

October 2010

AVIATION SAFETY

Certification and Approval Processes Are Generally Viewed as Working Well, but Better Evaluative Information Needed to Improve Efficiency



GAO

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Why GAO Did This Study

Among its responsibilities for aviation safety, the Federal Aviation Administration (FAA) issues thousands of certificates and approvals annually. These certificates and approvals, which FAA bases on its interpretation of federal standards, indicate that such things as new aircraft, the design and production of aircraft parts and equipment, and new air operators are safe for use in the national airspace system. Past studies and industry spokespersons assert that FAA's interpretations produce variation in its decisions and inefficiencies that adversely affect the industry.

GAO was asked to examine the (1) extent of variation in FAA's interpretation of standards for certification and approval decisions and (2) views of key stakeholders and experts on how well these processes work. To perform the study, GAO reviewed industry studies and reports and FAA documents and processes; convened a panel of aviation experts; and interviewed officials from various industry sectors, senior FAA officials, and unions representing FAA staff.

What GAO Recommends

GAO recommends that FAA develop a continuous evaluative process with measurable performance goals to determine the effectiveness of the agency's actions to improve its certification and approval processes. The Department of Transportation provided technical comments, which were included as appropriate.

[View GAO-11-14 or key components.](#)
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What GAO Found

Studies, stakeholders, and experts indicated that variation in FAA's interpretation of standards for certification and approval decisions is a long-standing issue, but GAO found no evidence that quantified the extent of the problem in the industry as a whole. Ten of the 13 industry group and company officials GAO interviewed said that they or members of their organization had experienced variation in FAA certification and approval decisions on similar submissions. In addition, experts on GAO's panel, who discussed and then ranked problems with FAA's certification and approval processes, ranked inconsistent interpretation of regulations, which can lead to variation in decisions, as the first and second most significant problem, respectively, with these processes for FAA's Flight Standards Service (which issues certificates and approvals for individuals and entities to operate in the national airspace system) and Aircraft Certification Service (which issues approvals to the designers and manufacturers of aircraft and aircraft parts and equipment). According to industry stakeholders, variation in FAA's interpretation of standards for certification and approval decisions is a result of factors related to performance-based regulations, which allow for multiple avenues of compliance, and the use of professional judgment by FAA staff and can result in delays and higher costs.

Industry stakeholders and experts generally agreed that FAA's certification and approval processes contribute to aviation safety and work well most of the time, but negative experiences have led to costly delays for the industry. Industry stakeholders have also raised concerns about the effects of process inefficiencies on the implementation of the Next Generation Air Transportation System (NextGen)—the transformation of the U.S. national airspace system from a ground-based system of air traffic control to a satellite-based system of air traffic management. They said that the processes take too long and impose costs that discourage aircraft operators from investing in NextGen equipment. FAA has taken actions to improve the certification and approval processes, including hiring additional inspectors and engineers and increasing the use of designees and delegated organizations—private persons and entities authorized to carry out many certification activities. Additionally, FAA is working to ensure that its processes are being followed and improved through a quality management system, which provides a mechanism for stakeholders to appeal FAA decisions. However, FAA does not know whether its actions under the quality management system are achieving the intended goals of reducing inconsistencies and increasing consistency and fairness in the agency's application of regulations and policies because FAA does not have outcome-based performance measures and a continuous evaluative process that would allow it to determine progress toward these goals. Without ongoing information on results, FAA managers do not know if their actions are having the intended effects.

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Abbreviations

CSI	Consistency and Standardization Initiative
DOT	U.S. Department of Transportation
FAA	Federal Aviation Administration
ISO	International Organization for Standardization
NextGen	Next Generation Air Transportation System
ODA	organization designation authorization
QMS	quality management system

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United States Government Accountability Office
Washington, DC 20548

October 7, 2010

The Honorable John L. Mica
Ranking Republican Member
Committee on Transportation and Infrastructure
House of Representatives

The Honorable Pete Sessions
House of Representatives

The Federal Aviation Administration (FAA) is responsible for aviation safety, in part by issuing certificates for new air operators, new aircraft, and aircraft parts and equipment, as well as granting approvals for such things as changes to air operations and aircraft, and the design and production of aircraft parts and equipment. FAA issues certificates and approvals based on the evaluation of aviation industry submissions against standards set forth in federal aviation regulations and related FAA guidance documents. Studies published over the last 14 years have asserted that inconsistencies or variation in FAA's interpretation and application of the regulations and guidance hinders the efficiency of the certification and approval processes. More recently, several aviation industry groups have asserted that FAA's processes for carrying out these functions continue to result in variation in decisions and inefficiencies, which can result in delays and higher costs for their members.

You asked us to examine FAA's processes for the certification and approval of national airspace users and products. To do so, we addressed (1) the extent of variation in FAA's interpretation of standards with regard to the agency's certification and approval decisions and (2) key stakeholder and expert views on how well the certification and approval processes work.

To fulfill these objectives, we reviewed relevant studies, reports, and FAA documents and processes and, with the assistance of the National Academy of Sciences, convened a panel of aviation industry and other experts on December 16, 2009. Selected with the goal of obtaining a balance of perspectives, the panel included FAA senior managers; officials representing large and small air carriers, aircraft and aerospace product manufacturers, aviation services firms, repair stations, and aviation consultants; and academicians specializing in aviation and organization theory. We also interviewed trade groups and certificate and approval holders of various sizes that represented a broad range of aviation industry

sectors—including air carriers, repair stations, and manufacturers. (See app. I for more information on our objectives, scope, and methodology.)

We conducted this performance audit from July 2009 to October 2010, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

Located in FAA's Office of Aviation Safety, the Aircraft Certification Service (Aircraft Certification) and Flight Standards Service (Flight Standards) issue certificates and approvals for the operators and aviation products used in the national airspace system based on standards set forth in federal aviation regulations. FAA inspectors and engineers working in Aircraft Certification and Flight Standards interpret and implement the regulations governing certificates and approvals via FAA policies and guidance, such as orders, notices, and advisory circulars.

Aircraft Certification

Aircraft Certification's approximately 950 engineers and inspectors in 38 field offices issue approvals to the designers and manufacturers of aircraft and aircraft engines, propellers, parts, and equipment, including the avionics and other equipment required for the Next Generation Air Transportation System (NextGen)—a federal effort to transform the U.S. national airspace system from a ground-based system of air traffic control to a satellite-based system of air traffic management. These approvals are issued in three areas: (1) *design*—including type certificates for new aircraft, engine, or propeller designs,¹ amended type certificates (issued only to the type certificate holder) for derivative models, and supplemental type certificates for major changes to existing designs by either the type certificate holder or someone other than the original type certificate holder; (2) *production*—including production certificates,

¹A type certificate is a design approval issued by FAA when the applicant demonstrates that a product complies with the applicable regulations. As defined by 14 C.F.R. § 21.41, the type certificate includes the type design, the operating limitations, the type certificate data sheet, the applicable regulations, and other conditions or limitations prescribed by the FAA Administrator. The type certificate is the foundation for other FAA approvals, including production and airworthiness approvals.

