U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
ARC Charter

Effective Date: 4/20/12

SUBJECT: Aircraft Certification Process Review and Reform Aviation Rulemaking Committee

1. **PURPOSE.** This charter creates the Aircraft Certification Process Review and Reform Aviation Rulemaking Committee (ARC) according to the Administrator's authority under Title 49 of the United States Code (49 U.S.C.) § 106(p)(5). This charter outlines the committee's organization, responsibilities, and tasks.

2. **BACKGROUND.** On February 15, 2012, the President signed the Federal Aviation Administration (FAA) Modernization and Reform Act of 2012 (the Act). Section 312 of the Act specifies that the Administrator of the FAA, in consultation with representatives of the aviation industry, shall conduct an assessment of the certification and approval process under 49 U.S.C. 44704.

3. **OBJECTIVES AND TASKS OF THE ARC.** The ARC will provide a forum for the United States aviation community to discuss and provide recommendations to the FAA. The ARC conducts the assessment required by Section 312 of the Act, and advises and provides written recommendations to the Director of the Aircraft Certification Service. The ARC will specifically make recommendations to improve efficiency and reduce costs through streamlining and reengineering the certification process under 49 U.S.C. 44704 to ensure that the FAA can conduct certifications and approvals in a manner that supports and enables the development of new products and technologies and the global competitiveness of the United States aviation industry. In conducting the assessment, the ARC shall consider—

   (1) The expected number of applications for product certifications and approvals the FAA will receive under 49 U.S.C. 44704 in the 1-year, 5-year, and 10-year periods following the date of enactment of the Act. (NOTE: 49 U.S.C. 44704 includes type certificates, supplemental type certificates, production certificates, airworthiness certificates, and design organization certificates.);
   (2) Process reforms and improvements necessary to allow the FAA to review and approve the applications in a fair and timely fashion;
   (3) The status of recommendations made in previous reports on the FAA's certification process;
   (4) Methods for enhancing the effective use of delegation systems, including organizational designation authorization;
   (5) Methods for training the FAA's field office employees in the safety management system and auditing; and
   (6) The status of updating airworthiness requirements, including implementing recommendations in the Administration's report entitled "Part 23—Small Airplane Certification Process Study" (OK–09–3468, dated July 2009).

4. ARC PROCEDURES.

(1) The ARC advises and provides written recommendations to the Director of the Aircraft Certification Service and acts solely in an advisory capacity. Once the ARC recommendations are delivered to the Director of the Aircraft Certification Service it is within the Director's discretion to determine when and how the report of the ARC is released to the public.

(2) The ARC may propose additional tasks to the Director of the Aircraft Certification Service for approval.

(3) The ARC will submit a report detailing recommendations by May 22, 2012. The chair of the ARC will send the recommendation report to both the Director of the Aircraft Certification Service and the Director of the Office of Rulemaking.

(4) The ARC may reconvene following the submission of its recommendations for the purposes of providing advice and assistance to the FAA, at the discretion of the Director of the Aircraft Certification Service, provided the charter is still in effect.

5. ARC ORGANIZATION, MEMBERSHIP, AND ADMINISTRATION.

The FAA will establish a committee of members of the aviation community. Members will be selected based on their familiarity with aircraft certification process, analysis and regulatory compliance. Membership will be balanced in viewpoints, interests, and knowledge of the committee's objectives and scope. ARC membership is limited to promote discussion. Active participation and commitment by members will be essential for achieving the ARC objectives. Attendance is essential for continued membership on the committee. When necessary, the committee may establish specialized work groups that include at least one committee member and invited subject matter experts from industry and government.

This ARC will consist of members from the FAA, and include members from the Aircraft Certification Service Directorates, Headquarters Divisions, and selceted aircraft certification offices and aviation associations representing manufacturers of part 23, 25, 27, and 29 aireraft.

The Director of the Aircraft Certification Service is the sponsor of the ARC and will select an industry chair(s) from the membership of the ARC and the FAA designated Federal official for the ARC. The FAA participation and support will come from all affected FAA lines-of-business.

The ARC sponsor is the Director of the Aircraft Certification Service who:

(1) Appoints members or organizations to the ARC, at the Director's sole diseretion;

(2) Receives all ARC recommendations and reports;

(3) Selects industry and FAA members; and

(4) Provides administrative support for the ARC.

Once appointed, the industry chair(s) will:

(1) Coordinate required committee and subcommittee (if any) meetings in order to meet the ARC's objectives and timelines;

(2) Provide notification to all ARC members of the time and place for each meeting;

(3) Ensure meeting agendas are established and provided to the committee members in a timely manner;

(4) Keep meeting minutes; and

(5) Perform other responsibilities as required to ensure the ARC's objectives are met.

The ARC will submit a report detailing recommendations for tasks (1) through (6) by May 22, 2012. The recommendation will enable the Administrator to meet the requirements of the FAA Modernization and Reform Act of 2012, Section 312, paragraphs (d) and (e) (see attached).

6. **COST AND COMPENSATION.** The estimated cost to the Federal Government for the Aircraft Certification Process Review and Reform Aviation Rulemaking Committee ARC is approximately $28,200 annually. All travel costs for government employees will be the responsibility of the government employee's organization. Non-government representatives, including the industry co-chair, serve without government compensation and bear all costs related to their participation on the committee.

7. **PUBLIC PARTICIPATION.** ARC meetings are not open to the public. Persons or organizations outside the ARC who wish to attend a meeting must get approval in advance of the meeting from a committee co-chairperson or designated federal official.

8. **AVAILABITY OF RECORDS.** Consistent with the Freedom of Information Act, Title 5. U.S.C., section 522, records, reports, agendas, working papers, and other documents that are made available to, or prepared for, or by the committee will be available for public inspection and copying at the FAA Headquarters, Aircraft Certification Service, AIR-1, 800 Independence Avenue, SW, Washington, DC 20591. Fees will be charged for information furnished to the public according to the fee schedule published in Title 49 of the Code of Federal Regulations, Part 7.

   You can find this charter on the FAA Web site at:
   http://www.faa.gov/about/committees/rulemaking/.

9. **EFFECTIVE DATE AND DURATION.** This ARC is effective upon issuance of this charter. The ARC will remain in existence for six months, unless sooner suspended, terminated or extended by the Director of the Aircraft Certification Service.

10. **DISTRIBUTION.** This charter is distributed to director-level management in the Office of the Associate Administrator for Aviation Safety, the Office of Aviation Policy and Plans, and the Office of Rulemaking.

The effective date of this charter is April 20, 2012.

Michael P. Huerta
Acting Administrator

SEC. 312. AIRCRAFT CERTIFICATION PROCESS REVIEW AND REFORM.

(a) IN GENERAL.—The Administrator of the Federal Aviation Administration, in consultation with representatives of the aviation industry, shall conduct an assessment of the certification and approval process under section 44704 of Title 49, United States Code.

(b) CONTENTS.—In conducting the assessment, the Administrator shall consider—

(1) the expected number of applications for product certifications and approvals the Administrator will receive under section 44704 of such title in the 1-year, 5-year, and 10-year periods following the date of enactment of this Act;

(2) process reforms and improvements necessary to allow the Administrator to review and approve the applications in a fair and timely fashion;

(3) the status of recommendations made in previous reports in the Administration's certification process;

(4) methods for enhancing the effective use of delegation systems, including organizational designation authorization;

(5) methods for training the Administration's field office employees in the safety management system and auditing; and

(6) the status of updating airworthiness requirements, including implementing recommendations in the Administration's report entitled "Part 23—Small Airplane Certification Process Study" (OK–09–3468, dated July 2009).

(c) RECOMMENDATIONS.—In conducting the assessment, the Administrator shall make recommendations to improve efficiency and reduce costs through streamlining and reengineering the certification process under section 44704 of such title to ensure that the Administrator can conduct certifications and approvals under such section in a manner that supports and enables the development of new products and technologies and the global competitiveness of the United States aviation industry.

(d) REPORT TO CONGRESS.—Not later than 180 days after the date of enactment of this Act, the Administrator shall submit to the Committee on Transportation and Infrastructure of the House of Representatives and the Committee on Commerce, Science, and transportation of the Senate a report on the results of the assessment, together with an explanation of how the Administrator will implement recommendations made under subsection (c) and measure the effectiveness of the recommendations.

(e) IMPLEMENTATION OF RECOMMENDATIONS.—Not later than 1 year after the date of enactment of this Act, the Administrator shall begin to implement the recommendations made under subsection (c).

A Report from the

Aircraft Certification Process Review and Reform Aviation Rulemaking Committee to the Federal Aviation Administration

Recommendations on the Assessment of the Certification and Approval Process

May 22, 2012

Prepared for

Director
Aircraft Certification Service
Federal Aviation Administration
Washington, DC

AIRCRAFT CERTIFICATION PROCESS REVIEW AND REFORM AVIATION RULEMAKING COMMITTEE

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LETTER FROM THE ACPRR ARC CO–CHAIRS

May 22, 2012

Ms. Dorenda Baker
Director
Aircraft Certification Service
Federal Aviation Administration
800 Independence Avenue, SW.
Washington, DC 20591

Dear Ms. Baker,

In April 2012, the FAA tasked the Aviation Certification Process Review and Reform (ACPRR) Aviation Rulemaking Committee (ARC) to conduct an assessment of the certification and approval process and to make recommendations to streamline and reengineer the certification process. The ACPRR ARC completed its assessment, developed recommendations, and has prepared this final report.

The ACPRR ARC recommendations are the result of a collaborative review by the ARC. The ARC members carefully deliberated and combined their extensive firsthand experience with the aircraft certification processes to produce recommendations to streamline and reengineer the certification process.

On behalf of the ACPRR ARC, it has been an honor to be selected to undertake this important initiative. We are confident the ARC recommendations upon implementation will result in the reduction of certification delays. Furthermore, implementation of the ARC's recommendations will allow the FAA to conduct type certifications and approvals that support and enable the development of new products and technologies and enhance the global competitiveness of the U.S. aviation industry.

The ARC would be happy to support you in reviewing the report to Congress as you prepare to meet the objectives of section 312 of the FAA Modernization and Reform Act of 2012.

Sincerely,

Ali Bahrami, Co-Chair
Manager, Transport Airplane Directorate
Aircraft Certification Service
Federal Aviation Administration

Christine Thompson, Co-Chair
Senior Manager, Lead ODA Project
Administrator Advisor,
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Boeing Commercial Airplanes

EXECUTIVE SUMMARY

Section 312 of the Federal Aviation Administration (FAA) Modernization and Reform Act of 2012 (Public Law 112–95) requires the FAA Administrator, in consultation with the aviation industry, to conduct an assessment of the aircraft certification and approval process. This final report responds to the Administrator's charter to conduct an assessment of the certification and approval process and to make recommendations to streamline and reengineer the aircraft certification process. The Administrator chartered the Aircraft Certification Process Review and Reform (ACPRR) Aviation Rulemaking Committee (ARC) to perform this assessment on April 20, 2012.

METHODOLOGY

The ARC reviewed FAA aircraft certification activity and the status of recommendations in previous reports on the FAA product certification process, then assessed the certification and approval processes. In making its assessment, the ARC considered the FAA and Industry Guide to Product Certification (Certification Process Improvement (CPI) Guide); the FAA's certification project sequencing, methods for enhancing the effective use of delegation, FAA activities related to safety management systems (SMS), methods for training FAA staff in SMS and auditing; and the status of updating airworthiness requirements, including the implementing recommendations from the FAA report "Part 23—Small Airplane Certification Process Study"[1]. The ARC's assessment prompted the ARC to also consider type certification validation processes and the consistency of regulatory interpretation.

The ARC documented key observations and special emphasis items (italicized in this Executive Summary) during its review, and developed recommendations based on common themes observed and in context of improving efficiency (resulting in cost reduction) and supporting and enabling the development of new technology and enhancing the global competitiveness of the U.S. aviation industry.

[1] OK–09–3468, July 2009.

FAA Certification Activity

The FAA Aircraft Certification Service's (AIR) certification activity has remained relatively steady for the past decade, in part because of the AIR project sequencing program (discussed below). However, AIR's workload has increased significantly as AIR resources are required for product certification as well as other areas, such as Continued Operational Safety (COS)-related activities for an increasing and aging U.S. fleet and establishing standards to keep pace with emerging technology and industry innovation. AIR spends most of its resources on COS and approximately one-third of its resources on product certification.

The ARC found that the type certification and design approval workload is expected to grow because of an ongoing trend in the increased introduction of new aviation products; technologies and materials; new rulemaking and fleet-wide safety initiatives; international type validations; SMS; and the migration of technologies from large transport airplanes to other category aircraft. In addition, the ARC reviewed U.S aircraft fleet data and the number of forecasted aircraft deliveries and observed AIR's COS activity is also expected to continue increasing as the composition of the fleet changes with the introduction of new aircraft models and designs with new technologies and materials, and other models and designs retiring.

Although the ARC charter was focused on certification process efficiencies, ARC members agreed that AIR can increase certification capacity and enhance global competitiveness by increasing efficiencies in all functions it performs, including COS and rulemaking activity. [See recommendation No. 6]

Status of Previous Recommendations Related to the FAA Certification Process

The ARC considered the status of recommendations made in previous reports on the FAA's certification process. The reports reviewed were from independent expert bodies and oversight agencies. All the reports provided recommendations to reform, streamline, and reengineer the product certification process to meet future challenges. A common theme is to shift the FAA certification process from a detailed product approach toward a systems safety approach.

The ARC noted the FAA has been generally responsive to the recommendations. However, there is no single repository that captures previous report recommendations and FAA actions in response to those recommendations. Furthermore, there is no system in place to track actions with agreed-upon metrics that show the effectiveness of implementing certain recommendations. [See recommendation No. 1b]

CPI Guide

The CPI Guide[2] describes principles to improve the effectiveness and efficiency of the product certification process. The key principles are early applicant/FAA discussions, a Project Specific Certification Plan (PSCP), and project management reviews to ensure major PSCP milestones are met or mutually replanned.

The ARC noted implementation of CPI Guide principles improves the effectiveness and efficiency of product certification processes resulting in a more effective use of FAA and industry resources, particularly through upfront identification of requirements and detailed project planning.

Industry and FAA implementation of the CPI Guide principles and best practices has been challenging and inconsistent. An update to type certification and project management policy and guidance to incorporate CPI Guide principles and best practices as a *prerequisite* for product certification would improve the overall effectiveness and efficiency of certification processes.

The certification process does not consistently monitor project management metrics or accountability to ensure both the applicant and FAA are meeting milestones and compliance activities documented in the agreed-upon certification plan. [See recommendation No. 1b]

Aircraft Certification Project Sequencing

In 2005, AIR instituted a sequencing program for all new design approval applications to prioritize processing of certification programs based on the availability of AIR resources. All new applications for certification and validation expected to require more than 40 hours of FAA involvement are placed into the aircraft certification project sequencing program. The FAA takes approximately 90 days to determine whether a project can begin.

Delays to the start of new certification projects can negatively impact industry in terms of cost and competitiveness, particularly for smaller companies and smaller projects. Delays in FAA certification can cause customers to use providers located outside of the United States to complete the work. The ARC identified improvements to the sequencing process that would reduce the overall impact on FAA resources and industry applicants including, development of detailed certification plans consistent with CPI Guide principles, reevaluating the 40-hour entry threshold, removing Organization Designation Authorization (ODA) projects, and providing a future start date as opposed to open 90-day delays.

[2] FAA and Industry Guide to Product Certification, Prepared by AIA, GAMA, and the FAA Aircraft Certification Service, Original edition January 25, 1999; Second edition September 2004.

Effective Use of Delegation

The FAA's delegation program[3] enables the FAA to meet its safety responsibilities and provide timely certification services by leveraging limited resources, which allows it to focus on critical safety areas and the application of new and evolving technologies.

The ARC review of previous reports and recommendations on the FAA certification processes found strong support for the value and importance of the delegation program. The ARC noted the FAA delegation program is a highly effective tool that is essential to the effectiveness and efficiency of the product certification processes and the FAA's ability to support a continuously growing level of aviation industry activity and Continued Operational Safety (COS) oversight.

However, current delegation programs cannot support compliance activities related to environmental tests such as noise and emission and is significantly underutilized for instructions for continued airworthiness (ICA). Although not directly managed by AIR, the standards and activities in these areas directly impact the effectiveness and efficiency of the certification process and AIR resources.

Although FAA Order 8100.15A[4] provides for delegation of ICA, such as aircraft maintenance manuals and inspection programs, most are reviewed and accepted by the FAA Flight Standards Service (AFS) Aircraft Evaluation Group (AEG). The volume of ICA continues to rapidly increase with the development of new aviation products and technologies and the AEG cannot keep up with the industry activity resulting in certification program delays. The FAA could delegate certain ICA review activity to authorized industry experts to improve effectiveness and efficiency and significantly streamline the certification process.

Expansion of delegation programs to include compliance activities related to noise and emission tests and ICA would reduce delays in certification approvals. [See recommendation No. 2]

Organization Designation Authorization

The FAA established the ODA program in 2005 and consolidated all existing organizational delegation types into this single program. This consolidation improved the safety, quality, and effectiveness of organizational delegations. However, the key benefits of ODA that improve the efficiency and lower the cost of certification processes are not yet fully realized because of the slow transition to a systems approach to certification.

The FAA and industry consider the ODA streamlining activity to date successful because of a FAA/Aerospace Industries Association (AIA)/General Aviation Manufacturers Association (GAMA) working group's 23-point detailed action plan that includes accountability, milestone dates, metrics, and clear actions/deliverables.

ODA streamlining success is characterized by "full utilization," which can be defined as ODA management of any function that is not inherently governmental. The criteria to achieve full utilization of ODA must be established as a common vision with exit criterion from ODA to the future state of certified design organization (CDO).

[3] Administered under 14 CFR part 183, Representatives of the Administrator.
[4] Organization Designation Authorization Procedures, effective August 9, 2011.

The FAA should ensure that management has the tools in place to define the roles, responsibilities of the Organization Management Team (OMT). The FAA also should ensure the position description and performance standards of the FAA staff that oversee delegated organizations reflect their appropriate roles and responsibilities. [See recommendation No. 2]

Individual Designee Program

The FAA issued Order 8100.8D, Designee Management Handbook on October 28, 2001, to address a U.S. Government Accountability Office (GAO)[5] recommendation to improve management control of the designee programs, increasing assurance that designated engineering representatives, designated airworthiness representatives, and designated manufacturing inspection representatives meet FAA performance standards.

Use of individual designees to the greatest extent possible is beneficial to both the FAA and industry. The FAA can reassign work to the designees or design approval holders (DAH) using the accountability framework concept (individuals are held accountable for their assigned portions of the entire process) and its discretionary function. Use of risk based resource targeting in exercising its discretion will allow the FAA to focus on areas of greatest risk.
[See recommendation No. 2]

Certified Design Organization

Congress authorized the FAA to develop and oversee a system for the certification of design organizations. The FAA can now approve and oversee design organizations with proven technical expertise and procedures in design, conformity, testing, and quality assurance processes instead of reviewing and approving thousands of individual drawings and tests itself or through individual designees.

