



**Australian Government**

**Civil Aviation Safety Authority**

# **NOTICE OF PROPOSED RULE MAKING**

## **Remotely Piloted Aircraft Systems**

Issued for public consultation by  
CASA's Standards Division

**NPRM 1309OS – May 2014**  
**Project Number: OS 11/20**

## Audience

This NPRM will be of interest to:

- Unmanned Aircraft System Operator's Certificate (UOC) holders
- remote pilots and other remote crew members
- ground support personnel involved in Remotely Piloted Aircraft Systems (RPAS) operations.

## Amendment

Proposed amendment to Civil Aviation Safety Regulation (CASR) Part 101.

## Key dates

The Civil Aviation Safety Authority (CASA) is responsible under the *Civil Aviation Act 1988* for, amongst other functions, developing and promulgating appropriate, clear and concise aviation safety standards. CASA must, where appropriate, consult with government, commercial, industrial, consumer and other relevant bodies and organisations in the performance of this function and the exercise of its powers.

*Civil Aviation Act 1988 Subsection 9(1)(c) and Section 16*

This NPRM contains proposed amendment to existing regulations that may be pursued as a future regulatory change.

No action will be taken until all responses and submissions have been considered. To ensure clear and relevant safety standards, we need the benefit of your knowledge as an aviator, aviation consumer and/or provider of related products and services.

**You can help by completing the NPRM Response Form and returning it to CASA by 16 June 2014.**

## Foreword

This Notice of Proposed Rule Making (NPRM) is issued by CASA with a view to ensuring that Australian aviation safety requirements are current and appropriately address safety risks.

CASA's policies require that the aviation safety regulations must:

- be necessary to address known or likely safety risks
- provide for the most efficient allocation of Industry and CASA resources
- be clear and concise
- where appropriate, be aligned with international standards and drafted in outcome based terms.

This amendment to CASR Part 101 relates to Remotely Piloted Aircraft (RPA) used for commercial operations, but excludes model aircraft used for recreational purposes. It establishes a revised risk based framework for regulating RPA operations. A key part of this amendment acknowledges the existence of a "low risk" class of RPA operations, which are determined as small RPA with a gross weight of 2 kilograms and below while they are being operated under the standard RPA operating conditions as defined and discussed in this NPRM.

For these RPA operations, CASA proposes that the requirements for a Remote Pilot (RP) Certificate or an Unmanned Aircraft System Operator's Certificate (UOC) will not apply.

RPA with a gross weight above 2 kilograms in all operating conditions, and all RPA operating outside of the standard RPA operating conditions, will require an operational approval.

This amendment also proposes a number of changes to:

- update the current terminology used within CASR Part 101 to bring it in line with the latest terminology used by ICAO as found in Annex 2 to the Convention on International Civil Aviation - Rules of the Air.
- clarify the current requirements for RP training and RP certification
- remove redundant requirements and to simplify the process for approval.

I would like to thank you for your interest in this proposal. I emphasise that no rule changes will be undertaken until CASA has considered all NPRM responses and submissions received by the closing date.

Peter Boyd  
Executive Manager  
Standards Division

May 2014

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# 1 Reference material

## 1.1 Acronyms and abbreviations

The acronyms and abbreviations used in this NPRM are listed in the table below.

Acronym / abbreviation	Description
AC	Advisory Circular
AIP	Aeronautical Information Publication
ATC	Air Traffic Control
ATS	Air Traffic Services
CAR	Civil Aviation Regulations 1988
CASA	Civil Aviation Safety Authority
CASR	Civil Aviation Safety Regulations 1998
CAO	Civil Aviation Order
ICAO	International Civil Aviation Organization
RP	Remote Pilot
RPA	Remotely Piloted Aircraft
RPAS	Remotely Piloted Aircraft System
RPS	Remote Pilot Station
NFRM	Notice of Final Rule Making
NPRM	Notice of Proposed Rule Making
SCC	Standards Consultative Committee
SOR	Summary of Responses
UAS	Unmanned Aircraft System
UAV	Unmanned Aerial Vehicle
UOC	UAS Operator's Certificate

## 1.2 Definitions

Terms that have specific meaning within this NPRM are defined in the table below.

Term	Definition
Remote Pilot	The person who manipulates the flight controls of a remotely piloted aircraft during flight time.

