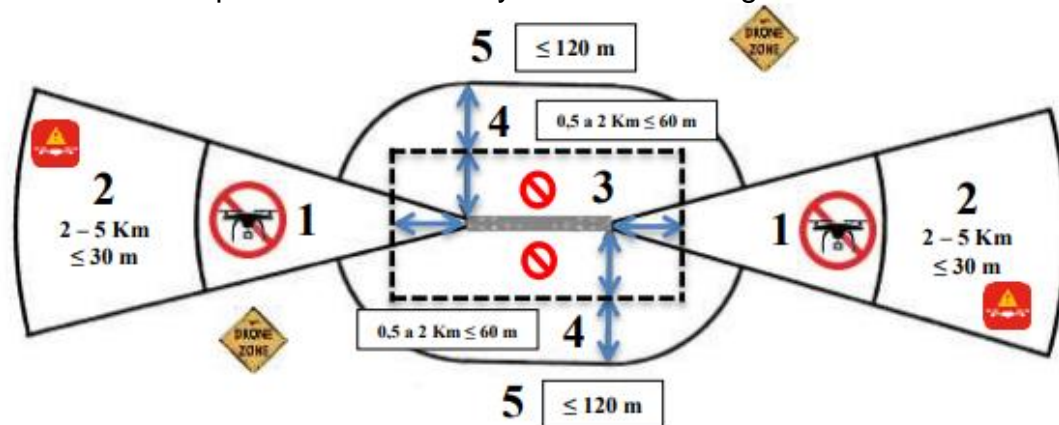
- ICA 100-40
 - Non-recreational operations
 - First edition on 19 November 2015 – current edition: 10 March 2017
- AIC N 17/17
 - Recreational operations
 - Issued on 10 July 2017 – current edition: 11 June 2018
- AIC N 23/17
 - Governmental operations
 - Issued on 2 August 2017 – current edition: 11 June 2018
- AIC N 24/17
 - Public security, civilian defense and customs operations
 - Issued on 2 August 2017 – current edition: 11 June 2018

Required approval submission time	Immediate		
MTOW	Any	< 25 kgf	< 25 kgf
Type of operation	Authorized recreational area	Public security	Other government ops (emergency)
VLOS/BVLOS	VLOS/BVLOS (FPV)	VLOS*	VLOS*
Height (AGL)	≤ 120 m	See image below	See image below
Gnd speed max	As authorized	Any	Any
Distance from aerodromes	As authorized	Figure below	Figure below
Issuance of NOTAM	No	No	No

* Operation may be temporarily flown BVLOS to preserve the security of the remote flight crew

Distance from aerodromes in urban areas

Note: in rural areas, height limited to 60 m

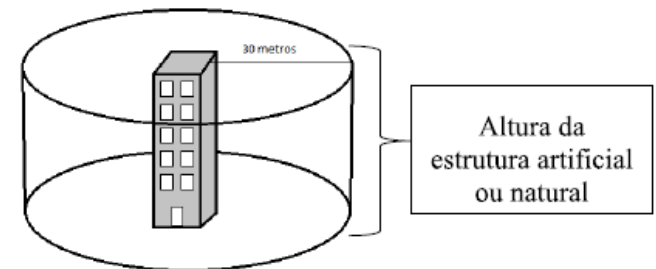


Required approval submission time	45 minutes	2 working days		18 days
MTOW	< 25 kgf	< 25 kgf	< 25 kgf	Any
Type of operation	General	General	General	Any
VLOS/BVLOS	VLOS	VLOS	VLOS	Any
Height (AGL)	< 100 feet	< 100 feet	< 400 feet	Any
Gnd speed max	30 kts	30 kts	60 kts	Any
Distance from aerodromes	≥ 3 nm	< 3 nm	≥ 5 nm	Any
Issuance of NOTAM	No	No	No	As required

➔ Areas that are not considered airspace:

➔ Confined areas: interior of buildings and closed constructions, even if partially, including open-air arenas and stadiums up to the vertical limit of its vertical structure. (ICA 100-40 11.2.2.1)

➔ Near obstacles: portion of airspace around the highest construction or obstacle, either artificial or natural, vertically limited by its height and distant up to 30 m from it and away at least 3 nm (5 km) from any registered aerodrome.