The FAA established a CDO ARC which recommended how the FAA could proceed with the development and implementation of CDO. The FAA has not yet issued a CDO rule but should establish a roadmap from standard certification to designee systems, ODA, and CDO.

The ARC review of previous reports and recommendations on the FAA certification processes found strong support for the FAA to approve or certify design organizations. This allows the FAA to improve the effectiveness and efficiency of certification processes by shifting toward a systems approach to safety oversight. [See recommendation Nos. 3 and 4]

[5] "FAA Needs to Strengthen the Management of Its Designee Programs" (GAO–05–40).

FAA Safety Management System and Training

Resource investment in successful SMS implementation within AIR should result in the reduction of certification delays and an increase in available resources to facilitate Next Generation Air Transportation System (NextGen) implementation and the introduction of advanced technologies.

Key initiatives to enable implementation of SMS are: risk-based analysis and decision-making; monitor safety and analyze data; oversee system performance; and assimilate lessons learned. In particular, application of risk-based resource targeting (RBRT) to define the level of direct involvement of FAA staff in certification projects will allow for a structured approach to delegation.

Through implementation of pilot SMS projects with certain companies, the FAA is collecting information that will help define the scope of the SMS for DAHs, validate certain best practices, and expand the knowledge base within the workforce and industry with respect to the essential elements of a robust SMS for manufacturers.

AIR has a robust process and governance with respect to development and delivery of technical training. Although SMS training courses were developed and delivered for AIR staff, the existing training capabilities and infrastructure have not been fully used to improve timeliness and effectiveness of the SMS-related training. Information provided to the ARC indicated multiple opportunities for better coordination between those responsible for SMS implementation and change management process and those charged with developing the training. [See recommendation Nos. 1a and 5]

Updating Airworthiness Requirements

Part 23—Small Airplane Certification Process Study

The FAA initiated a regulatory review of the part 23 airworthiness requirements which resulted in the Part 23 Certification Process Study (CPS), issued in July 2009. The FAA chartered the Part 23 Reorganization ARC (Part 23 ARC) in August 2011 to develop recommendations on how the FAA should implement the CPS recommendations.

The ARC notes that implementation of the CPS results through recommendations currently being developed by the Part 23 ARC can significantly improve the efficiency and reduce costs of certification for small airplanes.

The FAA should ensure the support necessary for the Part 23 ARC to facilitate the issuance of a notice of proposed rulemaking (NPRM) to implement its recommendations in a timely manner.

The goal of the Part 23 ARC is to develop performance-based regulations that allow flexibility in demonstration of compliance. The ARC believes such an approach to developing standards could also be helpful for other products. [See recommendation No. 6]

Timeliness of Rulemaking

The ARC's review of some general rulemaking process challenges highlighted an opportunity to improve the timeliness of rulemaking. The ARC analyzed the use of the Fast Track Harmonization Program, special conditions (SC), and mandatory continuing airworthiness information (MCAI) and identified efficiencies and inefficiencies in the FAA's current rulemaking process.

Fast Track Harmonization Program. The Fast Track Harmonization Program successfully expedited the rulemaking process for harmonizing approximately 114 sections of Title 14 of the Code of Federal Regulations(14 CFR) part 25 with the corresponding sections of the European standards in Joint Aviation Regulations (JAR)□25. The effort generally resulted in a net reduction of costs to industry without adversely affecting the existing level of safety.

Rulemaking for MCAI. The FAA process to issue MCAIs, which are airworthiness directives (AD) based on those issued by other State of Design civil aviation authorities, (CAA) requires review. Although the FAA has taken some action (such as developing a common template for all MCAI documents) to speed MCAI issuance, the continual and duplicative actions requiring significant FAA time and resources remain, and there are currently no metrics to prove that the process adds value.

Rulemaking for Special Conditions. The FAA expends significant resources issuing SCs to address new and novel design features in the type certification process. The rulemaking process does not allow timely implementation of new standards to address new and novel designs that become standard designs. For example, to address High Intensity Radiated Fields (HIRF), the FAA issued approximately 423 SCs between 1986 and 2007, until issuing a final rule addressing HIRF in 2007. A similar issue currently exists regarding inflatable lap belts (30 SCs issued), crew rest areas (61 SCs issued), and seats with nontraditional, large, nonmetallic panels (22 SCs issued).

Some areas of the FAA rulemaking process have become overly burdensome and could be streamlined for "good cause." The FAA should streamline the rulemaking process to address (1) the adequate capabilities of other CAAs when adopting MCAI and (2) the continual use of SCs in lieu of rulemaking through more simplified effort such as a fast track program. [See recommendation No. 6]

OTHER ARC CONSIDERATIONS

Bilateral Agreements

Type validation under a bilateral agreement facilitates the reciprocal airworthiness certification of civil aircraft and parts imported or exported between two countries by reducing or eliminating redundant activities. This significantly improves the efficiency of the certification process by enabling the FAA to rely on certification activity by other CAAs with comparable systems to certify imported products. This reduces workload and allows the FAA to focus limited resources on value-added activities such as safety critical issues and other U.S. industry requests for certification.

The ARC noted industry has advocated improvements to the effectiveness of validation processes in previous recommendations. One area of concern industry identified is the program reviews the FAA performs under the validation program are not structured and are conducted on an ad hoc basis. Furthermore, metrics are needed to gauge the health of the validation processes and whether bilateral agreements are being used effectively in reducing or eliminating redundant certification activities between the FAA and the equivalent CAA.

The ARC advocates increased implementation of type validation principles. Monitoring and reporting essential metrics is necessary to establish measurable and sustainable improvement in validation efficiency and timeliness. It is also essential that the U.S. Government establish international relationships that facilitate the acceptance or streamlined validation of U.S. FAA type certificated aviation products for import. The ARC noted that improvement in the efficiency of validation programs may be realized by strengthening existing agreements, policies, and procedures. [See recommendation No. 6]

Consistency of Regulatory Interpretation

The ARC noted that issues arise with inconsistent FAA interpretation of regulatory requirements and issuance of policy that changes interpretation of regulatory requirements and previously acceptable methods of compliance. Some FAA orders contain not only procedures for the FAA workforce to perform its job but also guidance for the industry on how to meet FAA rules. The ARC supports the FAA's recent effort to move material that is guidance for the industry from FAA orders to advisory circulars.

The FAA chartered the Consistency of Regulatory Interpretation (CRI) ARC in April 2012 to review a GAO report[6] on certification and approval processes and determine the root causes of inconsistent interpretation of regulations by AFS and AIR. The ACPRR ARC encourages the CRI ARC to support the ACPRR ARC's efforts to improve efficiencies in the certification process by recommending changes be implemented to the certification and approval processes as recommended in this report. [See recommendation No. 6]

[6] GAO–11–14, October 2010.

ACPRR ARC RECOMMENDATIONS

Recommendation Nos. 1 and 2 relate to streamlining the product certification process. Recommendation Nos. 3, 4, and 5 relate to reengineering the product certification process. Recommendation No. 6 would help to improve efficiency and effectiveness within AIR, and redirect resources to support aircraft certification. The ARC's recommendations are overarching and address systems, planning, measuring, and monitoring. Therefore, if implemented, these recommendations should address all previous recommendations the ARC reviewed from previous reports and the ARC's observations outlined in this report.

Recommendation 1—Development of Comprehensive Means to Implement and Measure the Effectiveness of Implementation and Benefits of Certification Process Improvements

Development of Comprehensive Implementation Plans

Recommendation 1a: The ARC recommends the FAA develop comprehensive implementation plans for certification process improvement initiatives, including SMS, that address—

- People (FAA staff knowledge, skills, and abilities; roles/responsibilities; and culture change),
- Process (including change management),
- Tools,
- Training, and
- Implementation (including the transition to new processes and tools).

Development of Tracking and Monitoring Process to Ensure Effectiveness

Recommendation 1b: The ARC recommends the FAA develop a means to track and monitor certification process improvement initiatives, including those in the CPI Guide, to ensure effectiveness of implementation, including—

- A database for tracking recommendations and FAA response initiatives;
- Metrics for implementation and measuring expected benefits; and
- Establishment of a joint FAA/industry group to review the status of implementation.

Recommendation 2—Enhanced Use of Delegation

The ARC recommends the FAA continue to improve the effectiveness of delegation programs to achieve full utilization as a priority and realize the safety benefits of leveraging FAA resources and improved efficiency of the certification process by—

- Implementation of the ODA action plan, including assessment of metrics to determine the effectiveness of improvements and periodic joint FAA/industry review of the status.
- Ensuring appropriate training and resources are available to maintain robust oversight of delegation programs, including teams/individuals with specialized audit training to conduct ODA audits.
- Expanding delegation capability to include support for all certification airworthiness standards when appropriate, particularly low-risk or routine activities such those related to noise and emissions tests and ICA.
- Reviewing and updating the AIR certification project sequencing program to account for ODA.

Recommendation 3—Integrated Roadmap and Vision for Certification Process Reforms

The ARC recommends the FAA develop an integrated, overarching vision of the future state for certification procedures and a roadmap such that—

- A detailed roadmap clearly shows how initiatives/programs support the future state and provides gates or phases with clear milestones and success criteria; and
- There is a periodic review and update to the vision and roadmap for certification procedures which includes input from affected stakeholders.

Recommendation 4—Update Part 21 to Reflect a Systems Approach for Safety

The ARC recommends the FAA undertake a review to update 14 CFR part 21 certification procedures to reflect a system safety approach to product certification processes and oversight of design organizations which includes consideration of—

- Minimum qualification and organizational requirements for design approval applicants and holders including responsibilities and privileges,
- CDO and the recommendations of the FAA's CDO ARC for implementation of this concept,
- Training and resources necessary to maintain robust oversight of design organizations and certification activity,
- SMS for DAHs, and
- Issuance of an advance notice of proposed rulemaking (ANPRM) to solicit public input and views on some of the concepts to be considered.

Recommendation 5—Culture and Change Management

The ARC recommends the FAA develop and implement a comprehensive change management plan that takes full advantage of training development capability to prepare the workforce for its new and evolving roles and responsibilities in a systems safety approach to certification and oversight. The SMS principles, data analysis, evaluation of safety systems, and root cause analysis should be required training for those AIR staff overseeing safety systems.

Recommendation 6—Process Reforms and Efficiencies Needed for Other AIR Functions

The ARC recommends AIR undertake a review of COS and rulemaking processes and implement reforms necessary to improve efficiency, including—

- Increased design approval holder responsibilities for continued operational safety activities.
- Strengthening the effectiveness of validation programs under bilateral agreements through the establishment of metrics and joint FAA/industry review of performance to eliminate redundant activities and ensure the intended efficiencies for both FAA and the industry.
- Eliminating duplication of efforts in issuing MCAI's by leveraging bilateral agreements and capability of the CAA State of Design.
- Fast Track rulemaking process to update airworthiness standards in cases where SCs have been used for a period of time and the design is no longer new and novel.
- Implementing the recommendations provided by the Aviation Rulemaking Advisory Committee (ARAC) Rulemaking Prioritization Working Group (RPWG).
- Implementing the recommendations provided by the CRI ARC to improve efficiencies in the certification process.
- Implementing the Part 23 ARC recommendations to address the Part 23 CPS recommendations.

CONCLUSION

The ARC noted that while the number of applications for product certifications and approvals do not specifically reflect a significant increase, the actual AIR workload for the FAA is expected to continue increasing. The FAA has limited capacity and must handle competing priorities because it supports the entire product life cycle including COS, rulemaking, and certification, and must address certification of new technologies such as unmanned aircraft systems. The ARC observed many existing improvement initiatives for certification process efficiencies are already implemented or in progress. However, the FAA has not fully integrated these initiatives, overseen their implementation, measured their benefits, or clearly linked them to a future state.

The ARC believes the best opportunity for efficiency gain today in the current state of the certification process is to (1) develop comprehensive implementation plans and a tracking and monitoring process to ensure effectiveness and (2) maximize delegation to the greatest extent in current delegation systems, preparing for the future of a systems approach to certification and safety oversight such as CDO.

1.0 ABOUT THE ACPRR ARC

The Federal Aviation Administration (FAA) chartered the Aircraft Certification Process Review and Reform (ACPRR) Aviation Rulemaking Committee (ARC) on April 20, 2012, to provide a forum for the FAA and U.S. aviation community to conduct a joint assessment of the certification and approval process under Title 49 of the United States Code (49 U.S.C.) 44704, Type Certificates, Production Certificates, Airworthiness Certificates, and Design Organization Certificates. The FAA formed the ARC to respond to section 312 of the FAA Modernization and Reform Act of 2012 (Public Law 112–95).

The ARC consists of nine members, selected by the FAA, representing aircraft and avionics manufacturers, manufacturer associations, and the FAA. The members were selected with the objective to include a wide range of entities that represent both larger and smaller companies while maintaining the effectiveness of the ARC. The ARC members and its support staff are listed in appendix A to this report.

The ARC will remain in effect until October 20, 2012, unless sooner suspended, terminated, or extended by its sponsor, the Director of the FAA Aircraft Certification Service (AIR–1). The ARC may reconvene following the submission of its recommendations to advise and assist the FAA, at the discretion of AIR–1, provided the ARC charter is still in effect.

2.0 BACKGROUND

2.1 OVERVIEW

2.1.1 Congressional Delegation

On February 15, 2012, the President signed the FAA Modernization and Reform Act of 2012 (the Act). Section 312 of the Act specifies that the Administrator, in consultation with representatives of the aviation industry, shall conduct an assessment of the certification and approval process under 49 U.S.C. 44704.

Industry testified before Congress in support of this provision. There was recognition that all government spending is being highly scrutinized, and significant political and Federal Government efforts are being made to identify savings and efficiencies wherever possible. The FAA not only provides safety oversight of the national air transportation system but also controls its operations and certification of new products and technologies. To support industry efforts to get new products to market, the FAA must certify every aspect of the aircraft and all components and technologies. Despite the FAA's efforts to continuously improve and streamline the certification process, there is greater industry activity than the FAA can support, resulting in delays that increase manufacturer costs and impact competitiveness, particularly in the case of small businesses.

These certification challenges will become ever more daunting, as industry activity is expected to continue growing and government spending for certification resources remains relatively flat or even reduced. Not only do manufacturers rely on the FAA to certify products, but the ability of U.S. manufacturers to export products to the global market also depends on the FAA's international certification activities and agreements with other civil aviation authorities (CAA). In addition, implementation of the Next Generation Air Transportation System (NextGen) to modernize the air traffic system will require significant FAA certification resources.

2.1.2 FAA Aviation Rulemaking Committee

The FAA tasked the ARC to make recommendations that improve efficiency and reduce costs through streamlining and reengineering the certification process, ensuring the FAA can conduct certifications and approvals in a manner that supports and enables the development of new products and technologies, as well as the global competitiveness of the U.S. aviation industry. The statute specified that the ARC consider the following in making its assessment:

1. The expected number of applications for product certifications and approvals the FAA will receive under 49 U.S.C. 44704;

2. Process reforms and improvements necessary to allow the FAA to review and approve the applications in a fair and timely fashion;

3. The status of recommendations made in previous reports on the FAA's certification process;

4. Methods for enhancing the effective use of delegation systems, including Organization Designation Authorization (ODA);

5. Methods for training the FAA's field office employees in the Safety Management System (SMS) and auditing; and

6. The status of updating airworthiness requirements, including implementing recommendations in the FAA's report titled "Part 23—Small Airplane Certification Process Study"[7].

The FAA tasked the ARC to submit its recommendations to the Administrator through its sponsor, AIR–1, by May 22, 2012. This report provides the ARC's response to the charter.

2.2 Methodology and Scope

2.2.1 ACPRR ARC Considerations

In conducting its assessment, the ARC examined each of its recommendations to streamline and reengineer product certification processes to ensure the recommendation:

- Improves efficiency.
- Reduces costs.
- Ensures the FAA can conduct certifications and approvals under 49 U.S.C. 44704 in a way that supports and enables the development of new products and technologies as well as the global competitiveness of the U.S. aviation industry.

Because the Act directs the FAA and representatives from industry to make recommendations that support and enable the development of new technologies and global competitiveness based on the certification and approval process under 49 U.S.C. 44704, the ARC found that 49 U.S.C. 44704(a) and (b), relating to type certificates (TC) and supplemental type certificates (STC) respectively, are most relevant to the Act's instructions. The ARC determined 49 U.S.C. 44704(c) and (d), which deal with production and airworthiness certificates respectively, do not directly contribute to the requested recommendations of the Act. Statutory authority for design organization certificates, covered in 49 U.S.C. 44704(c), is not effective until 2013.

The ARC primarily reviewed programs, data, and processes covering the 10-year period from 2002 to 2012. However, the ARC included information in its review preceding that timeframe if it appeared relevant to current product certification process activities. In addition, the ARC did not have access to proprietary cost data to make recommendations on cost reductions, so recommendations that improve efficiency are assumed to reduce costs as well.

The ARC conducted its assessment by reviewing the FAA's current priorities (including a review of historical trends in certification activity); validating the priorities of fleet safety, rulemaking, and certification; and identifying the opportunities within those areas to increase efficiency. The FAA Aircraft Certification Service (AIR) is responsible for administering 49 U.S.C. 44704 functions in the areas of Continued Operational Safety (COS), support for FAA Flight Standards Service (AFS), and aircraft certification regulation and policy development. The ARC was mindful that approximately two-thirds of these functions are

[7] OK–09–3468, July 2009.

outside the certification processes and are out of the ARC charter's scope. However, the ARC noted these activities consume a significant amount of AIR resources, affecting AIR's capacity to support global competitiveness and enable the certification of new products and technologies.

2.2.2 ACPRR ARC Meetings

The ARC held its initial planning meeting on April 23 and 24, 2012, in Arlington, Virginia. The ARC held second and final meeting May 7 through May 9, 2012, in Renton, Washington, to develop its recommendations and continue drafting its final report. In addition, the ARC held four teleconferences on May 2, 16, 18, and 21, 2012, to discuss its data collection and recommendations, resolve open issues, and finalize its report. ARC program support prepared summaries of the ARC meetings and teleconferences and posted them to the ARC SharePoint Web site for ARC member review. Program support also identified and tracked ARC member action items, agreements, and decisions, and maintained a list of those items on the ARC SharePoint site.

2.3 Organization of This Report

This report has eight chapters. Chapter 1.0 presents information on the ARC's composition and task. Chapter 2.0 discusses the ARC's specific taskings and the methodology and scope the ARC used to make its observations and develop recommendations. Chapter 3.0 contains a baseline discussion of the FAA's certification activity. Chapter 4.0 contains the ARC's review of the status of recommendations from previous reports related to the FAA certification process. Chapter 5.0 presents in detail each of the ARC's considerations used to assess the FAA certification and approval process. Chapter 6.0 discusses considerations not delineated in section 312 that surfaced during the ARC's assessment. Chapter 7.0 contains the ARC's recommended process reforms and improvements necessary to allow the FAA to review and approve applications in a fair and timely fashion. Chapter 8.0 contains the ARC's conclusion on its recommendations to improve efficiency and effectiveness in the product certification process.

