PRODUCTS = TYPE CERTIFICATES (TC)

- Aeroplanes
- Rotorcraft
- Engines
- Propellers
AEROPLANE DESIGN REQUIREMENTS

- Addresses Electric Propulsion
- Does Not Address Electric Propulsion

- ≈ <450 kg
- “Sport Aircraft”
- ≤ 8.618 kg or 19 Passengers
- > 8.618 kg or 19 Passengers

- State Regulated
- Certified to Design Standards
- Certified to CS-23
- Certified to CS-25

- Declared to Design Standards
- Certified to Part 23
- Certified to Part 25
PRODUCTS = TYPE CERTIFICATES (TC)

- **Aeroplanes**
  - Part 25 (Transport Airplanes)
    - 5-8 Years, $100^{5}M
    - Can be Flown Globally
    - Can Only be Sold Domestically

- **Rotorcraft**

- **Engines**
  - Part 23 (Small Airplanes)
    - 3-5 Years, $10^{5}M-$100M
    - Can be Flown Globally
    - Can Only be Sold Domestically

- **Propellers**
SMALL AEROPLANES

U.S. – 14CFR§23 (Part 23)
• Normal, Utility & Aerobatic Category – Up to 12,500lbs or 9 passengers
• Commercial Category – Propeller Driven Multi-Engine Airplanes Up to 19,000lbs or 19 passengers

Europe – Certification Specification 23 (CS-23)
• Normal, Utility & Aerobatic Category – Up to 5,700kg or 9 passengers
• Commercial Category – Propeller Driven Twin Engine Aeroplanes Up to 8,618lbs or 19 passengers

IMPORTANT NOTE: This is all changing around the end of 2016 or the beginning of 2017.
Faa part 23

- Initially issued in 1964
- Amended 62 times
- 7 subparts
  - Subpart a – general
  - Subpart b – flight
  - Subpart c – structure
  - Subpart d – design & construction
  - Subpart e – powerplant
  - Subpart f – equipment
  - Subpart g – operating limitation & information
14 CFR §23.563, Emergency landing dynamic conditions.
FAA PART 23

14CFR§23.563, Emergency landing dynamic conditions.

- 1950’s Crash Methodology
  - No Credit for Energy Absorption
  - No Credit for Survivable Volume
- Outdated Test Dummy Specified
- No Modern Simulation Tool Credit
- Completely Prescriptive
FAA PART 23

14CFR§23.563, Emergency landing dynamic conditions.

What is the Goal of this Requirement?

- 1950's Crash Methodology
- No Credit for Energy Absorption
- No Credit for Survivable Volume
- Outdated Test Dummy Specified
- No Modern Simulation Tool Credit
FAA PART 23

14CFR§23.563, Emergency landing dynamic conditions.

Goal of this Requirement:
Protect the occupants in the event of a crash.

- 1950's Crash Methodology
- No Credit for Energy Absorption
- No Credit for Survivable Volume
- Outdated Test Dummy Specified
- No Modern Simulation Tool Credit

19g
FAA PART 23

Part-23 Amendment 62

Today

Part-23 Amendment 63

Tomorrow

ASTM F44 Standard

Flight Test

ASTM F44 Standard

Flight Test

14 Standard

14 Standard

14 Standard

14 Standard
THE DRAFT PART-23

Part 23 Amd. 62 (180 Pg.)

Part 23 Amd. 63 (≈30 Pg.)

+ ASTM F44 Standards.
WORKING TOGETHER GLOBALLY TO ENABLE INNOVATION

• Internationally Accepted Standards for GA Aircraft
• 290 International Members of ASTM F44
  • Regulators
  • Aviation Manufacturers
  • Operating Groups
• Next F44 Meeting, Spring 2017
CS-23 / PART-23 PROGRESS

- Final ARC Report
- Draft Standards
- Rev.0 Standards
- Rev.1 Standards
- RMT .0498
- A-NPA
- NPA
- Decision
- NPRM – Final Rule

2013 2014 2015 2016 2017
FAA PART 23 NPRM + DRAFT AC23.10

- FAA Plan for Final Rule by End of 2016
  - Final Rule Sent to DoT 1st Week of September
  - DoT Sent to OMB 2nd Week of October
  - White House OMB Review Currently
  - FAA Administrator Signature by 31st December 2016

- ASTM F44 Standards
  - Initial Volume (Prescriptive Text from Old FAR 23) Complete
  - 1st & 2nd Revisions Underway – add Advisory Circular information
FAA PART 23 NPRM

• Significant Changes
  • “Objective Based” (rule language only 80% of old Part 23)
  • Tightly Coupled to F44 Consensus Standards to provide Means of Compliance for all applicants – not need ELOS, etc.
  • New Numbering System (no §23.1309)
  • Eliminates Utility and Commuter Categories – Covers all Normal Category airplanes up to 19pax and 19,000lbs MTOW
  • § 21.8 Approval of articles
FAA PART 23 NPRM: MAJOR CHANGES

• Airworthiness Levels based on Risk – not Weight or Propulsion
  • Level1: 0 to 1 pax
  • Level2: 2 to 6 pax
  • Level3: 7 to 9 pax
  • Level4: 10 to 19 pax

• High speed/Low speed Complexity Levels
  • Low Speed: $V_{mo} \leq 250$ KCAS (M0.6)
  • High Speed: $V_{mo} > 250$ KCAS (M0.6)

• Simple Airplanes – entry level: $V_s < 45$ KCAs & VFR Only
FAA PART 23 NPRM

• Significant Changes – More Safety and New Technology
  • Loss of Control
    • Non-Aerobatic Airplanes: Must warn of inadvertent stall & must not inadvertently depart controlled flight
    • Aerobatic Airplanes: Must be spin recoverable from any spin
  • Icing: new ability to fly in icing conditions more severe than “Part 25 Appendix C Icing”, or detect & exit the icing
  • Enables Electric Propulsion
  • New HIRF & Lightning Rules
EASA NPA CS-23

• EASA New CS-23 by 1st Quarter 2017
  • Address Comments – January 2017
  • Issue Decision – March 2017
• Harmonized with FAA Final Rule
NEW PART 23 AT KEY AVIATION REGULATORS

- CASA Australia - TBD
- ANAC, Brazil – Expected 2017
- CAAC China - TBD
- Transport Canada (TCCA) – Expected 2017
- Europe, EASA – March 2017
- New Zealand, CAA – Expected 2017
- United States, FAA – December, 2016
THE FUTURE FOR SMALL AEROPLANES

• Increased Safety

• Electric Propulsion

• Increased Automation