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- **SISANT – *Sistema para Aeronaves Não Tripuladas* (System for Unmanned Aircraft)**
- Developed to provide a simple platform to enable sUAS and model aircraft operators to “inscribe” their aircraft
- In use since 3 May 2017
- Online, automated and free of charge
- “Certificate of Inscription” automatically generated by the user

- System overview

Editar Operador / Aeronaves

Cadastrar Aeronave

Dados Pessoais

Aeronaves

Certificado

Aeronaves

Número de Cadastro da Aeronave *

000000000

Insira um código numérico único de 9 caracteres de livre escolha que será o código da aeronave.

Uso *

Recreativo Não Recreativo (comercial, corporativo, governamental ou outros)

Fabricante *

Escolha o Fabricante

Modelo *

Escolha o Modelo

Número de Série *

Peso máximo de decolagem (kg) *

0,00

Foto (tamanho máximo de 1MB) *

Nenhum arquivo selecionado.



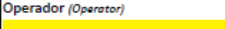


Anexar

Informações Adicionais






Salvar

Nº de Cadastro da Aeronave	Uso	Modelo	PMD	Validade
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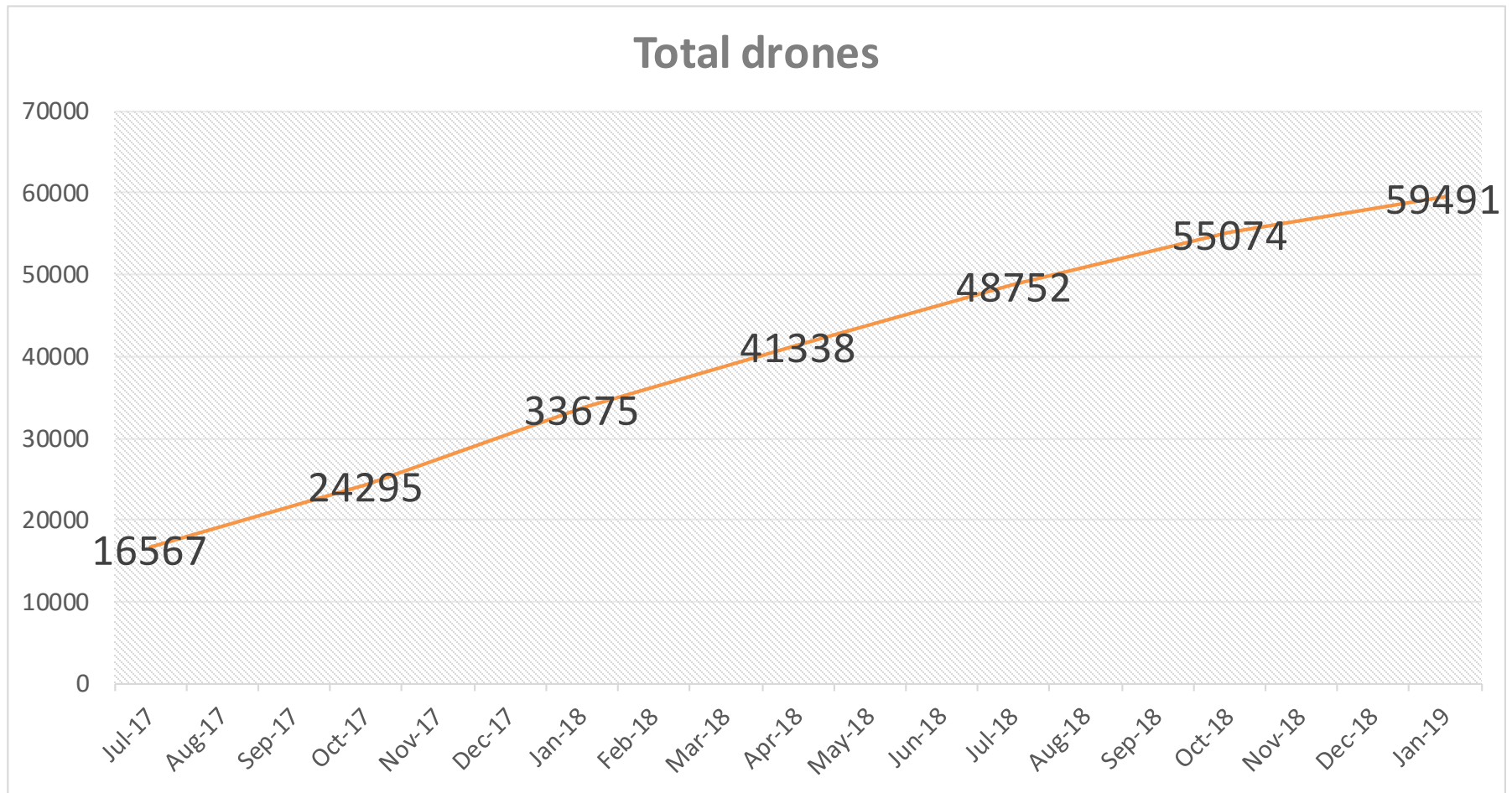
- Certificates