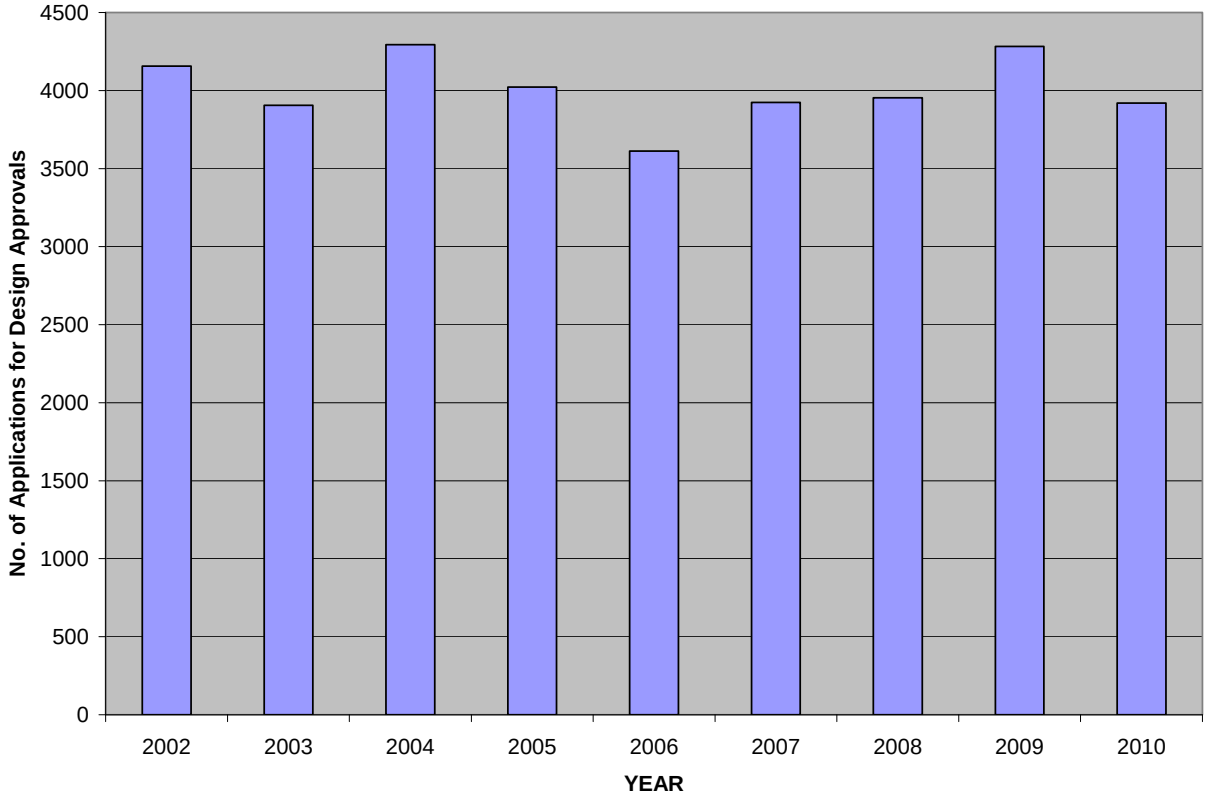
This report has six appendixes. Appendix A lists the ACPRR ARC members, observers, and ARC program support. Appendix B contains a list of acronyms. Appendix C contains a copy of section 312. Appendix D contains a copy of the ACPRR ARC charter. Appendix E contains a list of reports the ARC reviewed in considering the status of recommendations made in previous reports on the FAA's certification process. Appendix F presents the 23-point ODA action plan developed by the FAA, General Aviation Manufacturers Association (GAMA), and Aerospace Industries Association (AIA).

3.0 FAA AIRCRAFT TYPE CERTIFICATION ACTIVITY

The Act specifies in section 312(b)(1) that the Administrator should consider in the assessment "the expected number of applications for product certifications and approvals the Administrator will receive under section 44704 of such title in the 1-year, 5-year, and 10-year periods following the date of enactment of this Act." This chapter discusses the ARC's assessment of the expected aircraft type certification activity in the next decade and AIR's resource challenges to support this expected activity. Section 3.1 of this report considers historical aircraft certification activity of TCs, STCs, and parts manufacturer approvals (PMA). Section 3.2 concerns the scope of the demands on AIR resources before forecasting the certification workload. Section 3.3 describes the dynamic environment of aviation safety. Section 3.4 contains the forecast of FAA aircraft type certification activity.

3.1 HISTORY OF FAA AIRCRAFT TYPE CERTIFICATION ACTIVITY

The ARC reviewed historical certification activity to quantify AIR's existing aircraft type certification activity as a starting point to consider the forecast of FAA aircraft type certification activity. The FAA data in figure 1 below shows that AIR's type certification activity has remained steady for the past decade. The data history consists of cursory information on the number of applications submitted to AIR for design approvals including TCs, STCs, amended TCs, amended STCs, and PMAs. Technical standard order approvals are not included because the data is unavailable. As noted previously, the ARC limited its consideration of FAA aircraft certification activity to type design approvals. The ARC did not review activities relating to the issuance of production certificates and airworthiness certificates because those certificates are not directly related to the recommendation parameters requested by section 312.



Source: AIR

Figure 1—Number of Applications for Design Approvals by Year

The number of certification project applications has not changed significantly. The ARC believes this steady number of projects is a result of AIR's certification capacity limit, which AIR manages with its sequencing process. In addition, the ARC notes that in this 10-year period, the actual FAA aircraft certification workload has increased significantly as a result of demand on AIR resources to address projects relating to increased complexities in aircraft technologies and the globalization of aircraft design.

3.2 Demands on AIR Resources

In conducting its safety mission, AIR is involved in many activities that span the life cycle of a product. AIR workload continues to increase to safely manage new certification requests, oversight of organizational designees, changes in aviation business processes or business models, supplier outsourcing, and advances in aviation technologies including processing certification projects for unmanned aircraft systems (UAS). AIR is integral to and highly involved throughout the product life cycle, as depicted in figure 2 below, which shows AIR workload is not limited to certification.

Standards	Design and Development	Production	People	Operations	Maintenance and Modifications	Continued Operational Safety
Establish safety and certification regulations and policy Provide guidance on ways to meet the intent of the regulations and polity Promote voluntary engagement and cooperation with enhanced safety programs	Determine if design meets performance and certification standards Issue design approvals (type certification)	Evaluate manufacturer quality and production systems Issue production approval (production certificates)	Appoint Designees: •Individuals •Organizations FAA technical training on new standards and policy	Accept or approve instructions for continued airworthiness Approve airplane flight manuals	Issue alternative methods of compliance Issue supplemental type certificates Support inspectors with coordinated field approvals and airplane flight manuals	Continual oversight and surveillance of: • Individual designees • Organizational designees • Aircraft manufacturers Apply tools to manage risk and gain compliance: • Airworthiness directives • Precursor identification • Data sharing • Enforcement • Aircraft manufacturers

Figure 2—AIR Involvement in the Product Life Cycle

The AIR workforce has three significant areas of responsibility: COS, establishing standards, and certification.

Continued Operational Safety

AIR ensures COS of existing products through in-service product monitoring, safety surveillance and oversight programs, audits, evaluations, and support of accident/incident investigations. According to FAA labor distribution reporting, AIR spends most of its resources on COS-related activities. For example, a significant amount of AIR resources are spent on issuing airworthiness directives (AD). In 2011, AIR issued 350 ADs through the rulemaking process.

Establishing Standards

AIR creates and amends the rules, regulations, policies, and associated guidance material that apply to organizations and products operating in the U.S. civil aviation system. AIR also develops safety and certification standards and policies in collaboration with the aviation industry, government, and other CAAs. This activity is an inherently governmental function and is not delegated.

Certification

AIR issues TCs once it or its designees determine the applicant has demonstrated its aviation products comply with the applicable certification basis. This process ensures products meet the established minimum safety design standards.

3.3 Aviation Safety: A Dynamic Environment

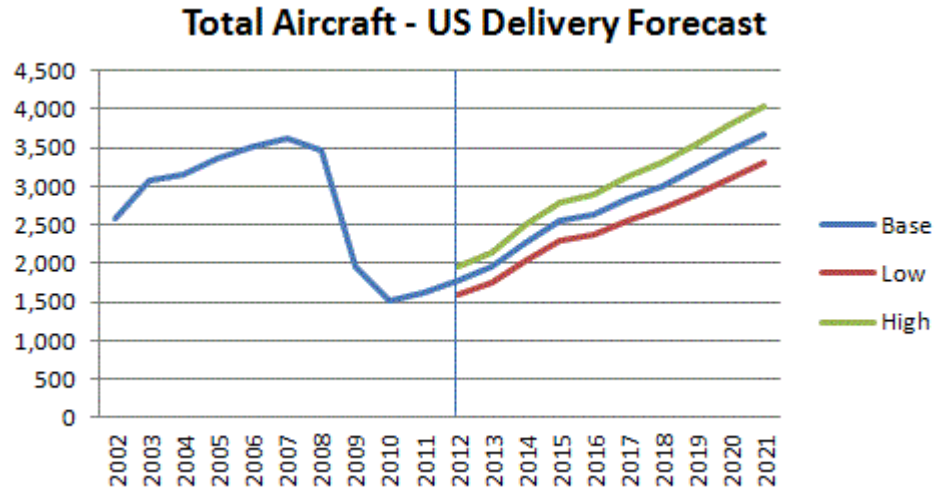
The introduction of new technologies related to NextGen and improved situational awareness, advanced engine technologies, and new materials requires AIR to develop new standards, policy, guidance, and regulations to accommodate new aircraft and aircraft systems entering the National Airspace System (NAS). In addition, AIR continues to develop SMS within the FAA and for industry. Also, migration of technologies traditionally considered exclusive to large transport airplanes into general aviation and rotorcraft will continue to put additional demands on the available certification resources. AIR meets these constantly shifting and increasing demands through increasing delegation and oversight, application of project sequencing, moving toward an SMS approach, requesting necessary resources, and ensuring personnel are fully equipped, trained, and capable of achieving the FAA's safety mission.

3.4 Forecast of FAA Aircraft Type Certification Activity

The ARC considered the expected number of applications for product certifications and approvals the FAA will receive under 49 U.S.C. 44704 in the 1-year, 5-year, and 10-year periods following February 2012. The ARC reviewed the FAA forecast of aircraft deliveries in figure 3 below to determine a correlation exists between certification workload and aircraft deliveries. No direct correlation was identified. However, the ARC agreed that AIR's type certification burden is expected to grow because of an increase in—

- Introduction of new technologies and materials. The ARC qualitatively notes the increased rate at which aircraft designers, manufacturers, and modifiers incorporate new technologies and materials such as network security and composites into their products. AIR's workload increases for new technologies and materials because, compared to established technologies and materials, additional work is necessary to establish new means of compliance, find compliance, and establish new standards.
- New rulemaking and fleet-wide safety initiatives. The ARC qualitatively notes significant new rulemaking and safety initiatives such as design for security and the fuel tank safety program add to AIR's workload.
- International validations. The number of countries that have either entered into aviation or expanded their aviation sector has surged. Consequently, AIR is involved in an increased number of validation projects or shadow certification projects. The shadow activities are essential steps in strengthening or expanding existing bilateral agreements. See chapter 7.0 of this report.

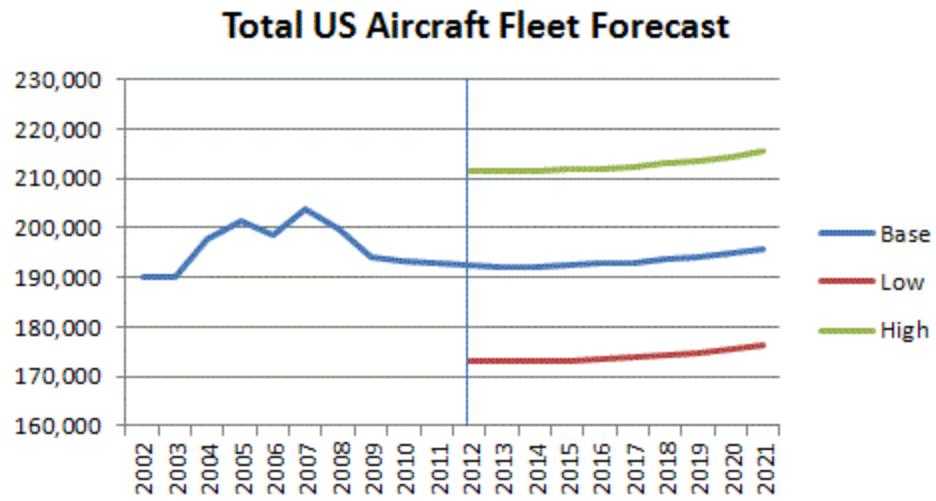
- Migration of technologies to other categories of aircraft. New technologies introduced to one category of aircraft are being adopted by other categories of aircraft. For example, certain flight deck technologies and installations, previously considered exclusive to large transport airplanes, are now being certified on small airplane and rotorcraft products. This migration of technology from one category of aircraft to another is expected to increase the AIR workload and introduce new challenges.



Source: APO–100

Figure 3—Total Aircraft U.S. Delivery Forecast

AIR's COS activity is also expected to continue increasing as the composition of the fleet grows with new aircraft models and designs with new technologies and materials being introduced, and other models and designs retiring. This change in aircraft fleet composition is supported by the forecast of a steady U.S. fleet size (see figure 4 below) and increased U.S. aircraft deliveries (see figure 3 above).



Source: APO–100

Figure 4—Total U.S. Aircraft Fleet Forecast

AIR's rulemaking activity is also increasing to provide standards for the increasing number of new technologies. These rules, regulations, policies, and associated guidance materials for new technologies are necessary for multiple categories of aircraft.

ARC Observation

The ARC made the following observations about future aircraft type certification activity:

- Although the number of certification projects has not changed significantly, the ARC notes that the aircraft certification workload has significantly increased and will continue to do so over the next 10 years. AIR has managed its increasing workload through increased delegation and oversight, application of project sequencing, and moving toward an SMS approach (see chapter 5.0 of this report), requesting necessary resources, and ensuring personnel are fully equipped, trained and capable of achieving the FAA's safety mission.

- AIR spends a small portion (approximately one-third) of its resources on product certification AIR can make gains in certification capacity and efficiency for new technologies and global competitiveness through gains in the capacity and efficiency of its COS and rulemaking activity.

4.0 STATUS OF PREVIOUS RECOMMENDATIONS RELATED TO THE FAA CERTIFICATION PROCESS

The Act specifies in section 312(b)(3) that the Administrator consider in the assessment the status of recommendations made in previous reports in the FAA's certification process. This chapter contains the ARC's consideration of the status of those recommendations.

The ARC identified and reviewed reports issued from 2002 to 2011 that recommended changes to the certification process. As no central repository for such reports exists, the ARC identified the reports through a variety of sources, and presumes the list of reports to be thorough but not necessarily complete. The ARC also included additional reports dating back as far as 1996 that it considered highly relevant to this topic. The ARC focused only on those reports that address the current industry environment and did not further consider any reports that contained obsolete information.

The ARC reviewed 29 reports, taking 19 reports into consideration and determining 10 reports not to be in scope. Appendix E to this report contains the full list of reports the ARC considered. These reports were developed by independent expert bodies such as the U.S. Aerospace Commission and National Research Council, as well as oversight agencies such as the U.S. Government Accountability Office (GAO) and the U.S Department of Transportation Office of the Inspector General (OIG). Some of these reports focused on specific FAA programs such as ODA and risk-based resource targeting (RBRT) tools, and provided recommendations to improve implementation and effectiveness of AIR program management and safety oversight. Other reports assessed the rapidly changing aviation environment (increased growth in industry activity combined with the accelerated development of new technology and products) and provided recommendations for reengineering the FAA certification processes to meet future challenges and continue to improve safety levels.

The ARC captured recommendations from the reports, combined them into a single list, and categorized them by area of recommendation (cost reduction, enabling new technology, global competitiveness, and improved efficiency).

Certification Process Reform Streamlining and Reengineering

The ARC identified multiple instances where recommendations from previous reports converged and overlapped. Several independent assessments of the certification process found that industry development of new aviation products and technologies is expected to continue growing at a pace that far exceeds the FAA's ability to support. All of the reports provided recommendations to reform, streamline, and reengineer the certification process to meet future challenges. The common theme among these recommendations is shifting the FAA certification process from a detailed product approach toward a systems safety approach. The following summarizes the key recommendations from previous reports:

- **Challenge 2000: Recommendations for Future Aviation Safety Regulation, April 1996.** The increased size and complexity of the aviation industry will require the FAA to leverage the demonstrated capability of top industry performers and move from detailed oversight of industry operations to more program-level development and performance analysis. This greater emphasis on systems will require increased skills in auditing and systems analysis. This change, more than any other, has the potential to improve aviation safety and increase FAA efficiency.
- **White House Commission on Aviation Safety and Security, February 1997.** Given the tremendous growth and globalization of the industry, it is neither realistic nor desirable to expect the FAA to rely on hands-on inspections to ensure safety. The FAA should develop standards for continuous safety improvement and target its regulatory resources based on performance against those standards. The FAA should also develop objective methods of measuring a company's ability to monitor and improve their own safety. FAA oversight should be adjusted to recognize the maturity and actual performance of individual operators and manufacturers. Such an approach will allow the FAA to target its inspector resources on those operators demonstrating the greatest risk, while allowing mature operators and manufacturers to manage their organizations without unproductive FAA involvement.
- **National Civil Aviation Review Commission, December 1997.** The relationship between the FAA and industry needs to change to reflect the current industry "maturity" level on safety matters. Government and industry should implement a comprehensive and concerted program that requires new ways of doing business with each other and a greater emphasis on cooperation and collaboration, with more FAA resources focused on effective Safety Risk Management (SRM).
- **National Research Council, Improving the Continued Airworthiness of Civil Aircraft, 1998.** The NRC performed an assessment of AIR safety management to determine how the current process might be improved. The process by which the FAA regulates aircraft production is a model that should be applied to the type certification process, whereby the FAA promotes the safety of individual products by verifying the manufacturer has established and is maintaining a safe and effective system that includes its own internal checks. The FAA should assess and approve the capabilities and procedures of an applicant's design organization rather than follow the current process, which requires FAA engineers to analyze the safety implications of new and modified designs independently. AIR should promote aircraft safety by certifying the competency

of an applicant's design organization rather than relying on the FAA's ability to detect design deficiencies through spot checks.

