Advisory Circular
AC102-1

Revision 1

Unmanned Aircraft – Operator Certification

xx xxxx 202x

General

Civil Aviation Authority (CAA) Advisory Circulars (ACs) contain guidance and information about standards, practices, and procedures that the Director has found to be an acceptable means of compliance (AMOC) with the associated rules and legislation.

Consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices, or procedures are found to be acceptable, they will be added to the appropriate AC.

Related Rules

This AC relates mainly to Part 102, *Unmanned Aircraft Operator Certification*, and refers to Part 101, *Gyrogliders and Parasails, Unmanned Aircraft (including Balloons), Kites, and Rockets Operating Rules*. It:

- outlines the requirement to assess risks in Part 102 operations, develop procedures to manage those risks in a way that promotes safe outcomes

- provides advice on how operators can develop a risk management plan as part of their exposition to satisfy CAA that risks to aviation safety are being adequately managed, and

- describes widely used risk management methodologies and other procedures that would help operators meet the intent of this rule.

Change Notice

Revision 1 is a comprehensive revision which:

- removes the FAQ section and out-of-date transition provisions (rule 102.27)

- focuses on the intent of the rule – for operators to assess and manage aviation risks and create procedures to ensure their operation is conducted safely, and

- adds three appendices:

    o   Appendix I – Guide to ISO: 31000 – Risk Management

    o   Appendix II - Specific Operations Risk Assessment (SORA), and

    o   Appendix III – Examples of sets of exposition documents.

Cancellation Notice

This AC cancels AC102-1, Revision 0, dated 27 July 2015.

Version History

The version history is outlined below:

Revision No.	Effective Date	Summary of Changes
AC102-1, Rev 0	27 July 2012	Initial issue of this AC.
AC102-1, Rev 1	Xx xxxx 202x	Removes the FAQ section and out-of-date transition provisions (rule 102.27). Focuses on the intent of the rule – for operators to assess and manage aviation risks and create procedures to ensure their operation is conducted safely. Adds three appendices: • Appendix I – Guide to ISO: 31000 – Risk Management • Appendix II - Specific Operations Risk Assessment (SORA), and • Appendix III – Examples of sets of exposition documents.

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Introduction

To be granted a Part 102 Unmanned Aircraft Operator Certificate (a Part 102 certificate or UAOC), operators need to:

- assess risks to aviation safety in their unmanned aircraft (UA) operation, and

- develop procedures to adequately manage these risks and ensure operations are conducted as safely as possible.

When applying for a Part 102 certificate, the operator must demonstrate how they will carry out their operations safely. CAA will assess whether the applicant has adequately identified the risks associated with their operation and developed controls and procedures to manage them appropriately. Considering the range of operations that may be undertaken under Part 102, the level of detail about how risks are analysed, assessed and managed will vary according to the nature and scope of their operation.

There are many models to manage risk. This AC covers some of the more common risk management methods. However it is up to applicants to demonstrate how they will manage the risks in their operation, whilst ensuring staff have adequate training and resources to do this effectively.

This AC will help applicants:

- determine whether a Part 102 certificate is required

- assess risks to aviation safety

- develop procedures to manage these risks

- understand common risk management methodologies, and

- understand the requirements for applying for a Part 102 Certificate.

Abbreviations

AC	advisory circular
AIP	Aeronautical Information Publication
AMOC	Acceptable means of compliance
BVLOS	beyond visual line of sight
CAA	Civil Aviation Authority
CONOPS	Concept of Operations
COTS	Commercial Off the Shelf
DG	Dangerous goods
FPP	Fit and Proper Person

JARUS	Joint Authorities for Rulemaking on Unmanned Systems
OCA	Operational Competency Assessment
OSO	Operation Safety Objectives (used in JARUS guidelines)
SAIL	Specific Assurance and Integrity Level/s
SMS	safety management system
SOP	standard operating procedures
SORA	Specific Operations Risk Assessment
UA	unmanned (or uncrewed) aircraft
UAS	unmanned (or uncrewed) aircraft system(s)
UAV	unmanned (or uncrewed) aerial vehicle
UAOC	unmanned (or uncrewed) aircraft operator certificate

Definitions

These terms below are provided in addition to aviation-specific definitions in Part 1, *Definitions and Abbreviations*, which operators should also consult.

Exposition: One or more documents that describes the operation, what they plan to do and how. This could range from a single document, for very simple operations, to a range of connected documents, for larger and more complex operations. A successful exposition needs to be tailored to an operator's individual needs.

Hazard: A condition or an object with the potential to cause or contribute to an aircraft incident or accident.

Prime Person: The person with primary responsibility for the operation, who CAA will assess to ensure they are fully aware of their responsibilities and have the knowledge and capabilities to perform the role.

Risk: The effect of uncertainty on objectives.

Risk management: The coordination of activities to adequately manage operational risk to ensure safety.

Risk management process: A series of process steps for evaluating, defining and justifying measures for eliminating or mitigating risk, and demonstrating how risks are being adequately managed.

Safety: The condition of being protected from harm. Or, within the context of Part 102, the state in which risks associated with aviation activities, relating to, or in direct support of the operation of an aircraft, are reduced and controlled to an acceptable level.

How to work with a performance-based rule

Part 102 is a performance-based rule, so does not contain prescriptive requirements for an operator to meet. Instead it requires, and enables, operators to assess their set of operational risks, their 'risk profile', and propose risk mitigations to apply to their operations. There is no one correct way to do this: each operator's risk management plan needs to be appropriate to the scale and risk profile of their operation.

This gives operators more flexibility to develop a risk management plan that best manages the specific risks associated with what they are trying to accomplish. This can be challenging, however, as operators must:

- understand their operation and risks well enough to develop a robust risk management and training plan, and

- be able to explain to CAA how this plan will work in practice to manage risks.

Applicants for a Part 102 certificate need to be able to show CAA they:

- have adequately assessed the risks for their intended operation

- have identified appropriate mitigations, and

- have an ongoing plan in place to identify, assess and manage any new or changing risks, and

- can ensure staff are adequately trained and resourced to carry this out on an ongoing basis.

This AC includes general advice about risk management and information about one of the most widely accepted risk management methodologies, ISO:31000, in Appendix I.

Operators who are working on new or complex technology or operations may also need to do a detailed initial risk assessment to show the adequacy of their proposed mitigations. The most common risk assessment method CAA recognises is the SORA, which was developed by the Joint Authorities for Rulemaking in Unmanned Aviation Systems (JARUS). JARUS is a group of national and regional aviation safety organisations, who recommend technical, safety, and operational requirements to safely integrate UA into the existing aviation system.

Appendix II of this AC summarises the SORA requirements. If using a SORA, applicants are strongly recommended to check the JARUS website, for documents and background. Applicants should also check the CAA website and seek advice from the Part 102 Unmanned Aircraft Certification team about using SORA in their application before submitting it.

Note: *As noted in the Introduction, a Part 102 operation's risk assessment should only cover aviation safety-related risks, not general risks to an operations financial state, staffing or reputation. While these non-aviation risks are still important, these need their own risk management process as part of ordinary business planning.*

Applicants considering genuinely innovative and novel technology are encouraged to check the CAA website for information about the Emerging Technology Programme and how it works with innovators developing cutting edge and complex technology. The CAA Emerging Technology Unit can be contacted at this link:

https://www.aviation.govt.nz/licensing-and-certification/emerging-technologies-programme/contact-us/

When Part 102 certification is required

An operator who plans to operate a UA in a way that is not permitted under the Part 101 rules needs a Part 102 certificate. Operations requiring Part 102 certification include any of the activities listed below, though this is not an exhaustive list:

(1)   flying over any property without the permission of the property owner or occupier

(2)   flying unshielded[1] and without a barrier[2] within four kilometres of an uncontrolled aerodrome without the permission of the aerodrome operator

(3)   operating an aircraft that is 25 kg or larger

(4)   flying at night, outside and unshielded

(5)   flying beyond visual line of sight (BVLOS), or

(6)   carrying out agricultural operations involving the aerial dispensing of agricultural chemicals or vertebrate toxic agents (VTAs).