		REPÚBLICA FEDERATIVA DO BRASIL FEDERATIVE REPUBLIC OF BRAZIL AGÊNCIA NACIONAL DE AVIAÇÃO CIVIL NATIONAL CIVIL AVIATION AGENCY	
CERTIDÃO DE CADASTRO DE AERONAVE NÃO TRIPULADA – USO NÃO RECREATIVO <i>UNMANNED AIRCRAFT REGISTER CERTIFICATE – NON-RECREATIONAL</i>			
Esta certidão de cadastro, emitida de acordo com o RBAC-E nº 94, é válida até 09/10/2019 , salvo em caso de cancelamento, suspensão ou revogação pela Autoridade de Aviação Civil Brasileira. <i>This Register Certificate, issued in accordance with RBAC-E nr. 94, shall remain valid until 10/09/2019, unless it is cancelled, suspended or revoked by the Brazilian Civil Aviation Authority.</i>		Nº do cadastro (Register Number): PP-77777779 Uso (Purpose): não recreativo (non-recreational) Ramo de atividade (Business): Aerodemonstração Fabricante (Maker): Manufacturer 1 Modelo (Model): Model 1 Nº de série (Serial Number): 00000002 Peso máximo de decolagem (MTOW): 3,00 kg Foto (Picture):	
Operador (Operator) 			
CPF (document): 			
O descumprimento da regulamentação aplicável pode ensejar consequências administrativas, civis e/ou criminais para o infrator.		Informações adicionais (additional information):	
O detentor desta certidão de cadastro (o operador) é considerado apto pela ANAC a realizar voos recreativos e não recreativos no Brasil, com a aeronave não tripulada acima identificada, em conformidade com os regulamentos aplicáveis da ANAC. É responsabilidade do operador tomar as providências necessárias para a operação segura da aeronave, assim como conhecer e cumprir os regulamentos do DECEA, da Anatel, e de outras autoridades competentes. <i>The holder of this register certificate (the operator) is considered apt by Brazilian Civil Aviation Authority to perform recreational and non-recreational flights in Brazil, using the above identified unmanned aircraft, in conformity with the applicable regulations of Brazilian Civil Aviation Authority. It's the operator's responsibility to take the necessary actions to ensure a safe operation, as well as know and comply with the regulations of air traffic control (ATC), telecommunications, and other competent authorities</i>			
A validade desta certidão pode ser verificada pelo link https://sistemas.anac.gov.br/SISANT/Aeronave/ConsultarAeronave			
Local e data de emissão (Place and date of issue) Brasília, 9 de outubro de 2017 Brasília, October 9th, 2017			
Esta certidão de cadastro não é válida para aeronaves não tripuladas acima de 25 kg de peso máximo de decolagem, ou em voos além da linha de visada visual (BVLOS) ou acima de 400 pés ou 120 metros acima do nível do solo (AGL). <i>This register certificate is not valid for unmanned aircraft of more than 25 kg maximum takeoff weight, or flying beyond visual line of sight (BVLOS) or over 400 feet or 120 meters above ground level (AGL).</i>			