- **RTCA Task Force 4—Certification, Final Report, February 1999.** The dynamic growth and globalization of aviation have outpaced the government's certification policies and regulatory oversight of the systems, equipment, and procedures used for air traffic management and communications, navigation, and surveillance. The RTCA, Inc., Task Force 4 was tasked to recommend what changes are needed to make the certification process more responsive to the current operational environment, as well as how and when any recommended changes should be implemented. The European certification system goes further than FAA regulations presently permit, and approves organizations to perform and approve certain data and procedures. The FAA should promptly amend U.S. regulations to provide for the use of organizational approvals, as is the case in Europe. Continued delay in this effort only serves to slow the modernization efforts for the entire NAS.
- **RTCA Task Force 4—Certification Select Committee, August 2001.** The current practice of direct agency involvement in each operational and product approval has become an impediment to the growth of aviation. The current practice should be replaced with organizational certification of operators and product manufacturers, modeled after current practices in Europe.
- **Certified Design Organization (CDO), 2003, 2008, 2012.** Congress authorized the FAA to certificate design and production organizations to certify compliance with requirements and airworthiness standards for the type certification of aircraft, aircraft engines, propellers, or appliances. These organizations must have adequate engineering, design, and testing capabilities, standards, and safeguards to ensure the product being certificated is properly designed and manufactured, performs properly, and meets the regulations and minimum airworthiness standards. A 2008 ARC submitted recommendations on how the FAA could proceed with CDO development and implementation.

Status of Previous Recommendations

The ARC found the FAA has taken actions on many of the recommendations to improve the effectiveness and efficiency of certification and approval processes such as the expansion of organizational delegation and international validation programs as well as internal quality and SMS to strengthen oversight. However, the ARC did not have time to research the actual status for each of the recommendations because of the time constraints for this review and the absence of a means for tracking the recommendations or their statuses.

The FAA indicated it has touched on most of the recommendations in some way, and although some of the activities have been successful (such as those related to the recommendations in an October 2004 GAO report[8]), all may not have been effective. In the case of an October 2010

[8] GAO–05–40, Aviation Safety: FAA Needs to Strengthen the Management of Its Designee Programs, October 2004.

GAO report[9], the FAA did not appear to implement the report's executive action recommendations, as the ARC could not locate the improvements in the certification and approval process in any existing FAA corrective action plans.

ARC Observation

Through its review of the recommendations made in previous reports, the ARC determined the FAA has been generally responsive to various recommendations. Some of the recommendations have been broad and more strategic in nature, making implementation challenging.

With respect to more systemic recommendations, AIR has initiated implementation activities. However, implementation of these longer term recommendations takes resources away from other functions such as COS and certification.

Although AIR has been responsive, there is no single repository that captures previous recommendations and FAA actions in response to those recommendations. Furthermore, there is no system in place to track actions with agreed-upon metrics that show whether the implementation of certain actions have been effective. Having a database that captures both the recommendations and the activities that are responsive to those recommendations would assist in integration, management, and linkage of the actions to the future state. Monitoring performance measures of certification process improvement initiatives would allow the FAA to determine progress toward program outcomes such as streamlined approval of certification plans and use of delegation.

The ARC developed its recommendations based on some of the previously issued recommendations. See chapter 7.0 of this report.

[9] GAO–11–14, Aviation Safety: Certification and Approval Processes Are Generally Viewed as Working Well, but Better Evaluative Information Needed to Improve Efficiency, p. 24, October 2010.

5.0 ARC ASSESSMENT OF THE CERTIFICATION AND APPROVAL PROCESS

This chapter contains the ARC's assessment of the FAA certification and approval process in response to section 312(b)(2) and (b)(4) through (b)(6) of the Act.

Title 14 of the Code of Federal Regulations (14 CFR) part 21, Certification Procedures for Products and Parts, is the basis for evaluating and certifying aircraft, engines, and propellers. The steps in the certification process include the applicant's conceptual design, the application for design approval, definition of the design standards, plans to demonstrate the design meets those standards, generation and substantiation of compliance data, determination of compliance, and issuance of the TC.

5.1 THE FAA AND INDUSTRY GUIDE TO PRODUCT CERTIFICATION

To reduce product certification costs and associated resource requirements, and to increase process efficiency, AIA, GAMA, and the FAA commenced a joint program in 1997 to redesign the certification process to become more efficient, effective, and compatible with modern business practices. This resulted in the publication of the FAA and Industry Guide to Product Certification (CPI Guide), which describes principles based on best practices on how to plan, manage, and document an effective, efficient product certification process and working relationship between the FAA and an applicant manufacturer. The key principles identified in the CPI Guide to improve the product certification process are—

- Early applicant/FAA discussions. Discussions in the early stages of a new product idea help identify potential technical and safety issues up front and facilitate better definition of the proposed certification project scope.
- Project Specific Certification Plan (PSCP). This requires significant industry effort in the early stages to develop a relatively mature design concept before even starting a certification program. A PSCP should include proposed methods of compliance for each applicable requirement and a delegation plan that identifies delegations by name or organization that will be used. Early development of a detailed PSCP allows the FAA to better plan its level of involvement and focus its resources on safety-critical items.
- Project management reviews. During the certification project, FAA and industry program management must ensure major PSCP milestones are either met or mutually replanned.

ARC Observation

The ARC fully supports the CPI Guide principles and best practices and finds that implementation improves the effectiveness and efficiency of product certification processes, providing significant benefits for both the FAA and industry. Although the approach for a formal Partnership for Safety Plan agreement is focused on large and/or complex programs, the CPI Guide principles of upfront planning, a detailed certification plan, and safety-focused project management are applicable to all applicants, large or small. Early FAA involvement helps identify and resolve the certification basis more efficiently (for example, equivalent level of safety and special conditions (SC)). This process will result in a more effective use of FAA and industry resources, particularly through upfront identification of requirements and detailed project planning.

However, FAA and industry implementation of the CPI Guide principles and best practices has been challenging and inconsistent. FAA regulations, policy, and guidance define the required certification processes. The development of detailed certification plans before application requires significant effort by industry earlier in a program, but 14 CFR 21.15 only requires an application for an aircraft TC to include basic information such as a three-view drawing and available preliminary basic data. In addition, current FAA certification project management is tied to formal application (as discussed in section 5.2 of this report) which means reduced priority and availability of FAA resources to support early discussions and the development of detailed PSCPs. Also, the certification process does not include project management metrics or accountability to ensure both the applicant and the FAA are meeting milestones and compliance activities documented in the agreed-upon certification plan. Some of the most significant challenges and inefficiencies in the certification process occur when the FAA and industry do not follow the agreed-upon certification plan and/or do not update the plan to address new issues.

An update to type certification and project management policy and guidance to incorporate CPI Guide principles and best practices as a requirement would improve the overall effectiveness and efficiency of certification processes.

The FAA should improve accountability for certification project performance by establishing key characteristic metrics of efficient certification programs and incorporating them into type certification and project management policy and guidance.

5.2 AIRCRAFT CERTIFICATION PROJECT SEQUENCING

Background

In 2005, the FAA reported it was facing significant budget shortfalls over the next several years due to continuously growing aviation industry activity, reduced funding from the Federal Government, and unfunded mandates imposed by Congress. The FAA stated it was not possible to continue reductions in discretionary spending such as travel and training without compromising its aviation safety mission, and it would have to reduce staffing relative to the level of activity. Because certification is not the highest priority for AIR, as discussed in section 3.2 of this report, these activities would be most impacted as a result of reduced staffing levels. AIR instituted a sequencing program for all new design approval applications to prioritize which new certification programs would be commenced and which would be delayed until resources are available.

The sequencing program is designed to prioritize projects in a fair and standardized manner based on safety and company contribution. All new applications for certification and validation expected to require more than 40 hours of FAA involvement are entered into the sequencing program, which requires approximately 90 days to determine whether they can be started. The FAA assesses the safety criteria, considering the program's relative safety impact based on the size and use of an aircraft and overall benefit to public safety. The FAA then assesses company contribution criteria, considering applicant experience, level of delegation available, and use of detailed PSCPs. Finally, the FAA notifies each applicant of whether the applicant can start the project or the FAA will provide another notice within another 90 days.

Public Comments

As a result of industry concerns regarding the lack of transparency and understanding of how AIR assesses and prioritizes industry projects, AIR published a draft of "Standard Operating Procedures (SOP) of the Aircraft Certification Service (AIR) Process for the Sequencing of Certification and Validation Projects" for public comment in September 2011. The FAA reopened the comment period in April 2012 for an additional 7 months because several comments received from small businesses and some government agencies stated they did not have adequate time to review and comment.

The ARC reviewed the public comments submitted to the FAA on the draft SOP for project sequencing and considered any recommendations made on the sequencing program. In general, industry expressed significant concerns about FAA delays to the start of an applicant's certification project because they have a potentially significant impact on overall cost and competitiveness. A majority of comments expressed the importance of the FAA focusing on implementing improvements to the overall effectiveness and efficiency of certification processes such as full use of available delegation. The comments also recognized the FAA needs to have a process in place to evaluate certification projects in a fair and standardized manner.

Small businesses have been particularly impacted because they cannot suspend their entire company's activities and employees while waiting for the FAA to decide if and when it can support a project. In addition, significant competitive implications arise if one company can begin a certification project before another company due to FAA resource availability in one part of the country versus another. Global competitiveness is also impacted. Most

STC modifications requested by individual customers interested in updating their aircraft, such as the installation of new equipment or cabin interiors, are smaller projects that should be completed within several months. Commenters stated an FAA delay of a few or several months is unacceptable to a customer so they find another provider outside of the United States to complete the work.

The FAA is currently considering the public comments and recommendations to update the SOP for project sequencing. The FAA stated it also plans to audit the SOP in all of the Aircraft Certification offices (ACO) to determine how it is being implemented and whether it is achieving the desired level of fairness and consistency nationwide.

ARC Observation

The ARC noted that delays to the start of new certification projects can have potentially significant impacts on industry in terms of cost and competitiveness, particularly for smaller companies and smaller projects. In addition, delays in FAA certification can cause customers to use companies located outside of the United States.

The ARC finds that the FAA SOP for certification project sequencing is appropriate and necessary if the start of new projects needs to be delayed to ensure they are prioritized in a fair and standardized manner. However, delays to the start of new certification projects should only be necessary during peak periods of industry activity; they should be the exception and not the rule. From a strategic perspective, the FAA must proactively manage the effectiveness and efficiency of certification processes in combination with necessary staffing management to ensure it can provide the safety certification necessary to support the economic growth of U.S. industry and the development of aviation products and technologies. This includes the implementation of recommendations provided in this report.

By providing a national view of industry activity and FAA workload, the sequencing process also helps the FAA better manage ACO activities and better understand ACO resources needed to support industry activity. This information supports implementation of certification process improvements such as improved certification planning, enhanced delegation, and risk management, and ensures FAA staffing plans better align with needed technical disciplines and locations.

Based on a review of the public comments submitted to the draft SOP for aircraft certification project sequencing and discussions among the group, the ARC provides the following recommendations to the FAA to improve the sequencing process so industry can better manage its certification programs to reduce the risk of program delays:

- The FAA should facilitate and enable upfront discussions between applicants and ACOs. Sequencing should not delay or prevent preliminary discussions necessary to develop detailed certification plans consistent with CPI Guide principles and best practices. In addition, more detailed certification plans allow the FAA to more efficiently determine the necessary level of involvement, conserving resources and resulting in fewer project delays.

- The FAA should reevaluate the entry threshold for sequencing. The relatively low 40-hour threshold means a very large number of projects must be managed in sequencing, which imposes a significant workload on the FAA with very limited efficiency benefit. In the amount of time it takes the FAA to assess the necessary level of involvement, smaller projects could be more than halfway completed. The threshold for projects to be subject to sequencing should be reevaluated based on factors such as level of FAA involvement (that is, 80 to 100 hours) or safety risk. In addition, the applicant must have an opportunity to review the FAA's assessment of level of involvement to ensure all information was available and understood to facilitate an accurate determination.
- The FAA should provide a future start date, as opposed to open delays. Industry certification program uncertainty and risk are significantly reduced if the FAA can provide applicants an estimated future start date, as opposed to open-ended 90-day delays.
- The FAA should update sequencing policy to recognize the ODA program. The FAA and industry have invested significant resources in the establishment of ODA. The FAA should fully implement this resource capability, and its use should not wait for the availability of other FAA resources.

5.3 Effective Use of Delegation

In the Federal Aviation Act of 1958, Congress authorized the FAA to appoint designees as representatives of the Administrator to examine, test, or make inspections necessary to support issuance of airman, operating, and aircraft certificates. The delegation program, administered under 14 CFR part 183, Representatives of the Administrator, enables the FAA to meet its safety responsibilities and provide timely certification services by leveraging limited resources, which allows it to focus on critical safety areas and the application of new and evolving technologies. The delegation program also allows the FAA to more effectively perform its safety oversight while significantly improving certification process efficiency, which reduces the time, burden, and cost impact on industry. The FAA appoints individual designees and grants approval of ODAs, and both types of designations require FAA oversight. FAA staff oversees individual designees directly, and ODAs based on a systems approach and evaluation.

The ARC review of previous reports and recommendations found strong support for the value and importance of the delegation program. The ARC finds the FAA delegation program is a highly effective tool that is essential to the effectiveness and efficiency of the aircraft certification processes and the FAA's ability to support a continuously growing level of aviation industry activity and COS oversight.

However, delegation programs are currently not implemented to support the full certification process, including compliance activities related to environmental tests such as noise and emissions, as well as instructions for continued airworthiness (ICA). The standards and activities in these areas are not directly managed by AIR, but directly impact the effectiveness and efficiency of the certification process and AIR resources.

ICA are the information necessary to support the safe operation of an aircraft throughout its life, such as maintenance manuals and inspection programs. Although FAA Order 8100.15A[10] provides for delegation of ICA, most of these documents are reviewed and accepted by the AFS Aircraft Evaluation Group (AEG). The volume of ICA documentation continues to increase at a rapid pace, matching the development of new aviation products and technologies. Delays to certification programs are regularly experienced because the AEG cannot keep up with industry activity. Most of the ICA information is based on experience and is consistent from one product to the next, so delegating ICA review activity to properly authorized industry experts in these situations would be far more effective and efficient. Delegation would allow the FAA to focus its limited resources on reviewing ICA that relate to new technologies or introduce novel inspection techniques and repair methods. The ARC believes appropriate delegation of ICA activities would significantly streamline the certification process.

Special Emphasis Item: The FAA should expand the delegation program to ensure it is available to support the entire certification process, including all compliance activities necessary to issue a design approval, and particularly compliance activities related to noise and emission tests and ICA.

Current Delegation System

Within the consideration specified in section 312(b)(4), the ARC reviewed the two current designation systems: (1) ODA, and (2) individual designee.

The ARC also explored how these current designation systems should map into the FAA and industry's long-term vision for aircraft certification processes. The ARC recognized Europe and Canada as nations having more mature systems approaches for regulatory oversight of design organizations and certification processes, but did not have time to conduct formal comparisons.

Organization Designation Authorization

Organizational delegation enables expansion of the delegation program by significantly reducing the FAA's workload by appointing organizations with the required qualifications, experience, and management systems to supervise the day-to-day activities of individuals who perform certification activities on behalf of the FAA. In October 2005, the FAA established the ODA program to improve the safety, quality, and effectiveness of the FAA's organizational delegations. ODA consolidated all existing organizational delegation types into a single program, standardizing requirements to the highest level and increasing the robustness and efficiency of oversight. ODA also expanded eligibility and authorizations for organizational delegation from only small airplanes and changed products to all type certificated products, including transport category aircraft, engines, and components.

The ODA rulemaking preamble discusses the need for regulatory change to enhance the FAA's delegation program by expanding organizational delegation, which shifts FAA oversight from a detailed product approach to a systems or process approach. The preamble highlights the recommendations of the 1993 GAO report "Aircraft Certification: New FAA Approach Needed to Meet Challenges of Advanced Technology"[11] and an independent 1996 report,

[10] Organization Designation Authorization Procedures, effective August 9, 2011.
[11] GAO/RCED–93–155, September 1993.

"Challenge 2000: Recommendations for Future Aviation Safety Regulations," to enhance the delegation program and improve the effectiveness and efficiency of FAA certification and safety oversight.

The ARC's review of ODA focused on aligning the current ODA streamlining activity with the section 312 considerations. The ARC also reviewed the individual designee system discussed in section 5.3.2 of this report.

Manufacturers have invested significant resources in developing the requirements, organizational structure, and technical capability needed to establish their ODA organizations. The Administrator and FAA senior management strongly support continued improvement in the effectiveness and efficiency of certification processes, and making the ODA process more beneficial to the FAA and industry in the near term.

Despite the FAA and industry's strong commitment to ODA development and implementation, the key benefits of ODA that improve the efficiency and lower the cost of certification processes are generally not yet realized. The implementation of ODA has been far more limiting, and the content of company ODA manuals is generally overly prescriptive beyond the requirements of the policy. One of the ARC's key findings is that local FAA and company personnel have not shifted to an organizational approach that makes better use of FAA oversight resources, but instead continue to operate in ways consistent with the traditional individual designees system (that is, as FAA specialists and designated engineering representatives (DER)). In addition, significant cultural issues result in FAA expectations for an increased level of detail in ODA certification plans and level of FAA involvement that does not fully utilize all available delegation, resulting in the ODA accomplishing less actual certification work.

In 2011, the FAA worked with AIA and GAMA to develop a detailed implementation plan to carry out agreed-upon actions regarding ODA improvement. In addition, GAMA recommended the establishment of an FAA/industry executive management governance process to monitor the implementation and effectiveness of the ODA recommendations and actions, and to ensure the necessary management support and resources.

The AIA/GAMA/FAA working group discussed the following ODA implementation and utilization issues:

- Certification plan review and project initiation,
- Full and efficient use of ODA authority,
- Processing of procedures manual revisions,
- Unit member selection process review,
- Proper ODA and Organization Management Team (OMT) communications, and
- Use of ODA-approved/accepted data.

The working group identified 23 specific actions to address these issues and assigned them as industry, FAA, or joint actions (see appendix F to this report). As agreed to in a meeting with the Administrator, the working group developed a detailed implementation plan that identified

specific milestones, dates, and individual focal points for each action item. The overall success of this initiative to improve the ODA program and ensure full utilization of available capabilities depends on the commitment of both the FAA and industry to carry out the actions in accordance with the defined milestones and schedules.

ARC Observation

The FAA and industry consider the ODA streamlining activity to date successful. This success is directly attributable to the working group's detailed action plan that includes accountability, milestone dates, metrics, and clear actions and deliverables. The accountability monitoring by the executive management governance is also fundamental to the current progress. Creation of mutually agreed-upon action plans with formal monitoring of milestones and metrics is the template recommended for all certification process initiatives, as well as FAA and industry progress toward an overarching vision.

Special Emphasis Item: The FAA should continue to manage the ODA streamlining initiative as a priority, including the monitoring of ODA metrics to assure the ODA program maintains improvements. Execution of the current plan will ensure alignment with the objectives to improve efficiency, reduce cost, and redirect FAA resources to enable development of new products and technologies. The streamlining activity is expected to be sustained over a period of time, with adjustments and additions to the action plan.

ODA streamlining success is characterized by "full utilization," which can be defined as ODA management of any function that is not inherently governmental. As such, the criteria to achieve full ODA utilization must be established as a common vision with an exit criterion from ODA to the future state of CDO.

With ODA implementation, the FAA has effectively increased certification capacity. Maximizing the full capacity of ODA will further reduce the FAA's certification workload.

