Aircraft Certification "Transformation" Pre-Decisional Involvement Report

Union Recommendations and Dissenting Opinion

February 6, 2017

Summary Statement

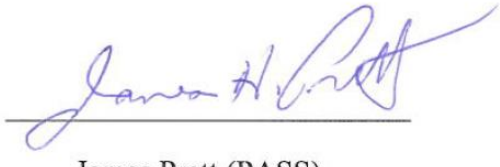
This report provides documentation of the concerns, recommendations and dissenting opinion of the three unions, (PASS, NATCA and AFSCME) that represent employees in the Aircraft Certification Service regarding changes in FAA oversight of airplane manufacturers. The term Transformation has been used to describe; reallocating about 40 percent of certification resources from direct involvement in the critical path of the certification process to 15 percent; and restructuring the oversight from a regional Directorate system that is based upon supporting specific product types, to a divisional system based upon functional performance. These changes will have profound impacts on the safety of the transportation system, the flying public, and bargaining unit employees.

The Unions signed an agreement with FAA management to participate in good faith, and expected to have an opportunity to have the Union's positions fully discussed and considered prior to any decisions being made. FAA management moved forward without addressing any of our concerns and has not supported their agreed to Pre Decisional Involvement with the Unions. During the PDI effort the Unions asked what was driving the agency to change a system that has produced the safest time in aviation history. We were told congressional actions (ARC 312 Report), industry concerns over FAA involvement in the critical path, as well as lack of resources, as the reason for expanded delegation to manufacturers, and reliance on foreign authority bilateral agreements for certification of foreign products. The Unions provided information to FAA management showing deficiencies in the current delegations system, the potential safety impact of removing FAA engineers from the critical path of certification, and the inaccuracy of statements they have made about lack of resources to maintain the current level of involvement in aircraft certification oversight.

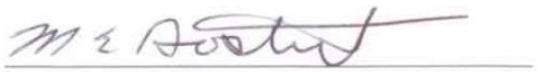
This report provides data, specific examples, and supporting evidence of the Union position that significant changes to the Aircraft Certification Service and Transformation organization defined by FAA management are needed to maintain the current high safety standards. We look forward to future opportunities to actually practice Pre-Decisional Involvement in the spirit of Executive Order 13522 to address the concerns and recommendations expressed in this report.

Signed:

Moin Abulhosn (AFSCME)



James Pratt (PASS)



Mike Dostert (NATCA)

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1.0 Transformation Pre Decisional Involvement Team Activity Summary

NATCA as well as PASS and AFSCME signed a Preliminary Decisional Involvement (PDI) charter[1] on June 9, 2016 with the FAA and received collaboration training with managers who made up the Organizational Development Team (ODT). While the Charter included language that the Unions would be treated as peers and that the ODT and PDI teams would "strive to reach consensus on all aspects of any deliverable", the ODT had been working for several months prior to June 9, 2016, with contractor support to develop the Transformation plan and made decisions on the recommended organizational structure and long term direction of the organization without Union involvement. Further, the ODT and PDI team charters had different sunset dates, and the ODT charter deadline of August 25, 2016, was the major driver for the ODT's activity. As such, the PDI team's conclusion is that the ODT was never fully committed to reaching consensus on ODT deliverables, and that lack of commitment was evident in PDI team interactions with the ODT.

The PDI team met with the ODT and was provided with a description of the proposed changes to AIR's organization structure. The PDI team was also present at ODT meetings where the ODT developed some detailed information regarding the implementation plan for this new organization structure. The PDI team put together a significant list of concerns and recommendations regarding Transformation that was given to the ODT in Kansas City in August 2016[2]. The ODT listened to the concerns and recommendations but did not address any of the concerns, stating these concerns would be addressed in a follow on implementation planning in "ODT2". The director of the Aircraft Certification Service, Dorenda Baker, was given a copy of the union concerns by the FAA PDI representative. In September 2016 the results of the ODT were presented to AIR managers (Dorenda and Dave Hempe) without any Union PDI members being invited to discuss their concerns and recommendations.

