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TCCA Presentation to the 8th EASA Rotorcraft Symposium

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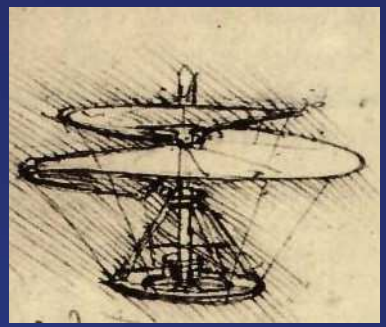

Outline

- TCCA Organization
- Certification Objectives
- Certification/Validation Process
- Post Certification Activities

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- **TCCA Organization**
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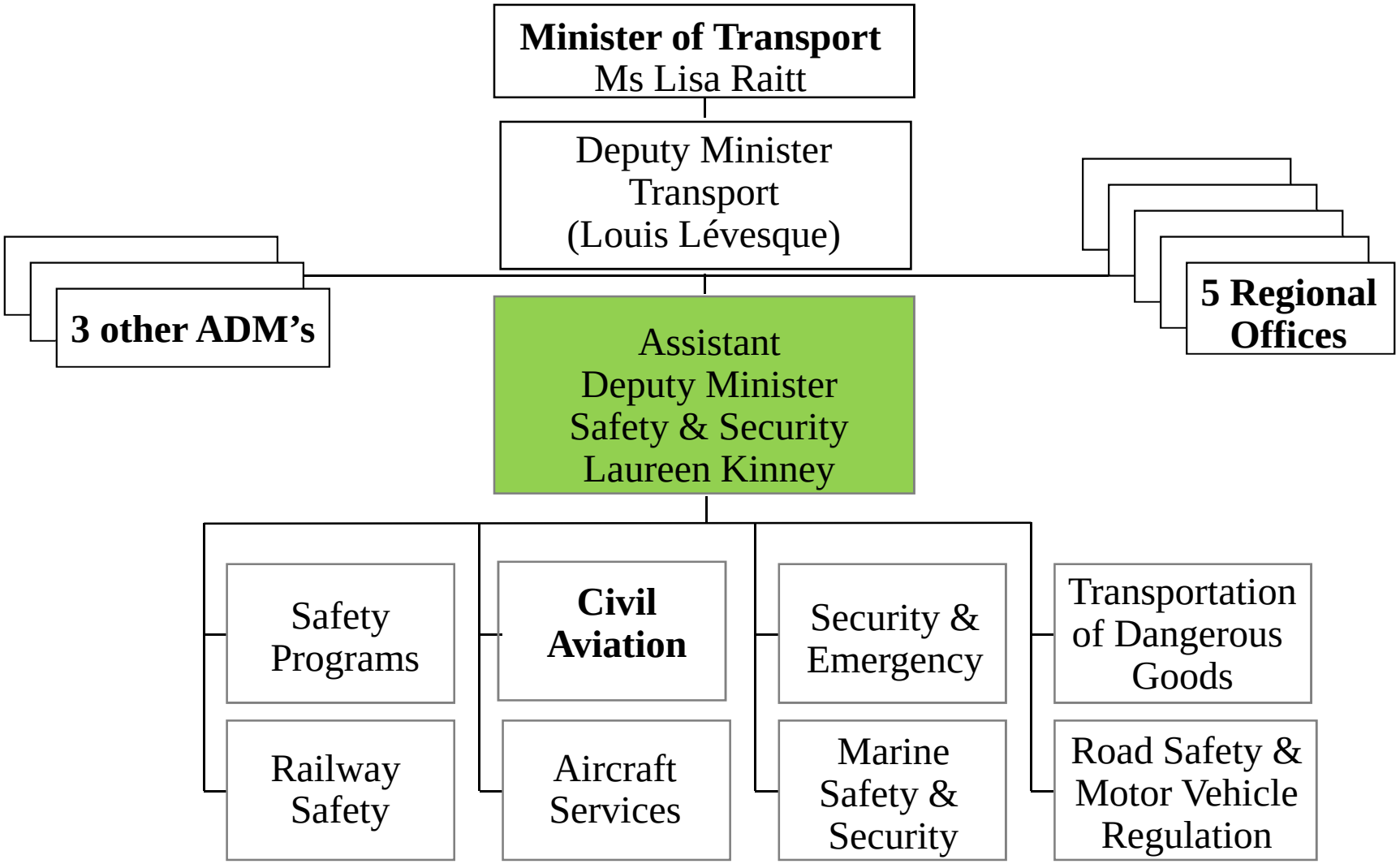
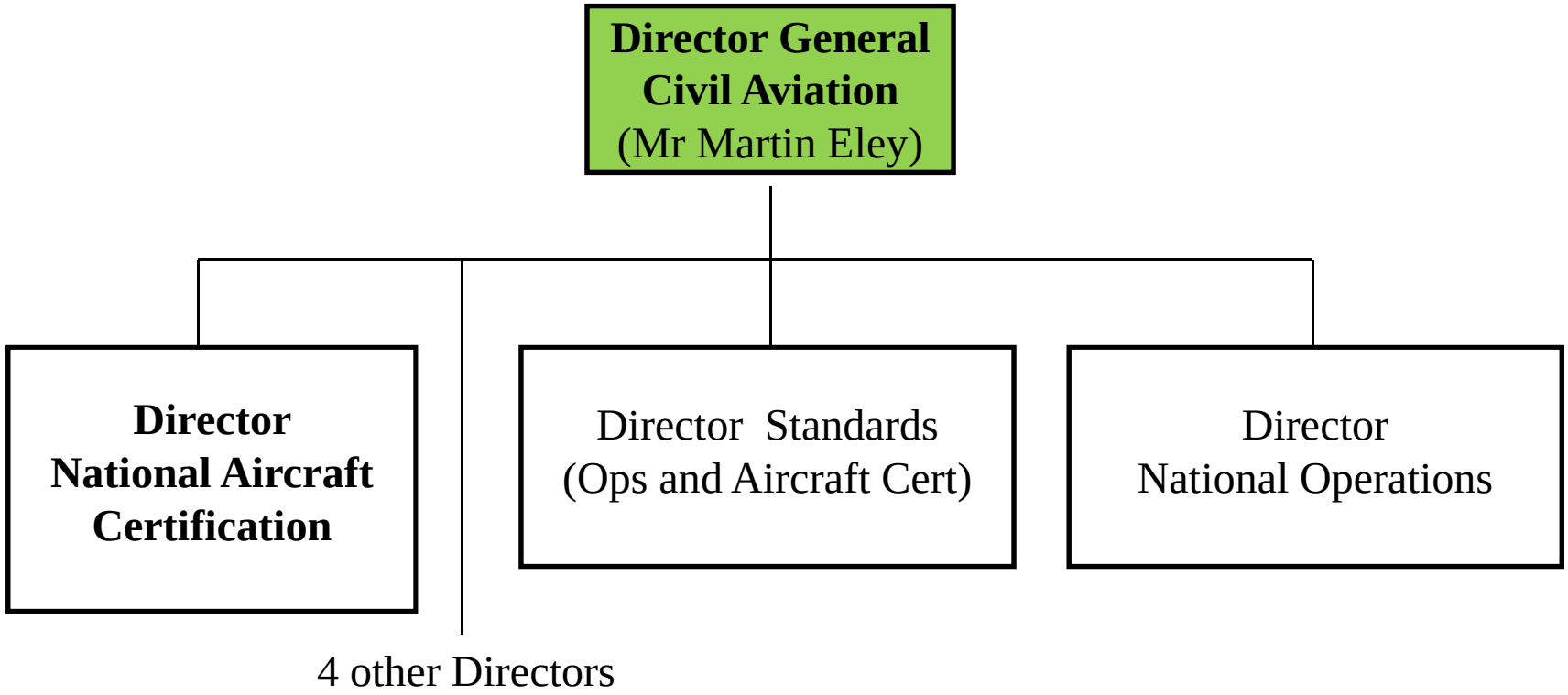
Transport Canada Offices