Special Emphasis Item: The FAA should ensure management has the tools in place to define the roles, responsibilities, and liabilities for the OMT. The FAA also should ensure the position description and performance standards of the FAA staff that oversee delegated organizations reflect their appropriate roles and responsibilities.

Special Emphasis Item: Regular and continuous communication and exchange of data occurs between ODA staff at various companies and the FAA oversight offices. Delays in exchange of data often adversely impact certification timelines. Effective tools and media to facilitate the data exchange will be beneficial in reducing certification time. The FAA should establish processes and tools to integrate the use of electronic data such as electronic signatures in the certification process. No clear implementation plan exists to facilitate the use of electronic data.

Individual Designee Program

AIR may appoint individual industry designees in the following areas: DERs, designated airworthiness representatives, and designated manufacturing inspection representatives. The FAA can authorize individual designees to perform any examination and approval for the issuance of a certificate based on their qualifications and experience. The designees are directly supervised by individual FAA engineers and inspectors who exercise complete discretion as to when they are used to support certification project activity.

In 2004, GAO conducted a study and issued a report, "FAA Needs to Strengthen the Management of Its Designee Programs"[12]. At this time, there were over 13,500 designees (this includes all FAA designees). FAA Order 8100.8D, Designee Management Handbook, issued on October 28, 2011, addressed the GAO's recommendations to improve management control of the designee programs, increasing assurance that designees meet the FAA's performance standards.

These improvements ensure robust oversight of the designee system, selecting designees based on their qualification and experience and clearly defining and consistently following criteria established for designees.

The FAA currently uses approximately 10,600 designees. This reduction in individual designee numbers can be equated to the expansion of the organizational delegations in the last few years, as discussed in section 5.3.1 of this report.

ARC Observation

It is beneficial to both the FAA and industry to use individual designees to the greatest extent possible. As part of this effort, the FAA has been pursuing the accountability framework concept, which entails holding individuals accountable for their assigned portions of the entire process. The philosophy behind an accountability framework is not new. Using this concept and its discretionary function, the FAA can reassign work to the designees or design approval holders (DAH). To achieve the maximum benefit of the FAA's discretionary function, the FAA is developing RBRT, which allows the FAA to focus its attention and effort on areas of greatest risk. This is discussed further in section 5.5.3 of this report.

5.4 CERTIFIED DESIGN ORGANIZATION

Background

In the Vision 100—Century of Aviation Reauthorization Act of 2003 (Public Law 108–176), Congress authorized the FAA to develop and oversee a system for the certification of design organizations under 49 U.S.C. 44704(e). This allows the FAA to recognize the expertise and capability of a manufacturer and shift to a systems safety approach for certification of aviation product designs. Instead of reviewing and approving thousands of individual drawings and tests by itself or through individual designees, the FAA would approve and oversee design organizations with proven technical expertise and procedures in design, conformity, testing, and quality assurance processes. CDO is a natural progression in the maturity of ODA programs and holds manufacturers fully responsible and accountable for all airworthiness compliance

[12] GAO–05–40, June 29, 2011.

activities. The FAA would conduct safety oversight of CDO, allowing it to further focus its resources on safety-critical activities and new technologies.

The FAA oversees safety in all other facets of aviation through the certification and oversight of organizations for production, air carrier operations, repair stations, and flight training. Therefore, FAA oversight is a proven and well-established approach to ensuring the highest levels of aviation safety. In addition, certification processes in Europe, Canada, Brazil, and other countries with comparable aviation safety systems use this more effective and efficient approach of formally recognizing approved design organizations to ensure compliance with applicable airworthiness standards.

Congress strengthened the CDO statute in section 303 of the Act and clarified that the FAA may issue a design and/or production certificate to qualified organizations beginning in 2013.

Status of FAA Implementation

Regulatory changes to part 21 certification procedures are needed to implement CDO along with the necessary guidance and policy to support consistent interpretation and acceptable methods of compliance. In 2008, the FAA established a CDO ARC, which submitted a final report with recommendations on how the FAA could proceed with the development and implementation of CDO. Currently, there is no requirement for a DAH or applicant to maintain any technical capability or management system to ensure work is done correctly. A CDO, as envisioned by the CDO ARC, is completely different, as it would require a systematic approach to compliance and safety that includes a regulatory compliance assurance system, SMS, and Quality Management System (QMS).

The FAA has not yet issued a rule to implement CDO, but should establish a roadmap from standard certification to designee systems, ODA, and CDO.

ARC Observation

The ARC review of previous reports and recommendations on FAA certification processes found strong support for the FAA to approve or certify design organizations. This allows the FAA to further leverage its limited resources and improve the effectiveness and efficiency of certification processes by shifting toward a systems approach to safety oversight. The ARC finds that FAA certification of design organizations is a natural progression of the maturity and capability of organizational delegation that provides a significant opportunity for improvements in safety, safety culture, and the overall effectiveness and efficiency of aircraft certification processes. CDO would require reengineering of the existing part 21 certification process to establish regulatory requirements for the qualification, performance, and management system of design organizations.

5.5 FAA Safety Management System and Training

The Act specifies in section 312(b)(5) that the Administrator should consider in the assessment "methods for training the FAA field office employees in SMS and auditing." This section discusses the ARC's consideration of methods for training the FAA's field office employees in those areas.

5.5.1 Safety Management System

The FAA's continuing mission is to provide the safest, most efficient aerospace system in the world. Use of an SMS is becoming standard throughout the aviation industry worldwide, and is recognized by the FAA Joint Planning and Development Office, International Civil Aviation Organization (ICAO), other CAAs, and product/service providers as the next step in the evolution of aviation safety.

ICAO is advocating SMS because of a global recognition of its benefits. ICAO also advises its member organizations (which are regulatory oversight entities) to have a State Safety Program, which is sometimes referred to as an internal SMS.

SMS concepts have generated widespread support in the aviation community as an effective approach that can deliver real safety benefits. The benefits materialize as organizations evolve from reactive to proactive to predictive entities. The FAA is pursuing the development of SMS regulations for entities it oversees through a multifaceted approach.

The FAA, through its Aviation Safety (AVS) office, envisions aerospace product/service provider organizations integrating a systematic risk-based and process-oriented approach to managing safety into operations and management. Methods of integration include changes to necessary organizational structures, accountabilities, policies, and procedures. Such an approach not only stresses compliance with technical standards, but also increases emphasis on those management systems that ensure risk management and safety assurance.

Relevant FAA Orders

FAA Order 1110.152, Safety Management System Aviation Rulemaking Committee. This order constitutes the SMS ARC charter to provide recommendations on the development and implementation of SMS regulations and guidance for aeronautical product/service providers. AVS issued a notice of proposed rulemaking (NPRM) addressing Safety Management Systems for Part 121 Certificate Holders on October 29, 2010. The proposal would add a new part 5, Safety Management Systems, to 14 CFR, creating the general framework for an SMS that a part 121[13] air carrier may adapt to fit the needs of its operation. It would also modify 14 CFR part 119, Certification: Air Carriers and Commercial Operators, to specify applicability and implementation of the new part 5 SMS framework for air carriers certificated under part 121. The NPRM also indicates the FAA has drafted part 5 so it may be applied to different parts such as part 21 (for design and manufacturing organizations), part 135[14] (for commuter and

[13] 14 CFR part 121, Operating Requirements: Domestic, Flag, and Supplemental Operations.
[14] 14 CFR part 135, Operating Requirements: Commuter and On Demand Operations and Rules Governing Persons On Board Such Aircraft.

on-demand operations), and part 145[15] (for repair stations). The comment period on the NPRM closed March 7, 2011, and the FAA is reviewing and preparing a disposition of those comments.

FAA Order VS 8000.367, Aviation Safety (AVS) Safety Management System Requirements. This order specifies that an SMS contains four components: Safety Policy, SRM, Safety Assurance (SA), and Safety Promotion. Safety Policy establishes top management commitment to safety and places safety accountability at the top levels of the organization. SRM consists of establishing formal methods of hazard identification, risk assessment, risk analysis, and risk mitigation processes. SA provides a means of verifying the organization's safety design and performance with respect to its own policies and objectives, validating the effectiveness of the safety risk controls, and identifying potential new hazards. SRM and SA are the operating functions of SMS, with SRM providing a sound basis for safety system decisionmaking and SA providing the activities that monitor and reassess operational systems to ensure COS. Safety Promotion includes establishment of a positive organizational safety culture, the organization's safety training programs, and the means by which the organization communicates regarding safety.

5.5.2 Aircraft Certification Service SMS

Consistent with FAA Order VS 8000.367, AIR has been actively developing and implementing an internal and external SMS. The initial focus was primarily on developing an internal set of processes, tools, and methodologies that facilitate the transition into the future state. AIR began that effort in 2005 and has made progress in defining key processes and tools. Later, with support from industry participants, the activities expanded to include development of standards for design and manufacturing organizations. Through implementation of pilot SMS projects with certain companies, the FAA is collecting information that will help define the scope of the SMS for DAHs, validate certain best practices, and expand the knowledge base within the workforce and industry with respect to the essential elements of a robust SMS for manufacturers. This information will also assist in defining the required regulatory standards and related guidance material.

Following are some of the key initiatives that will enable implementation of internal and external SMS.

Risk-Based Analysis and Decisionmaking

Over the past year, AIR has been updating policy, guidance, and training for FAA employees, designees, and applicants to clarify their roles and responsibilities in the certification process. In general, these updates emphasize that industry applicants are fully responsible for showing compliance to all applicable requirements and the FAA is responsible for performing an oversight role through both spot checks of individual compliance showings and systems oversight of processes and programs such as ODA.

[15] 14 CFR part 145, Repair Stations.

This is referred to as an accountability framework, which serves as the basis for the FAA's safety oversight role and ability to exercise discretion regarding direct level of involvement in certification program activities. This framework makes it clear that the certification process relies on the use of FAA employee judgment and reasonable choices when performing oversight roles and that the FAA is not required to make a specific finding or approval for the thousands of discrete applicant plans and compliance reports that make up a certification project. Discretionary function through risk-based level of involvement allows the FAA to delegate any and all compliance findings and accept a statement of compliance by a qualified manufacturer/applicant/design organization without the need for specific approval or review by either the FAA directly or an FAA designee.

The FAA has developed an IT-based tool for its engineers to help identify the appropriate level of involvement in certification projects based on applicant experience and capability, as well as safety risk of the specific compliance activity (technology and/or regulatory requirement). This tool, known as RBRT, is intended to support FAA decisionmaking on the use of delegation and level of involvement. Implementation of the RBRT tool and risk-based level of involvement has been delayed due to IT issues and FAA union workforce concerns that have resulted in audit reports by the OIG and GAO.

The FAA published Notice IR 8110.115, Applying Risk-Based Resource Targeting to Type, Amended Type, Supplemental Type and Amended Supplemental Type Certification, on March 31, 2012. It directs FAA certification project managers to begin using the RBRT tool on standard certification (non-ODA) projects to help focus the FAA's efforts and limited resources on high-risk compliance activities with the greatest impact on safety and to accept applicant showings for low-risk activities. In April, the FAA issued draft orders for comment on PMA and ODA certification procedures, which also recognized the use of FAA discretion for risk-based level of involvement in certification projects and the use of delegation and acceptance of company statements of compliance. The final orders are expected to be issued by October 2012.

Monitor Safety and Analyze Data (MSAD)

Through an automated workflow tool, data repository, and data analysis, MSAD provides aviation safety engineers the ability to efficiently and effectively perform the fleet issue analysis component of COS to identify potential safety issues.

Oversee System Performance (OSP)

The OSP process is the means by which AIR will provide oversight functionality to comply with FAA Order 8000.369, Safety Management System. It will be the vehicle by which AIR defines, collects, and analyzes safety data from the performance of certification activities.

Assimilate Lessons Learned (ALL)

ALL provides the means necessary to capture "lessons learned" knowledge gathered during the implementation of AIR business processes and share it across AIR.

Manufacturers Safety Management System (MSMS) Pilot Project

The MSMS pilot project is an industry outreach effort that seeks to collect input on potential rulemaking requirements, scalability, applicability, implementation assessment, oversight methods, and tools and guidance as they relate to SMS implementation in the design and manufacturing domain. The information collected through this effort will help the FAA validate the framework, guidance material, and oversight and assessment tools and methodologies, as well as provide the AVS SMS rulemaking team data and recommendations on scalability and applicability to part 21 certificate and approval holders.

5.5.3 Training

FAA Order 3100.7, Aviation Safety Training Doctrine, governs training for lines of business within AVS. It defines training principles such as curriculum management, leveraging resources, and applying best practices. Development and delivery of technical training is the responsibility of the lines of business.

FAA Order 8000.93B, Aircraft Certification Service Technical Training Plan, provides guidance to employees and supervisors for identifying organizational and individual needs and related priorities. To assist with compliance to this order, AIR has established a training advisory committee composed of representatives from key management teams and labor unions to develop and maintain a strategic focus for training consistent with broader AVS and FAA goals and objectives. The ARC members agreed that the current training governance works well in determining the technical needs and skills of AIR staff.

ARC Observation

RBRT is a tool to support FAA level of involvement decisions at the workforce and project levels. The ARC finds that formal implementation of the RBRT tool in FAA certification procedures and use of risk-based level of involvement concepts is an important step to support the awareness and cultural changes needed to streamline certification processes and focus the FAA's limited resources on safety-critical activities. RBRT can help enable full utilization of available delegation and identify low-risk activities for which the applicant showing of compliance is adequate. However, the effectiveness of RBRT implementation will need to be monitored at the project level to ensure the desired efficiency benefits are experienced by both the FAA and industry.

The FAA should develop a comprehensive implementation plan that includes training and metrics to ensure the desired efficiency benefits are experienced by both the FAA and industry. A significant opportunity exists for efficiency improvement using RBRT tools.

AIR is currently developing an SMS implementation plan. The ARC review of AIR SMS-related activities in section 5.3.2 of this report highlighted several key elements:

- Consistent with AVS direction, AIR has been proactive in moving forward with SMS implementation. The FAA incorporates the tenets for SMS and QMS into all of its training courses.
- AIR has made continuous progress toward achieving SMS implementation.

- Resource investment in successful SMS implementation should result in the reduction of certification delays and an increase in available resources to facilitate NextGen implementation and the introduction of advanced technologies.
- Application of RBRT to define the level of direct FAA staff involvement in certification projects will allow for a structured approach to delegation.
- AIR has a robust process and governance with respect to developing and delivering technical training.
- The change management process is a critical element of successful SMS implementation.

The existing training delivery methods for AIR field office staff are comparable and consistent with those used in industry and other government agencies. The ARC was briefed on the existing training development and delivery infrastructure as applied to preparing AIR staff on the use of SMS tools, methodologies, and required cultural changes. Although SMS training courses were developed and delivered in most cases, the existing training capabilities and infrastructure have not been fully used to improve timeliness and effectiveness of the SMS-related training. The information provided to the ARC indicated multiple opportunities for better coordination between those responsible for SMS implementation and the change management process and those charged with developing the training. The continuous expansion of delegated organizations and the transition to an SMS method of conducting safety functions require a dedicated strategic approach to training of safety professionals to evaluate systems and data analysis. Furthermore, training should supplement the required change management process to achieve successful implementation of SMS.

5.6 Updating Airworthiness Requirements

The Act specifies in section 312(b)(6) that the Administrator should consider in the assessment "the status of updating airworthiness standards." This section contains the ARC's consideration of the status of updating airworthiness requirements as required by section 312(b)(6) of the Act, including implementing recommendations in the FAA report ''Part 23—Small Airplane Certification Process Study'' (CPS)[16]. This section also includes consideration of the opportunities to improve efficiency in the rulemaking process.

5.6.1 Part 23—Small Airplane Certification Process Study

In early 2008, the FAA initiated a regulatory review of the part 23 airworthiness requirements, which prescribed minimum design standards for airplanes with a maximum certificated takeoff weight of 12,500 pounds (19,000 pounds in the commuter category). This review resulted in the Part 23 CPS, issued in July 2009. The CPS highlights that part 23 is comprised of the most diverse range of products of any FAA part, including aircraft ranging from simple one-seat piston-powered airplanes to corporate jets and commuter airplanes. Nearly all regulatory changes to part 23 over the past 30 years established new requirements to address the increasingly complex and higher performing airplanes being developed by industry. However, the CPS found that these new airworthiness requirements are not appropriate for simple airplanes, resulting in overly burdensome airworthiness requirements, overly complex

[16] OK–09–3468, July 2009.

certification processes, and prohibitive certification costs for small airplanes, which have discouraged the development of new products. With the average age of the part 23 small airplane fleet now at 40 years old, it is becoming clear that some fundamental changes in FAA requirements are necessary to foster the development of new small airplanes for training and recreational use. In addition, this has discouraged the development and installation of new technologies in small airplanes, which could significantly improve the safety level.

Status of FAA Implementation

The FAA chartered the Part 23 Reorganization ARC (Part 23 ARC) in August 2011 to develop recommendations suggesting how the FAA should implement the CPS recommendations. The Part 23 ARC has been tasked to reorganize part 23 airworthiness standards to better address the broad spectrum of airplane complexity and performance expected over the next 20 years and to allow for more efficient incorporation of safety technologies into the existing fleet of part 23 small airplanes. The goal of the Part 23 ARC is to reduce the certification burden by one-half for simple products while doubling the safety level by simplifying and clarifying airworthiness standards, which streamlines the certification process and enables cost-effective increases in safety and the incorporation of new technologies. In addition, the ARC is considering approaches to ensure airworthiness requirements are performance-based, providing the FAA and industry the flexibility necessary to address a wide range of future products and technologies without the need for new rulemaking, as it is widely recognized that these resources are very limited and the process is very slow. This includes the development of industry consensus standards and updates to the certification process to define processes as acceptable methods of compliance. The ARC is scheduled to submit its recommendations to the FAA by July 2013.

ARC Observation

The ARC finds that implementation of the CPS results through recommendations currently being developed by the Part 23 ARC can significantly improve the efficiency and reduce costs of certification for small airplanes.

Special Emphasis Item: The FAA should ensure the support necessary for the Part 23 ARC to facilitate the issuance of an NPRM to implement the recommendations in a timely manner. This includes coordination early in the ARC process among the necessary FAA policy offices for part 23 airworthiness standards, part 21 type and production certification procedures, and rulemaking, to include economic, small business, and legal review.

Special Emphasis Item: The goal of the Part 23 ARC is to develop performance-based regulations that allow flexibility in demonstration of compliance. The ARC believes such an approach to developing standards could also be helpful for other products.

5.6.2 Aviation Rulemaking Advisory Committee Rulemaking Prioritization Working Group

The FAA tasked the Aviation Rulemaking Advisory Committee (ARAC) Rulemaking Prioritization Working Group (RPWG) to provide advice and recommendations on how to prioritize rulemaking projects. During its deliberations, the working group evaluated, considered, and developed parameters and criteria for a risk assessment methodology, ensuring the most effective project receives the highest priority. The review included consideration of rulemaking drivers, including but not limited to safety, capacity, cost, environmental impacts, harmonization, and operations. The working group also developed criteria for considering security and social impacts.

