CIVIL AVIATION AUTHORITY
OF NEW ZEALAND

Advisory Circular

AC00-x

Draft Revision 0

(Date to be advised)

Electronic Signatures, Electronic Recordkeeping and Electronic Manuals

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General

Civil Aviation Authority advisory circular contains guidance and information about standards, practices, and procedures that the Director has found to be an acceptable means of compliance with the associated rules and legislation.

However, the information in the advisory circular does not replace the requirement for participants to comply with their obligations under the Civil Aviation Rules, the Civil Aviation Act 1990 and other legislation.

An advisory circular reflects the Director's view on the rules and legislation. It expresses CAA policy on the relevant matter. It is not intended to be definitive. 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 advisory circular. Should there be any inconsistency between this information and the rules or legislation, the rules and legislation take precedence.

An advisory circular may also include **guidance material** generally, including guidance on best practice as well as guidance to facilitate compliance with the rule requirements. However, guidance material should not be regarded as an acceptable means of compliance.

An advisory circular may also include **technical information** that is relevant to the rule standards or requirements.

Purpose

This advisory circular provides approval or acceptance guidelines for electronic signature, electronic recordkeeping, and electronic manual systems/programs. It is the participant's responsibility to address all of the requirements of the Civil Aviation Rules as well as the requirements of the Contract and Commercial Transactions Act. This advisory circular applies to aviation document holders who seek to incorporate electronic signature, recordkeeping or manual systems and programs into their operations.

Related Rules

This advisory circular relates specifically to various Civil Aviation Rules identified in Appendix B

Change Notice

This is the initial issue of this advisory circular.

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Cancellation Notice

There was no previous issue of this advisory circular, so there is no cancellation.

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Revision No.	Effective Date	Summary of Changes
0	To be advised	This is the initial issue of this advisory circular.

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1) Definition

1.1 The following terms are used in this advisory circular.

Data storage device means any article or device (for example, a disk) from which information is capable of being reproduced, with or without the aid of any other article or device.

Electrical system consists of an electrical power source, its power distribution system and the electrical load connected to that system.

Electrical system consists of an electrical power source, its power distribution system and the electrical load connected to that system**.**

Electronic includes electrical, digital, magnetic, optical, electromagnetic, biometric, and photonic.

Electronic communication means a communication by electronic means.

Electronic signature in relation to information in electronic form, means a method used to identify a person and to indicate that person's approval of that information.

Information includes information (whether in its original form or otherwise) that is in the form of a document, a signature, a seal, data, text, images, sound, or speech.

Information system means a system for producing, sending, receiving, storing, displaying, or otherwise processing electronic communications.

Authentication means by which a system validates the identity of an authorized user. These may include a password, a personal identification number (PIN), a cryptographic key, smart card and so on. These means may be combined (for example a cryptographic card and a PIN) for increased confidence in the identity of the system user.

Computer-based recordkeeping system means a system of record processing in which records are entered, maintained, archived, and retrieved electronically. The term "computer-based recordkeeping system" is synonymous with "electronic recordkeeping system."

Data backup means use of one of several recognized methods of providing a secondary means for archiving records, separately from the original or primary. This can be used to reconstruct the format and content of electronically stored records in case of loss, failure, or damage to the primary recordkeeping system.

Data verification means a process of ensuring accuracy of data records by systematically or randomly comparing electronic records with manual data entry documents.

Digital signature means cryptographically generated data that identifies a document's signatory, with date and time. The result of which, when properly implemented, provides the services of original authentication, data integrity, and signer non-repudiation.

Electronic manuals means aviation document holder manuals that may be electronically signed, stored, and retrieved by a computer system via CD-ROM, internet/intranet-based, or various other forms of electronic media, to include commercial off-the-shelf portable electronic device (PED) hardware (for example laptop, tablet, phone, and so on).

Electronic record means contract or other record created, generated, sent, communicated, received, or stored by electronic means.

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Electronic recordkeeping system means a system of record processing in which records are entered, signed, stored, and retrieved electronically. The term "electronic recordkeeping system" is synonymous with "computer-based recordkeeping system."

Electronic signature means functionally equivalent to a handwritten signature. The term "electronic signature" means an electronic process attached to, or logically associated with, a contract or other record and executed or adopted by a person with the intent to sign the record.