This list does not substitute for a full reading of Part 101 and Part 102 or other relevant Civil Aviation Rule Parts. Operators need to carry out a thorough assessment of their operation and understand the rules that apply, to decide whether they can operate under Part 101 rules or need to apply for a Part 102 certificate.

How to adequately manage risk in an aviation operation

Operators seeking Part 102 certification need to apply a risk management methodology that enables them to adequately assess any risk to safety their operation may pose. Any UA operation will introduce hazards and risks that need to be managed appropriately. This is the responsibility of the operator, so it is essential that they give this thorough consideration.

When applying for a Part 102 certificate, the applicant must be able to demonstrate that their proposed operations will be safe. CAA will assess the people involved, the aircraft, and the scope of the operation, and must be satisfied that the operation is safe, and the operator will be able to mitigate and control the risks before issuing the certificate.

Operators must have a risk register, which includes a hazard register. This records any hazards that have been identified and outlines how the associated risks will be mitigated or managed. This register is one key way to show that operators are aware of all the potential hazards, the level of risk each hazard poses, and the measures to be taken to mitigate both.

Risk management is a two-part process:

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[1] Shielded refers to flight that is within 100m laterally and below the height of a natural or constructed obstacle.

[2] A barrier refers to a physical object capable of halting the flight of an uncrewed aircraft.

- firstly, doing an initial risk assessment for the intended operations, then,

based on the risk assessment:

- developing robust and achievable procedures for operational checks, training, maintenance and so on, including procedures for how operators and staff will manage their risk on an ongoing basis.

To do this, an operator needs to:

- assess risks to aviation safety

- develop a plan to manage or mitigate risks to ensure they can operate safely

- develop procedures to carry out this plan

- describe their approach and the steps taken, and

- show that staff:

    o understand this approach and know how to run the risk management process

    o are adequately resourced to carry out this part of their jobs, and

    o are trained in risk management and their skills kept current.

The process needs to address safety risks and consider the potential impact of:

- technical issues

- human factors

- organisational factors

- environmental aspects

- financial or legal aspects, and

- all other possible influences

that may affect how an operation works.

Risk management is an ongoing process that is most effective when integrated through all levels of the operation and where risks and any lessons learnt are communicated to all staff, stakeholders and customers. When done well, this will improve awareness and understanding of the risks in the operating environment.

To carry out these steps, operators must develop a deep understanding of the nature of the risks in their operation and be able to explain why they have chosen the risk management controls or mitigations they have decided on, and how and why they will work.

There are many resources to help operators develop their skills in this area, some of which are listed in the *Further Resources* section and *Appendices I and II* of this AC. In addition, AC100-1, *Safety Management*, contains a lot of advice about the risk cycle and successfully running a risk management plan.

Developing a workable and effective risk management plan

To demonstrate the safety of the proposed operation, the operator requires an exposition that establishes and documents a set of standard operating procedures (SOPs). SOPs need to include a process for conducting a risk assessment on the types of operation the operator intends to carry out. Rule 102.11(b) outlines the different elements an exposition needs to cover.

The exposition must also contain the operator's risk management plan. CAA is not expecting a magic bullet that will remove all risk from an operation, because risks will always remain. But CAA does require a realistic plan for how the operator will manage their risks as much as is reasonably practicable, as well as keeping staff trained and competent in risk management.

A risk management plan needs to be specific to each operator's risk and set realistic methods and processes for analysing, mitigating, monitoring and communicating risks. Processes also need to be achievable. Setting up monitoring and auditing targets that staff will not have enough time for, or have not been trained to do, will not meet the requirements. Operators must ensure their staff are adequately trained, supported and resourced to carry out their work as per the risk management plan. Operators will need:

- to make realistic assessments of their staff's skill level in these areas, and

- a plan for increasing staff capability, if necessary, e.g. by external training courses or through on job training.

In assessing a risk management plan, CAA looks at how realistic the plan and associated procedures are, how well they fit the profile and scope of the operation and how well trained and resourced staff are to do this part of their jobs.

Elements of a risk management plan

Note: *For more information refer to Appendix I.*

Documenting hazards and risks

For an initial application, operators need to set up a risk register, which includes a hazard register. This will become a place to document risks (and hazards) as:

- operators notice them and then assess them, and

- existing ones change on an ongoing basis.

This is a live document which gets updated regularly. The operator's exposition needs to cover how it is used, who maintains it and how often.

When developing this register, operators must consider how best to assess and manage risks and ensure this work will carry on, not just disappear after a few months. Useful methods include:

- having regular risk meetings

- team brainstorming at meetings

- soliciting feedback from staff, for example, by an anonymous suggestions box, or inbox

- sharing articles and information about aviation safety with staff

- looking for relevant risks in their operations, and considering publishing these on the operator's website or in staff newsletters

- running desktop exercises (i.e. 'acting out' an aviation incident or accident) and analysing how well the exercise went afterwards

- sharing ideas and common issues at industry forums

- asking trusted clients for feedback, and

- discussing pilot concerns identified during operational planning or conducting operations.

Analysing risks

This can be done with any method that can be repeated, which enables users to drill deeper beyond the initial reason for a risk or potential weakness, to the real underlying reason.

Popular and widely-accepted methods which CAA accepts in Part 102 expositions include:

- a risk matrix approach where risks are assessed based on likelihood and consequence and ranked as minor to major

- a bowtie risk assessment, a bowtie shaped diagram that visualises a risk in one easy to understand picture, that allows users to add extra causes, creating a clear differentiation between proactive and reactive risk management.

There are links to information about these in the *Further Resources* section.

Whatever method, the important thing is that all users understand how it works and how to use it to assess the risks for their operations, whether it is pilots doing a pre-operation risk assessment or the Prime Person deciding whether to take on a different type of job.

Mitigating risks

Deciding suitable mitigations to decrease the likelihood or consequence of risks is a vital part of the risk management process. For the initial Part 102 certificate application, capturing the mitigations for identified risks in the applicant's risk and hazard register should lead the applicant to include those procedures in their exposition.

It is important to remember that risks and the mitigations needed may change over time, so operators need to be continuously assessing how well their mitigations are working, and whether new or different mitigations are needed, for existing or emerging risks. Operators are ultimately responsible for their mitigations, even if someone else is doing the work, so must regularly check these are still in place and have not been forgotten over time.

Communications

The SOPs and requirements in the exposition are key places where operators communicate their risk management plan, and the risks and mitigations themselves.

Recommended ways to promote risk management communication include:

- internal communication about what is being done to manage risks in staff meetings, during staff training sessions and/or posted on noticeboards, and

- encouraging staff and clients to report issues they have noticed, by promoting this and easy methods such as the website, feedback forms, and risk management meetings.

Monitoring

Learning what works over time and keeping an eye out for changes in the organisational and operational environment is key to maintaining an effective risk management plan over the longer term.

Keeping iteration and improvement going and feedback loops open are vital. Encouraging this, and continually looking for opportunities to improve the operation's risk management plan, is one of the Prime Person's key responsibilities in the risk management process.