		REPÚBLICA FEDERATIVA DO BRASIL FEDERATIVE REPUBLIC OF BRAZIL AGÊNCIA NACIONAL DE AVIAÇÃO CIVIL NATIONAL CIVIL AVIATION AGENCY	
CERTIDÃO DE CADASTRO DE AERONAVE NÃO TRIPULADA – USO RECREATIVO <i>UNMANNED AIRCRAFT REGISTER CERTIFICATE - RECREATIONAL</i>			
Esta certidão de cadastro, emitida de acordo com o RBAC-E nº 94, é válida até 09/10/2019 , salvo em caso de cancelamento, suspensão ou revogação pela Autoridade de Aviação Civil Brasileira. <i>This Register Certificate, issued in accordance with RBAC-E nr. 94, shall remain valid until 10/09/2019, unless it is cancelled, suspended or revoked by the Brazilian Civil Aviation Authority.</i>		Nº do cadastro (Register Number): PR-77777778 Uso (Purpose): recreativo (recreational) Fabricante (Maker): Manufacturer 1 Modelo (Model): Model 1 Nº de série (Serial Number): 00000001 Peso máximo de decolagem (MTOW): 3,00 kg Foto (Picture):	
Operador (Operator) 			
CPF (document): 			
O descumprimento da regulamentação aplicável pode ensejar consequências administrativas, civis e/ou criminais para o infrator.		Informações adicionais (additional information):	
O detentor desta certidão de cadastro (o operador) é considerado apto pela ANAC a realizar voos recreativos no Brasil, com a aeronave não tripulada acima identificada, em conformidade com os regulamentos aplicáveis da ANAC. É responsabilidade do operador tomar as providências necessárias para a operação segura da aeronave, assim como conhecer e cumprir os regulamentos do DECEA, da Anatel, e de outras autoridades competentes. <i>The holder of this register certificate (the operator) is considered apt by Brazilian Civil Aviation Authority to perform recreational flights in Brazil, using the above identified unmanned aircraft, in conformity with the applicable regulations of Brazilian Civil Aviation Authority. It's the operator's responsibility to take the necessary actions to ensure a safe operation, as well as know and comply with the regulations of air traffic control (ATC), telecommunications, and other competent authorities.</i>			
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Local e data de emissão (Place and date of issue) Brasília, 9 de outubro de 2017 Brasília, October 9th, 2017			

SISANT Stats



BVLOS and +400 feet AGL operations

- Initial step: RPAS Design Authorization or Type Certification.
- First model authorized in June 2017 (Arator 5B).
- Required license: specific for each design.
- There are currently eight active applications (from four different companies) for RPAS Design Authorization.
- No application for RPAS type certification until now.

Xmrobots Arator 5B



SPECIFICATIONS	
MTOW	3.5 kg
Wingspan	1.2 m
Length	0.7 m
Flight duration	55 min
Mission	<i>Agricultural Imaging</i>
Type of operation	<i>Extended VLOS</i>
Maximum distance	4.8 km
Maximum height	2,000 ft AGL
<i>Non-urban areas only</i>	

Authorization Process Summary

Application	13 June 2017
Issuance of authorization	08 June 2018
Reports reviewed	Total = 29 (not including revisions) <ul style="list-style-type: none">• Work Plan• Tests reports• System analysis: Lighting, C2 Link, etc.• Flight Manual• Maintenance Manual• Failure analysis• HW & SW configuration control• etc.
ANAC Flight Tests	Flight tests performed over two days: <ul style="list-style-type: none">• Lighting system evaluation (conspicuity)• C2 link functioning• Emergency recovery (GPS, RPS)• Envelope protection + geofencing
Authorization Data Sheet	ERPAS-1815080-00