Password means an identification code or device required to access stored material, intended to prevent information from being viewed, edited, or printed by unauthorized persons.

Return to service: abbreviated as RTS.

Signature means a mark or sign made by an individual to signify knowledge, approval, acceptance, or obligation, and to authenticate a record entry. A signature should be traceable to the individual making the entry, and it should be handwritten or part of an electronic signature system.

2) Approval, acceptance, and authorization

2.1 There are many Civil Aviation Rules that address signatures, records/recordkeeping, and manuals. There are varying requirements for approval, acceptance, and authorization.

(a) CAA approval is required to use electronic manual and recordkeeping systems. The CAA will use the exposition approval method to convey CAA approval or acceptance for those items that require specific CAA approval or acceptance to be maintained, accessed, or distributed electronically. The signature on the operational specification (approval specification or schedule of conditions) by the CAA inspector with operational specification signature (approval specification or schedule of conditions) authority indicates the CAA's approval or acceptance of the item (depending on the requirement).

2.3 The following information relates only to the New Zealand Civil Aviation Authority's acceptance guidelines for electronic records. It is not considered an approval or authority for operators to use any particular software, only that the New Zealand Civil Aviation Authority has no objections as long as the process meets certain requirements. Each aviation business has its own unique framework of legislative responsibility and, additionally, certain manufacturers prohibit the maintenance records for their products being delivered in digital form. With this in mind, it is the operator's responsibility to determine their obligations to all business stakeholders, prior to considering the use of such products.

2.4 In the absence of its own regulations, the CAA relies heavily on Part 4 of the New Zealand Contract and Commercial Law Act 2017 (CCLA). This is because any policy regarding electronic signatures must comply with this legislation regardless of the context in which it is used. The provisions in Appendix A are relevant to the types of products being proposed as alternatives to paper based return to service (RTS) systems. Participants are encouraged to read and review them for the relevant requirements. Participants will also need to confirm that the product they wish to use complies and, when they apply to us, they will need to address these, as applicable, in their exposition.

3) Time of dispatch and receipt

Reference: CCLA, Part 4, Sections 213 and 214

3.1 If applicable, participants should address accessibility issues associated with certifying personnel working in remote locations out of cell coverage. This raises the possibility that a

certifier may certify maintenance and submit it, but that the submission may not enter the proposed system until the mobile device is again within cell coverage. This means that the certification would not be valid until it was received by the system. If the aircraft was involved in an incident or accident prior to receipt, the record may be lost. This situation is similar to the current situation with the CAA400, so participants should address it in their exposition and explain the equivalent level of accountability and safety.

4) Integrity of information

Reference: CCLA, Part 4, Sections 221 and 228 (c) & (d) and Federal Aviation Administration (FAA) advisory circular AC120-78A, Chapter 2

4.1 Participants must demonstrate that their proposed product can guarantee that data in their systems is safe and cannot be altered. Relevant questions in this regard include:

(a) What data integrity/validation protocols exist to ensure a certified or signed document is not altered:

(i) without their knowing and;

(ii) without an original being held available?

(b) This requirement relates to both the signature itself and the data that the signature validates.

See also CCLA, Part 4, Section 226 below.

5) Requirement for information to be in writing

Reference: CCLA, Part 4, Section 222 and Federal Aviation Administration (FAA) advisory circular AC120-78A, Chapter 2

5.1 Participants must demonstrate that the search function of their product is sufficient to ensure that all information is made available for search and validation in the future. Relevant questions in this regard include:

(a) How is the information presented for review as a comprehensive list and not just what the internal search algorithm in the software presents for review?

(b) How do they access this information in the future for audit purposes?

(c) How is access provided to external auditors like the CAA? Is it permanent access or only for a limited period prior to audit?

(d) Is it able to be quarantined in case of an accident?

(e) How does the maintenance controller and/or contractor review any pilot maintenance records each maintenance check to ensure they are complete? This information is required to be summarised in the logbook at each scheduled inspection.

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6) Legal requirement for signature and presumption of its reliability

Reference: CCLA Part 4, Section 226 and Section 228 (a) & (b) and Federal Aviation Administration (FAA) advisory circular AC120-78A, Chapter 2

6.1 Participants must demonstrate that each signature entered is an accurate depiction of the known signature for that person. Relevant questions in this regard include:

(a) How does the operator adequately identify the signatory and adequately indicate the signatory's approval or verification of the information to which the signature relates?