Note: *The Prime Person does not have to be an expert in risk management, but if not, should have a sound understanding of risk management and have access to a risk management practitioner who can advise them.*

In summary, the risk management procedures in an exposition should outline any processes or documents used for the management of the operation's risk, such as:

- job safety assessments

- use of risk matrices

- feedback cards and how they are acted on, and

- incident reporting and how that is followed up.

Developing procedures to manage safety risks.

To demonstrate the safety of the proposed operation, the operator is required to produce an exposition that establishes and documents a set of operational requirements and SOPs.

Some key areas that operators need to consider when developing their exposition and SOPs include:

Training

Operators need to document how they will demonstrate their pilots are appropriately trained and competent to operate safely.

There is currently no prescribed licensing regime for UA aircraft pilots in New Zealand, so it may be appropriate for UA aircraft pilots to complete a Part 102 training course, delivered by an approved Part 141 training organisation. The Part 102 pilot qualification is an accepted safety mitigation for pilot competency for many UA operations.

Note: *For some operations, CAA may require pilots to complete additional training, for example night operations, agricultural aviation, or BVLOS operations.*

Higher complexity operations involving increased levels of integration with the traditional aviation system, e.g. plans for flight into controlled airspace under Instrument Flight Rules (or equivalent), using air traffic services, or landing in aerodromes, usually have increased risk. These operations are likely to require pilots who have completed more advanced training, qualifications and competency assessments. In these situations, pilots may need to hold a Part 61 Commercial Pilot Licence or Instrument Rating. Operators planning these types of operations are encouraged to:

- Look over the Emerging Technology Programme pages on the CAA website

- Email the Emerging Technology Programme at the link in their pages, noted above, and

- Study the Part 61 ACs for more information on syllabus requirements.

Competency/Currency

Operators must document how they will ensure their pilots remain competent following initial training. One common way of doing this is completing an Operational Competency Assessment (OCA) through a Part 141 training organisation every 12 months, which is considered an acceptable safety mitigation for assuring ongoing pilot competence.

An operator may nominate an alternative method such as conducting in-house pilot training and OCA using their own instructors. For this to be acceptable, CAA would need to be satisfied that the person employed for that purpose had sufficient skills and experience to conduct that sort of training and assessment, e.g. previous experience as a UA flight instructor and examiner.

As discussed above, in *Training*, the greater the complexity and risk of the intended operations, the more robust the ongoing pilot competency and currency requirements need to be.

Airworthiness

Operators' procedures must describe how they will determine that the aircraft being operated are airworthy, and they have adequately mitigated the risk of the aircraft malfunctioning and causing a hazard. This needs to take into account:

- the weight of the aircraft (if impacted by rule 101.215)

- whether it is new or used

- whether it is a Commercially off the Shelf (COTS) UA procured from a reputable dealer

- whether the aircraft:

    o has been tested or is already in use in the New Zealand environment or

    o is a first of its kind/ type, and

- whether it has any modifications, and

- whether it was designed for the operation being performed.

CAA may require aircraft that are:

- first of type in New Zealand

- home built, and/ or

- UA that exceed 25 kg

to be inspected by an appropriately qualified, independent UA engineer. Operators planning to use or develop any aircraft falling within these categories should seek advice from CAA's Part 102 Unmanned Aircraft Certification team about inspection and other requirements.

Maintenance

Like initial airworthiness, ongoing maintenance is also a risk mitigator against malfunction. Operators must have procedures that demonstrate how their aircraft will be maintained.

For COTS aircraft, adhering to the manufacturer's recommended maintenance schedule is the best starting point and is often acceptable. Not all UA come with a manufacturer's recommended maintenance schedule, however, and the robustness of manufacture's schedules also varies widely. An acceptable alternative for smaller COTS aircraft that do not come with a robust plan would be:

- a pre-flight check

- a post flight check, and

- an annual inspection (by someone suitably skilled and experienced) to check all aspects of the airframe and components.

Many Part 102 operators nominate an external maintenance provider for the annual inspection. (The UA sales agent or other industry experts can often help operators find one as can CAA.)

For large or complex craft that have:

- more perishable components (filters, hoses)

- more mechanical parts (oil or fuel systems, retractable arms and landing gear), or

- separate and exchangeable role equipment,

the manufacturer usually provides a more detailed recommended maintenance schedule that may have lifed components or timed checks (e.g., every 50 hours).

When a robust manufacturer's maintenance plan is provided, CAA expects it to be followed or, if an alternative is proposed, the operator to provide evidence as to why that gives an equivalent level of assurance.

For UA that are not COTS (i.e. homebuilt or modified UA) the applicant will need to provide maintenance procedures that are proportionate to the risks and scope of the operations. Operators who do not have experience in designing an acceptable UA maintenance programme are strongly recommended to consult an experienced UA maintenance provider or inspection engineer.

Writing Standard Operating Procedures (SOPs)

An SOP is written to explain what the pilot and crew must do to plan, prepare, conduct, and complete an operation, or part of an operation. Some operations may involve using more than one SOP. It will depend on the types of operations being conducted and how operators like to write their SOPs.

There is no one right way to write an SOP. In general, however, SOPs are written in chronological order of actions. In addition they should:

- be written in plain language that will be easily understood by their users, and

- be formatted so they can be easily followed, and

- include all the risk mitigations needed to conduct that operation safely.

In all cases, however, SOPs must be clear on:

- who does what

- when the SOP is to be used, and

- any conditions that limit the use of the SOP (e.g. operations that can only be done during daylight, or that can only be done when visibility is at least 5km).

Common SOPs used within Part 102 operations include those for:

- pre-flight planning

- pre-flight equipment checklist

- night flying

- flying within 4km of an aerodrome

- flying over property without permission

- dispersing agricultural chemicals

- flying above 400ft

- post flight checklist, and

- reporting an incident.

It is important to bear in mind that this is not an exhaustive list.

Contingency and emergency procedures

SOPs need to consider contingency or emergency procedures. Like all SOPs they are expected to be proportionate to the operation.

Emergency procedures are often written as a separate SOP, to provide emphasis, and so the SOP can easily be referenced. Some operators choose to print their emergency procedures on a laminated card or poster, to display them. Having emergency procedures in each SOP is also acceptable.

Emergency procedures must:

- define the trigger for the emergency (when the procedure will be actioned)

- be clear

- be concise, and

- explain who does each action.

Ideally, they will be self-contained procedures, so the readers do not have to refer to a lot of other pages within the exposition to complete the procedure (in what might be a very stressful moment).

Operators need to plan how they will train and refresh themselves and staff on the emergency procedures. It is recommended that information about this be included in the exposition.

Carriage of dangerous goods (DG)

If operators plan to carry DG as part of their operation, they need procedures to mitigate the risk of any harm being caused. These procedures need to be outlined in their exposition and, depending on the scale of the operation, they may also need to do an exposition specifically for the DG they plan to work with.

In the application form, operators have to declare if they intend to carry DG. It is important to bear in mind that operators do not need DG approval for the power source for their aircraft during the flight, e.g. batteries fitted to the aircraft or the fuel in the aircraft's manufacturers approved fuel tanks. They do, however, need approval to transport DG as cargo, including spare batteries not fitted to the aircraft, or extra fuel that might be required to power the aircraft at some later time (e.g. for a return flight).

In addition, some types of DG are fast-changing due to technological advancements, so the international standards that are the basis of CAA standards are also relatively quick to change. As a result, operators need to be proactive about keeping up-to-date on DG matters and ensuring their staff are well trained.

Agricultural chemicals

Many agricultural chemicals are DG. To disperse agricultural chemicals under Part 102, operators need:

- training, as noted in the *Training* section and outlined in AC61-15, *Pilot Licences and ratings – Agricultural Ratings* and AC92-1*, Dangerous Goods Training*, and

- specific procedures to mitigate these risks.