<http://servicos.decea.gov.br/sarpas/>

Bem-Vindo ao **SARPAS**

Solicitação de Acesso de Aeronaves Remotamente Pilotadas (RPAS)

O SARPAS foi desenvolvido com o objetivo de facilitar a solicitação de acesso ao Espaço Aéreo para o uso de Sistemas de Aeronaves Remotamente Pilotadas (RPAS/DRONES) no Espaço Aéreo Brasileiro.

Cadastro

Orientações

Entrar

Esqueceu a senha?

Entrar

Email

Coloque o email cadastrado.

Senha

Digite sua senha

Repita no campo ao lado o número que aparece na figura

5 9 2 3

Repita o número ao lado

Entrar



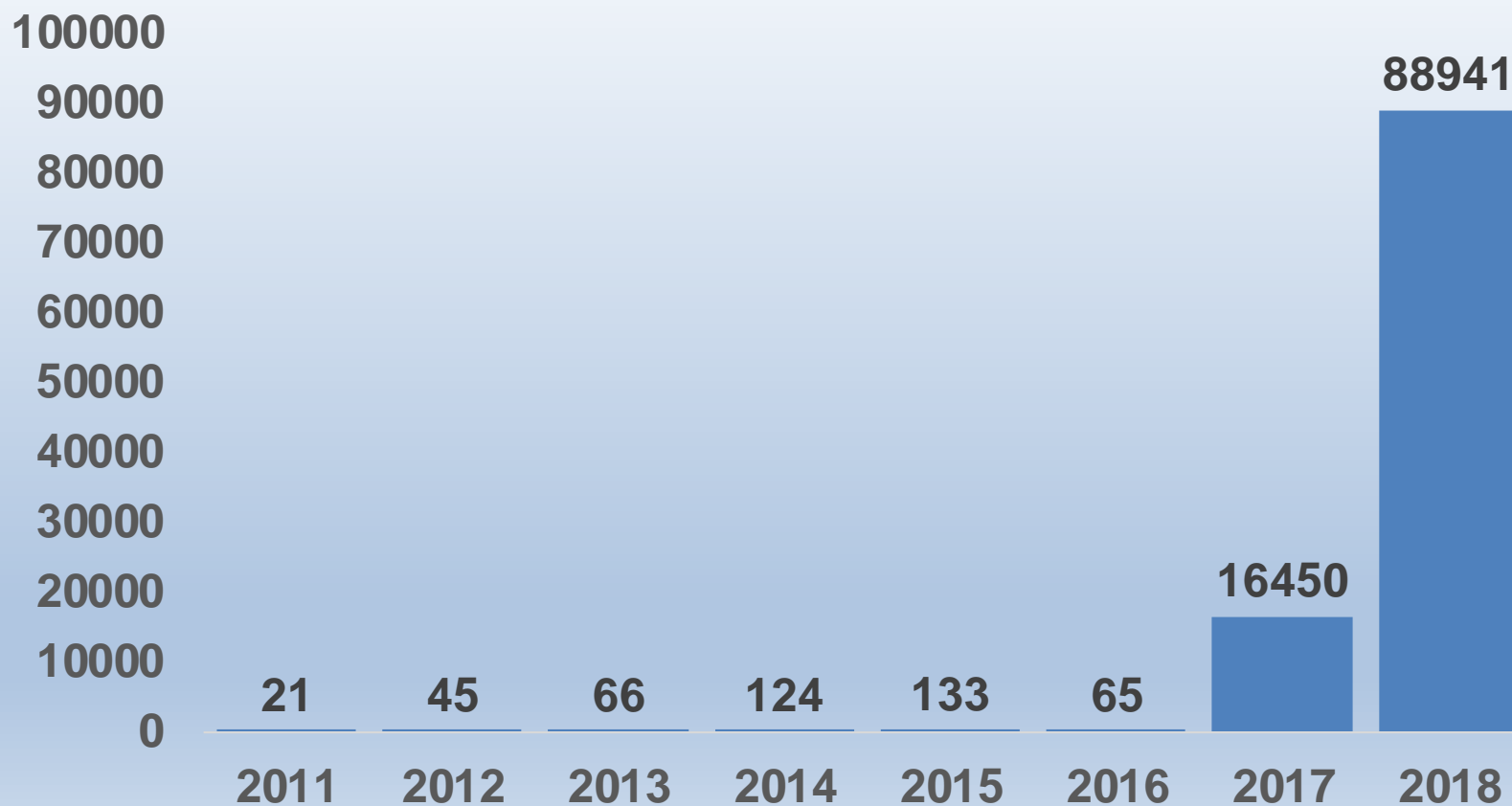
Departamento
de Controle do Espaço Aéreo
Comando da Aeronáutica