(b) Is the system reliable with respect to the purpose and circumstances in which the signature is given?

(c) How accurate and repeatable are signatures when all users sign using touchscreens?

(d) If the software is utilising a different method of identity validation, such as RealMe, smart phone thumb prints, facial or voice recognition, the participant must outline how their system interfaces with the identity validation method.

(e) Are these media then acceptable for RTS purposes?

(f) Is the appropriate RTS statement affixed next to the signature in their product?

NOTE: *Certain manufacturers prohibit maintenance records for their products being delivered in digital form. It is the operator's responsibility to determine their obligations to all business stakeholders prior to considering the use of such products.*

NOTE: *When utilising external validation systems, care must be given to ensure that those validation systems comply with the relevant provisions in the Electronic Identity Verification Act 2012. This Act provides guidance on how an electronic identity that is held by an organisation may be used. Participants should also demonstrate some awareness of the robustness of validation systems from external companies or suppliers. For example, certain smartphone manufacturers publish promotional material on their websites regarding the security of various access methods (for example fingerprint signatures versus 4-digit PINs). Participants need to assess the best method for their operation.*

7) Record keeping of electronic documents

Reference: CCLA, Part 4, Section 231 and Federal Aviation Administration (FAA) advisory circular AC120-78A, Chapter 2

7.1 Participants must demonstrate how their recordkeeping procedures comply with the requirements of CCLA Section 231. This includes ensuring that all records stored in their databases are stamped with the metadata information. Note that Sections 215 and 216 of the CCLA define origin and destination of electronic transmissions.

8) Additional information

8.1 Participants must demonstrate how they are made aware of any system revision changes that may affect system functionality, so that they can be sure that their statutory responsibilities continue to be met.

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9) Civil Aviation Rules (CAR) – retention of records

9.1 The Civil Aviation Rules1 impose certain requirements on operators to retain maintenance and logbook records for a certain period of time. In light of these requirements, participants must demonstrate how they will access records in the following scenarios:

(a) CAA is aware of certain development agreements where the developer continues to own the intellectual property (IP) and leases it to the service provider as a way of keeping programming and development costs down. The participant must confirm who owns the IP that underpins the application and how the product will continue to run with another developer if the original software developer ceases to support the software.

(b) Assuming the product is cloud based or the storage capability is outsourced, would the participant or their service provider still be able to access the files stored within the database servers if the database provider becomes insolvent, or if overseas governments choose to seize database assets? The participant should state whose insolvency or ownership laws apply in that situation, considering their data will likely be held offshore and multiple jurisdictions' laws will apply.

(c) If the service provider becomes insolvent, would the developer and database provider continue to support the product? How would the CAA retain access to these records? How would aircraft owners ensure they could forward a complete set of records with the aircraft when sold?

(d) If new owners of an aircraft previously maintained using the service no longer wish to use the service, how will the records of previous work be archived and accessed by auditors and/or investigators in the future?

(e) If the participant itself becomes insolvent or decides to cease trading, how does the CAA ensure it retains access to records held in the participant's name with their service/database providers?

10) Exposition changes

10.1 As a minimum, participants should add a section to, or amend current sections of, their exposition to incorporate the below requirements:

(a) Responsibility for administering and implementing/managing the system.

(b) System requirements. These should include the requirements of the relevant sections outlined above.

(c) Method of controlling revision state/version history of the software or application.

(d) Method of controlling the revision state of any form contained within the system.

(e) Requirements for service agreements with suppliers. This should be approached in the same way that the agreements with maintenance providers are in the exposition, namely, that the legislative and CAR requirements that are being outsourced to digital service providers are outlined and specified.

[1] See Appendix B below.

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(f) Integrate the use of the software into every applicable and relevant process that is currently required by New Zealand CAR's to be included in an exposition. Examples may include:

(i) Policy

(ii) Staff induction and termination

(iii) ERP

(iv) Risk management

(v) W&B calculations

(vi) Flight and duty calculations

(vii) DFR processing

(viii) Pilot maintenance certification

(ix) Maintenance control

(x) Maintenance programs

(xi) Document management and storage

(xii) Audits

11) Application process

11.1 Gather evidence from service providers in support of the above requirements. This evidence may be (but not limited to):

(a) Letters from suppliers that affirm the above. These should be signed and on a company letterhead.