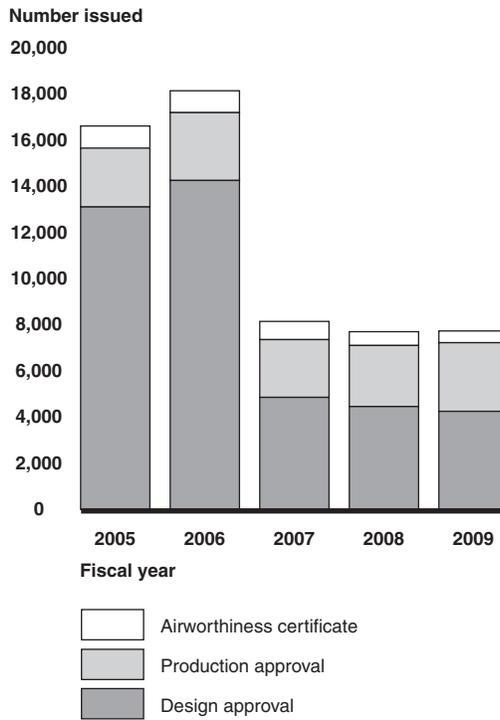
which certify a manufacturer's ability to build an aircraft, engine, or propeller in accordance with an FAA-approved design, and parts manufacturer approvals for spare and replacement parts; and (3) *flight approval*—original airworthiness certificates and approvals for newly manufactured aircraft, engines, propellers, and parts. Aircraft Certification, along with Flight Standards, provides a safety performance management system intended to assure the continued operational safety of all aircraft operating in the national airspace system and of U.S.-built aircraft operating anywhere in the world. Aircraft Certification is also responsible for the appointment and oversight of designees and delegated organizations that play a critical role in acting on behalf of FAA to perform many certification and approval activities, such as the issuance of design and airworthiness approvals for aircraft parts.²

Since 2005, Aircraft Certification has used project sequencing to prioritize certification submissions on the basis of available resources. Projects are evaluated against several criteria, including safety attributes and their impact on the air transportation system. In fiscal year 2009, Aircraft Certification issued 4,248 design approvals, 2,971 production approvals, and 508 airworthiness certificates. Figure 1 shows the Aircraft Certification approvals issued for fiscal years 2005 through 2009. As of June 2010, according to FAA, Aircraft Certification had a backlog of 47 projects.³ (According to a senior FAA official, the number of approvals decreased from fiscal year 2006 to fiscal year 2007 because Aircraft Certification implemented a new data collection system in fiscal year 2007 that improved data collection definitions and processes.) Figure 2 contains key information about Aircraft Certification's organization, and figure 3 indicates key phases in Aircraft Certification's product approvals process.

²Individuals appointed by FAA to act on its behalf are known as individual or organizational—if connected with an organization—designees, and delegated organizations are authorized to act on FAA's behalf under the organization designation authorization program. These appointments are allowed under 14 C.F.R. § 183.45.

³We did not obtain data on the number of certification projects that are not approved by Aircraft Certification, but FAA officials noted that projects are sometimes not completed because the applications are withdrawn.

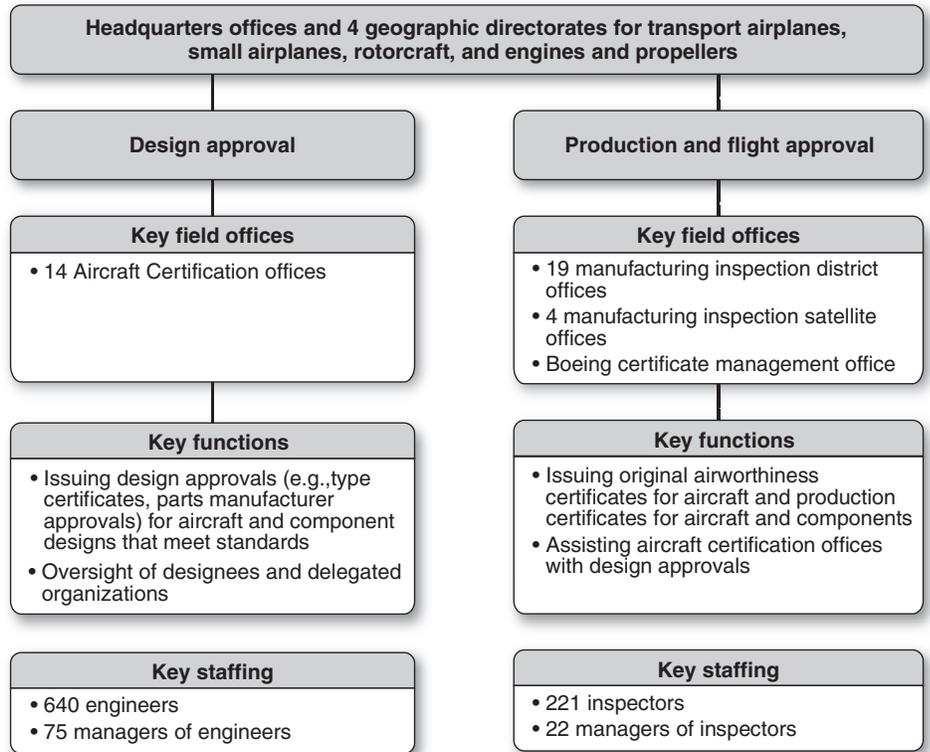
Figure 1: Approvals Issued by FAA's Aircraft Certification Service, Fiscal Years 2005-2009



Source: GAO analysis of FAA data.

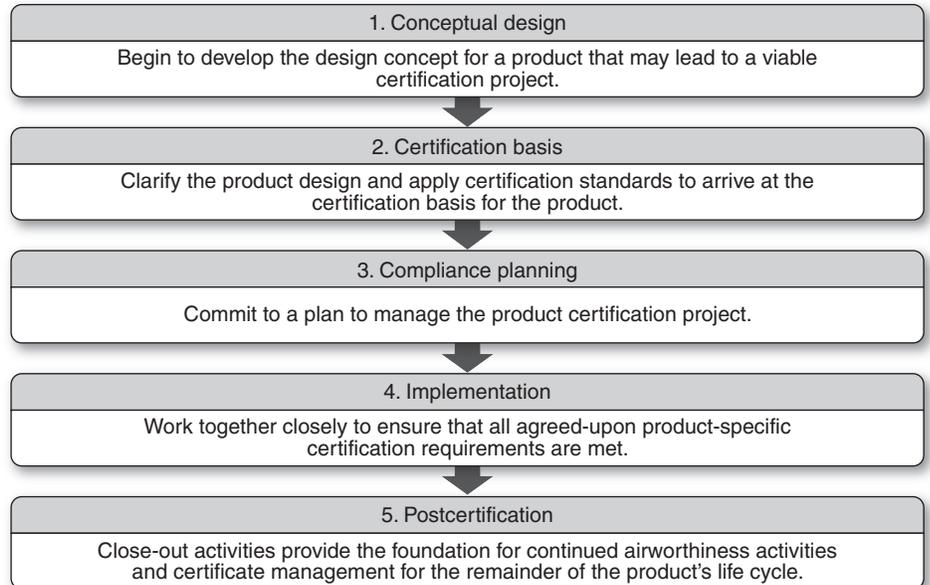
Note: Production approvals include new production certificates, amended/revised production certificates, approved production inspection system authorizations, parts manufacturer approval letters (including supplements), and corrections to approved parts manufacturer approvals.

Figure 2: Organization of FAA's Aircraft Certification Service



Source: FAA.

Figure 3: Key Phases in Aircraft Certification’s Process for Approving Aviation Products



Source: FAA.

Note: During each phase, both the applicant and FAA staff are involved. FAA staff include managers, engineers, inspectors, flight test pilots, a chief scientist, and technical advisors, as well as an aircraft evaluation group from Flight Standards.

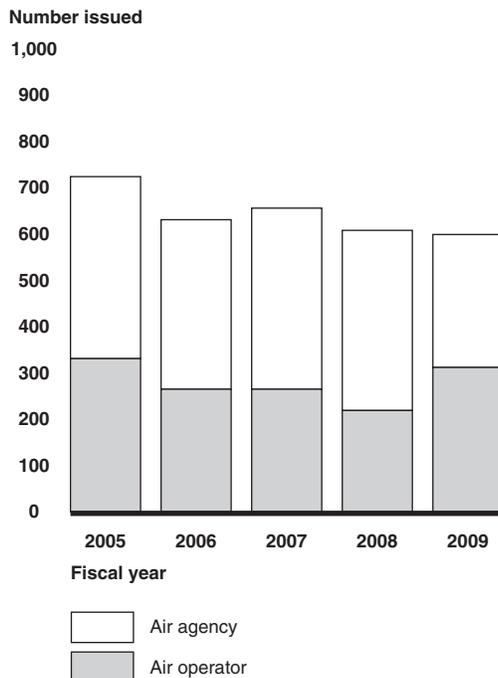
Flight Standards

Flight Standards’ nearly 4,000 inspectors issue certificates allowing individuals and entities to operate in the national airspace system. Flight Standards also issues approvals for programs, such as training and minimum equipment lists.⁴ Flight Standards field office managers in over 100 field offices use the Certification Services Oversight Process to initiate certification projects within their offices. According to FAA, the field offices are also assisted by a headquarters-based office that provides experts on specific aircraft and airlines. Accepted projects are processed on a first-in, first-out basis within each office once FAA determines that it has the resources to oversee an additional new certificate holder. Flight Standards issued 599 air operator and air agency certificates in fiscal year

⁴A minimum equipment list is a list of all equipment on an aircraft type. It details which equipment FAA has determined may be inoperative under certain operational conditions and still provide an acceptable level of safety.