The resulting methodology and tools were developed from an exploration of models or methodologies that proved helpful in creating the risk assessment methodology. The review included obtaining an understanding of the Commercial Aviation Safety Team methodology along with those used by other agencies and internal FAA divisions. The methodology is described in the Rulemaking Prioritization Evaluation Tools (R–PETS), which provide the FAA a systematic and standardized approach to collecting and analyzing information for prioritization of proposed rulemaking projects and include—

- The Rulemaking Evaluation Process (REP)—A flowchart that outlines the stages associated with placing a rulemaking project on the 4-Year Look-Ahead list for consideration by the FAA's Rulemaking Council as resources become available. The REP provides a quick overview of the process.
- The Rulemaking Assessment Matrix (RAM)—Used to "weigh" and "score" attributes and criteria associated with assessing the rulemaking project so it may be prioritized within a line of business (Office of Primary Responsibility) and across all lines of business within AVS.
- The Rulemaking Assessment Questionnaire (RAQ)—Used to the collect information necessary to complete the RAM. The RAQ ensures all relevant facts and factors are considered before initiating a rulemaking project. The information gathered is used to qualify and quantify the priority assigned to a project by the RAM.

The RPWG stated it believes the R–PETS will provide important improvements and benefits to the rulemaking process. By identifying the issue clearly and developing factually supportable data *before* "officially" beginning the rulemaking process, the FAA will not only ensure its resources are appropriately allocated, but will also have readily available and consistent facts to support its decisions. The result of using this tool is a comprehensive 4-Year Look-Ahead of potential rulemaking projects the FAA can accomplish in a prioritized manner as resources become available.

The RPWG was unable to fully test the R–PETS and recommended the FAA task ARAC to test the tool before the FAA's adoption of the methodology. In May 2012, ARAC tasked the RPWG to perform a pilot study on the recommendation with participation from FAA leaders, using already established yet recent rulemakings. This additional task is intended to refine the process and determine if the R–PETS drive reasonable priorities in rulemaking, as well as assess whether the tool is ready for full implementation. The RPWG held a kickoff meeting to launch this phase on May 15, 2012. Results are due to the ARAC Executive Committee in September 2012, with the objective of ARAC and FAA acceptance by December 2012.

ARC Observation

Special Emphasis Item: The ARAC RPWG should ensure its new methodology supports the prioritization of rulemaking activities necessary to support the certification process such as updates to certification procedures and airworthiness standards to codify requirements established through SCs.

5.6.3 Aviation Rulemaking Advisory Committee Process Improvement Working Group

ARAC provides a unique and very important opportunity for the FAA, along with interested and knowledgeable parties from industry and the public, to work together to provide input on important guidance and rulemaking issues. The result is an informed process that allows the final results (rules, guidance material, or policy) to be viable and beneficial to the aviation industry. ARAC has made many important contributions to FAA rulemakings and to aviation safety. The ARAC Process Improvement Working Group's (PIWG) objective was to increase that value through recommendations for process improvements.

In developing its recommendations, the PIWG reviewed past reports and studies on ARAC and the FAA rulemaking process, benchmarked other government advisory committee processes, and surveyed former ARAC participants from the FAA and industry.

The FAA is progressing at implementing the PIWG recommendations for ARAC that will provide a more effective means of supporting the FAA rulemaking process.

5.6.4 Other Rulemaking Actions

The ARC's review of some general rulemaking process challenges highlighted an opportunity to improve the timeliness of rulemaking. The ARC analyzed certain rulemaking actions and identified efficiencies and inefficiencies in the FAA's current rulemaking process.

The Fast Track Harmonization Program

In 2000, FAA Order 1100.160, Delegation of Authority—Fast Track Harmonization, delegated to the Manager of the AIR Transport Airplane Directorate the authority to issue certain rulemaking documents, including final rules, developed under the Fast Track Harmonization Program. This program was aimed at expediting the rulemaking process for harmonizing approximately 114 sections of 14 CFR part 25 with the corresponding sections of the European standards in Joint Aviation Regulations (JAR)–25. Under this process, parallel part 25 and JAR–25 standards were compared, and harmonization was reached by accepting the more

stringent of the two standards as the common standard for all. The more stringent requirement was then "enveloped" into the other standard through the normal, but expedited, rulemaking process. For the most part, these requirements were not controversial, but the overall effort generally resulted in a net reduction of costs to industry without adversely affecting the existing level of safety.

The Fast Track Harmonization Program was based largely on information and recommendations submitted by ARAC working groups, an agreement between the FAA and Joint Aviation Authority (JAA), and explicit encouragement from industry. It did much to successfully accelerate a historically long process to reach harmonization of FAA and JAA aircraft design and flight test regulations to the greatest extent possible.

The FAA should continue to identify opportunities with the European Aviation Safety Agency (EASA) to establish similar expedited processes to issue common standards.

Rulemaking for Mandatory Continuing Airworthiness Information

One suggestion is to review the FAA process that addresses mandatory continuing airworthiness information (MCAI), which are ADs issued by other State of Design CAAs, and streamline it similarly to the Fast Track Harmonization Program.

The FAA's process for issuing FAA ADs that are based on MCAI is documented in FAA Order 8040.5, Airworthiness Directive Process for Mandatory Continuing Airworthiness Information. The process calls for FAA engineers to review MCAI individually and then determine, among other things, whether an unsafe condition truly exists, whether the particular course of action called out in the MCAI is adequate to correct that unsafe condition, and whether the text of the MCAI is sufficient. The FAA then conducts a short economic analysis, puts the resulting parallel AD through the federal rulemaking public process (including time for notice and public comment), and finally issues a final rule that, for the most part, is little changed from the original AD on which it was based. In other words, the FAA seemingly "starts from scratch" each time an MCAI is addressed. In reality, many of the MCAI have already been vetted through some type of public process before issuance, and non-U.S. operators are already required to abide by the requirements.

The ARC noted that most CAAs merely "adopt" the FAA's ADs into their airworthiness requirements without further action.

While the FAA has taken some action (such as developing a common template for all MCAI documents) to make this process flow more quickly, the continual and duplicative actions requiring significant FAA time and resources still exist, and there are currently no metrics to prove the process adds value or creates a better AD.

Furthermore, increased consideration must be given to the adequate capabilities of other CAAs if the FAA is to achieve any serious changes in streamlining this rulemaking process to adopt MCAI. Consideration should also be given to the fact that when a CAA provides time for public commenting on its ADs, modern communication tools enable the public *worldwide* to comment, which raises the question why another period for public comment should be required for FAA's parallel AD.

Rulemaking for Special Conditions

The FAA expends significant resources issuing SCs to address new and novel design features in the type certification process. However, an inefficient rulemaking process does not allow timely implementation of new standards to address new and novel designs that become standard designs. For example, the need for High-Intensity Radiated Fields (HIRF) certification requirements was recognized as far back as 1986. Due to the lack of specific regulatory requirements, the FAA addressed HIRF by imposing SCs on applicants seeking issuance of a TC, amended TC, STC, or amended STC. The FAA found it necessary to issue approximately 423 SCs between 1986 and 2007, until finally issuing a final rule addressing HIRF[17]. For over 20 years, the FAA used its critical resources to prepare and issue all of the aforementioned SCs project by project, continually needing to divert resources from other important rulemaking, certification, or COS activities.

A number of current issues are similar to the HIRF situation, where FAA resources are being used to repeatedly issue nearly identical SCs because rulemaking on the issue has lagged. Examples of these issues include inflatable lap belts (30 SCs issued), crew rest areas (61 SCs issued), and seats with nontraditional, large, nonmetallic panels (22 SCs issued). In these cases, timely release of an airworthiness standard, perhaps with an opportunity to streamline the rulemaking process, would eliminate duplication and over-commitment of scarce resources.

Rather than continually expend resources used to issue SCs, the FAA could consider using direct final rules or a form of Fast Track rulemaking process (see below) to more quickly issue regulations to accommodate already proven standards.

ARC Observation

Some areas of the FAA rulemaking process have become overly burdensome and could be streamlined for "good cause." In the discussion above, the ARC points out two areas where this is obvious: the continual use of SCs in lieu of rulemaking, and the repeated processes to issue an FAA version of a previously issued MCAI. Were the FAA to streamline these particular processes using a more simplified effort, it would have more time to adequately address other rulemaking that has a more significant impact on the industry, the economy, and/or the environment.

[17] 72 FR 44015, August 6, 2007.

6.0 OTHER ARC CONSIDERATIONS

This chapter contains a discussion of key areas other than those specified in section 312 that require consideration when making recommendations for improving efficiencies in the aircraft certification process, reducing costs, and ensuring the FAA can conduct certifications and approvals that support and enable the development of new products and technologies and the global competitiveness of the U.S. aviation industry. The ARC considered bilateral agreements and certificate validation programs and the inconsistent interpretation of regulations.

6.1 BILATERAL AGREEMENTS

Bilateral agreements provide for cooperation between the United States and another country in a variety of aviation areas, including airworthiness, maintenance, flight operations, and environmental certification. Bilateral agreements are concluded only when the FAA is fully confident in a partner aviation authority and a certification system exists that produces equivalent results to the U.S system.

Type validation under a bilateral agreement facilitates the reciprocal airworthiness certification of civil aircraft and parts imported or exported between the two countries by reducing or eliminating redundant activities. This significantly improves the efficiency of the certification process by enabling the FAA to rely on certification activity by other CAAs with comparable systems to certify imported products. This reduces workload and allows the FAA to focus limited resources on value-added activities such as safety critical issues and other U.S. industry requests for certification. Likewise, other CAAs rely on FAA certification providing significant efficiencies for both the FAA and U.S. manufacturers. In addition, bilateral agreements improve the global competitiveness of U.S. manufacturers by streamlining international certification, which reduces time to export market and costs.

The ARC notes that bilateral agreements are essential tools that improve the efficiency of aircraft certification processes and foreign validation and the acceptance of FAA TCs. This is particularly important as the trend in global exports of U.S. aerospace products continues to grow, contributing to the U.S. economy as one of the leading positive balances of trade. The efficiency of validation procedures and acceptance of FAA type certificated aerospace products is essential to the competitiveness of U.S. manufacturers in the global aerospace market.

The FAA has bilateral agreements, including technical implementation procedures for airworthiness, in place with 33 countries and the European Community, which includes 31 nations. The most comprehensive and active bilateral agreement in terms of scope and level of certification activity and intended efficiencies is between the United States and the European Community, which represents the world's largest aerospace markets. This bilateral agreement was entered into force in May 2011 to provide for cooperation between the FAA and EASA, which was established to ensure a high level of civil aviation safety worldwide and minimize economic burdens on the aviation industry and operators from redundant regulatory oversight.

The FAA has established type validation principles for the airworthiness certification of U.S. and foreign products. The FAA guidance is contained in FAA Order 8110.52, Type Validation and Post-Type Validation Procedures.

The ARC noted that industry has advocated to streamline the aircraft certification process to improve effectiveness of the validation process in recommendations from previous reports. One area of concern identified by industry is the program reviews the FAA performs under the validation program are not structured and are conducted on an ad hoc basis. Furthermore, metrics are needed to gauge the health of the validation processes and whether bilateral agreements are being used effectively.

In response to U.S. and European industry concerns regarding overall effectiveness and efficiency, FAA and EASA established a Validation Implementation Team (VIT) at the October 2011 meeting of the Certification Oversight Board. The VIT is performing a program review of the implementation of type validation and the level of involvement by the validating authority and adherence to the principles and philosophy of the bilateral agreement. This will include the establishment of metrics to monitor ongoing validation performance to ensure the benefits and intended efficiencies are being achieved for both the authorities and industry. The ARC believes an effective review of the performance of validation and the establishment of appropriate metrics requires input from industry because it directly experiences the level of involvement and practical implementation by both the certifying and validating authorities. The ARC noted that the VIT will be seeking input from industry. The ARC recognizes the VIT's efforts to review validation procedures and practices and to provide recommendations that will enhance and simplify validation programs.

ARC discussions with representatives from major U.S. manufacturers and the FAA found an increasing level of involvement in technical certification investigations by CAAs of countries with and without a bilateral agreement. These are anecdotal indications that more and more countries are no longer accepting or recognizing U.S. FAA type certificated products as acceptable for import and are requiring a separate certification or validation by their own authorities. This can be for a variety of reasons related to safety, political, and economic issues, such as developing the competence and technical capability of their own CAAs to foster the growth of a domestic aerospace industry. There is an apparent trend of reduced global acceptance of U.S. FAA type certificated products. This would significantly increase the burden and cost on U.S. manufacturers and the FAA to support foreign certifications required for the export of U.S. products.

The ARC identified the following factors contributing to delays and obstacles to effective and efficient validation programs:

- FAA resources are limited and the AIR workload is increasing.
- Validating teams are often unfamiliar with validation principles.
- Increasingly complex products invite protracted investigations.
- The validation schedule is generally unsupportive of TC holder and operator needs.
- Other CAAs have shown a significant increase in interest and involvement in the validation process.

The ARC noted that realizing the full benefit of the CAA partnership will serve to—

- Enhance reliance on the certifying authority to the maximum extent possible.
- Avoid duplication of work done by the certifying authority.
- Promote reciprocal acceptance of FAA certifications.
- Enable FAA resources to focus on primary certification and COS activities.
- Commit resources and complete validation activities according to an agreed-upon plan.

The FAA makes significant investments to establish bilateral relations and technical implementation procedures with equivalent CAA. It is important that the FAA fully utilize type validation procedures under the bilateral agreement to improve the efficiency of its certification of foreign products while also ensuring the CAA provides an equal level of efficiency and benefit when validating U.S. products.

ARC Observation

The ARC advocates increased implementation of type validation principles. Monitoring and reporting essential metrics is necessary to establish measurable and sustainable improvement in validation efficiency and timeliness. It is also essential that the U.S. Government establish international relationships that facilitate the acceptance or streamlined validation of U.S. FAA type certificated aviation products for import. The ARC noted that improvement in the efficiency of validation programs may be realized by strengthening existing agreements, policies, and procedures.

6.2 Consistency of Regulatory Interpretation

The ARC noted that issues arise with FAA order information being interpreted as regulatory requirements. FAA orders outline procedures for FAA personnel when performing their job functions. On occasion, FAA personnel interpret procedures contained in FAA orders as regulatory instead of guidance. Some orders contain not only procedures for the FAA workforce to perform its job but also guidance for the industry on how to meet FAA rules. The ARC supports the FAA's recent effort to move material that is guidance for the industry from FAA orders to advisory circulars.

The FAA chartered the Consistency of Regulatory Interpretation (CRI) ARC in April 2012 to respond to section 313 of the Act. That ARC has been tasked to review the October 2010 GAO report on certification and approval processes (GAO–11–14) and determine the root causes of inconsistent interpretation of regulations by AFS and AIR. The ACPRR ARC reviewed that report as part of its tasking to review the status of recommendations made in previous reports on the FAA's certification process. The GAO report notes the amount of time it takes to resolve certification issues differs based on field office resources and expertise. The ACPRR ARC encourages the CRI ARC to support the ACPRR ARC's efforts to improve efficiencies in the certification process by recommending changes be implemented to the certification and approval processes as recommended in the ACPRR ARC report.

7.0 PROCESS REFORMS AND IMPROVEMENTS FOR FAIR AND TIMELY FAA REVIEW OF APPLICATIONS

The ACPRR ARC reviewed the recommendations from previous reports, considered the discussions and observations made in this report, and developed six recommendations for FAA consideration and implementation. The ARC's recommendations are overarching and address systems, planning, measuring, and monitoring. Therefore, the ARC believes its recommendations, if implemented would provide the greatest opportunity to make an effective difference in certification process efficiency and address implementation of nearly all of the recommendations from previous reports.

Recommendation Nos. 1, 2, and 3 relate to streamlining the product certification process by improving implementation and ensuring the effectiveness of existing processes and programs. Recommendation Nos. 4 and 5 relate to reengineering the product certification process by developing and implementing evolutionary changes to certification procedures and the way the FAA provides safety oversight of the design of aviation products. Recommendation No. 6 is not directly related to the aircraft certification process, but would help improve the efficiency of other important AIR activities, ensuring resources are available to support aircraft certification.

7.1 STREAMLINING THE AIRCRAFT CERTIFICATION PROCESS

Recommendation 1—Development of Comprehensive Means to Implement and Measure the Effectiveness of Implementation and Benefits of Certification Process Improvements

Development of Comprehensive Implementation Plans

As discussed in chapter 4.0 of this report, the ARC reviewed recommendations to improve the effectiveness and efficiency of certification and approval processes made in several previous reports and found the FAA has taken actions on most of them, such as the expansion of organizational delegation and international validation programs as well as internal quality and safety management systems to strengthen oversight. However, the FAA and industry have both experienced significant challenges nearly every time a change intended to improve certification processes is made because a comprehensive implementation plan that addresses all the facets necessary for success was not developed and/or well executed as part of the initiative.

Recommendation 1a—The ARC recommends the FAA develop comprehensive implementation plans for certification process improvement initiatives including SMS, that address—

- People (FAA staff knowledge, skills, and abilities; roles/responsibilities; and culture change),
- Process (including change management),
- Tools,
- Training, and
- Implementation (including the transition to new processes and tools).

Development of Tracking and Monitoring Process to Ensure Effectiveness

As discussed in chapter 4.0 of this report, the FAA has responded to previous recommendations with a number of initiatives and actions intended to improve the effectiveness and efficiency of the certification process. However, no mechanism exists to track and coordinate these initiatives, and the FAA does not have a means to determine whether its actions are achieving the intended goals because no performance measures exist to monitor the effectiveness of implementation.

Recommendation 1b—The ARC recommends the FAA develop a means to track and monitor certification process improvement initiatives, including those in the CPI Guide, to ensure effectiveness of implementation, including—

- A database for tracking recommendations and FAA response initiatives,
- Metrics for implementation and measuring expected benefits, and
- Establishment of a joint FAA/industry group to review the status of implementation.

This is consistent with a finding in the 2010 GAO report on certification and approval processes[18] that recommended the FAA "[determine] the effectiveness of actions to improve the certification and approval processes by developing a continuous evaluative process and use it to create measurable performance goals for the actions, track performance toward those goals, and determine appropriate process changes."

Recommendation 2—Enhanced Use of Delegation

As discussed in section 5.3 of this report, the ARC finds that the FAA delegation program is a highly effective tool that is essential to the effectiveness and efficiency of the aircraft certification process and the FAA's ability to support continuously growing aviation industry activity and COS. The FAA and industry have both invested significant resources in establishing the ODA program, which strengthens requirements upon industry and robustness of FAA oversight to expand the capability. However, the FAA and industry have not yet experienced the desired efficiencies and increased capacity as implementation continues.

In addition, the ARC believes the FAA should expand the delegation program to ensure its availability to support the entire certification process, including compliance activities necessary for the issuance of a design approval, particularly compliance activities related to noise and emission tests and ICA.