- **Headquarters in Ottawa, ON**
- **5 Regional Offices**

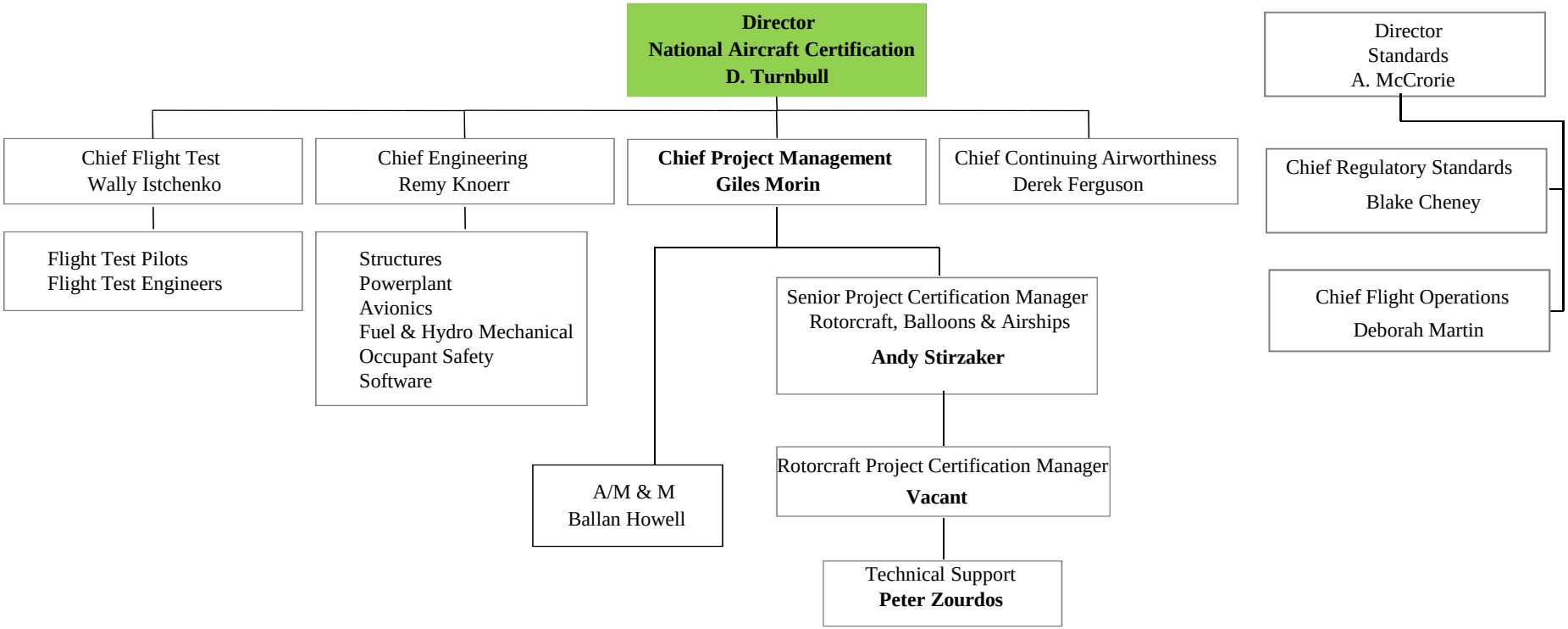
Transport Canada Organization



Transport Canada Civil Aviation Organization



TCCA National Aircraft Certification (NAC)



TCCA NAC Functions & Oversight

- Standards & Regulations
- International Harmonization
- Delegations
- Type Certification Projects
- Large DAOs and Operators (Surveillance and Audits)
- STC and CAN TSO approvals
- Continuing Airworthiness
- Maintenance & Manufacturing
- Flight Operations approvals
- Licensing

TCCA NAC Functions & Oversight (cont'd)

