

The Comparative Benefits of EFBs and Paper Documents in the Cockpit 2016-2022

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Introduction

- In aviation, the Pilot in Command (PIC) is in charge of gathering required materials such as performance calculations, charts, and other documents critical to flight in what is referred to as a "flight bag" (Fittzsimmons, 2002).
- Due to the volume of documents which can weigh up to 35-pounds, many pilots utilize electronic flight bags (EFBs) (Stribbe, 2013).
- A previous archival study from 1995 through 2015 found significant human factors issues with EFBs that include a lack of training, inhibited access to information, and distraction/workload (Sweet, 2016).
- Recently many companies such as Airbus have made the use of EFBs part of their standard operating procedures (Electronic Flight Bag, the New Standard, 2021).
- The proposed archival study aims to compare the hazards and benefits of carrying EFBs to the hazards and benefits of carrying paper documents in the cockpit utilizing the National Aeronautics and Space Administration (NASA) Aviation Safety Reporting System (ASRS) from 2016 through 2022 with the increased use of EFBs.



Figure 1. Electronic Flight Bag in the Cockpit

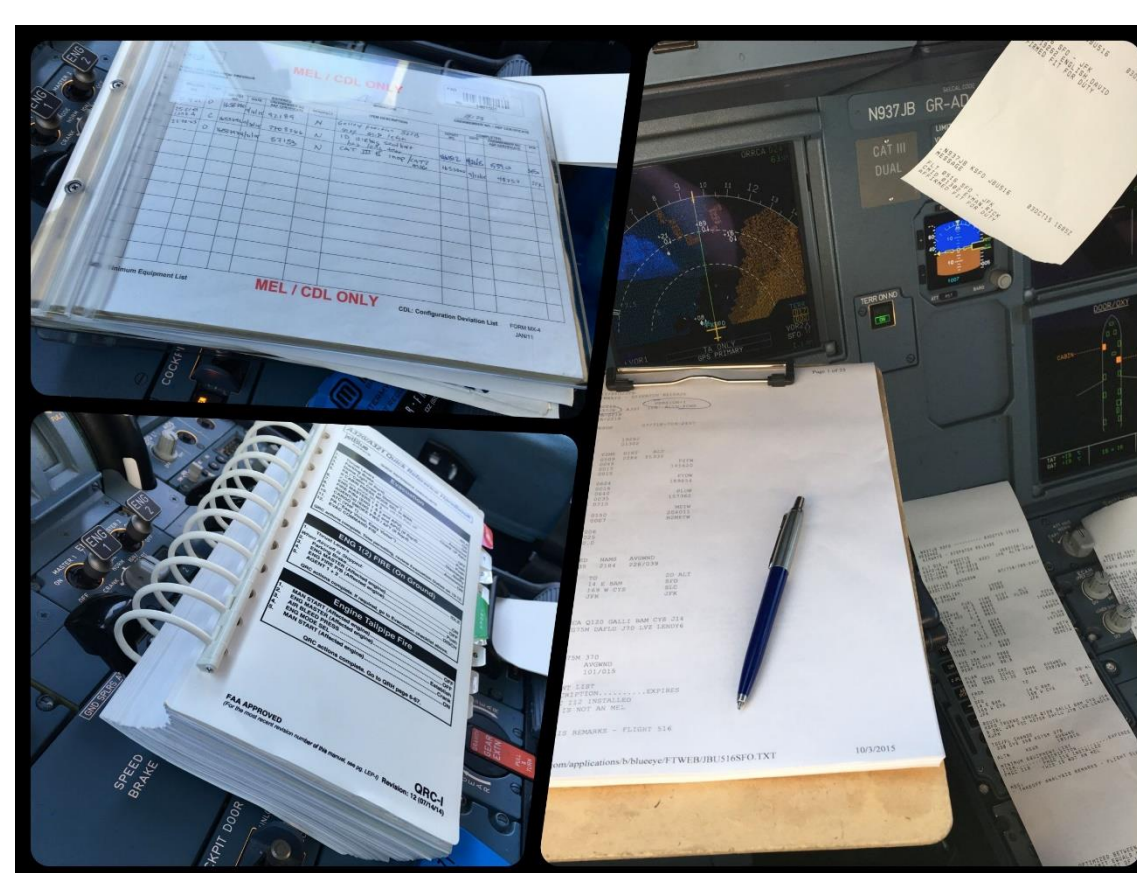


Figure 2. Paper Documents in the Cockpit

Objectives

- Gather data on EFB use in current conditions during actual flight
- Identify problems pilots are experiencing while using EFBs
- Identify problems pilots are still experiencing while using paper documents
- Produce results that may be used to influence government aviation regulations, company policies, and EFB development in the future