In October 2016, the PDI team was informed of a scheduled meeting between Dorenda Baker and the ODT, with the FAA Administrator Huerta. Since the Union concerns had not been addressed and NATCA had concerns AIR management might make implementation schedule commitments without addressing the expressed concerns, NATCA AIR representative Scott Odle, sent two letters[3] to Dorenda prior to the meeting. The first stated NATCA's request to be a full member of the ODT2 activity. The second, stated the implementation plan that had been proposed to eliminate the directorate system and implement the divisional organizational structure, would need to be negotiated with NATCA since the Union representational structure as well as employee jobs are defined based upon a Directorate structure, not the divisional structure that had been proposed.

[1] Appendix 4

[2] Appendix 3

[3] Appendix 11

The AIR management team met with the FAA Administrator on October 21, 2016, and the PDI team was informed the transformation concept was presented. The PDI team and Unions were not invited to the meeting, and as previously documented; we had expressed our concerns with the proposal. The PDI was informed after the meeting the Administrator concurred with the concept of reorganizing from a directorate system to a divisional system. The PDI team was informed that AIR management had been tasked with developing a robust plan for communication with internal and external stakeholders before moving forward with any reorganization actions. The management representative to the PDI team provided assurances that AIR remained fully committed to PDI as part of the AIR Transformation process, but in the unions' estimation, no evidence was provided that the PDI team concerns were part of the consideration prior to implementing the plan. In email exchanges with the PDI contact as well as a telecom, NATCA has requested a copy of the presentation given to the Administrator. However no copy has been provided and the reason given was that AIR-1 did not want the information passed on to stakeholders before communication with stakeholders had been completed.

Based upon failure of the ODT to address the union concerns, the unions are not supporting the transformation and offer this report to document our position. The unions contend that the proposed oversight structure is fundamentally flawed because it relies on company self-regulation by for profit companies focused on profit and will lead to a reduced level of safety. This concept is proven to be ineffective as demonstrated by the grounding of the 787 (See section 9.0 of this report), events at Volkswagen, the US banking industry, oil industry, and in aviation with the Koito 16G Seats[4], and the 737 MAX rudder system certification. The need for checks and balances is shown by past experience and examples were provided to the ODT in discussions within ODT meetings. The stated need for removing engineers and inspectors from the "critical path" of certification oversight and certification of foreign products because of limited resources and greatly increasing workload is not supported by data shown in section 5.0 of this report. The data shows FAA staffing in AIR has continually increased and the FAA certification and continued operational safety (COS) workload has been stable and not increasing for the last decade. The number of designees has steadily decreased, resulting in reduced oversight workload.

The US is experiencing the safest time in aviation history and the unions do not concur with changes to the existing system to reduce FAA involvement in the critical path of certification projects as proposed in the ODT. The proposed long term changes have a high likelihood of reducing safety, therefore we cannot support the implementation of the plan until our concerns have been addressed. The unions contend that AIR management has not followed Executive Order 13522's requirement for management to "discuss workplace challenges and problems with labor and endeavor to develop solutions jointly, rather than advise union representatives of predetermined solutions to problems and then engage in bargaining over the impact and implementation of the predetermined solutions." The unions are concerned that the safety benefits of a second set of eyes provided by direct oversight of both domestic and foreign

[4] http://www.airlinereporter.com/2010/07/safety-issues-with-koito-seats-cause-industry-wide-issues/

certification projects in high risk aspects of the certification process has not been recognized as an essential function within AIR. Section 10.0 of this report provides specific examples of "certification saves" where engineers and inspectors have identified design deficiencies and corrected critical errors that would have resulted in non-compliant and unsafe airplanes entering service. Contrary to what the ODT has stated, the unions contend that the proposed transformation plan is not risk based. No data has been provided to show critical point analyses have been conducted to identify where oversight should be directed and no analysis of potential degradation in safety by removing engineers and inspectors from the certification oversight process "critical path" has been conducted. The proposed actions will have a dramatic impact on our Bargaining Unit Employees and do not address serious safety flaws in the existing and proposed oversight system. Sufficient resources are available for oversight at high risk parts of the certification to maintain the safest time in aviation history.

