COE TTHP 4th Technical Webinar Meeting

AJF Fleet Modernization Study

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FAA Project Sponsor: Floyd Badsky

Center of Excellence for Technical Training & Human Performance

Project Overview

- Brief Overview of the project
- Methodology
- Value to the FAA

Scope of the Project

- Work with the FAA to analyze and recommend fleet modernization strategy to replace existing diverse and aging fleet.
- The new proposed fleet need to support and meet the expectations and flight demands for all missions.

Scope of the Project

- Mission Capabilities – The recommended fleet should be able to fully support the requirements and expectations of the missions.
- Modification OEM Support – The aircraft manufacturers should be able to support and accommodate any modifications needed to support the missions.

Scope of the Project

- Propulsion/Avionics – The recommended fleet should meet and exceed propulsion and avionics expectations and needs to support the missions.
- Maintenance/Ownership costs – The fleet should be able to meet viable and competitive costs for ownership, operation and maintenance.

Project Overview – Confidentiality Statement

- The Flight Program Fleet Modernization project is an internal FAA strategy that contains procurement sensitive information.
- The investigating research team has been advised by the FAA Sponsor that we cannot share details of the strategy in this form.
- For more information, please contact FAA Project Sponsor, Floyd Badsky, Director of Operations via the COE POC.

Flight Program Operations Organization

Flight Program Operations Missions

- Four primary missions:
  - Flight Inspection
  - Aviation Safety Training
  - Research, Development, Test & Evaluation (RDT&E) Support
  - Critical Event Response / Transportation

Flight Inspection

- Ensures the integrity of instrument approaches and airway procedures.
- Accomplishes mission through the airborne inspection of all space and ground based instrument flight procedures and the validation of electronic signals in space transmitted from ground navigation systems.

Aviation Safety Training

- Responsible for providing training and currency / proficiency services to Aviation Safety personnel.

Research, Development, Test & Evaluation (RDT&E) Support

- Conducts flight and ground testing directly related to research, development, test and evaluation of new electronic aids, air traffic procedures, aircraft improvements and aviation medical research under established agency projects.

Critical Event Response / Transportation

- Provides transportation required to accomplish official FAA responsibilities in times of emergency or disaster, as well as support the National Transportation Safety Board (NTSB) in carrying out its duties.

Methodology

- The team capitalized on their earlier research work on aircraft replacement as follows:
  - Bazargan, M. and J. Hartman (2012). "Aircraft replacement strategy: Model and analysis." Journal of Air Transport Management 25: 26-29.
- Multi-criteria optimization models were developed to support FAA goals and objectives.
- The models attempt to identify types of fleet to buy / lease and retire by considering a variety of constraints.

Methodology

- Some of the constraints incorporated into the models include:
  - Gradual retiring of existing fleet – The existing fleet should retire and be phased out in a timely manner to allow the FAA continue its operations without disruptions.

Methodology

- Meet the flight demands – Anticipating the annual growth for each mission, the existing and recommended fleet should meet the future demand.

Methodology

- Acquisition Strategy – Funding and acquisition is managed by the FAA and may impact timing.

Methodology

- Aircraft availability with age – There will be a reduction of aircraft availability with the age of the aircraft due to various scheduled and unscheduled maintenance programs.

Methodology

- Fleet Diversity – Fleet diversity results in higher operating costs including dedicated crew, maintenance and part requirements. The optimization model should propose a strategy to gradually reduce fleet diversity.

Methodology

- Missions with restrictions on leasing – Some missions require modifications on their fleet to support their operations. The leasing companies typically do not allow modifications on their aircraft.

ERAU Databases

- Aircraft purchase and lease prices – The investigating team at ERAU utilized diverse databases on aircraft purchase and lease prices by age.
- Maintenance Programs – Maintenance program man-hour and part requirements and estimated costs were incorporated into the model.
- Aircraft availability with age.

Optimization Models

- Test data were used to evaluate the performance of the optimization models.
- The optimization models were run with parameters from the FAA, database and OEM data.
- The results were shared with the FAA. The feedback was incorporated into the model over several iterations.

Value and Impact to the FAA

- A comprehensive analysis of current fleet composition in relation to mission needs and requirements.
- Recommendations on fleet mix, acquisition and retiring strategies within budget.
- Multi criteria fleet selection including support for missions, OEM support, avionics, cost and leasing options.
- Reduced fleet diversity.

Questions?

For more information, please contact

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