Operators do not need approval to carry agricultural chemicals classed as DG for immediate dispersal during an agricultural aircraft operation. They do, however, need approval for transporting those chemicals by air for later use (e.g. delivery to a job site).

Operators who are unsure if they need to declare the carriage of DG, should consult the DG-related materials in the Further Resources section of this AC. If still unsure, operators can email *certification@caa.govt.nz.*

Specific Operations Risk Assessment (SORA)

SORA is a specialised risk assessment process that has been developed for unmanned aviation activities. Completing a SORA helps operators determine what mitigations are needed in their proposed operations. Those mitigations are then factored into the operator's procedures in the exposition. There is more information about SORA in *Appendix II*, and on the JARUS website, listed in the *Further Resources* section.

Although CAA considers following the SORA methodology would be an AMOC as an initial risk assessment method under Part 102 requirements, not everyone applying for a Part 102 certificate needs to use SORA. This is because SORA has been developed to better outline the unique risk profile of new or more complex operations, so is not necessary for operations familiar to CAA and the UA industry.

Regardless of the scale or complexity of a Part 102 operator, and whether they need to do a SORA or not, all Part 102 operators must have an exposition which covers ongoing risk management for their aviation activities, and that is relative to the scale of their operations. For operators who do complete a SORA, the technical focus of the SORA will be complemented by the comprehensive scope of a more general on-going risk management plan, e.g. something based on ISO:31000.

Person with Primary Responsibility – Prime Person

Operators must nominate a person who has primary responsibility for their operations – the 'Prime Person'. CAA will assess and interview this person to ensure they are fully aware of their responsibilities and have the appropriate knowledge and capabilities to perform the role. The exposition will need to list the roles and responsibilities that this person will have.

For further guidance please read the Senior Persons GAP book and the CAA's website regarding the Fit and Proper Person (FPP) process.

Note: The person with primary responsibility, or Prime Person, does not have to be a UA pilot, but must have a sound understanding of the rules, risk management and the exposition.

Writing an exposition

To apply for a Part 102 certificate, operators must submit an exposition. Rule 102.11 (b) provides guidance of what needs to be included within an exposition: in addition, many of these elements have been mentioned in the risk management section above.

An exposition is one or more documents that describes: the operator's activities; the operations they do; and how they do them. This could range from a single document, for very simple operations, to a range of connected documents for larger, more complex, operations.

Appendix III sets out what is needed for the expositions of different types of operations, depending on their complexity. There are also some useful tools available to help with writing an exposition, though operators are not obliged to use any of them.

As outlined below, CAA can accept expositions created and managed through various means. Check the Applying for a Part 102 certificate | aviation.govt.nz webpage for more details.

CAA-developed sample expositions

Although every applicant must do an initial operational risk assessment, some approaches outlined in the appendices may be overly complicated for very small-scale or simple operations.

CAA provides a sample exposition for small-scale operations, which includes some acceptable safety mitigations within SOPs, and hopes to develop other sample expositions over time. Refer to CAA's webpage Applying for a Part 102 certificate for the latest available sample(s).

If there is a sample exposition with acceptable safety mitigations relevant to their operation, operators can use it as a starting point to develop their own exposition, as it will prompt writers to provide some of the information that is needed.

Even for low-complexity operations, however, the sample exposition on its own is only the first stage in developing a robust exposition. Operators need to add information about their specific operations, particularly their operating practices, fleshing out the skeleton of the sample exposition. Expositions must be specific to each operation, and operators must be familiar with the contents.

Third party exposition management tools and writers

CAA accepts expositions created and managed through online tools, or written by third party providers. Check the Applying for a Part 102 certificate | aviation.govt.nz webpage to see the latest details of the tools available.

If using an exposition writer, the operator still needs to fully understand the contents of their exposition, the scope of their operations, the risks their operations may pose and how those risks will be managed. Using a third party does not outsource these responsibilities.

Completing the application

To begin the Part 102 certification process, operators need to apply to CAA on form 24102/01, *Application for issue or renewal of an unmanned aircraft operator certificate under Civil Aviation Rules, Part 102*, which can be found on the CAA website (www.aviation.govt.nz) under *Forms*.

The form guides operators as to what other information is required, but as a minimum will include:

• an exposition

• a completed form 24102-03, *Part 102 compliance matrix*, and

• an FPP application and associated documents for the Prime Person.

It may also include documents such as UA manufacturer manual(s) or training manuals.

The application form is comprehensive as it needs to cover a wide range of very different operations. If there are sections that are not relevant to the operation being applied for, write N/A. However, the more information an operator provides, the easier CAA's assessment of the application will be and consequently the time taken can be reduced.

Operators who are applying, but are unsure about the level of detail needed, can contact CAA (certification@caa.govt.nz) for a pre-certification meeting to discuss the scope of the proposed operations, and likely requirements. There is no cost associated with this. This should be done once operators are ready to apply, have read the rule parts and this AC and have a clear concept of what operations they want to do, with what aircraft.

After the application is received, CAA will check that all required documents have been included, then assign a Part 102 assessor. Additional CAA specialists may also be assigned for more complex applications and operators may also be asked for more information or to meet with specialist CAA personnel or teams. The assessor(s) will review the proposed operation, using the exposition as a guiding document for this assessment.

Submitting the application

Although not all applications are the same, all applicants will need to meet at least the steps set out below. Applicants are encouraged to review these steps, so they know what to expect when they engage with CAA and can prepare appropriately.

Before submitting:

1. **Before submitting, do the research:** A poor quality or incomplete application may be rejected, and require additional work.

2. **Consider requesting a pre application meeting/discussion:** CAA offers up to one hour of non-chargeable time to discuss the intended application. This is not mandatory, but it is highly recommended, particularly if operators are new to this or are considering a more complex operation. Operators can request a meeting by emailing certification@caa.govt.nz

   Note: CAA may postpone meeting if applicants need to do more research on their own before CAA can have a productive discussion with them.

When submitting:

3. Email the complete application to certification@caa.govt.nz with all required documents and supporting information attached.

What CAA does with an application

4. CAA checks for completeness and, if complete, opens a Work Request (WR) file. (If the application is incomplete or incorrect, CAA will return it or request the missing information.)

5. CAA emails the applicant, confirming that a WR has been opened and is awaiting assignment to an assessor.

6. CAA assigns an assessor to lead the assessment (noting that more than one may be assigned for complex applications).

7. The assessor contacts the applicant to introduce themselves, provide contact details and discuss the application.

8. The assessor(s) conducts documentation review and provides feedback to applicant.

9. Applicant responds to feedback as appropriate, e.g. by implementing any changes or providing additional information.

Note: Steps 8 and 9 may be repeated multiple times, until the documentation is acceptable.

10. The assessor schedules an FPP interview of the Prime Person. The interview may be in person or online.

Note: The applicant will be charged for the time it takes to do the interview, but will not be charged additional fees for CAA's travel costs, unless international travel is necessary.

11. The assessor completes the assessment.

12.   CAA conducts internal peer review process and drafts documentation.

13.   The assessor makes a recommendation to Director Civil Aviation to:

- issue a certificate (if approved), or

- decline the applicant and explain the reasons to the applicant.

14.   The certificate is issued (if approved) or the applicant is informed of the decline (if declined).

Note: *Certificates can be issued for up to five years. To help with future scheduling, however, CAA may reduce the validity period by up to 6 months, e.g. to avoid a certificate expiring over the Christmas holiday period.*

Amending, renewing, or surrendering certificates

Amending a Part 102 Certificate

Once an operator has a Part 102 Certificate, they must conduct their operations as per the accepted procedures in their exposition and as stipulated on the operations specification document (including any conditions or limitations).