Recommendation 2—The ARC recommends the FAA continue to improve the effectiveness of delegation programs to achieve full utilization as a priority and realize the safety benefits of leveraging FAA resources and improved efficiency of the certification process is realized by—

- Implementation of the ODA action plan, including assessment of metrics to determine the effectiveness of improvements and periodic joint FAA/industry review of the status.
- Ensuring appropriate training and resources are available to maintain robust oversight of delegation programs, including teams and individuals with specialized audit training to conduct ODA audits.

[18] GAO–11–14.

- Expanding delegation capability to include support for all certification airworthiness standards when appropriate, particularly low-risk or routine activities such as those related to noise and emission tests and ICA.
- Reviewing and updating the AIR certification project sequencing program to account for ODA.

Recommendation 3—Integrated Roadmap and Vision for Certification Process Reforms

Several FAA and industry programs and initiatives have been implemented and are currently underway to streamline the certification process and improve its overall effectiveness and efficiency, including CPI Guide, ODA, RBRT, and SMS (as discussed in chapters 5.0 and 6.0 of this report). In addition, the FAA is also considering some new initiatives and potential rulemaking regarding certification processes, the roles and responsibilities of the FAA and industry, and new requirements for applicants and DAH organizations including minimum qualifications, COS, SMS, and CDO.

However, the ARC finds that there is limited visibility and understanding of how all the different initiatives and concepts, both current and longer term, to improve the certification process are related and whether these initiatives and concepts are complementary. This contributes to challenges with implementation, particularly those initiatives that impact the day-to-day activities and responsibilities of the FAA workforce and industry applicants.

Recommendation 3—The ARC recommends the FAA develop an integrated, overarching vision of the future state for certification procedures and a roadmap such that—

- A detailed roadmap clearly shows how initiatives and programs support the future state and provides gates or phases with clear milestones and success criteria.
- There is a periodic review and update to the vision and roadmap for certification procedures is performed, including input from affected stakeholders.

7.2 Reengineering the Aircraft Certification Process

Recommendation 4—Update Part 21 to Reflect a Systems Approach for Safety

Effective implementation of ODA and the FAA's internal SMS for risk-based decisions on oversight and direct level of involvement in certification activity leverages its limited resources and improves the certification process by shifting from a detailed product approach toward a systems safety approach. However, a reengineering update to part 21 certification procedures is necessary to achieve the full opportunity of a systems safety approach for effective and efficient certification processes. The design organization must have full responsibility and accountability through the establishment of regulatory requirements for minimum qualification, performance, and management systems. The ARC finds that this is a natural progression of the maturity and capability of ODA and the FAA's safety management oversight of discrete compliance findings on a project-by-project basis to an organization's performance, systems, and processes.

FAA approval or certification of design organizations provides significant opportunity for improvements in safety, safety culture, and the overall effectiveness and efficiency of aircraft certification processes through an evolutionary shift to a systems safety approach. This is consistent with how the FAA provides safety oversight of aircraft production, air carrier operations, and repair stations. In addition, this approach to aircraft certification is used in Europe, Canada, and Brazil. The ARC review of previous reports and recommendations on the FAA certification processes found strong support for the FAA to continue shifting toward a systems approach to aircraft certification and establish new requirements to approve or certify design organizations.

Recommendation 4—The ARC recommends the FAA undertake a review to update part 21 certification procedures to reflect a systems safety approach to product certification processes and oversight of design organizations, including consideration of—

- Minimum qualification and organizational requirements for design approval applicants and DAHs including responsibilities and privileges,
- CDO and the recommendations of the FAA's CDO ARC for implementation of this concept,
- Training and resources necessary to maintain robust oversight of design organizations and certification activity,
- SMS for DAHs, and
- Issuance of an advance notice of proposed rulemaking to solicit public input and views on some of the concepts to be considered.

Recommendation 5—Culture and Change Management

As discussed in chapter 5.0 of this report, successful implementation of more advanced oversight systems based on SMS principles requires an effective change management process and training that are complementary. Consistent with recommendation No. 3 above, the ARC finds that the FAA needs to develop and implement a comprehensive change management plan that addresses workforce roles, responsibilities, and training and culture to ensure effective implementation of improvements and changes to the certification process. Position descriptions and performance standards, as well as recognition of the FAA staff that oversee the safety systems, should reflect their new roles and responsibilities.

Recommendation 5—The ARC recommends the FAA develop and implement a comprehensive change management plan that takes full advantage of training development capability to prepare the workforce for its new and evolving roles and responsibilities in a systems safety approach to certification and oversight. The SMS principles, data analysis, evaluation of safety systems, and root cause analysis should be required training for those AIR staff overseeing safety systems.

7.3 Other Process Reforms

Recommendation 6—Process Reforms and Efficiencies Needed for Other AIR Functions

As discussed in section 3.2 of this report, AIR is responsible for COS, establishment of airworthiness standards, and certification of new products. Because FAA resources cannot grow at the same pace as industry, there has been a trend of fewer resources available for aircraft certification. As previously noted, approximately one-third of current AIR resources are used for conducting design approvals. This is the basis of the sequencing program, which prioritizes and delays the start of new certification projects until resources are available.

AIR needs to implement process reforms and efficiency improvements in the other major areas of COS and rulemaking, as this would allow for availability of additional resources to support certification. For example, as discussed in section 5.5 of this report, the FAA should expand the Fast Track rulemaking process, further streamline issuance of MCAI, and leverage the approvals done by U.S./CAA partners to adopt MCAI in a more timely way with fewer AIR resources. In cases where SCs have been used for a period of time and the design is no longer new and novel, the use of Fast Track rulemaking is an ideal alternative.

Recommendation 6—The ARC recommends AIR undertake a review of COS and rulemaking processes and implement reforms necessary to improve efficiency, including—

- Increased design approval holder responsibilities for continued operational safety activities.
- Strengthening the effectiveness of validation programs under bilateral agreements through the establishment of metrics and joint FAA/industry review of performance to eliminate redundant activities and ensure the intended efficiencies for both the FAA and industry.
- Eliminating duplication of efforts in issuing MCAIs by leveraging bilateral agreements and capability of the CAA State of Design.
- Implementing the Fast Track rulemaking process to update airworthiness standards in cases where SCs have been used for a period of time and the design is no longer new and novel.
- Implementing the recommendations provided by the ARAC RPWG.
- Implementing the recommendations provided by the CRI ARC to improve efficiencies in the certification process.
- Implementing the Part 23 ARC recommendations to address the Part 23 CPS recommendations.

8.0 CONCLUSION

The ARC found that while the number of applications for product certifications and approvals predicted in the 1-year, 5-year, and 10-year periods following 2012 do not specifically reflect a significant increase, the actual AIR workload for the FAA is expected to continue increasing. The FAA has limited capacity and must handle competing priorities because it supports the entire product life cycle including COS, rulemaking, and certification, and must address new certification of new technologies such as UAS.

The ARC noted in this report that there are many existing improvement initiatives for certification process efficiencies. Some have been implemented; others are underway. However, these initiatives are not fully integrated and it does not appear implementation is overseen or benefits are measured. These activities are not clearly linked to a future state.

The ARC believes the greatest increase in efficiency can be achieved with procedures that require a systems approach to certification, such as CDO (approved design organizations) and FAA risk-based oversight. Recommended actions taken will achieve not only improvements and efficiencies in the current state of type certification but align the process with the future state of CDO and FAA risk-based oversight. The best opportunities for efficiency gains in the current certification process are (1) developing comprehensive improvement implementation plans and a tracking and monitoring process to ensure effectiveness, and (2) maximizing delegation in delegation systems to the greatest extent possible, preparing for the future of a systems approach to certification and safety oversight such as CDO.

The ARC collectively developed and agreed to the recommendations presented in this report. The ARC notes that the certification process will become more efficient and effective if the recommendations as delineated in this report are implemented, resulting in reduced costs to government and industry while ensuring safety. The streamlining of the aircraft certification process as recommended will also support and enable the U.S. aviation industry to develop new products and technologies and compete globally.

The ARC members and their respective organizations appreciate the opportunity to participate in this review of the aircraft certification processes and make recommendations, and they look forward to assisting the FAA with future implementation as needed.

APPENDIX A—ARC MEMBERS

MEMBERS AND ALTERNATES

Mr. Ali Bahrami, *Co-Chair*, Federal Aviation Administration (FAA) Transport Airplane Directorate (ANM–100)

Ms. Christine Thompson, *Co-Chair*, Boeing Commercial Airplanes

Mr. John Bouma, Cessna Aircraft Company

Mr. Walter Desrosier, General Aviation Manufacturers Association

Mr. Paul Dionne, Sikorsky Aircraft Corporation

Ms. Mary Little, Rockwell Collins, Inc.

Mr. Andrew May, GE Aviation

Mr. Richard Peri, Aircraft Electronics Association

Mr. William Whitton, Gulfstream Aerospace Corporation

Ms. Jacque Holloway, *Alternate*, Cessna Aircraft Company

PROGRAM SUPPORT

Mr. Daniel Kutz, Standardization Branch, FAA ANM–100

Mr. Robert E. Robeson, Jr., FAA Office of Aviation Policy and Plans (APO)

Mr. George Thurston, Economist, FAA APO

APPENDIX B—ACRONYMS

14 CFR	Title 14 of the Code of Federal Regulations
49 U.S.C.	Title 49 of the United States Code
ACO	Aircraft Certification office
ACPRR	Aircraft Certification Process Review and Reform
AD	airworthiness directive
AEG	Aircraft Evaluation Group
AFS	FAA Flight Standards Service
AIA	Aerospace Industries Association
AIR	FAA Aircraft Certification Service
AIR–1	Director of the FAA Aircraft Certification Service
ALL	Assimilate Lessons Learned
APO	FAA Office of Policy & Plans
ARAC	Aviation Rulemaking Advisory Committee
ARC	Aviation Rulemaking Committee
AVS	FAA Aviation Safety
CAA	civil aviation authority
CDO	certified design organization
COS	Continued Operational Safety
CPI	Certification Process Improvement
CPS	Certification Process Study
CRI	Consistency of Regulatory Interpretation
DAH	design approval holder
DER	designated engineering representative
EASA	European Aviation Safety Agency

FAA	Federal Aviation Administration
GAMA	General Aviation Manufacturers Association
GAO	U.S. Government Accountability Office
HIRF	High-Intensity Radiated Fields
ICA	instructions for continued airworthiness
ICAO	International Civil Aviation Organization
JAA	Joint Aviation Authority
JAR	Joint Aviation Requirements
MCAI	mandatory continuing airworthiness information
MSAD	Monitor Safety/Analyze Data
MSMS	Manufacturers Safety Management System
NAS	National Airspace System
NextGen	Next Generation Air Transportation System
NPRM	notice of proposed rulemaking
ODA	Organization Designation Authorization
OIG	Office of the Inspector General
OMT	Organization Management Team
OSP	Oversee System Performance
PIWG	Process Improvement Working Group
PMA	parts manufacturer approval
PSCP	Project Specific Certification Plan
QMS	Quality Management System
R–PETS	Rulemaking Prioritization Evaluation Tools
RAM	Rulemaking Assessment Matrix
RAQ	Rulemaking Assessment Questionnaire

RBRT	risk-based resource targeting
REP	Rulemaking Evaluation Process
RPWG	Rulemaking Prioritization Working Group
SA	Safety Assurance
SC	special condition
SMS	Safety Management System
SOP	Standard Operating Procedure
SRM	Safety Risk Management
STC	supplemental type certificate
TC	type certificate
UAS	unmanned aircraft system
UM	unit member
VIT	Validation Implementation Team

APPENDIX C—FAA MODERNIZATION AND REFORM ACT OF 2012 (PUBLIC LAW 112–95, SECTION 312)

SEC. 312. AIRCRAFT CERTIFICATION PROCESS REVIEW AND REFORM.

(a) IN GENERAL.—The Administrator of the Federal Aviation Administration, in consultation with representatives of the aviation industry, shall conduct an assessment of the certification and approval process under section 44704 of Title 49, United States Code.

(b) CONTENTS.—In conducting the assessment, the Administrator shall consider—

(1) the expected number of applications for product certifications and approvals the Administrator will receive under section 44704 of such title in the 1-year, 5-year, and 10-year periods following the date of enactment of this Act;

(2) process reforms and improvements necessary to allow the Administrator to review and approve the applications in a fair and timely fashion;

(3) the status of recommendations made in previous reports in the Administration's certification process;

(4) methods for enhancing the effective use of delegation systems, including organizational designation authorization;

(5) methods for training the Administration's field office employees in the safety management system and auditing; and

(6) the status of updating airworthiness requirements, including implementing recommendations in the Administration's report entitled ''Part 23—Small Airplane Certification Process Study'' (OK–09–3468, dated July 2009).

(c) RECOMMENDATIONS.—In conducting the assessment, the Administrator shall make recommendations to improve efficiency and reduce costs through streamlining and reengineering the certification process under section 44704 of such title to ensure that the Administrator can conduct certifications and approvals under such section in a manner that supports and enables the development of new products and technologies and the global competitiveness of the United States aviation industry.

(d) REPORT TO CONGRESS.—Not later than 180 days after the date of enactment of this Act, the Administrator shall submit to the Committee on Transportation and Infrastructure of the House of Representatives and the Committee on Commerce, Science, and transportation of the Senate a report on the results of the assessment, together with an explanation of how the Administrator will implement recommendations made under subsection (c) and measure the effectiveness of the recommendations.

(e) IMPLEMENTATION OF RECOMMENDATIONS.—Not later than 1 year after the date of enactment of this Act, the Administrator shall begin to implement the recommendations made under subsection (c).

APPENDIX D—CHARTER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
ARC Charter

Effective Date: 4/20/12

SUBJECT: Aircraft Certification Process Review and Reform Aviation Rulemaking Committee

1. **PURPOSE.** This charter creates the Aircraft Certification Process Review and Reform Aviation Rulemaking Committee (ARC) according to the Administrator's authority under Title 49 of the United States Code (49 U.S.C.) § 106(p)(5). This charter outlines the committee's organization, responsibilities, and tasks.

2. **BACKGROUND.** On February 15, 2012, the President signed the Federal Aviation Administration (FAA) Modernization and Reform Act of 2012 (the Act). Section 312 of the Act specifies that the Administrator of the FAA, in consultation with representatives of the aviation industry, shall conduct an assessment of the certification and approval process under 49 U.S.C. 44704.

3. **OBJECTIVES AND TASKS OF THE ARC.** The ARC will provide a forum for the United States aviation community to discuss and provide recommendations to the FAA. The ARC conducts the assessment required by Section 312 of the Act, and advises and provides written recommendations to the Director of the Aircraft Certification Service. The ARC will specifically make recommendations to improve efficiency and reduce costs through streamlining and reengineering the certification process under 49 U.S.C. 44704 to ensure that the FAA can conduct certifications and approvals in a manner that supports and enables the development of new products and technologies and the global competitiveness of the United States aviation industry. In conducting the assessment, the ARC shall consider—

   (1) The expected number of applications for product certifications and approvals the FAA will receive under 49 U.S.C. 44704 in the 1-year, 5-year, and 10-year periods following the date of enactment of the Act. (NOTE: 49 U.S.C. 44704 includes type certificates, supplemental type certificates, production certificates, airworthiness certificates, and design organization certificates.);
   (2) Process reforms and improvements necessary to allow the FAA to review and approve the applications in a fair and timely fashion;
   (3) The status of recommendations made in previous reports on the FAA's certification process;
   (4) Methods for enhancing the effective use of delegation systems, including organizational designation authorization;
   (5) Methods for training the FAA's field office employees in the safety management system and auditing; and
   (6) The status of updating airworthiness requirements, including implementing recommendations in the Administration's report entitled ''Part 23—Small Airplane Certification Process Study'' (OK–09–3468, dated July 2009).

Initiated By: AIR-100

4. ARC PROCEDURES.

(1) The ARC advises and provides written recommendations to the Director of the Aircraft Certification Service and acts solely in an advisory capacity. Once the ARC recommendations are delivered to the Director of the Aircraft Certification Service it is within the Director's discretion to determine when and how the report of the ARC is released to the public.

(2) The ARC may propose additional tasks to the Director of the Aircraft Certification Service for approval.

(3) The ARC will submit a report detailing recommendations by May 22, 2012. The chair of the ARC will send the recommendation report to both the Director of the Aircraft Certification Service and the Director of the Office of Rulemaking.

(4) The ARC may reconvene following the submission of its recommendations for the purposes of providing advice and assistance to the FAA, at the discretion of the Director of the Aircraft Certification Service, provided the charter is still in effect.

5. ARC ORGANIZATION, MEMBERSHIP, AND ADMINISTRATION.

The FAA will establish a committee of members of the aviation community. Members will be selected based on their familiarity with aircraft certification process, analysis and regulatory compliance. Membership will be balanced in viewpoints, interests, and knowledge of the committee's objectives and scope. ARC membership is limited to promote discussion. Active participation and commitment by members will be essential for achieving the ARC objectives. Attendance is essential for continued membership on the committee. When necessary, the committee may establish specialized work groups that include at least one committee member and invited subject matter experts from industry and government.

This ARC will consist of members from the FAA, and include members from the Aircraft Certification Service Directorates, Headquarters Divisions, and selected aircraft certification offices and aviation associations representing manufacturers of part 23, 25, 27, and 29 aircraft.

The Director of the Aircraft Certification Service is the sponsor of the ARC and will select an industry chair(s) from the membership of the ARC and the FAA designated Federal official for the ARC. The FAA participation and support will come from all affected FAA lines-of-business.

The ARC sponsor is the Director of the Aircraft Certification Service who:

(1) Appoints members or organizations to the ARC, at the Director's sole discretion;
(2) Receives all ARC recommendations and reports;
(3) Selects industry and FAA members; and
(4) Provides administrative support for the ARC.

Once appointed, the industry chair(s) will:

(1) Coordinate required committee and subcommittee (if any) meetings in order to meet the ARC's objectives and timelines;
(2) Provide notification to all ARC members of the time and place for each meeting;
(3) Ensure meeting agendas are established and provided to the committee members in a timely manner;
(4) Keep meeting minutes; and
(5) Perform other responsibilities as required to ensure the ARC's objectives are met.

The ARC will submit a report detailing recommendations for tasks (1) through (6) by May 22, 2012. The recommendation will enable the Administrator to meet the requirements of the FAA Modernization and Reform Act of 2012, Section 312, paragraphs (d) and (e) (see attached).

6. **COST AND COMPENSATION.** The estimated cost to the Federal Government for the Aircraft Certification Process Review and Reform Aviation Rulemaking Committee ARC is approximately $28,200 annually. All travel costs for government employees will be the responsibility of the government employee's organization. Non-government representatives, including the industry co-chair, serve without government compensation and bear all costs related to their participation on the committee.

7. **PUBLIC PARTICIPATION.** ARC meetings are not open to the public. Persons or organizations outside the ARC who wish to attend a meeting must get approval in advance of the meeting from a committee co-chairperson or designated federal official.

8. **AVAILABITY OF RECORDS.** Consistent with the Freedom of Information Act, Title 5, U.S.C., section 522, records, reports, agendas, working papers, and other documents that are made available to, or prepared for, or by the committee will be available for public inspection and copying at the FAA Headquarters, Aircraft Certification Service, AIR-1, 800 Independence Avenue, SW, Washington, DC 20591. Fees will be charged for information furnished to the public according to the fee schedule published in Title 49 of the Code of Federal Regulations, Part 7.