Desenvolvido pela ASCOM/DECEA



AIRSPACE ACCESS APPLICATIONS



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✈ Resolution 25/2008:

✈ Examples of fines that may be issued by ANAC

BRAZILIAN CODE OF AERONAUTICS

ART. 299

COD		INDIVIDUAL		
SCO	II – To perform air service in way that compromise the order or public security or in violation of air transport safety rules;	2.000	3.500	5.000

ART. 302

I – INFRACTIONS RELATED TO THE USE OF AIRCRAFT

COD		P. FÍSICA		
ASM	a) To use or employ aircraft with no registration;	1.600	2.800	4.000
AIN	g) To use or employ aircraft without observing the air traffic rules published by the aeronautical authority;	800	1.400	2.000

II – INFRACTIONS ATTRIBUTABLE TO AIRMEN OR AIRCRAFT OPERATORS

COD		INDIVIDUAL		
PAS	c) To pilot aircraft without having the license or aircraft documents or survival equipment;	800	1.400	2.000
OEE	q) To operate an aircraft while drunk;	2.000	3.500	5.000

V – INFRACTIONS ATTRIBUTABLE TO MANUFACTURERS OF AIRCRAFT AND OTHER AERONAUTICAL PRODUCTS

COD		LEGAL ENTITIES		
IRA	a) To not comply with requirements related with the certification of aeronautical products defined by the aeronautical authority;	1.600	2.800	4.000
ICH	b) To not comply with the terms and conditions defined in the related product certificate;	1.600	2.800	4.000

V – INFRACTIONS ATTRIBUTABLE TO OTHER GROUPS

COD		LEGAL ENTITIES		
SSA	d) To perform any type of air service without being properly authorized;	6.000	10.500	15.000

- Law of Misdemeanors (RBAC-E 94 Subpart H)
 - Art. 33: to operate aircraft without being properly licensed.
 - Imprisonment of fifteen days to three months and fine.
 - Art. 35: to perform acrobatics or low flights, outside of permitted areas, as well as land outside of permitted places.
 - Imprisonment of fifteen days to three months and fine.
- Criminal Code
 - Art. 261: to expose own or other vessel or aircraft to danger or to take any action to prevent or impede navigation by sea, river or air.
 - Imprisonment of two to five years.
 - Art. 132: to put the life or health of third parties in direct or imminent danger.
 - Imprisonment of two to five years.