In time operators may need to make changes to the way they operate. Common changes include:

- expanding the types of operations

- improving a procedure, or

- adding a new type of UA.

These types of changes require operators to make an amendment to the exposition and operations specification documents.

Amendment Procedure

Work through form 24102-12 to establish whether an assessed or non-assessed amendment is required, by filling out the form and following its instructions.

There are two types of amendments: Non-assessed amendments and assessed amendments.

1.   **Non-assessed amendments:** These amendments involve minor changes to the exposition that do not affect the existing level of risk or scope of operations, or require changes to the operations specification document. Because the level of risk has not changed, there is no requirement for the changes to be assessed by a CAA assessor. The amended exposition must be emailed to certification@caa.govt.nz along with a completed form 24102/12, *Application for amendment of an unmanned aircraft operator certificate*.

Common examples of non-assessed amendments include:

- correcting spelling mistakes or grammar

- changing the pre-flight checklist form after discovering the text boxes aren't large enough

- adding a step in the procedure for pre-flight planning requiring all company vehicles to be fuelled the night before an operation, and/ or

- splitting a section into two parts to make it easier to read, resulting in the page numbers changing.

2. **Assessed amendments:** These require assessment by a CAA assessor to ensure the changes proposed continue to comply with CAA rules and that any new risks have been appropriately managed. This type of assessment usually results in some change to the operations specification document and/or exposition.

Common examples of assessed amendments include adding:

- a new procedure and 102 privilege to operate unshielded at night;

- a new type of aircraft, and/or

- a new company, or change your company's existing trading name.

Non-assessed amendments:

Amend the exposition and email it to certification@caa.govt.nz with the completed 24102/12 form. (The correct email address is on the form.)

CAA will email to acknowledge that the amended exposition has been received and accepted. Once received, operators can start using the amended exposition.

The certificated organisation is responsible for distributing the amended exposition within the organisation and ensuring continued compliance with the Part 102 certificates conditions.

Note 1: The non-assessed amendments process does not incur assessment costs or fees.

Note 2: Operating with an amended exposition that operators have not provided to CAA, even for a minor change, is an offense as an operator's approval is based on the accepted exposition. Operators need to ensure that the amendment procedures in the exposition are followed.

Assessed amendments:

Fill out form 24102-02, *Application for amendment of an unmanned aircraft operator certificate*, and submit it to certification@caa.govt.nz as per the form's instructions with any required documents (such as the amended exposition).

Assessment is like the process followed for a new application, but *only* those elements changing or impacted by the change are assessed, not the entire operation.

Applications for a major amendment, or the introduction of high complexity to operations, may require a certification plan and additional documentation, such as a risk assessment. The CAA assessor assigned to the amendment will discuss this with the operator at the start of the assessment.

Note 1: Unlike non-assessed applications, assessed applications do incur assessment fees.

Note 2: An assessed amendment request must be submitted at least 30 days before it is needed. Complex amendments may need even more lead time than this. Operators must continue to fully comply with the existing approved operations specifications and exposition until the amendment has been assessed and an approval issued.

Renewing a Part 102 certificate

A Part 102 certificate may be issued for up to five years. To help with future scheduling, CAA may reduce the validity period by up to 6 months, e.g. to avoid a certificate expiring over the Christmas holiday period.

Renewal of a certificate **does not** happen automatically. Operators are responsible for ensuring that their certificate remains current.

Renewal Procedure

While this is similar in process to a new application, CAA may request less detailed evidence from operators who have demonstrated a high level of compliance with applicable requirements.

Complete form 24102-01 and submit it with all required documents to certification@caa.govt.nz, no less than 90 days before expiry.

Note: Failure to submit the renewal application in time may result in the certificate expiring before a new certificate can be issued causing disruptions to operations.

CAA will assign an assessor who will review the renewal application, assess the FPP status of the Prime Person, and assess any changes requested. The nominated Prime Person may be re-interviewed to ensure they still have the necessary skills and experience required for that position.

Operators *can* request amendments to their certificate's operating conditions at the time of renewal. However, complex amendments at the time of renewal may slow the process. If any of the changes proposed are likely to impact the renewal assessment, the CAA assessor will discuss this with operators and request a plan be put in place to address the concerns.

If operators allow the Part 102 certificate to expire and subsequently apply for renewal the same priority cannot be assured.

It is an offence to operate without a current Part 102 certificate, and having to cease operations while waiting for a renewal can be costly to the operator's business. For both these reasons, operators are advised to submit applications to renew certificates in sufficient time.

Surrender of a certificate

An operator who no longer wishes to hold a Part 102 certificate is required to surrender their Part 102 certificate by sending CAA the original certificate and a letter, signed by the Prime Person.

CAA will acknowledge receipt of the request to surrender the certificate and send confirmation when the certificate has been cancelled. This does not incur costs.

Further resources

- CAA's SMS pages, including the four SMS Resource kit booklets.

- AC100-1 – Safety Management

- https://www.aviation.govt.nz/licensing-and-certification/emerging-technologies-programme/

- AC61-5 – Pilot licences and ratings – Commercial pilot licence

- AC61-15 – Pilot licences and ratings - Agricultural Ratings

- AC61-17 – Pilot licences and ratings – Instrument Ratings

- https://www.aviation.govt.nz/safety/safety-advice/transporting-dangerous-goods/

- AC92-1, Dangerous Goods Training

- AC92-2, Carriage of Dangerous Goods

- AC92-3, Dangerous Goods Packaging approval,

- AC92-4, Dangerous Goods Manuals

- https://www.standards.govt.nz/shop/iso-310002018/ (not available for free)

- ISO 31000, Risk management

- ISO 31000:2018, Risk management — Guidelines (not available for free)

- ISO 31000:2018 Risk management – Principles and Guidelines

- JARUS – Joint Authorities for Rulemaking on Unmanned Systems (jarus-rpas.org)

- https://shahrdevelopment.ir/wp-content/uploads/2020/03/ISO-31000.pdf

- You Tube video: Principles of ISO 31000 risk management

- https://cdn.auckland.ac.nz/assets/auckland/health-safety-wellbeing/health-safety-topics/risk-assessments/hsw-risk-assessment-template-matrix-only-v3-2021-07-01.pdf

- https://www.auditboard.com/blog/what-is-a-risk-assessment-matrix/#:~:text=As%20part%20of%20the%20risk,or%20at%20the%20enterprise%20level.

- https://www.nzta.govt.nz/roads-and-rail/rail/operating-a-railway/risk-management/risk-matrix-likelihood-and-consequence-tool/

- https://www.wolterskluwer.com/en/solutions/enablon/bowtie/expert-insights/barrier-based-risk-management-knowledge-base/the-bowtie-method

- https://intesafety.co.nz/bowtie-risk-analysis-model/

- https://www.wolterskluwer.com/en/solutions/enablon/bowtie/bowtiexp

Appendix I – Guide to ISO: 31000 – Risk Management

As discussed elsewhere in this AC, all applicants for a Part 102 certificate need a comprehensive risk management plan that is specific to their operations and which their staff have the capability and the capacity to carry out.

There are several methods for risk assessments and implementing and recording risk mitigations. The method and procedures must be outlined in the exposition, and the Prime Person must understand them and have the capability to they are followed.

This appendix is based on the International Standard on Risk Management ISO: 31000:2018, a widely used risk management methodology, which provides a generic framework for establishing the context of the operation, analysing, evaluating, treating, monitoring and communicating risk. It is one way to approach risk management, and can be a good entry point for operators who are new to this.