The unions acknowledge that the management representative to the PDI team has indicated that FAA management fully agrees with the argument that FAA resources should be targeted to areas of greatest risk in the certification process, that effective targeting of FAA oversight and direct certification involvement will continue to enhance safety, and that improving AIR's capability for risk-based decision-making is a key component of the AIR Transformation concept. Further, the unions acknowledge the AIR management representative's contention that this PDI effort has been very successful in creating a forum to discuss challenges associated with AIR Transformation, and concurs that additional management-union pre-decisional involvement is needed to achieve the vision intended by AIR Transformation.

2.0 Transformation Overview

The following section was prepared by the union representatives as a summary of their understanding of AIR Transformation, based on the information provided to them in response to through pre-decisional involvement. The management representative to the PDI Team contends that this description does not fully capture what is being proposed for AIR Transformation. However, the PDI Team believes this description is a valuable outcome of the PDI effort, because it will help management understand which aspects of AIR Transformation have not been effectively described to the union representatives.

2.1 Background: What is Transformation?

Transformation includes two primary facets. The first facet is reorganizing the AIR organizational structure from a regional Directorate system, with each Directorate office having responsibility for a specific aviation product (e.g. Transport Airplane, Engine and Propeller, Rotorcraft, Small Airplane), to a functional division system where each division is responsible for processes that apply to multiple aviation products. The second facet includes expanded delegation and reallocation of certification resources.

AIR Current State

In the current organization AIR is highly involved in compliance-related matters

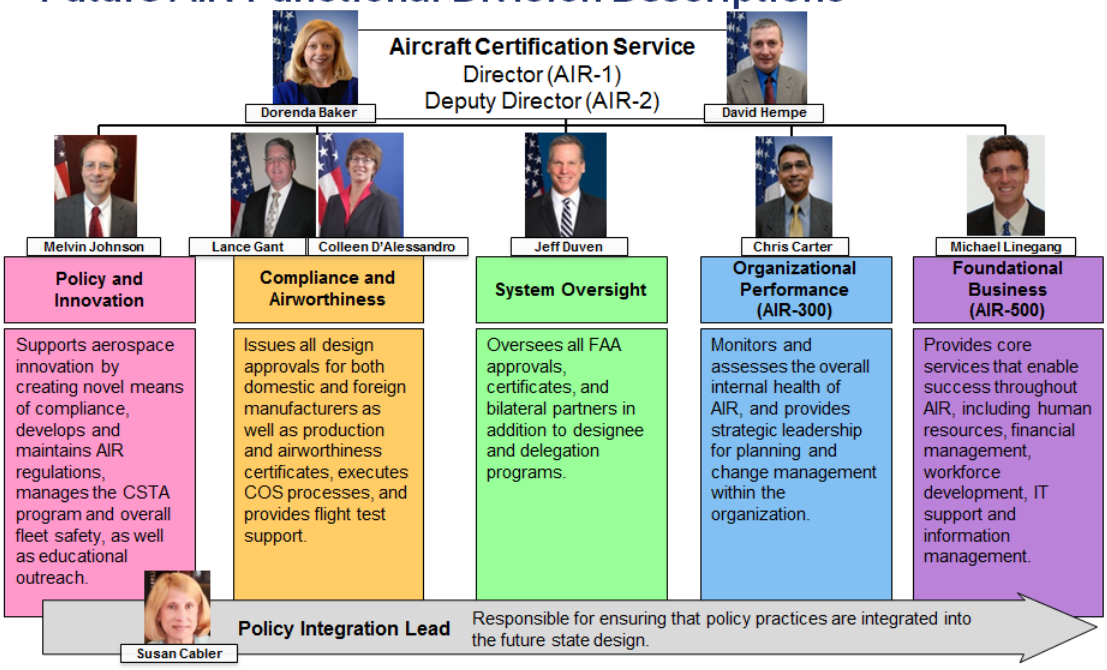
- Product-driven Directorates and roles
- Inconsistencies across product types due to siloed organizations
- Difficulty addressing organization-wide safety issues
- Focus on safety design and transactional decisions

AIR Future State

The future AIR organization promotes early industry engagement and risk-based monitoring

- Functionally aligned divisions to improve efficiency and effectiveness
- Deepening of functional expertise
- Upfront engagement with industry to ensure compliance and risk-based monitoring
- Continued focus on safety outcomes and system reliance