(b) Promotional material (as website data is subject to change, promotional material sourced from websites should be provided in such a form as it appears at the time of application. Providing URL's is not acceptable).

(c) Service contracts.

(d) Demonstrations, supported by screen shots or similar evidence.

11.2 Make the appropriate changes to their exposition, as identified in the above sections.

11.3 Generate an implementation plan for the integration of the software into company operations.

(a) If they are SMS certified, the implementation plan should be in accordance with their own SMS and Element 8 of AC100-1, Management of Change. Participants who are not SMS certified should incorporate these principles. Depending on complexity, an implementation plan produced by a service provider to manage the introduction and implementation of their product may be leveraged.

(b) Whatever method is used, it must appropriately mitigate the risks inherent in transitioning from one system to another, whilst maintaining the integrity of legal documents.

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11.4 Apply to the CAA using the appropriate form for amendment of certificate and supporting matrices as are applicable to the extent of the anticipated use of the software. The gathered evidence, exposition and implementation plan must be supplied in such a way as can be stored on file in InfoHub or the CAA preferred document management system.

12) Additional advisory information

12.1 Currently, CAA are aware that certain operators have been approved for the use of products that contain electronic sign off. CAA encourages all approved operators to perform a gap analysis and submit a plan to address any shortcomings or opportunities for improvement that have emerged as a result of this guidance.

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A1. APPENDIX A: Contract and Commercial Law Act 2017[2], Part 4, Electronic transactions

A1.1 s213 Time of dispatch

(a) An electronic communication is taken to be dispatched at the time the electronic communication first enters an information system outside the control of the originator.

(b) For the purposes of this section and section 214, information system means a system for producing, sending, receiving, storing, displaying, or otherwise processing electronic communications.

A1.2 s214 Time of receipt

(a) An electronic communication is taken to be received:

(i) in the case of an addressee who has designated an information system for the purpose of receiving electronic communications, at the time the electronic communication enters that information system; or

(ii) in any other case, at the time the electronic communication comes to the attention of the addressee.

A1.3 s221 When integrity of information maintained

(a) For the purposes of this subpart, the integrity of information is maintained only if the information has remained complete and unaltered, except for the addition of any endorsement, or any immaterial change, that arises in the normal course of communication, storage, or display.

A1.4 s228 Presumption about reliability of electronic signatures

(a) For the purposes of sections 226 and 227, it is presumed that an electronic signature is as reliable as is appropriate if:

(i) the means of creating the electronic signature is linked to the signatory and to no other person; and

(ii) the means of creating the electronic signature was under the control of the signatory and of no other person; and

(iii) any alteration to the electronic signature made after the time of signing is detectable; and

(iv) where the purpose of the legal requirement for a signature is to provide assurance as to the integrity of the information to which it relates, any alteration made to that information after the time of signing is detectable.

A1.5 s222 Legal requirement that information be in writing

(a) A legal requirement that information be in writing is met by information that is in electronic form if the information is readily accessible so as to be usable for subsequent reference.

[2] Contract and Commercial Law Act 2017 http://www.legislation.govt.nz/act/public/2017/0005/21.0/whole.html.

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A1.6 s226 Legal requirement for signature

(a) A legal requirement for a signature other than a witness's signature is met by means of an electronic signature if the electronic signature:

(i) adequately identifies the signatory and adequately indicates the signatory's approval of the information to which the signature relates; and

(ii) is as reliable as is appropriate given the purpose for which, and the circumstances in which, the signature is required.

(b) However, a legal requirement for a signature that relates to information legally required to be given to a person is met by means of an electronic signature only if that person consents to receiving the electronic signature.

A1.7 s231 Extra conditions for electronic communications

(a) In addition to the conditions specified in section 230, if a person is required to retain information that is contained in an electronic communication:

(i) the person must also retain such information obtained by that person as enables the identification of

- the origin of the electronic communication; and
- the destination of the electronic communication; and
- the time when the electronic communication was sent and the time when it was received; and

(ii) the information referred to in paragraph (a) must be readily accessible so as to be usable for subsequent reference.