2009. These include certificates to commercial air carriers under 14 C.F.R. part 121, operators of smaller commercial aircraft under 14 C.F.R. part 135, repair stations under 14 C.F.R. part 145, and pilot schools and training centers under 14 C.F.R. parts 141 and 142, respectively. According to its Director, Flight Standards also issues over 6,000 approvals daily. Figure 4 shows the number of air operator and air agency certificates issued by Flight Standards in fiscal years 2005 through 2009.

Figure 4: Certificates Issued by FAA's Flight Standards Service, Fiscal Years 2005-2009



Source: GAO analysis of FAA data.

Note: Air agencies include aircraft repair stations and pilot schools; air operators include operators of large and small commercial passenger aircraft and agricultural operators.

FAA officials noted that certification projects within and among the categories of air operators and air agencies require various amounts of FAA resources. For example, FAA indicated that an agricultural operator certification requires fewer FAA resources than a repair station certification. Additionally, certifications of small commercial aircraft operations that are single pilot, single plane require a different set of resources than operations that are dual pilot and/or fly more aircraft. As of July 2010, Flight Standards had 1,142 certifications in process and a

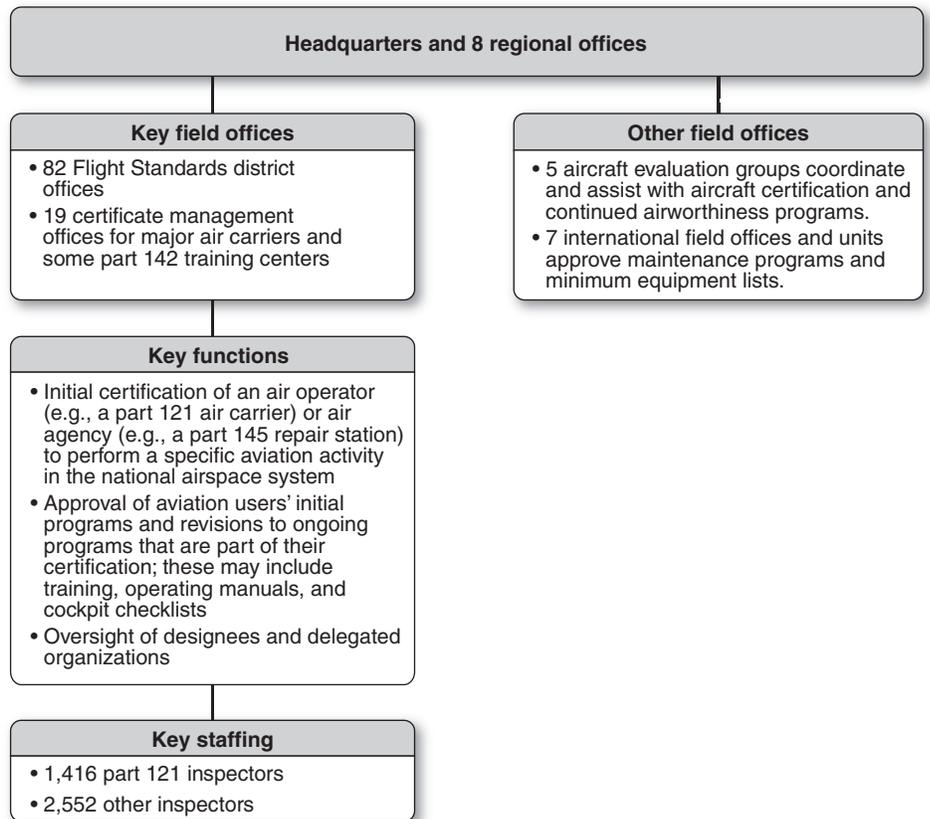
backlog of 489 applications.⁵ According to an FAA official, Flight Standards has more wait-listed applications than Aircraft Certification because it receives numerous requests for certificates, and its certifications are substantially different in nature from those issued by Aircraft Certification.

Flight Standards is also responsible for assuring the continued operational safety of the national airspace system by overseeing certificate holders, monitoring (along with Aircraft Certification) operators' and air agencies' operation and maintenance of aircraft, and overseeing designees and delegated organizations. Flight Standards inspectors were tasked with overseeing 13,089 air operators and air agencies, such as repair stations, as of March 2010. Unless assigned to a large commercial air carrier issued a certificate under part 121, a Flight Standards inspector is typically responsible for overseeing several entities that often perform different or several functions within the system—including transporting passengers, repairing aircraft, and training pilots.

Figures 5 and 6 contain key information about Flight Standards' organization and certification process for air operators and air agencies.

⁵We did not obtain data on the number of certification projects that are not approved by Flight Standards, but FAA officials noted that some projects are not completed because the applications are withdrawn.

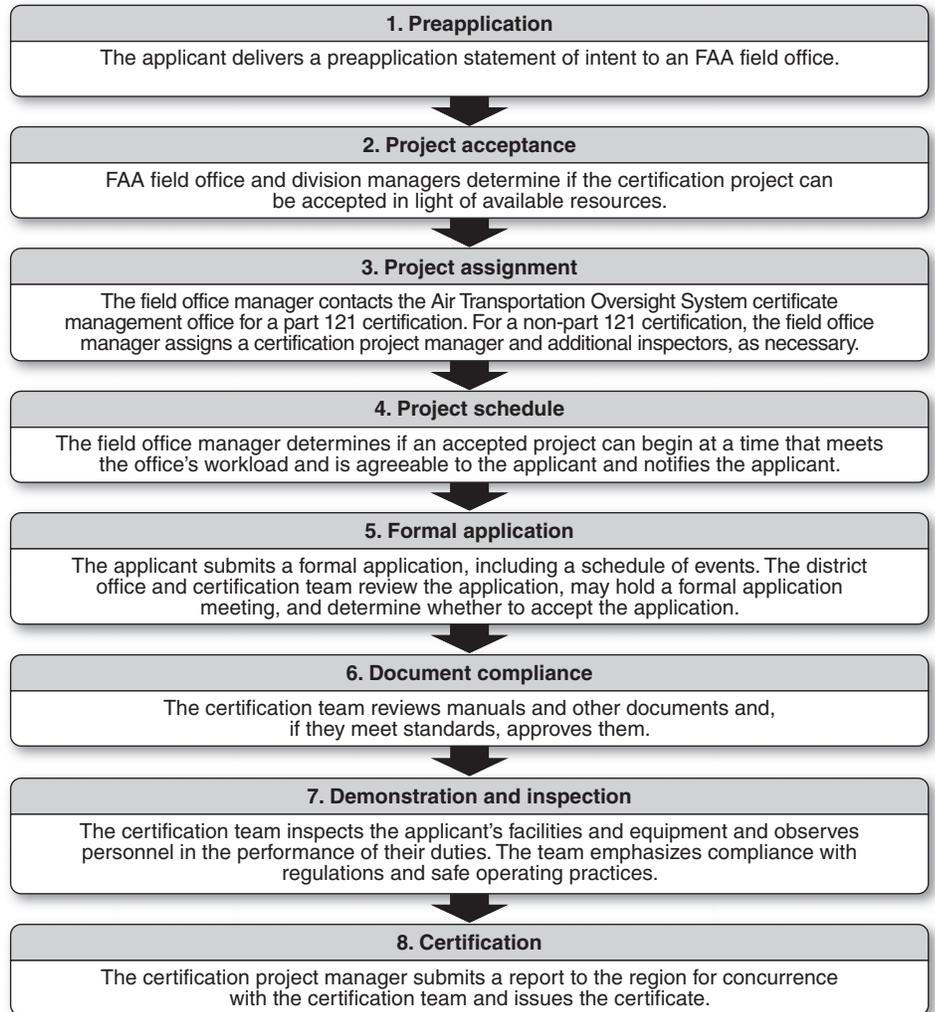
Figure 5: Organization of FAA's Flight Standards Service



Source: FAA.

