FAA Aircraft Certification and Airworthiness Approvals (AERO0541)

Instructor: John Tigue

Course Description
This course provides an overview of FAA Aircraft Certification in its regulatory context, including type design, production, airworthiness, repairs and alterations, and continued operational safety. It includes FAA approvals for military derivatives of civil aircraft, including FAA's policies and limitations on these projects. Students will recognize the requirements and procedures for the various types of approvals. They will be able to identify the FAA's airworthiness functions, related organizational structure, customer principles, and Partnership for Safety Plans (PSP). Students will review the relevant Code of Federal Regulations (CFR) parts, including airworthiness standards, procedural rules, and the FAA's rulemaking and advisory processes. They will learn to distinguish among individual and organizational delegations authorized by the FAA. Students will recognize the FAA Continued Operational Safety processes used to identify unsafe conditions and to mandate inspections and modifications to address them. Students will be able to state how the U.S. uses executive agreements and Bilateral Aviation Safety Agreements to mutually accept product approvals with other authorities.

This course is FAA approved for Inspection Authorization (IA) renewal.

Who Should Attend?
Those involved in aircraft certification and airworthiness (equipment manufacturers, aircraft modifiers, suppliers and airworthiness authorities) including design engineers, airworthiness engineers, consultants, certification specialists, project managers, quality assurance managers, FAA designees, and FAA ODA Unit Members

Learning Objectives
- Recognize the scope and nature of the requirements for Design and, Production approvals, Major Repair and Alteration (MRA) approvals, and Airworthiness approvals
- Identify the organization of the FAA’s Aircraft Certification Service and Flight Standards Service with respect to the functions of these organizations in airworthiness activities and their associated regulations, orders, and advisory circulars
- Distinguish among the individual and organizational delegations used by the FAA in the activities above
• Recognize the FAA Continued Operational Safety processes used to mandate inspections and modifications to address known unsafe conditions in certificated products
• State how the United States uses executive agreements and Bilateral Aviation Safety Agreements to accept product approvals issued by other authorities
• Recognize FAA’s role in military approval of derivative versions of civil aircraft

Course Highlights
• Type Certification (TC), Supplemental Type Certification (STC), Production approvals, and Airworthiness approvals
• Overview of the FAA Aircraft Certification (AIR) and Flight Standards Service (AFS) organizations and functions
• FAA and Industry Guide to Product Certification
• Regulations, Advisory Circulars, and Orders
• Code of Federal Aviation Regulations (CFR) Parts 1, 11, 21, 23, 25, 26, 27, 29, 33, 35, 36, 39, 43, 45, and 183
• Safety Management Systems approach, and continued operational safety
• International Bilateral Aviation Safety Agreements and international validation projects
• FAA approvals for military derivatives of commercial aircraft (MDCA)

Course Outline
Introduction to FAA Aircraft Certification and Airworthiness Approvals – 1.5 hours
• Certification definition
• Why certification;
  o Civil vs public aircraft per CFR Title 49
• Aircraft Airworthiness cycle
• Airworthiness Roles
• Type design and product definitions
• Type Certification
• Production Approvals
• Airworthiness Certificates and airworthiness approvals
• Repairs and alterations
• Continued Operational Safety

FAA History and Organization – 1.5 hours
• Airworthiness functions in FAA
• Flight Standards’ reorganization and the Aircraft Certification Transformation
• Customer principles, vision, The FAA and Industry Guide to Product Certification, Partnership for Safety Plans (PSP)
• Organization Designation Authorizations (ODAs) and Organization Management Teams (OMTs)–
  • Chief Scientific and Technical Advisors (CSTAs) and Senior Technical Specialists (STS) Programs

FAA Regulations – 2.0 hours
• Organization of Rules
• The Federal Register
• Preambles to rules
• The Rulemaking processes
  o 14 CFR Part 11
  o Petition for rulemaking
  o Petition for exemption
• Airworthiness standards and their history
  o CFR relationships to CAR / CAM
• FAA Regulatory and Guidance Library (RGL)
• CFR Title 14
  o 14 CFR Part 1
  o 14 CFR Part 21
  o 14 CFR Part 26
  o 14 CFR Parts 33 and 35
  o 14 CFR parts 34 and 36
    ▪ Acoustic changes.
  o PMA and TSO
  o 14 CFR Part 183 and Order 8110.37
• Operational rules
  ▪ Design / equipment requirements
  ▪ Special Airworthiness Information Bulletins (SAIBs)
  o 14 CFR Part 107 UAS and OPA (civil operated unmanned aircraft systems and optionally piloted aircraft) CFR 107