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A2. APPENDIX B: Affected Civil Aviation Rules (CAR)

(a) The following parts have been reviewed: 12, 19, 26, 39, 43, 47, 91, 119, 135, 137, 141, 145, 146, 147 and 148.

(b) Not all reviewed rules had provisions that are impacted by electronic signatures and data storage systems, the affected rules are included in the tables below.

(c) As well as rules directly impacted by electronic signatures and data storage systems, rules that outline how the CAA maintains oversight through either Directors approval or acceptance have also been included.

A2.1 Part 19 *Transition Rules*

Rule 19.321(b)(5) Supply control procedures	Requires Director's approval of system for certification of release notes. If electronic system is to be used, this is then approved by Director.

A2.2 Part 43 *General Maintenance Rules*

Rule 43.69(a) and (b) Maintenance records	Rule requires use of "appropriate" logbooks. Advisory Circular AC43-1 *Aircraft Maintenance* para 43.69 explains that electronic records may be used but, if they are to be used in place of CAA logbooks, must be submitted to the Director in an exposition for acceptance. AC43-1 para 43.69 also states that the use of electronic records in place of logbooks is not considered appropriate for non-certificated organisations.
Rule 43.69(c) Maintenance records	(1) Mentions release-to-service (RTS) of defect rectification in the technical log. This must form part of the exposition submitted for acceptance by the director, if it is to be in electronic form. Ref also 91.619. (2) and (3) refer to the requirements in 43.69(a) and (b).
Rule 43.69(d)(2) Maintenance records	This states that a signature is required to certify RTS, *"except"* where electronic records are used. This does not negate the fact that such a record keeping system needs to be accepted by the Director, as outlined in 43.69(a) and (b). To clarify, any exemption from attaching a symbol as an electronic signature, as defined by this AC, only extends to the use of digital signatures.
Rule 43.103(c)(2)(ii) Requirements for certifying release-to-service	This states that a signature is required to certify RTS for an operational check flight in the logbook or worksheet and technical log, "*except"* where electronic records are used. This does not negate the fact that such a record keeping system needs to be accepted by the Director, as outlined in 43.69(a) and (b). To clarify, any exemption from attaching a symbol as an electronic signature, as defined by this AC, only extends to the use of digital signatures.
Rule 43.105(a)(2) Certifying release-to-service after maintenance	This states that a signature is required to certify RTS after maintenance in the logbook or worksheet and technical log, *"except"* where electronic records are used. This does not negate the fact that such a record keeping system needs to be accepted by the Director, as outlined in 43.69(a) and (b). To clarify, any exemption from attaching a symbol as an electronic signature, as defined by this AC, only extends to the use of digital

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	signatures.
Rule 43.105(b)(1) Certifying release-to-service after maintenance	This states that, for components defined in CAR, Part 43.54 or exported by CAR, Part 145, or Part 148 certificated organisations, a signature is required to certify RTS on a Form 1. If Form 1's are to be in digital form, such a record keeping system needs to be accepted by the Director, as outlined in 145.67(c) and 148.67(b).
Rule 43.105(b)(2) Certifying release-to-service after maintenance	This states that, for components that aren't fitted to aircraft, a signature is required to certify RTS on a Form 2. If Form 2's are to be in digital form, such a record keeping system needs to be accepted by the Director, as outlined in 43.69(a) and (b).
Rule 43.109(3)(i) Defects	This states that any defects that remain un-cleared after maintenance checks are entered into the logbooks and/or technical log and that a signature is required to certify that the aircraft is *not* released to service. Ref 43.69(a)(b) and (c).
Rule 43.113(d)(2) Duplicate safety inspection control system	This states that a signature is required to certify duplicate inspections in the logbook or worksheet, *"except"* where electronic records are used. This does not negate the fact that such a record keeping system needs to be accepted by the Director, as outlined in 43.69(a) and (b). To clarify, any exemption from attaching a symbol as an electronic signature, as defined by this AC, only extends to the use of digital Signatures.
Rule 43.155(a)(2)(ii) Certifying review	This states that a signature is required to certify RTS for a review of airworthiness in the logbook, *"except"* where electronic records are used. This does not negate the fact that such a record keeping system needs to be accepted by the Director, as outlined in 43.69(a) and (b). To clarify, any exemption from attaching a symbol as an electronic signature, as defined by this AC, only extends to the use of digital signatures.