Note: A minimum equipment list is a list of all equipment on an aircraft type. It details which equipment FAA has determined may be inoperative under certain operational conditions and still provide an acceptable level of safety.

Figure 6: Key Steps in Flight Standards' Process for Issuing Certificates to Air Operators and Air Agencies



Source: FAA.

Note: These steps are accomplished within a four-phase process for part 121 certifications and a five-phase process for part 135 and repair station certifications. For part 121, the phases include application, design assessment, performance assessment, and administrative functions. For part 135 and repair stations, the phases are preapplication, formal application, document compliance, demonstration and inspection, and certification.

Extent of Variation in Interpretation Is Unknown but Potentially Stems from Factors Related to Performance-Based Regulations and FAA's Processes

Extent of Variation in FAA's Interpretation of Standards for Certification and Approval Decisions Is Unknown, but Stakeholders and Experts Indicate That Serious Problems Occur Infrequently

Studies we reviewed and aviation stakeholders and experts we spoke with indicated that variation in FAA's interpretation of standards for certification and approval decisions is a long-standing issue that affects both Aircraft Certification and Flight Standards, but the extent of the problem has not been quantified in the industry as a whole. Inconsistent or variant FAA interpretations have been noted in studies published over the last 14 years. A 1996 study by Booz Allen & Hamilton, conducted at the request of the FAA Administrator to assess challenges to the agency's regulatory and certification practices, reported that, for air carriers and other operators, the agency's regulations are often ambiguous; subject to variation in interpretation by FAA inspectors, supervisors, and policy managers; and in need of simplification and consistent implementation.⁶ A 1999 task force, convened at the request of the FAA Administrator to assess FAA's certification process, found that the agency's requirements for the various approvals—such as type certificates and supplemental type certificates—varied substantially because of differences in standards and inconsistent application of those standards by different FAA field offices.⁷ While FAA has put measures in place since these two reports appeared, a 2008 Independent Review Team, which was commissioned by the Secretary of Transportation to assess FAA's safety culture and approach to safety management, found that a wide degree of variation in “regulatory

⁶Booz Allen & Hamilton, *Challenge 2000: Recommendations for Future Aviation Safety Regulation*, prepared for FAA, Office of Policy, Planning and International Aviation (McLean, VA: Apr. 19, 1996).

⁷RTCA Task Force 4, *Final Report of RTCA Task Force 4 “Certification”* (Washington, D.C.: Feb. 26, 1999).

ideology” among FAA staff continues to create the likelihood of wide variation in decisions within and among field offices.⁸

Industry officials and experts representing a broad range of large and small aviation businesses told us that variation in interpretation and subsequent decisions occurs in both Aircraft Certification and Flight Standards, but we found no evidence that quantified the extent of the problem in the industry as a whole.⁹ Specifically, 10 of the 13 industry group and individual company representatives we interviewed said that they or members of their organization experienced variation in FAA’s certification and approval decisions on similar submissions; the remaining 3 industry representatives did not raise variation in interpretations and decisions as an issue. For example, an official from one air carrier told us that variation in decisions occurs regularly when obtaining approvals from Flight Standards district offices, especially when dealing with inspectors who are newly hired or replacing a previous inspector. He explained that new inspectors often task air carriers to make changes to previously obtained minimum equipment lists or conformity approvals for an aircraft.¹⁰ The official further noted that inspector assignments often change for reasons such as transfers, promotions, or retirement and that four different principal operations inspectors were assigned to his company during the past 18 months.

Experts on our panel and most industry officials we interviewed indicated that, though variation in decisions is a long-standing, widespread problem,

⁸Independent Review Team Appointed by Secretary of Transportation Mary E. Peters, *Managing Risks in Civil Aviation: A Review of FAA’s Approach to Safety* (Washington, D.C.: Sept. 2, 2008). The authors described two phenomena that confirmed for them the existence of conflicting regulatory ideologies: (1) a high number of enforcement actions from a small portion of an inspection team within an office and (2) the description of enforcement-oriented inspectors as “rogue inspectors” by both industry stakeholders and FAA management while their own observations of several inspectors described as rogues found them to be articulate, sophisticated, and professional.

⁹A recent attempt to quantify the issue was a 2009 industry survey conducted by the National Air Transportation Association, which represents about 2,000 aviation businesses, including fixed-base operators, charter providers, aircraft management companies, maintenance and repair organizations, flight training companies, and airline service companies. However, this survey, conducted from July to September 2009, suffered from a low general response rate, nonitem response issues (e.g., some questions had a large number of nonresponses), and a universe (population) that was not clearly defined or identified.

¹⁰A conformity approval is a determination by FAA that an aircraft was manufactured in accordance with and conforms to its type certificate and is safe for operation.

it has rarely led to serious certification and approval process problems. Experts on our panel generally noted that serious problems with the certification and approval processes occur less than 10 percent of the time. However, when we asked them to rank certification and approval process problems we summarized from their discussion, they chose inconsistent interpretation of regulations, which can lead to variation in decisions, as the most significant problem for Flight Standards and as the second most significant problem for Aircraft Certification.¹¹ Panelists' concerns about variation in decisions included instances in which approvals are reevaluated and sometimes revised or revoked in FAA jurisdictions other than those in which they were originally granted. Industry officials we interviewed, though most had experienced it, did not mention the frequency with which variation in decisions occurred. However, 8 of the 13 said that their experiences with FAA's certification and approval processes were generally free of problems compared with 3 who said they regularly experienced problems with the process.¹²

FAA's Deputy Associate Administrator for Aviation Safety and union officials representing FAA inspectors and engineers acknowledged that variation in certification and approval decisions occurs. The Deputy Associate Administrator noted that variation in interpretation and certification and approval decisions occurs in both Aircraft Certification and Flight Standards. He acknowledged that a nonstandardized process for approvals exists and has been a challenge for, and a long-term criticism of, the agency. Furthermore, he explained that efforts were being made to address the issue, including the establishment of (1) an Office of Aviation Safety quality management system (QMS) to standardize processes across Aircraft Certification and Flight Standards, (2) a process for industry to dispute FAA decisions, and (3) standardization offices within Aircraft Certification directorates. The first two efforts are discussed in greater detail later in this report.

¹¹Panelists responded to this question using the following list of answer choices: less than 10% of the time, 11 to 20% of the time, 21 to 30% of the time, 31 to 40% of the time, 41 to 50% of the time, 51 to 60% of the time, 61 to 70% of the time, 71 to 80% of the time, more than 80% of the time, and do not know/no basis to judge. See appendix II for the entire list of questions and responses.

¹²Two industry officials did not mention their overall experiences in dealing with FAA.

Industry Stakeholders Noted That Variation in Decisions Occurs as a Consequence of Performance-Based Regulations and FAA's Exercise of Professional Judgment

Variation in FAA's interpretation of standards and certification and approval decisions occurs as a result of factors related to performance-based regulations and the use of professional judgment by FAA inspectors and engineers, according to industry stakeholders. FAA uses performance-based regulations, which identify a desired outcome and are flexible about how the outcome is achieved. For example, performance-based regulations on aircraft braking would establish minimum braking distances for aircraft but would not call for a particular material in the brake pads or a specific braking system design. According to officials in FAA's rulemaking office, about 20 percent of FAA's regulations are performance-based. Performance-based regulations, which are issued governmentwide,¹³ provide a number of benefits, according to literature on the regulatory process.¹⁴ By focusing on outcomes, for example, performance-based regulations give firms flexibility in achieving the stated level of performance; such regulations can accommodate technological change in ways that prescriptive regulations that focus on a specific technology generally cannot. For those certifications and approvals that relate to performance-based regulations, variation in decisions is a consequence of such regulations, according to one air carrier, since performance-based regulations allow the applicant multiple avenues to comply with regulations and broader discretion by FAA staff in making certification and approval decisions. According to senior FAA officials, performance-based regulations allow innovation and flexibility while setting a specific safety standard. The officials added that the benefits of performance-based regulations outweigh the potential for erroneous interpretation by an individual inspector or engineer. While agreeing with this statement, a panel member pointed out that the potential for erroneous interpretation also entails a risk of inconsistent decisions.