- ➔ Guide for Law Enforcement Agents
 - ➔ Published by Secretariat of Civil Aviation
 - ➔ Required documents, flight restriction zones, operational rules, legal framework
- ➔ First publication: Olympic Torch Relay (2016)
- ➔ Currently in version 4



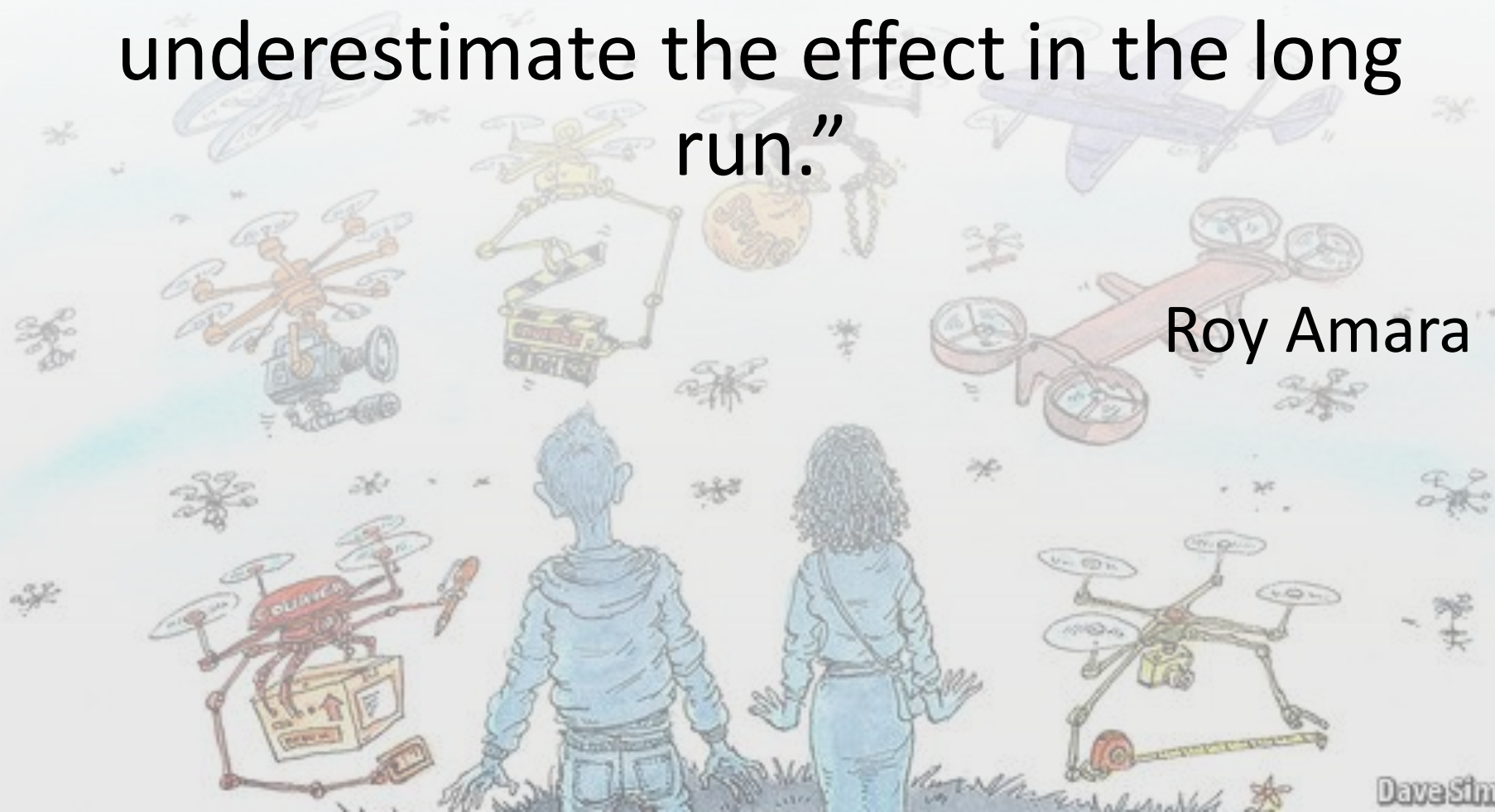
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- e-Identification
- Operations over people
- Deliveries/logistics
- Urban mobility
- Operations in non-segregated airspace
- UTM
- International harmonization

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“We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run.”

Roy Amara



Questions?

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