A2.3 Part 91 *General Operating and Flight Rules*

Rule 91.607(a) Approval of maintenance programmes	References Part 91.605(a)(2) and requires Director's approval of Part 119 maintenance programs.
Rule 91.607(b) Approval of maintenance programmes	Gives requirements for maintenance programs that are to be approved under 91.607(a). Any electronic record keeping process that is outlined in this paragraph is then subject to approval by the Director.
Rule 91.616(1) Maintenance logbooks	Requires "appropriate" logbooks to be provided. Refer 43.69(a) and (b).
Rule 91.617(d) Maintenance records	Say's that records may be kept in "encoded" form, but references the information in 91.617(a)(b) and (c), which in turn refer to the record keeping systems in 43.69. Thus, this "encoded" form of record keeping must be accepted by the Director under CAR and AC43.69. Refer 43.69(a) and (b).
Rule 91.619(a) and	Gives requirements for technical log data and states that the Director's

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(c) Technical log	acceptance must be gained prior to any holder of a 119 certificate using a medium for recording signature bearing technical log data that is different to the normal CAA approved system.
Rule 91.621 Transfer of maintenance records	States all maintenance records in 91.617(a) and (b) must be transferred with aircraft ownership. This then impacts on the requirements of any signature bearing record keeping systems that are accepted by the Director, under 43.69(a) and (b).
Rule 91.623 Retention of records	States all maintenance records must be retained for specified periods. This then impacts on the requirements of any signature bearing record keeping systems that are accepted by the Director, under 43.69(a) and (b).

A2.4 Part 100 *Safety Management*

Rule 100.3(b) System for safety management	The SMS element 2, ERP must integrate any measures to quarantine records held in externally managed databases and include them in any safety investigation carried out IAW element 6. Further, if any other SMS elements utilise external service providers to operate (such as risk management apps), the SMS must reference how this is managed.

A2.5 Part 119 *Air Operator Certification*

Rule 119.15(b)(8) Operations Specifications	The Director may include details of a participant's management system in the operations specifications.
Rule 119.51(b) Personnel requirements	Airline operator must establish who has responsibility for oversight and maintenance of the system and submit as part of the exposition for acceptability.
Rule 119.81(a) and (b) Airline air operator exposition	Airline operator's exposition must contain all information required by CAR 119 and be acceptable to the Director, this includes details of all document and record management systems that may be held in electronic form.
Rule 119.101(b) Personnel requirements	General Aviation Air Operator must establish who has responsibility for oversight and maintenance of the system and submit as part of the exposition for acceptability.
Rule 119.125(a) and (b) General aviation air operator exposition	General Aviation Air Operator's exposition must contain all information required by CAR 119 (including maintenance program that shall include a description of the system used to record maintenance activity and retain those records) and that expositions must be acceptable to the Director.
Rule 119.151(b)(ii) Continued compliance	Type and format of stored exposition must be acceptable to Director.

A2.6 Part 135 *Air Operations – Helicopters and Small Aeroplanes*

Rule 135.415(c) Maintenance review	Requires that continuous maintenance review systems that form part of airline maintenance programs are acceptable to the Director.
Rule 135.415(d)(3)	Requires that signature be affixed to maintenance reviews for those carried

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Maintenance review	out under the privileges of a CAR 135 certificate. If these are certified electronically, these systems must form part of an exposition that is acceptable to the Director, under CAR 119.
Rule 135.803(a)(4) Operator responsibilities	CAR 135 Operator's flight and duty schemes must be acceptable to the Director. Any electronic application used to record, track or advise such a scheme must also be acceptable and forms part of the certification requirements in CAR 119.
Rule 135.857(a) and (b) Daily flight record	Defines the information that must be available as part of a daily flight record for each flight. Any electronic application used to record, track or advise such a scheme must also be acceptable to the Director and forms part of the certification requirements in CAR 119.
Rule 135.857(c) Daily flight record	States which daily flight record information is to be made available to the pilot, prior to flight. Any electronic application used to record, track or advise such a scheme must also be acceptable to the Director and forms part of the certification requirements in CAR 119.
Rule 135.859(d) Retention period	Document retention requirements for daily flight records. Any electronic application used to record, track or advise such a scheme must also be acceptable to the Director and forms part of the certification requirements in CAR 119.