In addition, FAA oversees a large, diverse industry, and its certification and approval processes rely, in part, on FAA staffs' exercise of

¹³The Office of Management and Budget's regulatory guidance contained in Executive Order 12866 suggests that if regulations are to be adopted as justified by benefit-cost analysis, performance-based regulations are generally preferred.

¹⁴See, for example, C. Coglianese, J. Nash, and T. Olmstead, "Performance-Based Regulation: Prospects and Limitations in Health, Safety, and Environmental Protection," *Administrative Law Review* 55 (2003) and P. May, "Performance-Based Regulation and Regulatory Regimes" (paper prepared for the Global Policy Summit on the Role of Performance-Based Building Regulations in Addressing Societal Expectations, International Policy, and Local Needs), National Academy of Sciences (Washington, D.C.: November 2003).

professional judgment in the unique situations they encounter. In the opinion of senior FAA officials, some differences among inspectors may be due to situation-specific factors that industry stakeholders may not be aware of. According to officials from Flight Standards, because differences may exist among regions and district offices, operators changing locations may encounter these differences.

Key Stakeholders and Experts Said the Certification and Approval Processes Generally Work Well, but When They Do Not, It Can Be Costly for Industry

Stakeholders and Experts Said the Certification and Approval Processes Contribute to System Safety and Work Well Most of the Time

Many industry stakeholders and experts stated that FAA's certification and approval processes contribute positively to the safety of the national airspace system. For example, industry stakeholders who participated in our expert panel ranked the office's safety culture and record as the greatest strength of Flight Standards' certification and approval processes and the third greatest strength of Aircraft Certification's processes.

Industry stakeholders and experts also noted that the certification and approval processes work well most of the time because of FAA's long-standing collaboration with industry, flexibility within the processes, and committed, competent FAA staff. In most instances, stakeholders and experts said, when industry seeks certifications and approvals, its experiences with FAA's processes are positive. For example, two aviation manufacturers and an industry trade association with over 400,000 members noted that most of their experiences or their members' experiences were positive. Seventeen of 19 panelists indicated positive or very positive experiences with Aircraft Certification, and 9 of 19 panelists indicated positive experiences with Flight Standards.¹⁵ Panelists ranked

¹⁵See appendix II for the entire list of questions and responses.

FAA's collaboration with applicants highly—as the second greatest strength of both Aircraft Certification and Flight Standards. In addition, representatives of two trade associations representing over 190 aviation companies said that the processes provide flexibility for a large, diverse industry. Additionally, panelists ranked FAA inspectors' and engineers' expertise as the greatest strength of Aircraft Certification and the third greatest strength of Flight Standards, while officials from two industry trade groups cited the inspectors' and engineers' competence and high level of expertise.

Industry Stakeholders Said Negative Experiences Are Infrequent but Can Cause Costly Delays

Industry stakeholders and experts noted that negative certification and approval experiences, although infrequent, can result in costly delays for them, which can disproportionately affect smaller operators. While industry stakeholders indicated that negative experiences occur in dealings with both Aircraft Certification and Flight Standards, experts on our panel noted that negative experiences are more likely to occur with Flight Standards than with Aircraft Certification. For example, three experts noted that, overall, industry's experience in obtaining certifications and approvals from Flight Standards has been negative or very negative, while no experts thought industry's experience with Aircraft Certification was negative. The panelists indicated that negative experiences occur during the processing of certifications and approvals and as applicants wait for FAA resources to become available to commence their certification or approval projects. For example, an aviation industry representative reported that his company incurred a delay of over 5 years and millions of dollars in costs when it attempted to obtain approvals from Aircraft Certification and Flight Standards field offices. Another industry representative indicated that it abandoned an effort to obtain an operating certification after spending \$1.2 million and never receiving an explanation from FAA as to why the company's application was stalled. One panelist indicated that the negative experiences focus more on administrative aspects of the certification and approval processes and not on safety-related items.

The processing of original certifications and approvals in Aircraft Certification and Flight Standards involves progressing through a schedule of steps or phases. Responsibilities of both FAA and the applicant are delineated. However, even with this framework in place, industry stakeholders noted that the time it takes to obtain certifications and approvals can differ from one FAA field office to another because of differences in office resources and expertise. In some cases, delays may be avoided when FAA directs the applicant to apply at a different field office.

Nevertheless, applicants who must apply to offices with fewer resources can experience costly delays in obtaining certifications or approvals.

Delays also occur when FAA wait-lists certification submissions because it does not have the resources to begin work on them. Aircraft Certification meets weekly to review certification project submissions. If it determines that a submission is to be wait-listed, the applicant is sent a 90-day delay letter and if, after the initial 90 days, the submission is still wait-listed, the applicant is sent another letter. Additionally, Aircraft Certification staff and managers periodically contact applicants to advise them of the status of their submissions. Flight Standards also notifies applicants when their certification submissions are wait-listed, and Flight Standards staff are encouraged to communicate with applicants regularly about the status of their submissions. However, according to an FAA notice, staff are advised not to provide an estimate of when an applicant's submission might be processed.¹⁶ While Aircraft Certification tracks in a national database how long individual submissions are wait-listed, Flight Standards does not. Without data on how long submissions are wait-listed, Flight Standards cannot assess the extent of wait-listing delays or reallocate resources to better meet demand. Further, industry stakeholders face uncertainty with respect to any plans or investments that depend on obtaining a certificate in a timely manner.

Industry stakeholders have also raised concerns about the effects of inefficiencies in the certification and approval processes on the implementation of NextGen. As NextGen progresses, operators will need to install additional equipment on their aircraft to take full advantage of NextGen capabilities, and FAA's certification and approval workload is likely to increase substantially. According to our October 2009 testimony on NextGen, airlines and manufacturers said that FAA's certification processes take too long and impose costs on industry that discourage them from investing in NextGen equipment.¹⁷ We reported that this inefficiency in FAA's processes constitutes a challenge to delivering NextGen benefits to stakeholders and that streamlining FAA's processes will be essential for the timely implementation of NextGen. FAA is

¹⁶Notice 8000.311, Certification Services Oversight Process for Original Organizational Certifications, 10/27/2005.

¹⁷GAO, *Next Generation Air Transportation System: FAA Faces Challenges in Responding to Task Force Recommendations*, [GAO-10-188T](#) (Washington, D.C.: Oct. 28, 2009).

working to address the certification issues that may impede the adoption and acceleration of NextGen capabilities.¹⁸ Flight Standards has identified NextGen-dedicated staff in each of its regional offices to support the review and approval of NextGen capabilities within each region. Aircraft Certification has created a team of experts from different offices to coordinate NextGen approvals and identify specialists in Aircraft Certification offices with significant NextGen activity. FAA also plans a number of other actions to facilitate the certification and approval of NextGen-related technology, including new procedures and criteria for prioritizing certifications, updating policy and guidance, developing additional communication mechanisms, and developing training for inspectors and engineers. Since many of these actions have either just been implemented or have not yet been completed, it is too early to tell whether they will increase the efficiency of FAA's certification and approval processes and reduce unanticipated delays and costs for the industry.

Industry Stakeholders and Experts Told Us That the Efficiency of FAA's Processes Is Hampered by Several Shortcomings; FAA Has Taken Some Actions to Remedy Them

Industry stakeholders also noted that the efficiency of the certification and approval processes was hampered by a lack of sufficient staff resources to carry out certifications and approvals and a lack of effective communication mechanisms for explaining the intent of the regulations to both FAA staff and industry. The stakeholders said that these inefficiencies have resulted in costly delays for them.