<b>Term</b>	<b>Definition</b>
Remotely Piloted Aircraft	An unmanned aircraft where the flying pilot is not on board the aircraft.
Remotely Piloted Aircraft System	A set of configurable elements consisting of a remotely piloted aircraft, its associated remote pilot station(s), the required command and control links and any other system elements as may be required at any point during flight operation.
Remote Pilot Station	The station at which the remote pilot manages the flight of a remotely piloted aircraft.
Unmanned Aerial Vehicle (UAV)	Obsolete term - refer to 'remotely-piloted aircraft' definition above.

### 1.3 References

CASR Part 101 - Unmanned Aircraft and Rocket Operations

ICAO Circular 328 – Unmanned Aircraft Systems, published March 2011

ICAO Annex 2 to the Convention on International Civil Aviation - Rules of the Air

## 2 Industry consultation

### 2.1 Previous consultation

CASA is committed to working cooperatively with the aviation industry to maintain and enhance aviation safety. The Standards Consultative Committee (SCC) is a joint industry/CASA forum that brings together CASA staff and representatives from a diverse range of aviation industry organisations. The SCC provides the aviation industry with the opportunity to be formally involved during the development of regulatory proposals. CASA and industry experts work together in SCC sub-committees and project teams to develop regulatory material (both new regulations and amendments) and advisory material related to the regulations.

An SCC UAS Sub-committee, tasked with the development of regulations and standards pertaining to UAS, including UAS operations, remote pilot licensing and unmanned aircraft certification, manufacture and maintenance, is currently being constituted. In advance of this more formal mechanism, the following CASA and industry representatives were involved in the development and formulation of the proposals contained in this NPRM under the auspices of Project OS 11/20:

#### Industry

Representative	Organisation
Peggy MacTavish	Australian Association for Unmanned Systems
Peter Hartley	Defence
Reece Clothier	RMIT University
Richard Stevens	Airservices Australia
David Guerin	Airservices Australia
Nigel Meadows	Insitu Pacific
St. John Morris	Defence
Mark Wade	Defence
Mark Xavier	V-Tol
Stuart Lomas	AIPA
Joe Urli	Australian Certified UAV Operators Inc
Wayne Bates	Community Safety QLD Gov.
Paul Hermann	Aerosonde
Les Watts	Manufacturing Skills Australia
Brian Cobb	Manufacturing Skills Australia
Ian Brown	Cobham Aviation
Phil Hurst	AAAA

<b>Representative</b>	<b>Organisation</b>
Brendan William	Australian Research Centre for Aerospace Automation

**CASA**

<b>Representative</b>	<b>Role</b>
Peter Boyd	Project Sponsor
James Coyne	Project Leader
Phil Presgrave	UAS Specialist
Dennis Lamy	Airways and Aerodromes Specialist
Simon Denby	Internal Audit and Standards Officer
Selina Fothergill	Human Performance Specialist
John Frost	Licencing specialist
James Perry	Flying Operations Inspector
Grant Hamilton	Manufacturing Inspector
Mike Broom	Senior Standards Officer Certification, Airworthiness
Richard Allen	Principal Maintenance Engineer
Glenn Steemson	Principal Engineer, Certification
Jill Collinge	Project Secretariat

**2.2 What CASA does with your comments**

CASA is required to register and review each comment and submission received, but will not individually acknowledge a response unless specifically requested to do so. A summary of the comments provided in each submission will be published without attribution in a Summary of Responses (SOR), typically provided as an Annex to the subsequent Notice of Final Rule Making (NFRM). If consent is provided, the contributor’s name will additionally be published as a List of Respondents, typically provided in the subsequent NFRM.

At the end of the response period for public comment, all submissions will be analysed, evaluated and considered. Subsequent to the closing date for comments, an NFRM (including a SOR) will be prepared and published in conjunction with the making of the Final Rule.

## 3 Proposed change

### 3.1 Background

#### 3.1.1 Terminology

CASR Part 101 was promulgated in 2002 in anticipation of civil operations of unmanned aircraft. At the time there was little civil operational experience to draw on from other States and as a consequence there was limited detail included in the regulation. CASR Part 101 relied heavily on the rules governing model aircraft and the terminology at the time referred to unmanned aircraft as unmanned aerial vehicles (UAV).

