

Design and Use of Technical Information and Checklists

This activity, started in 2013, address the variety of challenges associated with the design and use of technical instructions. “Failure to follow the check list or procedures” applies to all aviation environments. This issue is repeatedly identified as a significant contributing factor in aviation maintenance events and accidents. This research includes all maintenance documentation for all aircraft categories and associated systems.

Example Background Challenges

- In 2000, an FAA study looked at maintenance error. The study focused on major malfunctions that occurred within 90 days of a heavy maintenance check. Failure to comply with maintenance documentation was the number one reason for malfunction ([Johnson & Watson, 2001](#)).
- In 2004, the NTSB accident report of the Charlotte USAir Express ([AAR-04-01](#)) stated that the FAA should: “...require 14 CFR Part 121 air carriers to implement a program in which carriers and aircraft manufactures review all work card and maintenance manual instructions for critical flight safety systems and ensure the accuracy and usability of these instructions so that they are appropriate to the level of training of the mechanics performing the work...”
- In 2007, a report by the Confidential Human Factors Incident Reporting Program (CHIRP), from the United Kingdom ([www.chirp-mems.co.uk](#)) indicated the top two most frequently occurring errors reported were: (1) information not used and (2) procedures not followed. Their recommendation was to simplify the procedures and align company task cards with the aircraft maintenance manual.
- A 2012 analysis of the FAA enforcement database, for actions taken against mechanics regarding 14 CFR Part 43 Section 43.13(a), showed that technical documentation is a challenge. Of nearly 900 “closed” cases from 2010, over 850 were taken against mechanics. Over one-third of the violations (36%) were associated with not using the proper technical documentation. The data revealed this is the number one cause for Enforcement Investigation Reports (Hodges-Austin, 2012).
- A 2012 analysis of the National Aeronautics and Space Administration (NASA) Aviation Safety Reporting System (ASRS) maintenance reports from 2001 to 2011 (14,267 reports) showed that nearly 64% (about 9,000) of safety incidents coded in the reporting system were related to technical documentation or procedural challenges or both (Moya, 2012).

Activities for the Research

The research agenda is driven by government and industry ([see Avers, et al, 2012](#)). It includes the following types of activity:

1. Quantify financial loss related to documentation issues.
2. Develop/apply methods for evaluating quality of technical documentation.

3. Leverage voluntary reporting to identify specific problems with documentation.
4. Improve/create guidance for FAA personnel working documentation issues, especially Instructions for Continued Airworthiness (ICA).
5. Expand incident investigation to identify details associated with documentation issues.
6. Improve integration and linkage of content across maintenance documents -- maintenance manuals, task cards, and illustrated parts catalogs.
7. Delegate approval from FAA to industry using established Organization Designation Authorization (ODA).
8. Improve usability of manual format, accessibility of manual, and training on manual use.
9. Initiate industry mandate requiring users to address known documentation issues.
10. Improve coordination of document professionals from industry segments and government.