A2.7 Part 141 *Aviation Training Organisations Certification*

Rule 141.63(b) Standard aviation training organisation exposition	A certificated Training Organisation's exposition must contain all information required by CAR 141.63(a) and be acceptable to the Director, this includes details of all document and record management systems that may be held in electronic form.

A2.8 Part 145 *Aircraft Maintenance Organisations Certification*

Rule 145.11(a) Privileges of certificate holder	Allows certificated Maintenance Organisations to perform maintenance on and release to service aircraft and components, as outlined in their exposition, and to issue release notes under Part 19. Refer 119.321(b)(5).
Rule 145.55(2) Equipment, tools, and material	A certificated Maintenance Organisation's exposition must contain procedures for control and calibration of specialist tools. If these are calibrated under procedures included in the exposition and certified in electronic form, this system's function must be documented in the exposition. Refer 145.67(c).
Rule 145.59(b)(6) and (7) Maintenance control procedures	This requires an applicant to develop procedures for release-to-service of aircraft or components and to issue authorisations for certification of Form 1's. If these are handled in electronic form, this must be documented in the exposition. Refer 145.67(c) and 43.105(b)(1).
Rule 145.63(a) Records	This requires an applicant to establish procedures for management of records to ensure a product or component is fit for release-to-service. If these are handled in electronic form, this must be documented in the exposition. Refer 145.67(c).

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Rule 145.67(a)(8)(vii), (x) and (xv) Maintenance organisation exposition	A certificated Maintenance Organisation's exposition must contain procedures for performance of maintenance activities, release-to-service of aircraft and components, and handling of records. If these are handled in electronic form, this must be documented in the exposition.
Rule 145.67(c) Maintenance organisation exposition	A certificated Maintenance Organisation's exposition must be acceptable to the Director.

A2.9 Part 146 *Aircraft Design Organisations Certification*

Rule 146.55(2) Equipment, tools, and data	A certificated Design Organisation's exposition must contain procedures for control and calibration of specialist tools. If these are calibrated under procedures included in the exposition and certified in electronic form, this system's function must be documented in the exposition. Refer 146.67(b).
Rule 146.59(b)(5) and (6) Design control procedures	This requires an applicant to develop procedures for issuing statements of compliance and design change approvals. If these are handled and certified in electronic form, this must be documented in the exposition. Refer 146.67(b).
Rule 146.63(a) Records	This requires an applicant to establish procedures for management of records to ensure that each design or design change conforms to applicable design data. If these are handled in electronic form, this must be documented in the exposition. Refer 146.67(b).
Rule 146.67(b) Design organisation exposition	A certificated Design Organisation's exposition must be acceptable to the Director.

A2.10 Part 148 *Aircraft Manufacturing Organisations Certification*

Rule 148.11 Privileges of certificate holder	Allows certificated Manufacturing Organisations to manufacture aircraft and components, as outlined in their exposition, and to issue release notes under part 19. Refer 119.321(b)(5).
Rule 148.55(2) Equipment, tools, and material	A certificated Manufacturing Organisation's exposition must contain procedures for control and calibration of specialist tools. If these are calibrated under procedures included in the exposition and certified in electronic form, this system's function must be documented in the exposition. Refer 148.67(b).
Rule 148.59(b)(7) Production control procedures	This requires an applicant to develop procedures for issuing Form 1 release certificates. If these are handled and certified in electronic form, this must be documented in the exposition. Refer 148.67(b).
Rule 148.63(a) Records	This requires an applicant to establish procedures for management of records to ensure that each design or design change conforms to applicable design data. If these are handled in electronic form, this must be documented in the exposition. Refer 148.67(b).

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Rule 148.67(b) Manufacturing organisation exposition	A certificated Manufacturing Organisation's exposition must be acceptable to the Director.

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A1.3 APPENDIX C: Exposition guidance

A1.3.1 Pre-amble

Historically paper systems have been used to make records for flight and duty, MRS, pilot maintenance, daily flight records and other aviation records which may require a sign off. While these processes are generally well understood, advances in computer and portable electronic device technology have allowed systems to be developed to replace traditional paper records. The purpose of this appendix is to provide guidance for operators wishing to use electronic signatures as part of their compliance with CAA rules.