The ICAO Unmanned Aircraft System Study Group (UASSG) has proposed a new framework for unmanned aircraft and the term UAV has been replaced with Unmanned Aircraft System (UAS), Remotely Piloted Aircraft Systems (RPAS) and Remotely Piloted Aircraft (RPA), as appropriate. Similarly, the terms used for the crew members who operate RPA have been changed to reflect their role by the introduction of the term “remote” before the noun, e.g., “remote pilot”.

#### 3.1.2 Weight Categorisation

CASR Part 101.F relates to unmanned aircraft used for commercial operations, but excludes model aircraft used for recreational purposes. This Subpart currently divides RPA into three categories, micro, small and large, based on weight. CASR 101.240 defines a ‘micro UAV’ as a UAV with a gross weight of 100 grams or less, a ‘large UAV’ as an aeroplane with a launch mass greater than 150 kilograms (100 kilograms for rotorcraft) and a ‘small UAV’ as not a large nor a micro UAV. These weight limits were based on the weights pertaining to model aircraft and are not risk-based. The current proposal is to adopt a risk-based approach, based on the kinetic energy and potential for harm of the RPA.

CASA has investigated the risks and the potential for harm to people and property on the ground and other airspace users associated with impacts from small RPA in order to determine a low kinetic energy RPA mass. A human injury prediction model was developed for the impact of small RPA. The model provides estimates of injury severity as a function of the RPA’s mass and impact velocity. Further, a number of other National Aviation Authorities have investigated the risks associated with small RPA. The general consensus is that RPA with a gross weight of 2 kilograms and below have a very low kinetic energy, pose very little risk to aviation and have a low potential for harm to people and property on the ground and other airspace users. By coupling this weight with a set of conditions that limit the operations of these small RPA, CASA proposes that the regulation relating to the requirement for a RP certificate or a UOC will not apply to RPA of 2 kilograms and below, providing they are operated under the following standard RPA operating conditions:

Standard RPA Operating Conditions:

- Visual Line Of Sight (VLOS). An operation in which the remote crew maintains direct visual contact with the RPA, only aided by spectacles or contact lenses (not binoculars or telescopes etc.) to manage its flight and meet separation and collision avoidance requirements

- Less than 400 feet above ground level (AGL) and over water
- In non-populous areas, including more than 30 metres from any person not directly involved in the operation of the RPA
- Day Visual Meteorological Conditions (VMC), i.e., day time operations only
- Outside of controlled airspace (OCTA), including outside of prohibited and restricted areas
- Greater than 3NM (5 kms) from an aerodrome boundary.

RPA with a gross weight above 2 kilograms and all RPA operating outside of the standard RPA operating conditions will require an operational approval. Under the provisions of CASR 11.055 the operational approval process must include a documented risk assessment and treatment plan describing how identified safety risks will be managed to an acceptable level.

These standard operating conditions and the requirements for an operational approval do not apply to model aircraft being used for recreational purposes.

### 3.1.3 Remote Pilot Training and Certification

The current requirements for eligibility for RP certification outlined in CASR 101.295 were established in 2002 and combined some of the requirements governing model aircraft and private pilot licences. These requirements have been simplified and redundant requirements have been removed. If an applicant completes a manufacturer conducted training course in the operation of an RPA that he/she proposes to operate then he/she is still eligible for an RP certificate.

### 3.1.4 RPAS Approval Process

The approval process and the qualifications needed to obtain a RP Certificate or a UOC is being clarified to explain that an operator will not require an RP Certificate or a UOC for the operation of an RPA for practice, training and demonstration as outlined in CASR 101.235. However, both will be required when the RPA is being used for hire and reward.

The regulation is currently silent on whether persons are allowed to carry out maintenance on an RPA. The regulation has been amended to permit persons to carry out maintenance on an RPA that is an Australian aircraft.

The proposed amendments will clarify the RPAS approval process and remove redundant requirements.

## 3.2 Case for change

The terminology is being changed to harmonise with ICAO Annex 2 to the Convention on International Civil Aviation - Rules of the Air.

CASA has conducted a risk assessment for small RPA of 2 kilograms and below and has established that such RPA have a very low kinetic energy, pose very little risk to aviation and have a low potential for harm to people and property on the ground and other airspace users. This risk based framework has determined that the operation of small RPA will maintain an acceptable level of safety due to the reduced level of risk posed by the low weight and the imposition of a strict set of operating conditions.