Type Certification of Aeronautical Products (Domestic and Foreign) in Canada

- Aircraft Type Certification
  - RFM, MMEL, Product Improvements
- Aircraft Engines
- Propellers
- Appliance Type Certification (CAN TSO)
- Supplemental Type Certification (STC)
- Repair Design Approval

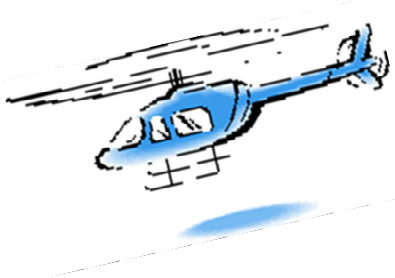
TCCA NAC Functions & Oversight (cont'd)

- Continuing Airworthiness of Aircraft in Service
  - Service Difficulty Reporting System
  - Airworthiness Directives
  - Promotions/Evaluations
- Design Standards and Regulations
  - Development and promulgation
  - International Harmonization

Canadian Airworthiness Code

- Aeronautics Act
  - Canadian Aviation Regulations
    - Airworthiness Manual (AWM)
      - Canadian Advisory Circular's (AC's)
        - Transport Canada Staff Instructions (SI's)

Airworthiness Standards



- Airworthiness Manual Chapter 527 and 529 for normal and transport category helicopters are based on the FAA FAR Part 27 and 29, plus additional airworthiness requirements unique to TCCA.

- Canada adopts each FAR Part 27 & Part 29 amendment shortly after it is published in the USA.

- Canada adopts each FAA Advisory Circulars shortly after it is published in the USA.

Environmental Standards

- Airworthiness Manual 516
- TCCA adopts by reference ICAO Annex 16 for both Noise and Emission standards

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- **Certification Objectives**
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TCCA Type Certification Objectives

- Determine if the proposed domestic Certification basis is adequate.
- Understand how the aircraft complies with the Basis (includes SCA, ESF, Exemptions) and environmental standards.
- Review and accept RFM, MMEL & AWL/CMR
- Establish configuration of aircraft eligible for approval (incl. required kits)
- Establish procedures for approval of Post Certification changes to configuration and flight manual (TCCA/EASA)
- Understand domestic approval process for design changes
- Familiarization with the Aircraft

Continuing Airworthiness Objectives

- Review service history
- Obtain knowledge of the type design
- Obtain knowledge of the CAW system
  - Service Difficulty Reporting System
  - Airworthiness Directives
  - Promotions/Evaluations

Maintenance and Manufacturing Objectives

- Obtain knowledge of the type design for M&M
- Review of maintenance instruction task development
- Review of maintenance task validation process
- Compliance with AWM 527 or 529.1529 for ICA’s

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Certification/ Validation Process

- Canadian Aviation Regulations Chapter 521 contains the procedures for issue of Type Certificate and the privileges and responsibilities of the type certificate holder.

- TCCA Staff Instructions SI 511-001 and SI 511-004 covering Type Certification of Foreign Aeronautical Products

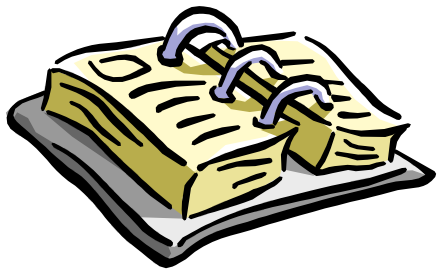
These documents are available on the Transport Canada website at the following address:
http://www.tc.gc.ca/eng/civilaviation/opssvs/managementservices-referencecentre-documents-menu-135.htm

Validation Process Elements

- Application via the domestic Airworthiness Authority
- Initial Briefing to Transport Canada
- Establish the Proposed Certification Basis
- TCCA to provide a visit Work Plan (LoI) to the applicant
- On-Site Review (draft findings will be provided upon departure)
- Determination of Compliance
- Document Compliance
- Presentation/Resolution of Findings
- Certification
- Post Certification Activities

Establish Canadian Type Certification Basis (Issue Paper G-1)