Future AIR Functional Division Descriptions



2.1.1 Organizational Transformation

While the unions do not strongly oppose this facet, we have not been presented data showing shortfalls with the current structure and any substantive benefit of changing from the current Directorate system. No apparent efficiency and effectiveness benefits of the reorganization have been identified. For example the employee to management ratio defined in the new organization remains well below that of industry standards, indicating a top heavy organization. One would expect consolidation of support functions such as training, travel, budgeting etc. into the Foundational Business Division would result the need for less staffing. Staffing is projected to increase. We have provided recommendations intended to maintain technical competency of the workforce and information transfer within the transformed organization.

2.1.1.1 Information Stove Piping and Technical Expertise

The current AIR structure evolved because of the need to serve the many industry stakeholders and the need to have highly specialized technical expertise essential to do effective oversight of complex aviation products. Reorganizing the structure may create difficulties for

FAA stakeholders who will be forced to interface with multiple divisions that may be located across the country. In addition this structure and geographic boundary configuration may lead to "stove piping" of information. The current organizational structure produces geographically beneficial access to the FAA across the country, produces highly specialized technical capabilities to support certification of complex and unique products including small airplanes, large transport airplanes, engines and rotor craft. The proposed divisional approach will lead to loss of one organization responsible for all aspects of a particular product line. This could have negative consequences if specialized technical expertise is diluted and information transfer between the divisions is inhibited by stove piping of information.

2.1.1.2 Technical Competency

Retaining technical competency is a major concern with the proposed organizational structure. Engineers entering the agency have historically been hired into the Aircraft Certification Offices where they learn first-hand during certification about the technical details, regulations and policy applicable to a particular product line. These engineers are also responsible for continued operational safety aspects of the product and oversight of company Organization Designation Authorization (ODA)[5]. The experienced engineers typically move from the ACOs into higher grade policy staff positions. Much of the organization technical capability originates through the aircraft certification process where engineers are directly involved and receive hands on experience. The proposed reallocation of resources from certification will remove the engineers from the certification process, eliminating a critical learning opportunity that builds technical competency in the agency. How will the engineers responsible for continued operational safety, development of regulations and policy, and oversight (audits) obtain technical training to maintain technical competency in the agency? The ODT was unable to provide an answer to this question. The PDI team recommends developing an extensive training program as well as rotating engineers and inspectors within the divisions as possible options to address this concern.

2.1.1.3 Possible Advantages of new Structure

Several advantages were discussed within the ODT for reorganization. One included separating the ODA oversight function from the certification function so dedicated resources are provided for ODA oversight. Today the Boeing Aviation Safety Oversight Office (BASOO) is focused on meeting Boeing certification needs and does not allocate significant resources to oversight. As shown in Appendix 8, the FAA Inspector General has identified numerous issues with lack of oversight by the FAA of ODAs and the need for improvements.[6] Reorganizing could establish dedicated resources for designee oversight since certification related functions of the BASOO could be located in a separate division.

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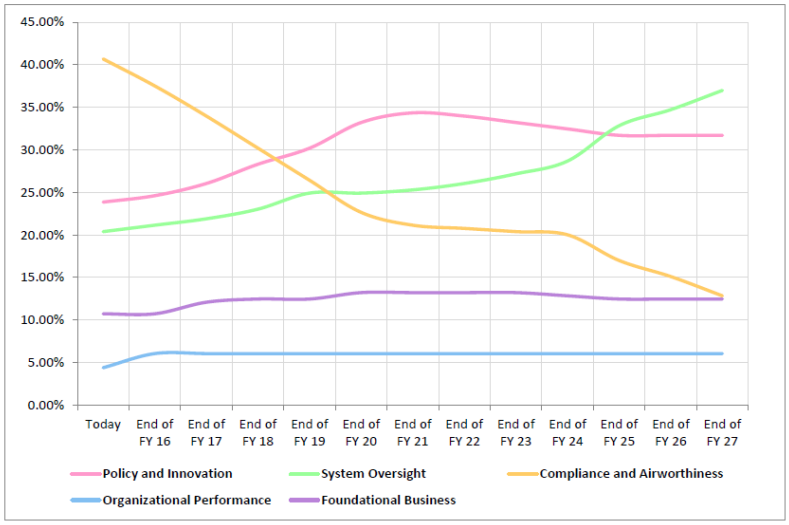
[5] Organization Designation Authorization (ODA) The ODA program of part 183 subpart d, encompasses all FAA delegation to organizations. Organizations may obtain any appropriate authority based upon their qualifications and experience. Order 8100.15 defines the different ODA program types and authority.