Comprehensive and appropriate training is essential to the establishment of safe and effective RPA operations. This includes fundamental aviation knowledge and skills, as well as specialist RPAS knowledge and skills. The training should include human factors, safety management systems, including threat and error management. Adoption of these requirements by those who are involved in RPAS training and operations will ensure that appropriate flying standards are set, safety levels are maintained and public trust in RPAS is gained.

The RPA approval process will clarify the following:

- RP certification requirements
- Who is permitted to carry out maintenance on RPA
- RPA operator’s certificate requirements
- How an RPA can be flown for practice, training and demonstration (i.e., not for hire and reward) without the need for an RP certificate or a UOC
- The standard RPA operating conditions.

### 3.3 Options considered and assessed by CASA

The following Options have been considered by the RPAS working group and through internal consultation:

- CASA does not issue approvals for RPA operating under the conditions laid out in CASR 101.235.
- All RPA with a gross weight less than or equal to 150 kilograms require CASA approval.
- Division of RPA by weight, where RPA with a gross weight less than or equal to 2 kilograms will not require CASA approval.

The level of risk is determined by the product of the probability (likelihood) that harm can occur multiplied by the consequence (severity) of that harm.

#### 3.3.1 Risk, implications and evaluation of Option 1

The probability of an accident was assessed as possible (might occur at some time in the future) and the consequence was assessed as major (could result in death at worst case). This resulted in a risk level which was assessed as high.

Pros: Would remove the need for CASA to issue approvals.

Cons: The high level of risk will require mitigation treatment to reduce the severity of the harm and is considered unacceptable.

#### 3.3.2 Risk, implications and evaluation of Option 2

The probability of an accident was assessed as possible (might occur at some time in the future) and the consequence at the larger gross weights was assessed as major (could result in death at worst case). This resulted in a risk level which was assessed as high.

Pros: CASA would have visibility of all RPA operators.

Cons: Will result in an increased workload to issue approvals due to the increasing number of operators of RPA in the small category.

A high probability of a large numbers of operators who will not engage CASA for approvals due to costs and long lead times for approval.

### 3.3.3 Risk, implications and evaluation of Option 3

The probability of an accident was assessed as possible (might occur at some time in the future) and the consequence was assessed as minor (minor injury or First Aid Treatment Case). This resulted in a risk level which was assessed as low.

Pros: Poses a low risk, which can be managed by routine procedures.

These conditions currently apply to small model aircraft.

Cons: CASA would not have any visibility of the RPA less than 2 kilograms.

Objections from operators with RPA below 2 kilograms who have gone through the current approval process.

CASA will have no knowledge of the level of competency of RPA operators.

CASA will have no knowledge of types or location of RPA operations.

## 3.4 CASA's preferred option for change

RPA of 2 kilograms and below have a very low kinetic energy, pose very little risk to aviation and have a low potential for harm to people and property on the ground and other airspace users, provided they are operated under the Standard RPA Operating Conditions.

Thus, CASA's preferred option for change is Option 3 - Division of RPA by weight, where only RPA greater than 2 kilograms require a CASA approval.

CASA proposes that RPA of 2 kilograms and below will not require approval via a UOC, nor will the operator require an RP certificate when operating in standard RPA operating conditions only.

## 3.5 Key change proposals

The key proposed changes, as detailed in the proposed amendment instrument, are:

**Key Proposal 1:** Bring the terminology in line with ICAO.

**Key Proposal 2:** Clarify the current requirements for remote pilot training and certification.

**Key Proposal 3:** Remove redundant requirements and simplify the process for approval.

**Key Proposal 4:** RPA of gross weight of 2 kilograms and below, operating under standard RPA operating conditions will not require CASA approval to operate.

## **4 Implementation and review**

### **4.1 Implementation timeframes**

Following consideration of responses to this NPRM, CASA will prepare a SOR and make revisions to the CASR Part 101 amendments, where considered necessary.

CASA will further analyse the nature and extent of the impact that these changes will have on operators and remote pilots to ensure an adequate timeframe is given for implementation. A preliminary date for the proposed rules to be made is mid-2014. However, this date may change depending on when the final rules are made by the Governor General.

### **4.2 Transition and post-implementation reviews**

CASA will monitor and review the new rules on an ongoing basis during the transition phase. Thereafter, following the commencement of the rules, CASA will conduct post-implementation monitoring and reviews as needed, or every 2-3 years as prescribed by Government guidelines.

Additional information is available from:

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