Stakeholders and experts said that, at some FAA offices, delays in obtaining certifications and approvals were due to heavy staff workloads, a lack of staff, or a lack of staff with the appropriate expertise. Staff and managers at one FAA field office told us that in the past a lack of staff had contributed to delays in completing certifications. The relative priority of certifications and approvals within FAA's overall workload also affects the availability of staff to process certifications and approvals. According to FAA, its highest priority is overseeing the continued operational safety of the people and products already operating within the national airspace system,¹⁹ but the same staff who provide this oversight are also tasked with the lower-priority task of processing new certifications and

¹⁸GAO, *Next Generation Air Transportation System: Challenges with Partner Agency and FAA Coordination Continue, and Efforts to Integrate Near-, Mid-, and Long-term Activities Are Ongoing*, [GAO-10-649T](#) (Washington, D.C.: Apr. 21, 2010).

¹⁹FAA, *AVS Work Plan for NextGen 2010*, March 2010.

approvals. Additionally, Flight Standards field staff we contacted said that the system under which their pay grades are established and maintained provides a disincentive for inspectors to perform certification work because the system allocates no credit toward retention of their pay grades for doing certification work. Flight Standards headquarters officials pointed out that there is an incentive for field office inspectors to perform initial certifications because once certificated the new entities add points to an inspector's complexity calculation, which is used to determine his or her pay grade.²⁰

FAA has addressed staff resource issues by increasing the number of inspectors and engineers. Over the past 3 years, FAA has steadily increased its hiring of Aircraft Certification engineers and Flight Standards inspectors, thereby reducing the risk of certification delays. According to agency data, FAA's hiring efforts since fiscal year 2007 have resulted in an 8.8 percent increase in the number of Aircraft Certification engineers and a 9.4 percent increase in the number of Flight Standards inspectors on board. FAA hired 106 engineers in Aircraft Certification and 696 inspectors in Flight Standards from the beginning of fiscal year 2007 to March 15, 2010. FAA also hired 89 inspectors in Aircraft Certification from fiscal year 2007 through August 2010.²¹ In addition, Flight Standards headquarters staff are available to assist field staff with the certification of part 121 air carriers—an average of 35 of these staff were available for this assistance annually from 2005 through 2009, and they helped with 16 certification projects.

²⁰Aviation safety inspectors, like many federal employees, are classified and assigned pay grades under the General Schedule. Within Flight Standards, inspectors with responsibility for the oversight of certificate holders are allocated a certain number of points for each pay grade. Additionally, the entities overseen by these inspectors are allocated a point value based on the complexity of the certificate or operation, and the combined point value for each inspector's oversight responsibilities must meet or exceed the points allocated for the inspector's grade. However, not all of the inspectors' duties receive points in this system, and inspectors are subject to a downgrade if entities in their portfolio relocate or go out of business. For example, a grade 14 principal inspector needs to maintain an oversight workload representing at least 2,500 points and would be assigned a manageable number of operators or agencies that would accrue a score of at least 2,500 points. The inspector would be required to maintain that point score to retain his or her pay grade. However, certification work provides no credit toward the inspector's total points and retention of his or her pay grade, and the inspector could be downgraded if one of his or her operators relocated to the jurisdiction of another field office.

²¹Aircraft Certification did not collect hiring and attrition numbers in 2007, so the number of inspectors hired in 2007 is the number hired minus the losses from attrition.

Furthermore, FAA delegates many certification activities to individuals and organizations (called designees) to better leverage its resources. As we previously reported, FAA's designees perform more than 90 percent of FAA's certification activities. We have reported that designees generally conduct routine certification functions, such as approvals of aircraft technologies that the agency and designees already have experience with, allowing FAA staff to focus on new and complex aircraft designs or design changes.²² Panelists ranked the expanded use of designees second and fifth, respectively, among actions that we summarized from their discussions that would have the most positive impact on improving Aircraft Certification's and Flight Standards' certification and approval processes. FAA is increasing organizational delegations under its organization designation authorization (ODA) program and expects the ODA program will allow more effective use of its resources over time.

Stakeholders pointed to a lack of effective communication mechanisms as another problem with the certification and approval processes, especially deficiencies in the guidance FAA issues and a lack of additional communication mechanisms for sharing information on the interpretation of regulations. Stakeholders said that the lack of effective communication mechanisms can lead to costly delays when, for example, methods or guidance for complying with regulations is not clear. Stakeholders and experts had several issues with the FAA guidance that interprets the regulations and provides supplemental information to the industry. Stakeholders said there are sometimes discrepancies between the guidance and the regulations. For example, one stakeholder reported informing an FAA training course instructor that a particular piece of guidance contradicted the regulations. The instructor agreed that the contradiction existed but told the stakeholder that FAA teaches to the guidance, not the regulations.²³ One employee group representing some FAA inspectors was concerned that not all guidance has been included in an online system that FAA has established to consolidate regulations, policy, and guidance. FAA acknowledged that it is working to further standardize and simplify the online guidance in the Flight Standards information management system.

²²GAO, *Aviation Safety: FAA Needs to Strengthen the Management of Its Designee Programs*, GAO-05-40 (Washington, D.C.: Oct. 8, 2004).

²³Senior FAA officials indicated that it is agency policy to teach what the regulations say because the regulations take precedence over guidance.

Stakeholders also identified a lack of opportunities for sharing information about the interpretation of regulations and guidance. An industry expert noted that FAA lacks a culture that fosters communication and discussion among peer groups. Moreover, an industry group with over 300 aviation company members suggested that FAA should support and promote more agencywide and industrywide information sharing in less formal, less structured ways to enhance communication. Finally, according to an official of an employee group representing some FAA inspectors, because their workloads tend to be heavy, inspectors are less able to communicate with the companies they oversee, and the reduced level of communication contributes to variation in the interpretation of regulations. FAA officials disagreed with these assertions and indicated that FAA staff participate in numerous committees and conferences, share methods of compliance in technical areas via forums with stakeholders, and communicate resolutions to problems in various formats, such as by placing legal decisions online.

FAA Has Taken Other Actions That Might Address Process Shortcomings but Lacks Performance Data to Assess the Actions' Effectiveness

Other FAA actions could identify and potentially address some of the shortcomings in the agency's certification and approval processes as follows:

- In 2004, FAA's Office of Aviation Safety introduced QMS, which is intended to ensure that processes are being followed and improved and to provide a methodology to standardize processes. QMS is expected to help ensure that processes are followed by providing a means for staff to report nonconformance with FAA procedures or processes and was established as part of the office's effort to achieve certification by the International Organization for Standardization (ISO).²⁴ Any employee can submit a report and check the status of an issue that has been reported. From October 2008 to March 2009, approximately 900 reports were submitted, and 46 internal audits were completed. For example, in July 2009, an FAA staffer noted that a required paragraph on aging aircraft inspection and records review was missing from a certificate holder's operations

²⁴ISO is a network of the national standards institutes of 159 countries that develops and publishes international standards. ISO 9001:2008 specifies requirements for a quality management system. According to a senior FAA official, each Aviation Safety office originally had its own ISO certification. Flight Standards headquarters achieved ISO 9001 certification in 2004 and, in 2006, the Office of Aviation Safety achieved ISO 9001 certification.

specifications.²⁵ The issue was resolved and closed in August 2009 when the missing paragraph was issued to the certificate holder. Some FAA staff told us that QMS has helped improve the processes because it requires management action to respond to report submissions.

- To provide industry stakeholders with a mechanism for appealing certification and other decisions, the Office of Aviation Safety implemented the Consistency and Standardization Initiative (CSI) in 2004.²⁶ Appeals must begin at the field office level and can eventually be taken to FAA headquarters. CSI requires that FAA staff document their safety decisions and that stakeholders support their positions with specific documentation. Within Aircraft Certification and Flight Standards, CSI cases at each appeal level are expected to be processed within 30 working days. The total length of the CSI process depends on how many levels of appeal the stakeholder chooses. Aircraft Certification has had over 20 CSI cases, and Flight Standards has had over 300. Most CSI cases in Aircraft Certification involved clarification of a policy or an approved means of complying with a regulation, while most of those submitted to Flight Standards involved policy or method clarification, as well as scheduling issues, such as delays in addressing a stakeholder's certification, approval, or other issue. The large discrepancy between the number of cases filed for the two services, according to FAA officials, may be due to the fact that Aircraft Certification decisions are the result of highly interactive, deliberative processes, which are not typical in granting approvals in Flight Standards, where an inspector might find the need to hand down a decision without prolonged discussion or deliberation. Stakeholders told us that CSI lacks agencywide buy-in and can leave stakeholders who use the program potentially open to retribution from FAA staff.²⁷ However, others noted that CSI is beneficial because it requires industry stakeholders to use the regulations as a basis for their complaints, which often leads to resolution. According to one of our panelists, inconsistencies occur when FAA does not start with the regulations as the basis for decisions.