- Applicable Airworthiness Standards in effect in Canada at the time of application to the domestic authority, plus
- Canadian Additional Airworthiness Requirements of AWM 527 and 529 and applicable Advisory Circulars (AC's)
- TCCA unique Special Condition, Exemption and Equivalent Safety Findings
- Noise and Emissions (AWM 516)
- Later amendments to the Standards ("Elect to Comply")



Additional Airworthiness Requirements

TCCA Additional Airworthiness Requirements at the time of application to the domestic authority:

TCCA Additional Airworthiness Requirements in AWM 527 compared to CS 27 & FAR 27

527.1093	Induction System Icing Protection
527.1301–1	Rotorcraft Operations after ground Cold Soak
527.1557(c)(3)	Miscellaneous Markings and Placard
527.1583(h)	Operating Limitations, Ambient temperature

TCCA Additional Airworthiness Requirements in AWM 529 compared to CS 27 & FAR 29

529.807(c)(6)	Passenger Emergency Exits
529.813	Emergency Exit Access
527.1093	Induction System Icing Protection
527.1301–1	Rotorcraft Operations after ground Cold Soak
527.1557(c)(3)	Miscellaneous Markings and Placard

Additional Airworthiness Requirements (cont)

AWM 527/529.1093 Induction System Icing Protection (b)(ii) In falling, blowing, and recirculating snow without adverse effect on engine operation; or (iii) If certification for flight in snow has not been requested, the engine tolerance to snow shall be demonstrated.	**CS/FAR 27/29.1093 Induction System Icing Protection** (b)(ii) In snow, both falling and blowing, without adverse effect on engine operation, within the limitations established for the rotorcraft. **No equivalent text**.
AWM 527/529.1301-1 Rotorcraft Operations After Ground Cold Soak Substantiation of satisfactory operation of the rotorcraft as a total system, by cold weather testing or by documented evidence of satisfactory operation at low temperature, is required after the rotorcraft has experienced a prolonged exposure to ground ambient temperatures equal to or less than -35°C unless an alternative minimum ground ambient temperature has been proposed by the applicant and accepted by the Minister.	**No equivalent text**
AWM 527/529.1557 Miscellaneous Markings and Placards (c) (3) If placards and markings at the fuel or oil opening include tank capacity, the capacity must be specified in litres. Imperial or U.S. gallons may be included.	**CS/FAR 27/29.1557 Miscellaneous markings and placards.** **No equivalent text**
AWM 527.1583 Operating Limitations (h) Ambient temperature. Maximum and minimum ambient temperature limitations must be furnished.	**CS/FAR 27.1583 Operating limitations.** **No equivalent text**

Additional Airworthiness Requirements (cont)

AWM 529.803 Emergency Evacuation	CS/FAR 29.803 Emergency Evacuation
(d) Except as provided in (e) of this section, the following categories of rotorcraft shall be tested in accordance with the requirements of Appendix D of this Chapter to demonstrate that the maximum seating capacity, including the crew members required by the operating rules, can be evacuated from the rotorcraft to the ground within 90 seconds:	(d) Except as provided in paragraph (e) of this section, the following categories of rotorcraft must be tested in accordance with the requirements of Appendix D of this part to demonstrate that the maximum seating capacity, including the crewmembers required by the operating rules, can be evacuated from the rotorcraft to the ground within 90 seconds.
(e) A combination of analysis and tests may be used to demonstrate that the rotorcraft is capable of being evacuated within 90 seconds under the conditions specified in section 529.803 (d) if the Minister finds that the combination of analysis and tests will provide data, with respect to the emergency evacuation capability of the rotorcraft, equivalent to that which would be obtained by actual demonstration.	(e) A combination of analysis and tests may be used to show that the rotorcraft is capable of being evacuated within 90 seconds under the conditions specified in Sec. 29.803(d) if the Administrator finds that the combination of analysis and tests will provide data, with respect to the emergency evacuation capability of the rotorcraft, equivalent to that which would be obtained by actual demonstration.
AWM 529.813 Emergency Exit Access	**CS/FAR 29.813 Emergency Exit Access**
(b) For each emergency exit covered by section 529.809 (f), there shall be enough space adjacent to that exit to allow a crew member to assist in the evacuation of passengers without reducing the unobstructed width of the passageway below that required for that exit.	(b) For each emergency exit covered by Sec. 29.809(f), there must be enough space adjacent to that exit to allow a crewmember to assist in the evacuation of passengers without reducing the unobstructed width of the passageway below that required for that exit.
(c) There shall be access from each aisle to each Type III and Type IV exit, and:	(c) There must be access from each aisle to each Type III and Type IV exit, and
(1) for rotorcraft that have a passenger seating configuration, excluding pilot seats, of 20 or more, the projected opening of the exit provided shall not be obstructed by seats, berths, or other protrusions (including seatbacks in any position) for a distance from that exit of not less than the width of the narrowest passenger seat installed on the rotorcraft;	(1) For rotorcraft that have a passenger seating configuration, excluding pilot seats, of 20 or more, the projected opening of the exit provided must not be obstructed by seats, berths, or other protrusions (including seatbacks in any position) for a distance from that exit of not less than the width of the narrowest passenger seat installed on the rotorcraft:
(d) It shall be demonstrated through the design of the rotorcraft that there is easy access to each usable emergency exit when the rotorcraft is resting on its side.	**No equivalent text**