**Type Certificate and Supplemental Type Certificate Processes – 9.0 hours**
• Order 8110.4 and the five phases of certification projects
• Application, certification plans, certification basis, and issue papers
  o Methods of compliance (MOC)
    ▪ Equivalent safety findings, exemptions and special conditions
    ▪ Analysis, similarity, and inspection
    ▪ Compliance Inspections
    ▪ Testing
      • Test plans and test reports
      • Compliance test conformity requirements
      • Engineering tests
      • Flight Tests
        o Type Inspection Authorizations / Type Inspection Report (TIA / TIR)
        o Discontinuance Letter
    ▪ Qualification tests
• Aircraft Evaluation Group (AEG) and their boards
• Function and Reliability testing
• Provisional Type Certificates
• Instructions for Continued Airworthiness (ICA) and airworthiness limitations
• Aircraft Flight Manual (Airplane AFM / Rotorcraft (RFM))
• Type Certificate Data Sheet (TCDS)
• Changes to type design
  o Major vs minor changes
  o Supplemental Type Certification and Supplemental Type Certificates
    ▪ STC similarity to Type Certification and important differences
• Certification basis considerations
  o Significant design changes and the changed product rule

Production Approvals – 2.5 hours
• Production Certificates, TSOA, and PMA
  o Supplier management

Airworthiness Certification and Airworthiness Approval – 3.0 hours
• Airworthiness Certificates
  o Standard
  o Special
  o Export
• Airworthiness Approvals
• Repairs and alterations
• 14 CFR Part 43 and 145
• Airworthiness Issues

International Type Design Validation -2.5 hours
• International Civil Aviation Organization (ICAO)
• Bilateral agreements
• European Aviation Safety Agency (EASA) / FAA validation processes
• Canadian and other BASA Technical Implementation procedures

Safety Management Systems (SMS) and Continued Operational Safety (COS) – 2.0 hours
• ICAO Standards
• FAA risk-based approach
• Industry SMS requirements and trends
• Reporting requirements
• Service documents
• Airworthiness Directives (AD’s)
• Special Certification Reviews (SCR’s)

FAA Certification for US Military Customers – 4.0 hours
• Military Commercial Derivative aircraft and other special mission modifications to civil aircraft
• Required vs. non-required equipment
• Type design certification procedures for Military Commercial Derivative Aircraft
• FAA Military Certification Office
• FAA Application
• FAA, applicant and Military Airworthiness Authority roles
• Compliance and conformity of special mission equipment
• Flight tests
• Unique military functions
• FAA restrictions and limitations
• Military systems and equipment issues
• Methods of approving military equipment
• Military airworthiness
• Continued airworthiness

Classroom hours / CEUs
28.00 classroom hours
2.8 CEUs

Certificate Track
Aircraft Compliance

Course Fees
Early registration course fee: $2,295 if you register and pay by the early registration deadline (45 days out).

Regular registration course fee: $2,495 if you register and pay after the early registration deadline.

U.S. Federal Employee Discount
This course is available to U.S. federal employees at 10% off the registration fee. To receive the federal employee discount, you must enter the code FGVT116 during the checkout process. Please note that you must validate your eligibility to receive this discount by entering your U.S. government email address (ending in .gov or .mil) when creating your online registration profile. This discount is available for both the early registration and regular registration fees.

Netherlands Defence Academy Discount
This course is available to Netherlands Defence Academy employees at a discounted registration fee. Please contact the NDA Procurement and Contracting department for details. Please note that you cannot register using our online system when requesting this discount.

Instructor Bio
John Tigue is a private consultant in aircraft certification. He has 22 years of experience in domestic and international certification with the FAA, along with 21 years of certification experience in the aircraft industry. Mr. Tigue served as Manager of the FAA Engine and Propeller Standards Staff, Manager of the FAA Atlanta Aircraft Certification Office, Assistant Manager of the FAA Small Airplane Directorate and Senior FAA Aviation Advisor to Indonesia. In industry, he served as the Director, Airworthiness and Certification for Raytheon Aircraft and the Compliance Administrator for Gulfstream ODA. Mr. Tigue's experience includes certification and continued airworthiness of aircraft engines and propellers, rotorcraft, small airplanes, transport airplanes and hot air balloons including FAA validation of international engines and
transport airplanes. His accomplishments include being named a Raytheon Engineering Fellow, chairing the AIA/GAMA working group for type certification conformity and representing Raytheon Aircraft as a member of the FAA-Industry Certification Process Improvement (CPI) team. Mr. Tigue holds a Bachelor of Science in Aerospace Engineering from Auburn University, a Master of Science in Air Transportation from the University of California at Berkeley, as Master of Arts in National Security and Strategic Studies from the United States Naval War College and a Master of Business Administration from Wichita State University.

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