The risk management process is described in ISO: 31000 in more detail, but the main process steps are:

Establish Context

Operators need a good understanding of the context in which they are operating and to be able to describe that context within their exposition. This includes:

- the size and complexity of the operation

- the nature and frequency of the aircraft operation being proposed

- the nature and complexity of the aircraft being operated

- whether the operation is novel, or the operator has a previous track record with this type of operation

- the role that individuals and the organisations plays in keeping the operation safe and the desired safety culture

- the extent and nature of the interface with other individuals and organisations

- the future positioning of the organisation and the planned rate of growth if any, and

- the fiscal sustainability of the organisation.

Hazard identification and assessment

Operators must develop a hazard identification and assessment model and procedures which allow a consistent, on-going, and systematic approach for the identification and assessment of risks. This should include a method that will help determine what risks are acceptable or unacceptable and to prioritise the mitigation actions.

Hazards can be identified through many sources including safety reporting systems, inspections, audits, brainstorming sessions, information sharing, and expert judgement.

The two main methodologies for identifying hazards are:

1) **Reactive risk management** responds to events that have already happened, such as serious incidents or accidents. This involves analysis of past outcomes or events.

Hazards are identified through investigation of safety occurrences, incidents or events, or quality audits. Incidents and accidents are an indication of system deficiencies and therefore can be used to determine which hazard(s) contributed to the event. Sharing safety critical data can mean that an event in one operation or part of an organisation, can become a learning opportunity for others.

2) **Proactive risk management** actively seeks to manage safety risks through the analysis of the operation's environment, activities and processes. It uses predictive and monitoring techniques. It is especially applicable to new or changing parts of the operation. This involves collecting safety data of lower consequence events or process performance. Analysis of the safety information and frequency of occurrence will help operators determine if a hazard could lead to an accident or incident. The safety information for proactive hazard identification primarily comes from safety reporting systems and any programmed safety inspections. Proactive hazard identification can also be achieved through systematic reviews of operational processes and procedures as well as during planning for change that the operation may considering.

Once a hazard and its associated risk(s) has been identified, the operator needs to analyse what the consequence(s) might be and how likely it is to occur. It is then possible to assess these to establish which risks are acceptable and which risks are unacceptable.

There are a number of risk assessment tools available, and the operator should select the tool that best suits their operation and enables them to adequately manage risks. For example, a risk matrix is a tool that combines consequence and likelihood into a risk level (either qualitatively or quantitatively or both). This may work well for more formal risk assessments, such as a risk management plan. However, for smaller-scale risk assessments, an operator might just rank their risks according to what looks the highest.

In essence the assessment process helps the operator decide on actions to minimise unacceptable risks. The table below shows some commonly used risk assessment tools along with some strengths and weaknesses for organisations to consider.

TOOL	STRENGTHS	WEAKNESSES
Risk Matrix	Easy to use Provides a value that can be compared (e.g. untreated versus treated risk)	Confusion over how to use consequence and likelihood Does not lend itself to complex risk assessments
Bowtie Analysis	Provides visual description of causes and effects including preventative and mitigating controls Drives a thorough evaluation of hazard and method(s) of interaction	Requires a competent facilitator to set the correct level of analysis Time consuming to develop and maintain
Strengths Weaknesses Opportunities and Threats (SWOT)	Simple to perform – works well with brainstorming Recognises positive risk (opportunities)	Can over-simplify and lack definition through use of vague terms Subject to compiler bias and scope creep

The tools used may need to be reviewed and customised periodically to ensure they remain suitable for the operating context, as more sophisticated approaches may better reflect the needs of their operation as it grows, or operators decide to do more complex operations.

If an operation plans to change its risk management methodology, that would be considered a material change. The operator would need to apply for an amendment to the exposition, which CAA would assess.

Hierarchy of risk controls

Managing risks also involves assessing and determining the right mitigation control measures for eliminating or minimising the risk.

There is a two-stage hierarchy. Firstly, consider eliminating the risk. Secondly, if and only if it is not practical to do so, then consider other ways to minimise the risk. When minimising the risk, operators should take reasonably practicable steps to do so.

Reasonably practicable is a concept that is well understood in Health and Safety legislation in New Zealand and the Director has deemed the concept as being applicable and appropriate when determining whether an organisation is adequately managing safety risk.

Reasonably practicable within the context of Part 102 asks the operator to consider and weigh up all relevant matters and do what is reasonable at any particular time to ensure safety. When determining what is reasonable, operators should consider:

a)   the likelihood of the hazard or the risk concern occurring

a)   the degree of harm that might result from the hazard or risk

b)   what the person concerned knows, or ought reasonably to know about:

   i.   the hazard or risk; and

   ii.   ways of eliminating or minimising the risk; and

c)   the availability and suitability of ways to eliminate or minimise the risk

d)   after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.

Hazard register

The operator must create a hazard register, as part of its risk register, to document the risk management process. A hazard register is a tool to help operators document known hazards and demonstrate that the operator is aware of all the potential hazards, the level of risk each hazard poses, and the measures that will be taken to mitigate these risks. Hazard assessment should consider all phases of operation.

The hazard register should be treated as a living document. It needs to be reviewed and updated frequently, both to manage hazards, and to enable continuous improvement.

In developing the content of the hazard register, it is important for the operator to involve the end users and subject matter experts to help determining appropriate safety risk controls. Ensuring the right people are involved maximises the practicality of the safety risk mitigations. A determination of any unintended consequences, particularly the introduction of new hazards, should be made prior to the implementation of any safety risk controls.

For example, it is appropriate as a minimum to consider:

- the ongoing competency and fitness of the pilot to operate the aircraft

- the ongoing airworthiness of the aircraft

- the interface (if any) with the traditional aviation system, and

- the existence of any environmental hazards.

Hazard registers are usually done as a table and typically include:

- more details of the hazard

- potential consequences

- assessment of associated risks

- identification date

- when or where it happens

- who identified it

- what measure have been put in place to mitigate the risks

- who is monitoring each risk and making sure the measures are being carried out

- who owns each risk, so is ultimately responsible for making sure it is being managed, and

- what has happened after measures have been put in place to manage attendant risks.

Examples of hazards to aviation safety are circumstances that could lead to:

- injury to people in the air or on the ground, and

- damage to property including other aircraft in the air or on the ground, and

- disruption to the New Zealand civil aviation system, and

- a situation where other airspace users are forced to take action that could endanger their flight operations.

The hazard register should be tailored to the scale of the operation, with appropriate and proportionate mitigations applied to the risks that emerge from those hazards.

Examples of the types of hazards posed by specific activities covered by Part 102 are:

Hazard	How this could be mitigated
Flight over any property without the permission of the property owner or occupier	Developing a process to identify any hazards posed by the property to your operation, hazards your operation poses to the property, and how to mitigate the risks from those hazards

| Flight unshielded and without a barrier within 4 km of any aerodrome without the permission of the aerodrome operator | Developing a process to gain thorough knowledge of the NZ AIP details of the aerodrome, as well as knowledge of any local procedures.

Developing procedures to detect and remain well clear of other aircraft to mitigate the risk of a collision. |
|---|---|
| Operating an aircraft that is 25 kg or larger | Ensuring operators understand the likelihood and consequences of an impact, either with the surface, an aircraft, or a person,

Investigating proposed mitigations and how they take into account the weight of the aircraft. |
Flight at night, outside and unshielded	Demonstrated and tested processes to mitigate the risk from hazards at night, such as visual illusions, lack of depth perception, disorientation, lack of spatial awareness etc.
BVLOS flight	Developing adequate procedures to maintain control of the UA and to detect and avoid other aircraft and objects.
Carrying out agricultural operations involving the aerial dispensing of agricultural chemicals	Ensuring that all staff involved with handling and dispensing of agricultural chemicals have adequate training and competency.