Additional Airworthiness Requirements (cont)

Remember to consider the Additional Airworthiness Requirements when applying to TCCA

On-Site Review Objectives

- Obtain knowledge of the domestic Aviation Authority certification process
- Obtain knowledge of product to support Canadian Certification, operation and continuing airworthiness
- Obtain knowledge of the manner in which product complied with proposed Canadian certification basis
- Focus on unique Canadian requirements as well as the domestic Equivalent Safety Findings, Exemptions and Special Conditions.

Findings

A draft copy of the TCCA findings will be provided prior to the teams departure following the on-site visit. These will be reviewed and discussed with TCCA Senior Management prior to their formal release.

- Issue Papers
- Concern Papers
- Action Items
- Flight Test Debrief Notes

TCCA Issue Papers

- Similar purpose as EASA CRI's and FAA IP's, to document possible existence of non-compliance
- Raised against requirements in the Canadian certification basis for that product that are unique to Canada (not common between TCCA/EASA/FAA certification basis ie: ATC, SC, EFS, etc.)
- Written position from the applicant and EASA/FAA
- Require closure prior to issuance of the TCCA Type Certificate

TCCA Concern Papers

- Similar purpose as EASA CRI and FAA IP, except that they are raised against requirements in the Canadian certification basis that are common to both TCCA and EASA certification basis.
- Items concerning areas where clarification is required with respect to the means of compliance accepted by EASA (ie: different interpretation of requirement)
- Addressed only to EASA/FAA (Authority may seek applicants support for their position)
- Require closure prior to issuance of TCCA Type Certificate

Action Items

- Identify areas where additional information and/or clarification is required
- May result in escalation to Issue or Concern Papers if not resolved.
- Majority will require closure prior to issuance of TCCA Type Certificate or an agreed commitment and plan to close.

Flight Test Debrief Notes

- Raised by TCCA Flight Test during on-site flight evaluations
- May be escalated to Issue Paper during or post on-site visit if not resolved and a compliance issue is perceived
- Require closure prior to issuance of Type Certificate unless otherwise indicated

Outline

- TCCA Organization
- Certification Objectives
- Certification/Validation Process
- **Post Validation Activities**

Post Validation Activities

- Acceptance of MMEL (as applicable)
- Provision of Manuals
  - In quantities required and with revision service (HQ and Region where aircraft is based)
- Issuance of Flight and Operational authorities
- Submission of changes to type design affecting:
  - These are made through EASA/FAA using the guidelines defined in the TCCA/EASA Technical Implementation Procedures - TCCA/FAA BASA
  - Limitations or ratings contained in Certification
  - Approved Canadian Rotorcraft Flight Manual Supplement (if required)
  - Modifications unique to Canadian configuration

Thank you and we look forward to working with you in the future!