Methods

- Reports will be gathered from NASA ASRS Database from January 2016 through December 2022 Containing the terms "EFB", "iPad", "Jeppesen", "Electronic", "Paper", "TAC Chart", or "Sectional Chart" in the narrative.
- Relevant reports will be categorized into 13 Human Factors Categories: Access to Information, Automation, Climate/Environment, Display, Format/Configuration, Distraction/Workload, Information Architecture, Insufficient Training, Missing Document, Missing or Incorrect Information, Outdated Information, Physical Platform/Auxiliaries, and Pilot Error.
- Subject matter experts (two professional pilots) will validate report categorization.
- Chi-squared tests of independence and post-hoc tests will be conducted to analyze the data.

Preliminary Results

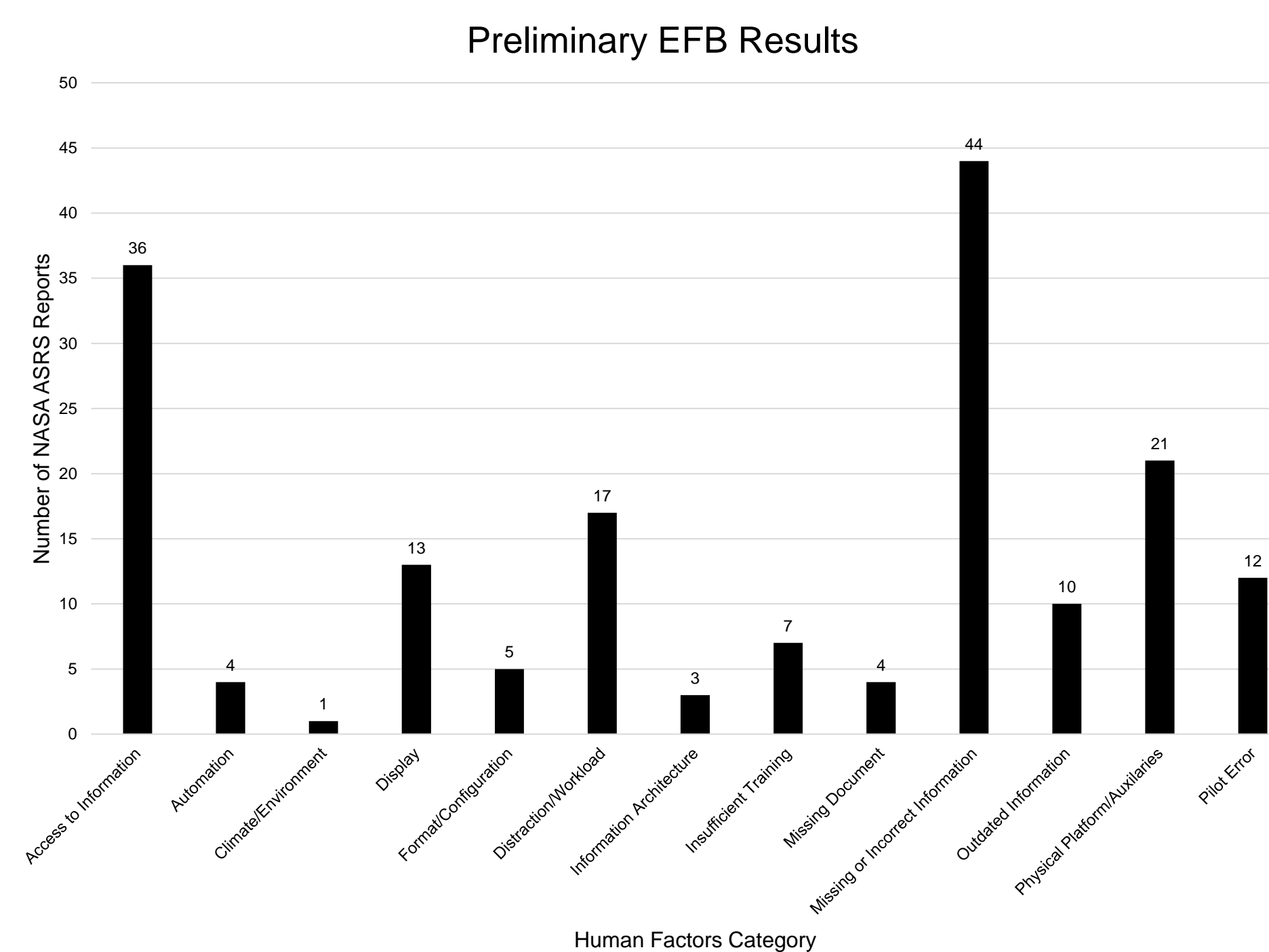


Figure 3. Frequency of NASA ASRS Reports with "EFB" keyword search

- Most issues with missing or incorrect information search and access to information