²⁵The operations specifications for an air operator contain the authorizations, limitations, and certain procedures under which each kind of operation, if applicable, is to be conducted.

²⁶CSI, which is part of QMS, was originally called the Customer Service Initiative.

²⁷Although several industry stakeholders mentioned that they feared or experienced retribution from FAA staff for submitting CSI complaints, they provided no evidence that confirmed such retribution actually occurred.

Although QMS and CSI are positive steps toward identifying ways to make the certification and approval processes more efficient, FAA does not know whether the programs are achieving their stated goals because it has not established performance measures for determining program accomplishments. One of the goals for QMS is to reduce inconsistencies and increase standardization. A QMS database documents the reports submitted and, through information in these reports, FAA says it has identified instances of nonconformance and initiated corrective action to prevent recurrence; revised orders to ensure they are consistent with actual practice; and improved its processes to collect feedback from stakeholders and take action on trends. However, FAA does not know whether its actions have reduced inconsistencies because its measures describe the agency's output—for example, number of audits conducted—rather than any outcomes related to reductions in process inconsistencies. FAA officials described CSI goals as promoting early resolution of disagreements and consistency and fairness in applying FAA regulations and policies. They provided us with data on the number of CSI cases in both Aircraft Certification and Flight Standards, the types of complaints, and the percentage of resolutions that upheld FAA's original decision, but as with the overall QMS program, we could find no evidence that FAA has instituted CSI performance measures that would allow it to determine progress toward program outcomes, such as consistency and fairness in applying regulations and policies. Outcome-based performance measures would also allow QMS and CSI program managers to determine where to better target program resources to improve performance.

Conclusions

FAA has taken actions to address variation in decisions and inefficiency in its certification and approval processes, although the agency does not have outcome-based performance measures and a continuous evaluative process to determine if these actions are having their intended effects. Because the number of certification and approval applications is likely to increase for NextGen technologies, achieving more efficiency in these processes will help FAA better manage this increased workload, as well as its current workload. In addition, while both Aircraft Certification and Flight Standards notify applicants whether resources are available to begin their projects, Flight Standards does not monitor how long applicants are wait-listed and is therefore unaware how long projects are wait-listed and unable to reallocate resources to better meet demand for certification services.

Recommendations for Executive Action

To ensure that FAA actions contribute to more consistent decisions and more efficient certification and approval processes, we recommend that the Secretary of Transportation direct the Administrator of FAA to take the following two actions:

- 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. To the extent that this evaluation of agency actions identifies effective practices, consider instituting those practices agency wide.
- Develop and implement a process in Flight Standards to track how long certification and approval submissions are wait-listed, the reasons for wait-listing them, and the factors that eventually allowed initiation of the certification process. Use the data generated from this process to assess the extent of wait-listing delays and to reallocate resources, as appropriate, to better meet demand.

Agency Comments

We provided a copy of a draft of this report to the Department of Transportation (DOT) for its review and comment. DOT provided technical comments, which we incorporated as appropriate.

As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 21 days from the report date. At that time, we will send copies to the appropriate congressional committees, the Secretary of Transportation, the Administrator of FAA, and other interested parties. The report also will be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you or your staff members have any questions or would like to discuss this work, please contact me at (202) 512-2834 or dillingham@gao.gov. Contact points for our offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix III.

A handwritten signature in black ink that reads "Gerald Dillingham". The signature is written in a cursive style with a large, prominent initial "G".

Gerald L. Dillingham, Ph.D.
Director
Physical Infrastructure Issues

Appendix I: Objectives, Scope, and Methodology

This report provides information on the Federal Aviation Administration's (FAA) processes for granting certifications and approvals to air operators, air agencies such as repair stations, and designers and manufacturers of aircraft and aircraft components. It describes the processes and discusses (1) the extent of variation in FAA's interpretation of standards with regard to the agency's certification and approval decisions and (2) key stakeholder and expert views on how well the certification and approval processes work. To address these objectives, we reviewed relevant studies, reports, and FAA documents and processes; convened a panel of aviation industry and other experts; and interviewed aviation industry members, an expert, and FAA officials. We did not address FAA processes for issuing certifications to individuals, such as pilots and mechanics.

Expert Panel

We contracted with the National Academy of Sciences (the Academy) to convene a panel on FAA's certification and approval processes on December 16, 2009. The panel was selected with the goal of obtaining a balance of perspectives and included FAA senior managers; officials representing large and small air carriers, aircraft and aerospace product manufacturers, aviation services firms, repair stations, geospatial firms, and aviation consultants; and academics specializing in aviation and organization theory. (See table 1.)

Table 1: Participants in GAO's December 16, 2009, Expert Panel

Presenters

John Allen, Director, Flight Standards Service, FAA

Dorenda Baker, Director, Aircraft Certification Service, FAA

Eric Byer, Vice President, Government and Industry Affairs, National Air Transportation Association (NATA)

Walter Desrosier, Vice President, Engineering and Maintenance, General Aviation Manufacturers Association (GAMA)

Joe White, Managing Director, Engineering, Maintenance and Materiel, Air Transport Association of America (ATA)

Panelists

Bill Ashworth, Consultant

Ali Bahrami, Manager, Transport Airplane Directorate, FAA

Chris Benich, Director, Aerospace Regulatory Affairs, Honeywell

John Byrd, Government Affairs Manager, Management Association for Private Photogrammetric Surveyors (MAPPS)

John Duncan, Manager, Flight Standards Air Transportation Division, FAA

Jacque Holloway, ODA Administrator, Cessna Aircraft Company

Appendix I: Objectives, Scope, and Methodology

Dennis Keith, President, Jet Solutions, L.L.C.
Todd LaPorte, Professor Emeritus of Political Science and Professor of the Graduate School, University of California, Berkeley
Jerry Mack, President, Mack Global Solutions
Sarah MacLeod, Executive Director, Aeronautical Repair Station Association (ARSA)
Kristine Marcy, Consultant, McConnell International
Bill McCabe, President, The McCabe Group, L.L.C.
Roger Southgate, Director of Avionics Certification, Rockwell Collins
John Strong, CSX Professor of Finance and Economics, The College of William and Mary (Moderator)
Brad Tuttle, General Manager, 10 Tanker Companies
Gregory Walden, Of Counsel, Patton Boggs L.L.P.
Bill Whitton, Vice President-Lead Administrator, Gulfstream ODA
Mark Yerger, Vice President of Aircraft Engineering and Technical Planning, FedEx
Dan Zuspan, Director, Aviation and Regulatory Affairs, Boeing Commercial Airplanes

Source: GAO.

In the first session, FAA and industry officials presented their organizations' perspectives on these processes and responded to questions. The presenters then departed and did not participate in the remaining sessions. In the next three discussion sessions, the panelists—led by a moderator—shared their views on various aspects of FAA's certification and approval processes. After the first two discussion sessions, panelists voted in response to questions posed by GAO. (See app. II for the questions and responses.) The views expressed by the panelists were their own and do not necessarily represent the views of GAO or the Academy. We shared a copy of an earlier draft of this report with all of the presenters and panelists for their review and to ensure that we correctly captured information from their discussions and, on the basis of their comments, made technical corrections to the draft as necessary.

Industry Interviews

We interviewed aviation industry certificate and approval holders, trade groups, an industry expert, officials of unions that represent FAA inspectors and engineers, and FAA staff in Aircraft Certification and Flight Standards (see table 2). The industry and trade groups were selected to provide a range of large and small companies and a variety of industry sectors (e.g., aircraft and parts manufacturers, air carriers, and repair stations). The interviews were conducted to gain an understanding of the extent of variation in FAA's certification and approval decisions and interviewees' views on FAA's certification and approval processes. The FAA interviews provided an understanding of the key aspects of FAA's

certification and approval processes, information on data collection and analysis related to the processes, and current and planned process improvement efforts. In addition to using information from the individual interviews, as relevant throughout the report, we analyzed the content of the interviews to identify and quantify the key issues raised by the interviewees.