   You can find this charter on the FAA Web site at:
   http://www.faa.gov/about/committees/rulemaking/.

9. **EFFECTIVE DATE AND DURATION.** This ARC is effective upon issuance of this charter. The ARC will remain in existence for six months, unless sooner suspended, terminated or extended by the Director of the Aircraft Certification Service.

10. **DISTRIBUTION.** This charter is distributed to director-level management in the Office of the Associate Administrator for Aviation Safety, the Office of Aviation Policy and Plans, and the Office of Rulemaking.

The effective date of this charter is April 20, 2012.

Michael P. Huerta
Acting Administrator

APPENDIX E—REPORTS REVIEWED AND STATUS OF RELEVANT RECOMMENDATIONS

The ARC reviewed 29 reports, taking 19 reports into consideration and determining 10 reports not to be in scope.

REPORTS REVIEWED THAT SUPPORTED ACPRR ARC OBJECTIVES

1. Safety Management System Aviation Rulemaking Committee Final Report, March 31, 2012.

2. Department of Transportation Inspector General, Report No. AV–2001–136, FAA Needs to Strengthen Its Risk Assessment and Oversight Approach for Organization Designation Authorization and Risk-Based Resource Targeting Programs, June 29, 2011.

3. General Accounting Office, Report No. GAO–11–14, Aviation Safety: Certification and Approval Processes Are Generally Viewed as Working Well, but Better Evaluative Information Needed to Improve Efficiency, October 2010.

4. RTCA, Inc., NextGen Mid-Term Implementation Task Force Report, September 9, 2009.

5. Certified Design Organization Aviation Rulemaking Committee Report to the Federal Aviation Administration, May 2008.

6. Department of Transportation Inspector General, Report No. CC–2008–080, Key Safety and Modernization Challenges Facing the Federal Aviation Administration, April 17, 2008.

7. Department of Transportation Inspector General, Report No. CC–2008–046, Actions Needed to Strengthen FAA's Safety Oversight and Use of Partnership Programs, April 3, 2008.

8. Federal Aviation Administration, Report No. AV–2008–026, Assessment of FAA's Risk-Based System for Overseeing Aircraft Manufacturers' Suppliers, February 26, 2008.

9. Department of Transportation Inspector General, Report No. CC–2006–074, Observations on FAA's Oversight of Aviation Safety, September 2006, 2006.

10. Department of Transportation Inspector General, Report No. CC–2006–03, Aviation Safety: Observations on FAA's Oversight and Changes in the Airline Industry, November 17, 2005.

11. General Accounting Office, Report No. GAO–05–40, Aviation Safety: FAA Needs to Strengthen the Management of Its Designee Programs, October 2004.

12. FAA Associate Administrator for Regulation and Certification, Commercial Airplane Certification Process Study: An Evaluation of Selected Aircraft Certification, Operations, and Maintenance Processes, March 2002.

13. General Accounting Office, Report No. GAO–01–821, Aviation Rulemaking: Further Reform Is Needed to Address Long-standing Problems, July 2001.

14. RTCA, Inc., Final Report of RTCA Task Force 4 Certification, February 26, 1999.

15. National Research Council Committee on Aircraft Certification Safety Management, Improving the Continued Airworthiness of Civil Aircraft: A Strategy for the FAA's Aircraft Certification Service, 1998.

16. National Civil Aviation Review Commission, Avoiding Aviation Gridlock and Reducing the Accident Rate: A Consensus for Change, December 1997.

17. White House Commission on Aviation Safety and Security, Final Report, February 12, 1997.

18. Dyment, Michael J., Challenge 2000: Recommendations for Future Aviation Safety Regulation: Shifting Roles and Responsibilities Between FAA and Industry, April 19, 1996.

19. General Accounting Office, Report No. GAO/RCED–93–155, Aircraft Certification: New FAA Approach Needed to Meet Challenges of Advanced Technology, September 1993.

REPORTS REVIEWED THAT DID NOT SUPPORT ACPRR ARC OBJECTIVES

1. Federal Aviation Administration, FAA Response to Recommendations of the RTCA NextGen Mid-Term Implementation Task Force, January 2010.

2. General Accounting Office, Report No. GAO–06–920, U.S. Aerospace Industry: Progress in Implementing Aerospace Commission Recommendations, and Remaining Challenges, September 2006.

3. General Accounting Office, Report No. GAO–05–728, Aviation Safety: FAA Management Practices for Technical Training Mostly Effective; Further Actions Could Enhance Results, September 2005.

4. General Accounting Office, Report No. GAO–04–54, Aviation Safety: More Research Needed on the Effects of Air Quality on Airliner Cabin Occupants, January 2004.

5. General Accounting Office, Report No. GAO–04–33, Aviation Safety: Advancements Being Pursued to Improve Airliner Cabin Occupant Safety and Health, October 2003.

6. General Accounting Office, Report No. GAO–01–916, General Aviation: Status of the Industry, Related Infrastructure, and Safety Issues, August 2001.

7. General Accounting Office, Report No. GAO/RCED–00–111, Aviation Safety: Safer Skies Initiative Has Taken Initial Steps to Reduce Accident Rates by 2007, June 2000.

8. General Accounting Office, Report No. GAO/RCED–96–193, Aviation Safety: FAA Generally Agrees With but Is Slow in Implementing Safety Recommendations, September 1996.

9. Federal Aviation Administration, FAA 90 Day Safety Review, September 16, 1996

10. General Accounting Office, Report No. GAO/T–RCED–94–53, Aircraft Certification: FAA Can Better Meet Challenges Posed by Advances in Aircraft Technologies, Testimony, October 20, 1993.

APPENDIX F—23-POINT ODA ACTION PLAN

	AIA/GAMA & FAA ODA Dashboard Action Tracker		
	Agreed Improvement Action	**Action Plan**	**Action Item**
Appointment & Expansion of UMs	**ODA holders understanding of proper FAA/ODA communication** -- ODA holders will educate UMs on the importance of proper communication and coordination within the ODA.		1
		Develop Inventory of AIA/GAMA ODAs	1.1
		Develop Discussion of Issue & Proper UM/FAA Relationship	1.2
		Coordinate w/FAA	1.3
		Communicate to AIA/GAMA ODA Holders	1.4
		Measure ODAs that have educated UMs (y of x)	1.5
Appointment & Expansion of UMs	**OMT's understanding of proper FAA/ODA communication** -- Conduct training to assure that the FAA directs UMs seek guidance and instruction from within their ODA rather than directly between the UM and the FAA.		2
		IVT for ACO Managers	2.1
		ODA Seminar	2.2
		Communicate to FAA ODA Focal Points	2.3
		ACO Management Lead Discussions with OMT members	2.4
		Revise FAA Academy DM Course	2.5
		Incorporate policy in Change 1 to 8100.15A	2.6
		Assess Need for Additional Written Guidance or Training	2.x
Appointment & Expansion of UMs	**OMT prescreening of proposed UM's and review of UM appointment decision process** -- There was mutual agreement that the FAA's role in the UM appointment process for inexperienced organizations is two-fold: 1 – "Prescreening" - Prior to beginning a UM candidate evaluation, the ODA will notify the OMT of the name of the candidate. If the FAA has information that indicates a UM candidate is not acceptable based upon past history (known to FAA through history as DER, AR, employee, etc.) the FAA will provide that information prior to the time the ODA holder completes the candidate evaluation 2 – "Appointment Decision Review" - Following the ODA candidate evaluation, the FAA will review the decision to appoint a UM. In the event the FAA finds that the process was not followed or the proposed UM is not qualified, the agency will assure that the ODA holder addresses any process weaknesses and if necessary the ODA holder makes a change to the manual. It is not required that the FAA evaluate the UM candidate however the FAA should verify that the documentation generated to support the appointment indicates that the proposed UM meets the appointment requirements.		3
		IVT for ACO Managers	3.1
		ODA Seminar	3.2
		Communicate to FAA ODA Focal Points	3.3
		ACO Management Lead Discussions with OMT members	3.4
		Recommendations provided to DM Course Manager	3.5
		Revise FAA Academy DM Course	3.6

Appointment & Expansion of UMs	**Industry metric #1 -- OMT UM prescreening and appointment process review turnaround times** -- Consider a metric to measure the efficiency of the UM appointment and the FAA oversight process. It is expected that this measurement will indicate the health and efficiency of this process as the FAA and industry work to refine the appointment process.		4
		Develop Metrics	4.1
		Coordinate w/Sample ODAs	4.2
		Coordinate w/FAA	4.3
		Communicate to AIA/GAMA ODA Holders	4.4
		Measure Quarterly	4.5
UM by Name in Certification Plans	**Joint Team #1 -- Cert plan improvements and use of appropriate UM's** -- The FAA and industry will form a small team to determine what information will be captured in a certification plan to assure the ODA utilizes the appropriately experienced and approved UM for a particular finding or perhaps a clear process in the ODA manual for assuring the appropriate UM is used. The results of this team will be communicated through training and/or policy updates. (to be worked same time as item #11) (Necessary for Action Number 6)		5
		Select Industry and FAA Team Members	5.1
		Series of Team Meetings Held	5.2
		Recommendation Provided to FAA	5.3
		FAA Policy and Training Milestones TBD after team recommendations are submitted	5.4
UM by Name in Certification Plans	**OMT familiarity with UM's in cert plan not required** -- Begin internal education to assure the review of the UM in the certification plan is not focused on whether the OMT is familiar with the individual but whether the ODA has proposed an individual who has the appropriate approval and experience with the task. (Supports Action Number 5)		6
		IVT for ACO Managers	6.1
		ODA Seminar	6.2
		Communicate to FAA ODA Focal Points	6.3
		ACO Management Lead Discussions with OMT members	6.4
		Revise FAA Academy DM Course	6.5
		Incorporate policy in Change 1 to 8100.15A	6.6
		Assess Need for Additional Written Guidance or Training	6.x
Changes to ODA Manual	**OMT lead decides who reviews PM changes** -- Clarify to field personnel that the OMT lead may decide which OMT members must review a particular ODA manual change and which do not.		7
		Incorporate in 8100.15A	7.1
		IVT for ACO Managers	7.2
		ODA Seminar	7.3
		Communicate to FAA ODA Focal Points	7.4
		ACO Management Lead Discussions with OMT members	7.5
		Recommendations provided to DM Course Manager	7.6
		Revise FAA Academy DM Course	7.7

Changes to ODA Manual	**ODA holder to identify PM revisions driven by policy or audit findings** -- When submitting changes, ODA holders will identify manual revisions which are necessary to comply with FAA audit findings or FAA policy.		8
		Develop Inventory of AIA/GAMA ODAs	8.1
		Develop Discussion of Issue & Proper UM/FAA Relationship	8.2
		Coordinate w/FAA	8.3
		Communicate to AIA/GAMA ODA Holders	8.4
		Measure ODAs are Identifying Type of Manual Revision	8.5
Changes to ODA Manual	**OMT to expedite review of PM revisions driven by policy or audit findings** -- The FAA will expedite the approval of revisions necessary to comply with FAA audit findings or FAA policy.		9
		IVT for ACO Managers	9.1
		ODA Seminar	9.2
		Communicate to FAA ODA Focal Points	9.3
		ACO Management Lead Discussions with OMT members	9.4
		Measure cycle time (QMS) - Phase 1 - begin measuring GAMA companies (Feb 1) - Review process and data at GAMA AMG meeting (mid-April) - Phase 2 - begin measuring all ODA's (May 1)	9.5
		Revise FAA Academy DM Course	9.6
		Incorporate policy in Change 1 to 8100.15A	9.7
		Assess Need for Additional Written Guidance or Training	9.8
Changes to ODA Manual	**OMT completes PM revisions in 30 days** -- Work towards the goal that proposed ODA manual revisions will be reviewed in 30-days.		10
		Measure cycle time (QMS) - Phase 1 - begin measuring GAMA companies (Feb 1) - Review process and data at GAMA AMG meeting (mid-April) - Phase 2 - begin measuring all ODA's (May 1)	10.1
Changes to ODA Manual	**Joint Team #1 -- Definition/examples of minor PM changes not requiring OMT review** -- The industry will propose a definition or examples of minor changes to an ODA manual which can be implemented in the ODA manual without FAA review. (to be worked same time as item #5)		11
		Select Industry and FAA Team Members	11.1
		Team Meetings Held	11.2
		Recommendation Provided to FAA	11.3
		FAA Policy and Training Milestones TBD after team recommendations are submitted	11.4

Changes to ODA Manual	**Industry metric #2 -- ODA PM revision turnaround times** -- Measure the review time necessary for ODA manual revision review and categorize these revisions bases upon: compliance with FAA audit findings/policy, ODA expansion, misc.		12
		Develop Metrics	12.1
		Coordinate w/Sample ODAs	12.2
		Coordinate w/FAA	12.3
		Communicate to AIA/GAMA ODA Holders	12.4
		Measure Quarterly	12.5
Full/Efficient Use of ODA	**Sequencing for ODA's** -- Review the 40-hr sequencing threshold and will determine if ODA should have a different standard applied for sequencing to minimize the loss of use of an ODA due to the sequencing queue. As compared to previous forms of delegation, industry feels that the FAA is reserving a higher level of findings when projects are conducted under ODA. Areas which were traditionally delegated are being withheld despite the better process and documentation within an ODA. The FAA acknowledges that under ODA the FAA may be able to delegate more widely than currently utilized and changes may be necessary to get to this point.		13
		ACOLT Consider Change to SOP	13.1
Full/Efficient Use of ODA	**RBRT for ODA's** -- As a longer-term action, following the adoption of Risk Based Resource Targeting (RBRT) in standard certification, the FAA will consider the application of Risk Based Resource Targeting (RBRT) to ODA projects.(Supports Action Number 16 But Does Not Hold This Item Up)		14
		Implementation of RBRT for Standard Certification Projects	14.1
		Develop assessment/implementation milestones strategy for ODA	14.2
Full/Efficient Use of ODA	**OMT will delegate based on demonstrated ODA capabilities** -- Clarify to field offices that they should delegate completely based on ODA capabilities unless an item qualifies as a "Specific Finding" per the Order or there is an otherwise documented issue.		15
		Communicate to FAA ODA Focal Points	15.1
		ACO Management Lead Discussions with OMT members	15.2
		Recommendations provided to DM Course Manager	15.3
		Revise FAA Academy DM Course	15.4
		Assess Need for Additional Written Guidance or Training	15.5
			15.6
			15.7

Full/Efficient Use of ODA	**OMT provided rationale for FAA specific findings** -- Consider whether to require that OMTs provide written rationale/justification for FAA specific findings when the ODA unit is authorized to make the finding.		16
		AIR-110 coordinates proposal with ACOLT	16.1
		Incorporate policy in Change 1 to 8100.15A	16.2
		Revise FAA Academy DM Course to Address	16.3
			16.4
			16.5
			16.x
Full/Efficient Use of ODA	**OMT authorized pre-PNL approval activities** -- Clarify any limitations regarding what types of certification projects/activity may be performed without prior FAA notification (through the certification plan or PNL).		17
		Incorporate in 8100.15A	17.1
		IVT for ACO Managers	17.2
		ODA Seminar	17.3
		Communicate to FAA ODA Focal Points	17.4
		ACO Management Lead Discussions with OMT members	17.5
		Recommendations provided to DM Course Manager	17.6
		Revise FAA Academy DM Course	17.7
		Assess Need for Additional Written Guidance or Training	17.8
Full/Efficient Use of ODA	**Industry Team #1 -- Use of pre-PNL approval activities to maximum extent possible** -- ODA holders will work with their oversight office to assure they are utilizing the capability to conduct project work, without prior FAA notification, to the maximum extent.		18
		Select Industry Team Members	18.1
		Team meetings held and preliminary review conducted with FAA	18.2
		Final Presentation or Message Created	18.3
		Communicate to AIA/GAMA ODA Holders & FAA Offices	18.4
		Measure Impact of Message	18.5
Full/Efficient Use of ODA	**OMT STC and major change PNL/Cert plan review in 30 days** -- For certification plans/PNLs that must be accepted by the FAA, the agency will set the goal that the review of STC/Major Change projects is accomplished within 30-days. It is possible that new TC projects will require longer review.		19
		Measure cycle time (QMS) - Phase 1 - begin measuring GAMA companies (Feb 1) - Review process and data at GAMA AMG meeting (mid-April) - Phase 2 - begin measuring all ODA's (May 1)	19.1

Full/Efficient Use of ODA	**Industry metric #3 -- OMT Cert plan turnaround time** -- Measure the FAA review time necessary for proposed certification plan review.		20
		Develop Metrics	20.1
		Coordinate w/Sample ODAs	20.2
		Coordinate w/FAA	20.3
		Communicate to AIA/GAMA ODA Holders	20.4
		Measure Quarterly	20.5
Use of Approved/Accepted Data	**Supplier conformities and data approvals** -- The FAA will clarify through a policy letter and training, that on a Non-ODA Project an ODA supplier may: TC ODA – Provide approval of dataPC ODA -Provide conformity determinationsSTC ODA - Provide both conformity and data approvals only for articles manufactured by the ODA holder. (Must provide all related conformity and data approvals).PMA ODA - Provide conformity determinations & data approvals only for articles manufactured by the ODA holder. (Must provide all related conformity and data approvals).		21
		Incorporate in 8100.15A	21.1
		IVT for ACO Managers	21.2
		ODA Seminar	21.3
		Communicate to FAA ODA Focal Points	21.4
		ACO Management Lead Discussions with OMT members	21.5
		Recommendations provided to DM Course Manager	21.6
		Revise FAA Academy DM Course	21.7
Use of Approved/Accepted Data	**Joint Team #2 -- Multiple ODA Supplier UM training** -- The FAA and industry will work to define standardized training requirements for suppliers UMs which work under a variety of ODAs.		22A
		Coordinate FAA/Industry Team & Potential Standards Bodies	22A.1
		Team Meetings Complete	22A.2
		Recommendation Provided to FAA	22A.3
		FAA Policy/Regulatory Development	22A.4
		Incorporate policy in future change to 8100.15	22A.5
Use of Approved/Accepted Data	**Multiple Specialty Service Providers** -- The FAA and industry will work to define the Specialty Service Suppliers (S^3) concept. UPDATE: US/European industry advised FAA/EASA at Oct. 20 COB meeting that S3 would not be pursued as originally proposed by the authorities (Feb 2009)		22B
		Coordinate EASA/FAA/Industry Team @ CMT	22B.1
		Team Meetings Complete	22B.2
		Recommendation Provided to EASA/FAA	22B.3
		EASA & FAA Policy/Regulatory Development	22B.4
		EASA & FAA Policy/Regulation Available	22B.5
Use of Approved/Accepted Data	**Recognition of foreign CAA design organizations for conformity and test witnessing** -- Clarify that on TC ODA projects, conformity & test witnessing could be accomplished by an organization recognized under a BASA without using tech assist process &without involving the ACO.		23
		Incorporate policy in Change 1 to 8100.15A	23.1