Monitoring effectiveness of controls and identifying new hazards or risks

The hazard register should evolve over time and the operator's risk management approach must monitor its operational activities, not only to determine if the risk mitigation controls are working as desired, but also to identify new or emerging aviation risks using the reactive, proactive or predictive methods described previously.

The operator needs to document processes they will use to perform this monitoring activity, which include explaining in detail the processes to:

- enable staff, contractors, clients or other interested parties to raise or report safety concerns or issues, and how they will be reported to the regulator

- assess hazards and review the mitigations in place to manage them

- investigate safety incidents or accidents, when needed

- engage with staff and contractors and other interested parties to identify hazards and the methods to determine appropriate controls for hazards

- carry out systematic reviews or audits of the operational activities being conducted.

Appendix II - Specific Operations Risk Assessment (SORA)

Relationship between SORA and risk management plan

To be granted a Part 102 certificate, operators need to have a risk management plan, which includes a hazard register, and a set of procedures that will satisfy CAA that they are able and prepared to manage risk to a level that is reasonably practical in their operations. In addition, operators who are planning to work on new or complex technology may need to complete a SORA. This appendix outlines the key process of SORA, but, if doing a SORA, applicants are strongly recommended to check the JARUS website, for documents and background.

Risk assessment

Please refer to the sections on risk management in the body of this AC for more details.

SORA methodology

As UA have become more commonplace, JARUS have developed the SORA methodology for risk assessment of UA operations and design. CAA views this methodology as one AMOC, but not the only means of compliance, with the risk assessment required by rule 102.1(1).

JARUS SORA documentation is freely available on the JARUS website.

At the time of writing, SORA version 2.0[3] is the current version. Applicants should use the latest version of SORA available, if they decide to do a SORA.

The following guidance is intended for proposed operations that can achieve a Specific Assurance and Integrity Levels (SAIL) of I-IV under the SORA assessment. For any proposals that fall into SAIL V or above, it is recommended the applicant contact the CAA before applying to discuss the proposal.

When SORA is used, a stand-alone SORA safety portfolio shall be submitted in three phases:

Phase One: Applicant submits the SORA safety portfolio with data developed from SORA steps 1-7. CAA reviews and agrees with (or rejects) the Concept of Operations (CONOPS), ground and air risks, mitigations, and SAIL determination. Acceptance of this phase allows applicants to proceed to Phase Two.

Note: It is extremely important for applicants to spend the time to develop a detailed and thorough CONOPS document when submitting a SORA, as failure to do this well usually results in extra assessment, significant delays and additional certification costs. JARUS Annex A contains guidance on what is need for a CONOPS.

There is a spreadsheet on CAA's 102 forms page, the Part 102 SORA assessment workbook, which acts like a matrix for SORA. It allows applicants to work through the steps, listing what they have claimed and where the evidence for claims can be found in the documentation.

CAA strongly recommends that operators who need to do a SORA use this tool as it helps speed up CAA's assessment.

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[3] As at February 2024, version 2.5 was awaiting ratification, but not yet published.

Phase Two: Applicant proposes their methods of compliance with the required mitigations and the Operation Safety Objectives (OSOs) at the agreed robustness levels based on the SAIL outcome (SORA step 8) and adjacent airspace considerations (SORA step 9).

Means of compliance can be shown in a number of ways, including by:

- indicating where evidence is found in another compliance document, such as the exposition or a procedure document

- identifying an industry standard that will be met to show compliance

- identifying third-party verification plans, and/ or

- any other proposal by the participant.

Applicants should summarise how they intend to meet the OSOs in matrix form as in the example below, using the SORA workbook:

OSO Number	OSO Description	Robustness Level (O, L, M, H)	Means of Compliance	Evidence Location
01	Ensure the operator is competent and/or proven		Comply with standard, demonstrate through procedure, etc.	Document Name and Number
02	UAS manufactured by competent and/or proven entity		Comply with standard, demonstrate through procedure, etc.	Document Name and Number
…				
…				
24	UAS designed and qualified for adverse environmental conditions		Comply with standard, demonstrate through procedure, etc.	Document Name and Number

CAA will review and agree with (or reject) the proposals for SORA steps 8 and 9. Acceptance of this phase allows applicants to proceed to Phase Three.

Phase 3: Applicant develops the data proposed in Phase Two and submits the final safety portfolio, including and documents used in showing compliance, for approval and issuing of the Part 102 certificate.

Submitted data should be released and under revision control. Draft or uncontrolled data will be rejected. Applicants need to track document revisions between phases and may have to address comments from CAA within phases. Some form of change tracking (e.g. change bars) should be used in these revisions.

Other requirements for complex operations

For some Part 102 applicants that have large numbers of aircraft or personnel or very complex operations, an SMS may be required. Information on developing an organisation SMS is available from AC100-1, *Safety Management*, on the CAA website at or on the UK CAA website at [Safety management systems | Civil Aviation Authority (caa.co.uk)](#).

When preparing an exposition, applicants may wish to, or be required to, incorporate requirements from other Civil Aviation Rule Parts (for example, Part 91 *General Operating and Flight Rules*, or for an agricultural operation, Part 137 *Agricultural Aircraft Operations*) where this would help provide assurance to the Director that the operation will be conducted according to the highest possible safety standard.

As noted earlier in this document, applicants who are considering genuinely innovative and novel technology are encouraged to approach CAA's [Emerging Technology Programme](#) which works with innovators developing cutting edge and complex technology.

Appendix III – Examples of sets of exposition documents

An exposition is several controlled documents that CAA assesses as part of the certification process. This could range from a single document, for very simple operations, to a range of connected documents, for larger and more complex operations.

Example 1: Operations that fit the sample exposition

The applicant's operation matches the description of a sample exposition. Alongside the required application forms, the applicant must send CAA:
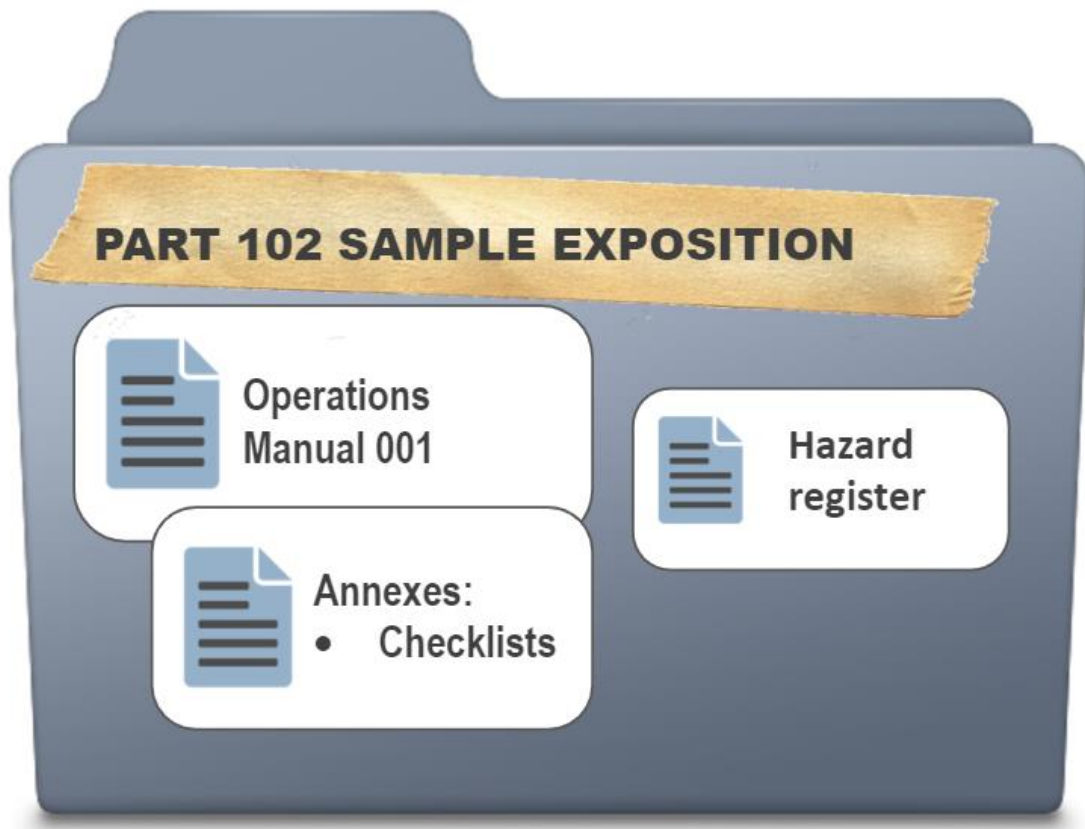

