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Summary of Course Content
FAA Certification and Airworthiness Processes for Civil Aircraft
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Objective:

This two-day course provides a top-level overview of the Federal Aviation Administration's (FAA) design, production, and airworthiness certification processes. Participants will gain a familiarity of product and production approval requirements as well as airworthiness certification and continued operational safety requirements and policies. FAA regulations, policies, and procedures are integral to these approval processes.

Application of these processes and policies for military civil derivative aircraft will be discussed. The FAA's designee system, its philosophy regarding safety expectations for all classes and operations of aircraft, and procedures for working with other countries are explained. The instructor will include case studies when explaining aspects of the processes. The training serves as an introduction to the processes necessary to design, produce, and maintain a safe aircraft to meet the FAA mission of a safe and efficient aerospace system.

Relevant reference material is provided with class notes.

Major topics include:

- FAA Certification and Flight Standards organizational structure
- Product approval – primarily type certification
- Production approval
- Initial airworthiness approvals
- Continued operational safety
- Airworthiness Directives
- Instructions for continued airworthiness
- Approval of repairs, alterations, and major changes to type design
- Approval to return to service after changes
- Designees
- Levels of safety
- Important documents in the certification processes
- Key regulations

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Summary of Course Content

FAA Certification and Airworthiness Processes for Civil Aircraft

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- Advisory Circulars, Orders, and other policy documents
- Regulatory process (special conditions, exemptions, equivalent levels of safety, etc.)
- Certification of commercial derivative aircraft for military use
- Repair facilities
- Working with authorities of other countries

Chapter by Chapter Summary of Class Content:

Chapter 1, Introductions: student expectations, course objectives, course outline. (Approx :40)

Chapter 2, FAA Overview: This chapter introduces FAA's role in aviation safety. Organizational structure, an overview of regulations, and the FAA documents library are covered. The process for military commercial derivative aircraft certification is introduced. (Approx 1:20)

Chapter 3, Design Approvals: This critical chapter delves into the regulations, policies, and procedures for type certification (TC) of aircraft designs. Among the subjects explained are: partnership for safety plans, certification basis, issue papers, special conditions, exemptions, equivalent level of safety, and means of compliance. The process for military commercial derivative aircraft certification is explained. The parts manufacturing approval (PMA) and Technical Standard Order Authorization (TSOA) approval processes are also discussed. (Approx 2:20)

Chapter 4, Production Approvals: This chapter covers regulations, policies, and procedures for production certification (PC) of aircraft. FAA expectations regarding quality systems, supplier control, and production in other countries are among the topics discussed. The production approval process for PMA and TSO are also explained. (Approx 1:00)

Chapter 5, Initial Airworthiness Approvals: This short chapter discusses airworthiness certificate requirements. In addition to standard airworthiness, special certificates for restricted and experimental operation are covered. (Approx :30)

Chapter 6, Designees: This chapter addresses the FAA's use of designees to maintain the safety and efficiency of the civil aircraft industry. A high level look at the FAA's designee system is presented. Next, details about the qualifications, roles, and responsibilities of Designated Engineering Representatives (DER), production certification designees (DAR, DMIR), and Organization Designation Authorization (ODA) are discussed. Certification requirements for mechanics, repairmen, and inspectors are also addressed. (Approx 1:00)

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Chapter 7, FAA’s Safety Continuum: Over time the FAA has evolved its perspective on a “safety continuum.” The rationale will be explained and how the FAA is applying this approach to design approvals and continued operational safety will be discussed. (Approx :40)

Chapter 8, Continued Operational Safety (COS): This short chapter introduces the FAA’s approach to continued operational safety (COS). It outlines what the FAA expects from design approval holders and also provides an introduction into the FAA’s approach to risk assessment and risk management for COS. Chapters 9-12 provide more details about aspects of COS. Chapter 10 of the Sustainment segment also provides details about risk assessment and risk management. (Approx :40)

Chapter 9, Instructions for Continued Airworthiness: This short chapter covers FAA expectations for instructions for continued airworthiness (ICA). Some case studies are discussed. While most of the chapter addresses FAA regulations and policies, application to military programs will be discussed. (Approx :40)

Chapter 10: MSG-3: This short chapter covers the MSG-3 (Maintenance Steering Group) process. This is strictly a civil application. (Approx :20)

Chapter 11, Continued Operational Safety Actions: This chapter describes the FAA’s process and policies for assessing COS concerns. This disciplined approach to risk assessment and risk management is called “Monitor Safety/Analyze Data” (MSAD). The Airworthiness Directive (AD) process is explained as well as means to alert operators of less urgent safety concerns. The data-driven method the FAA uses to determine risk is explained and the Boeing 787 lithium-ion battery issue is used as a case study of the approach. (Approx 1:20)

Chapter 12, Changes and Return to Service This chapter covers the processes for changes to a type design. The requirements for a supplemental type certificate (STC) are explained as well as the importance of assessing the need to update the type certification basis. Next, the various processes for returning a civil airplane to service after repair or modification are discussed. Some cases studies are described. Military policies are also presented. (Approx 1:00)

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Chapter 13: FAA Working with Other Countries: This short chapter provides an overview of how the FAA and type design approval holders interact with aviation safety authorities of other countries. The role of the International Civil Aviation Organization (ICAO) is explained. Also described are how the FAA uses bi-lateral agreements to define how it cooperates with other countries on design and production approvals, product export, and COS issues.
(Approx :30)

NOTE: Chapter times are approximate. Times will vary according to class questions and discussion. Approximate total lecture length is 12 hours.