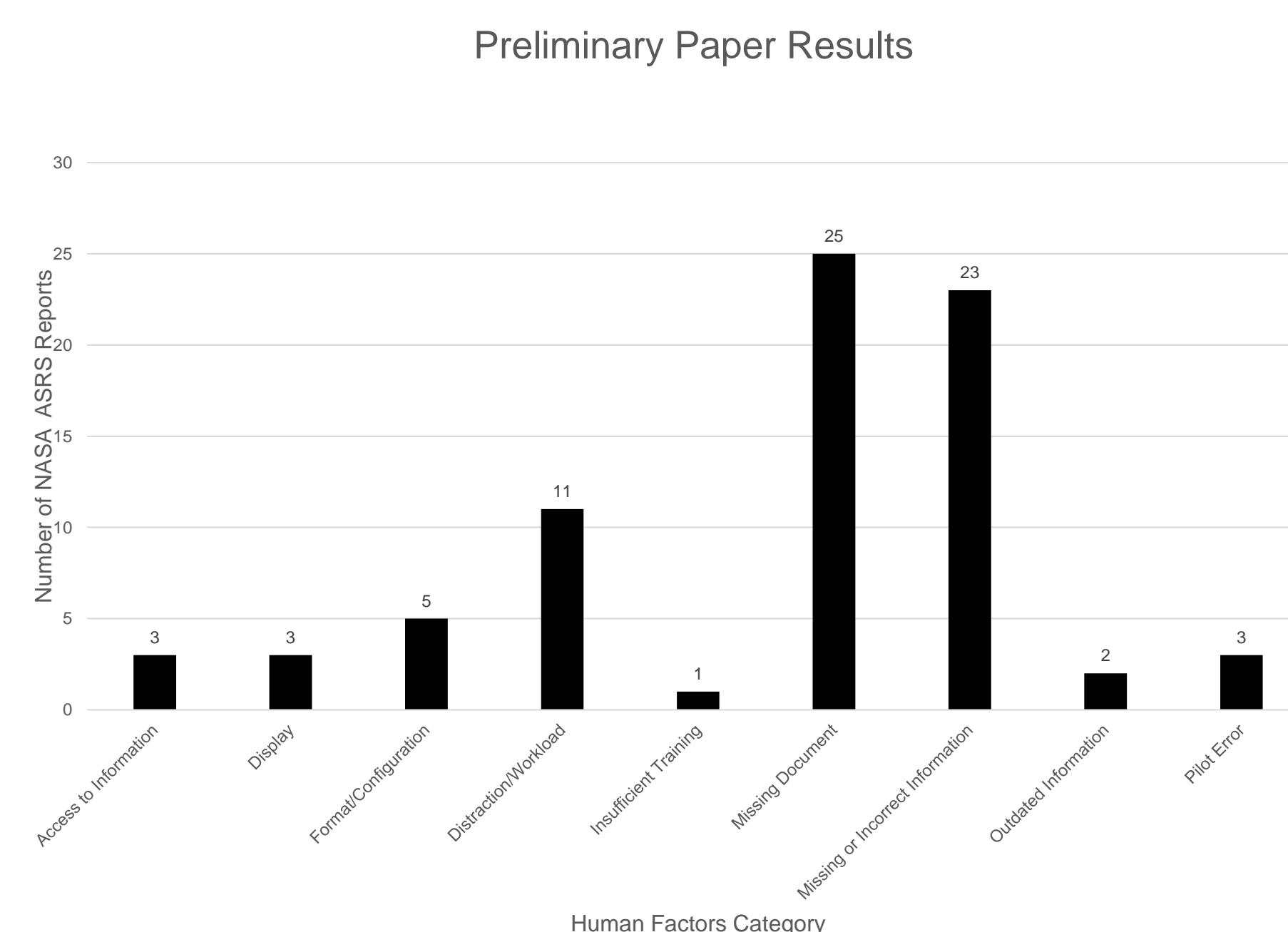


Figure 4. Frequency of NASA ASRS Reports with "Paper" keyword search

- Most issues with missing document and missing or incorrect information
- More reports generated from "EFB" keyword search than "Paper" keyword search

Preliminary Discussion

- Common problems pilots are experiencing with EFBs**
 - Inconsistencies between information provided in EFBs and published documents
 - iPads freezing causing inability to access information
 - iPads losing battery charge during flight
 - EFB mount causing inaccessibility in the Cockpit
- Common problems pilots are experiencing with paper documents**
 - Failure to locate required documents onboard the aircraft
 - Inconsistencies between information provided in paper documents and published documents

References and Acknowledgements

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