This appendix contains guidance material for the content of the operator's exposition, located in the operators specification. While it is accepted that some of the information required will be supplied by the software developer, this information must be understood, and appropriate procedures incorporated into the exposition.

This appendix also contains minimum system specifications that are required for software to be approved. This information is not required in the operator's exposition but will be required to be supplied by the developer as part of the acceptance process for the first client certification. Once a software application is approved, it will only require re-approval after a major change that affects the criteria listed in the checklist.

A1.3.2 Operator considerations

Changing from the traditional paper process to an electronic system presents new risks to the operator and as such a management of change process will need to be conducted. The operator will need to ensure that they have understood the benefits and limitations of the software package being used and have procedures in place to effectively deal with these. The operator will need to establish procedures for how the software is to be used, procedures during out of coverage operation and supply training for these. The operator will need to specify the minimum specification level of the equipment used and how these devices are issued, maintained and all software is kept up to the latest version.

The operator checklist below contains further requirements that will need inclusion in the exposition.

A1.3.3 Software considerations

The software security will need to be robust enough to stop a record being deleted. If a record is entered in error there will need to be the option of entering another record to correct the original, without deleting or modifying the original.

The database will need to be backed up on a regular basis, preferably with a maximum time of one hour between backups in case of server failure.

If the primary server is located overseas, the software developer should have a local server available should the server be seized / locked by any overseas jurisdiction or corrupted in such a way that the server is no longer accessible. The backup should enable the system to be brought back online with minimal disruptions. The application should be able to warn users should the database become unusable and refer them to backup paper processes.

The software must consider the use of the system outside of cell coverage. This could create the situation where a record is signed on the device but not received by the system. When a record is created, these must be stored locally until such time as connectivity is re-established and the data is able to be uploaded. The system will also be required to timestamp the upload so these can be compared.

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Operator Procedure (documented in the exposition)	**Yes**	**No**	**Accepted**
Does the operator have back up process for out of coverage use?			
Does the operator have back up process for device unserviceability?			
Does the operator have a process for transferring electronic to paper process (i.e. aircraft logbook), or between systems?			
Is the electronic system integrated across the whole business as far as possible?			
Does the operators training programme include training for electronic system use and common failures?			
Does a process exist for cross checking data entered into the electronic system?			
Does a nominated person hold responsibility for ensuring software is the latest version?			
Does a nominated person hold responsibility for ensuring aircraft (and other data) is updated with any change of status?			
Does the operator have a procedure for allocation of electronic devices?			
Does the operator have a procedure for control of the device?			
Does the operator have sample signatures on file for all authorised staff?			
Can the operator's staff reproduce their signature accurately onto a mobile device each time?			
Is the device secured with a pin, password or other method of identification unique to the person signing for the record?			
Has the operator specified the minimum equipment specification required?			

Software configuration (developer)	Yes	No	Accepted
Is the operator required to physically sign each time?			
Does the software timestamp metadata when the signature is created			
Does the software timestamp metadata when the document is uploaded			
Is the record locked after signing to prevent modification after completion?			
Is the operator prevented from deleting records once signed?			

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Can the operator search the database for an individual record?			
Can the operator view records as required to fulfil their required function?			
Can the operator download the database for viewing after contract termination?			
Can the data be transferred to another similar system?			
Is the data backed up from the server on a timeline to minimise potential data loss			
If the primary server site is outside New Zealand, is a backup kept on a New Zealand based server?			
Does the record match the requirements for a paper RTS (if applicable)			
Is the operator notified that an update is required?			
Is there a process for transferring data to a new device?			
Can the database be isolated at the request of CAA / TAIC / internal investigator?			
Does the contract allow for the CAA to request locking of the database under Civil Aviation Act s24?			
Can the database be exported / viewed without using proprietary software (i.e. as a CSV file / PDF)?			
Can the operator print reports from the system in a suitable format?			
Is the software secured with password, pin or fingerprint or other system to identify the person using it?			
Is the software configured to report in the same time format as other records (New Zealand time or GMT)?			
Does data auto delete after a given timeframe (retention of records)?			
Does the supplier publish minimum equipment specifications?			
Can the software or device automatically notify users when backup paper systems must be used (out of coverage or server loss)?			

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