'Operations manual' is the provided sample document with the checklists annexed, and any relevant company information inserted.

A start point hazard register is given, so the participant does not need to create a format, just ensure the content is relevant to their operations.

Example 2: More complex operations that do not match the sample but do not need a SORA

The applicant's operation does not match a sample exposition description, but it does not require a SORA. This also applies to an operator that can match a sample exposition but chooses not to use the CAA sample format. Alongside the required application forms, the applicant must send CAA:
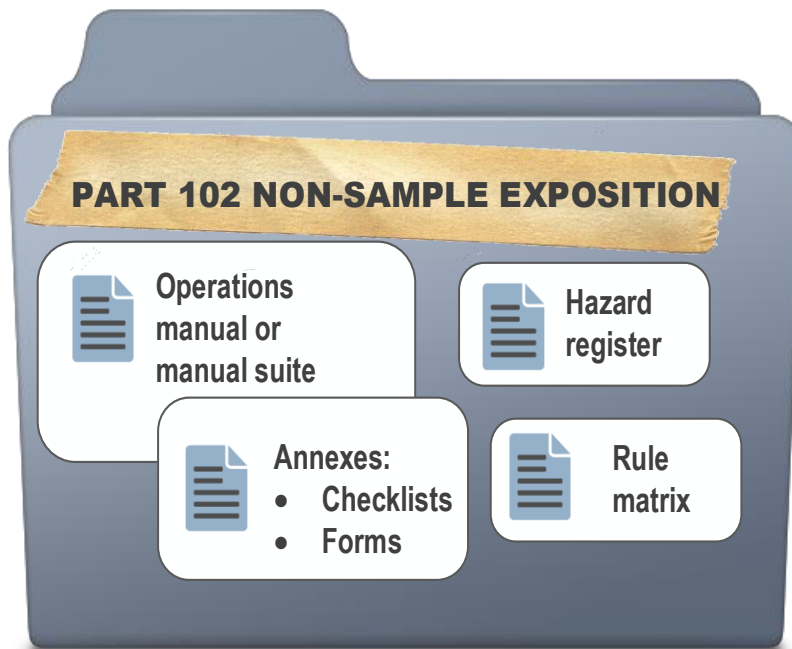
The Operations manual may follow a similar format to a sample exposition that covers some of the required rule privileges, and must also contain relevant risk mitigations and procedures for other privileges required.

Alternatively, any format of operations manual can be provided at the applicant's choice.

A Part 102 compliance matrix (which may also be known as a rules checklist) is required.

Some applicants may choose to provide more than one manual as relevant to the scale of their operations, e.g. a maintenance manual.

Example 3: Complex operations that do not match the sample and need a SORA

The operation is unique and/or first of type. Appendix II provides more information about risk assessments, the JARUS SORA methodology and the SORA process, including links to templates and other documents. The figure overleaf outlines requirements if applicants need to do a SORA risk assessment (if using another risk assessment method, speak to CAA to discuss requirements).
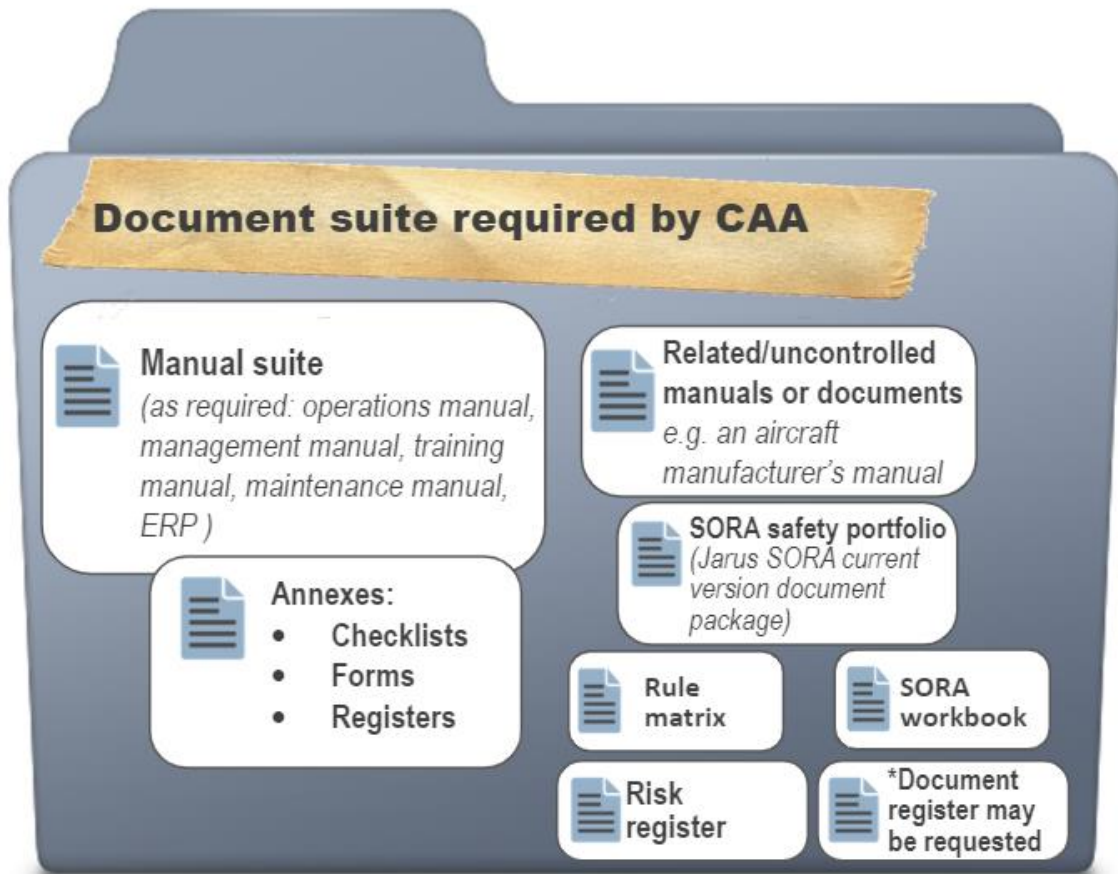
This scenario may not require all documents to be produced at the time of application, as several feedback points exist. In some cases, the SORA assessment may be provided at a later stage in the application process: please see Appendix II, below, for more information.

An indication of the different stages in the process is provided below:

Application form

Manual suite drafts
Operational manual likely incomplete

SORA portfolio steps 1-7, 9
All related documents

CAA assessment of SORA, feedback cycle until final SAIL reached

Final manual and supporting documents

Full SORA portfolio
OSO matrix

Rule matrix