Table 2: Aviation Stakeholders Interviewed for This Study

Aviation certificate and approval holders
Boeing
Honeywell
Jet Aviation
Jet Solutions
Ryan International Airlines
Aviation industry expert
Anthony Broderick, Independent Aviation Safety Consultant
Aviation industry trade groups
Aeronautical Repair Station Association (ARSA)
Aerospace Industries Association (AIA)
Aircraft Owners and Pilots Association (AOPA)
General Aviation Manufacturers Association (GAMA)
Management Association for Private Photogrammetric Surveyors (MAPPS)
National Air Carrier Association (NACA)
National Air Transportation Association (NATA)
National Association of Flight Instructors (NAFI)
National Business Aviation Association (NBAA)
Regional Airline Association (RAA)
FAA
Aviation Safety Organization
Aircraft Certification Service
Aircraft Certification Service's Transport Airplane Directorate, Renton, WA
Flight Standards Service
Flight Standards District Office, Washington, D.C.
FAA inspector and engineer unions
National Air Traffic Controllers Association (NATCA)
Professional Aviation Safety Specialists (PASS)

Source: GAO.

Appendix II: Summary of Responses from GAO Expert Panel

This appendix summarizes the responses the panelists provided to questions we posed at the close of their discussion sessions. The response options were based on the contents of their discussions. To develop the rankings in questions 1, 2, and 12, we asked the panelists, in a series of three questions, to vote for the option he or she believed was the first, second, and third greatest, most significant, or most positive. To rank order the items listed for these questions, we assigned three points to the option identified as greatest, most significant, or most positive; two points to the second greatest, most significant, or most positive; and one point to the third greatest, most significant, or most positive option. We then summed the weighted values for each option and ranked the options from the highest number of points to the lowest.

1. What is the greatest strength of the certification and approval processes?

Strength ranking	Aircraft Certification	Flight Standards
1	Inspector/engineer expertise	Safety culture and record
2	Collaboration with applicants	Collaboration with applicants
3	Safety culture and record	Inspector/engineer expertise
4	Clear well-defined requirements and processes	Do not know/no basis to judge
5	None	Flexibility of requirements
6	Flexibility of requirements	Clear well-defined requirements and processes
7	Do not know/no basis to judge	None

Note: In total, there were only five responses for Aircraft Certification for “greatest strength,” so the analysis for Aircraft Certification is based only on responses for the second and third greatest strengths.

2. What is the most significant problem with the certification and approval processes?

Problem ranking	Aircraft Certification	Flight Standards
1	Delays	Inconsistent interpretations
2	Inconsistent interpretations	Delays
3	Dispute resolution process problems	Dispute resolution process problems
4	Lack of communication	Lack of communication
5	Duplication of approvals	Do not know/no basis to judge
6	Do not know/no basis to judge	Not following procedures
7	Not following procedures	Duplication of approvals

3. What leading factor has contributed to problems with the certification and approval processes?

Leading factor in process problems	Aircraft Certification	Flight Standards
Lack of FAA resources	2	1
FAA's prioritization system for managing certifications and approvals	1	0
FAA's rulemaking process and development of guidance (e.g., amount of time required to develop or change regulations, etc.)	4	3
Culture of FAA (e.g., stove-piping, resistance to change, etc.)	5	7
Organizational structure of FAA (e.g., decentralization, varying procedures among local offices, etc.)	4	2
Lack of adequate dispute resolution mechanisms	0	1
Lack of consequences for erroneous interpretations	1	3
Do not know/no basis to judge	0	1
Total responses	17	18

4. How often do serious problems occur each year with the certification and approval processes?

Rate of problem occurrences	Aircraft Certification	Flight Standards
Less than 10 percent of the time	17	7
11 to 20 percent of the time	0	3
21 to 30 percent of the time	1	1
31 to 40 percent of the time	0	1
41 to 50 percent of the time	0	1
51 to 60 percent of the time	0	1
61 to 70 percent of the time	0	0
71 to 80 percent of the time	0	0
More than 80 percent of the time	0	0
Do not know/no basis to judge	1	5
Total responses	19	19

5. Overall, how positive or negative do you think industry's experience has been in obtaining certifications and approvals from Aircraft Certification and Flight Standards?

Characterization of process experience	Aircraft Certification	Flight Standards
Very positive	2	0
Positive	15	9
Neither positive nor negative	2	4
Negative	0	3
Very negative	0	1
Do not know/no basis to judge	0	2
Total responses	19	19

6. How would you assess the overall impact of the certification and approval processes on the safety of the national airspace system?

Overall impact of processes	Aircraft Certification	Flight Standards
Very positive	9	5
Positive	9	11
Neither positive nor negative	1	2
Negative	0	0
Very negative	0	0
Do not know/no basis to judge	0	1
Total responses	19	19

7. Overall, how would you characterize efforts to improve the certification and approval processes?

Characterization of process improvement efforts	Aircraft Certification	Flight Standards
Very effective	1	0
Effective	10	5
Neither effective nor ineffective	4	7
Ineffective	2	4
Very ineffective	0	0
Do not know/no basis to judge	2	2
Total responses	19	18

8. Overall, how would you characterize efforts to prioritize certifications and approvals?

Characterization of process prioritization efforts	Aircraft Certification	Flight Standards
Very effective	3	0
Effective	10	5
Neither effective nor ineffective	3	1
Ineffective	1	5
Very ineffective	0	3
Do not know/no basis to judge	2	5
Total responses	19	19

9. Overall, how would you characterize efforts to improve dispute resolution through the Consistency and Standardization Initiative (CSI)?

Characterization of dispute resolution improvement efforts	Aircraft Certification	Flight Standards
Very effective	0	0
Effective	7	2
Neither effective nor ineffective	5	4
Ineffective	3	6
Very ineffective	0	1
Do not know/no basis to judge	4	4
Total responses	19	17

10. Regarding efforts to improve dispute resolution through CSI, what is the key factor hindering the progress of efforts?

Key hindrance factor	Aircraft Certification	Flight Standards
Lack of FAA-wide buy-in for efforts	4	3
Lack of national level data for assessing efforts	3	1
Industry fear of retribution	5	7
Other	3	2
Do not know/no basis to judge	4	5
Total responses	19	18

11. What should be done to mitigate the effects of this factor?

Potential mitigation action	Aircraft Certification	Flight Standards
FAA should establish support for efforts	3	5
FAA should improve data collection and analysis related to efforts	3	0
Eliminate potential for retribution	6	7
Other	3	3
Do not believe efforts are ineffective	^a	1
Do not know/no basis to judge	4	3
Total responses	19	19

^aThis response option was not available to the panelists.

12. What action will have the most positive impact on improving the certification and approval processes?

Action ranking	Aircraft Certification	Flight Standards
1	Culture shift/improve staff accountability	Culture shift/improve staff accountability
2	Expand use of designees/organization designation authorizations (ODA)	Permit universal acceptance
3	Industry improve knowledge and expectations	Develop improved/different dispute resolution
4	Permit universal acceptance	Increase standardization of requirements
5	Develop improved/different dispute resolution	Expand use of designees/organization designation authorizations (ODA)
6	Improve rulemaking process	Industry improve knowledge and expectations
7	Increase standardization of requirements	Do not know/no basis to judge
8	Do not know/no basis to judge	Improve rulemaking process
9	Other	Other

Source: GAO.

Appendix III: GAO Contact and Staff Acknowledgments

GAO Contact

Gerald L. Dillingham, Ph.D., (202) 512-2834 or dillinghamg@gao.gov.

Staff Acknowledgments

In addition to the contact named above, Teresa Spisak (Assistant Director), Sharon Dyer, Bess Eisenstadt, Amy Frazier, Brandon Haller, Dave Hooper, Michael Silver, and Pamela Vines made key contributions to this report.

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