[6] FAA Office of Inspector General Audit Report, "FAA NEEDS TO STRENGTHEN ITS RISK ASSESSMENT AND OVERSIGHT APPROACH FOR ORGANIZATION DESIGNATION AUTHORIZATION AND RISK-BASED RESOURCE TARGETING PROGRAMS", Report Number: AV-2011-136 Date Issued: June 29, 2011

Another foreseeable advantage of the divisional structure speculated by the ODT was improvements in operational efficiencies. However information presented to date describing the new divisional structure and proposed staffing indicates there are no synergies or improved efficiencies being achieved by the divisional approach, enabling reallocation of resources from overhead support functions such as Foundational Business, to more mission critical stakeholder needs. The proposal presented to the PDI would slightly increase staffing in Foundational Business. (see graph below). The limited benefits that could be realized by this change do not appear to outweigh the risks associated with loss of technical capabilities, communication of information for particular product lines, and the impact on regional stakeholders who now must deal with multiple contacts located in different parts of the country.

2.2 Expanded Delegation and Reallocation of Resources

The second facet of Transformation involves restructuring the fundamental way the FAA Aircraft Certification Service (AIR) conducts safety oversight of certificate holders by refocusing FAA resources away from direct involvement during certification of both domestic and foreign products. The ODT has referred to this as the "systems approach". The plan would focus resources on establishing certification requirements early in the program, delegating the majority of compliance findings to the industry ODA or company (applicant only findings) and involving the FAA in post certification audits and continued operational safety activities (ADs). The ODT planned allocation of resources provided to the PDI team is shown in the following graph:



Note that the compliance and airworthiness function is projected to be reduced from over 40 percent today, to less than 15 percent, while system oversight is projected to grow.

The plan proposes a 60 percent reduction in engineering involvement in certification oversight (from current 40 percent to 15 percent of all resources). The shifting of resources from direct up front oversight at the high risk point in the certification, to post certification audits and correcting unsafe conditions that are discovered on in-service aircraft is a fundamentally flawed concept

and is not based upon data or risk analysis. This concept is based on the premise the ODA will independently make correct compliance findings without involvement of the second set of eyes provided by FAA engineers and inspectors. The assumption a "for profit" company that is faced with significant financial incentive will always make appropriate compliance findings contradicts human nature, and is not supported by experience in other industries and the performance of the Boeing ODA. The consequences of ODA approval of noncompliant or unsafe designs would result in introduction of large numbers of airplanes in passenger carrying service, resulting in exposure of the public to a lower level of safety and the need for expensive retrofit of the fleet. These deficiencies would only be corrected if FAA oversight audits discovered the error and these audits only spot check compliance findings and would be conducted many months or years after compliance findings had been made. The likelihood of finding the non-compliant or unsafe features using post certification audits is low, resulting in a lower level of safety than required by the regulations that brought us today's high safety level.

3.0 Reason for Transformation, Why Reallocate Certification Resources?

Because the US is currently experiencing ever-increasing aviation safety and reduction in accidents, the biggest question PDI members, and the employees they represent, ask is, "why transform the organization?" As the old adage goes, "If it ain't broke, don't fix it." The answer to this question provided by the FAA PDI representative was the need to address congressional mandates included in FAA reauthorization budget actions dating back to 2012. The proposed Transformation plan would implement recommendations from the "312 ARC[7]." As discussed later in Section 5, these recommendations were not based upon a risk or safety analysis and were primarily focused on reducing burden on manufactures.

3.1 312 ARC Recommendations

The Section 312 Initiatives relevant to Transformation are summarized as follows:

- Develop an integrated comprehensive roadmap for major change initiatives in AIR
- Deploy system to monitor process improvement and effectiveness
- ODA action plan
- FAA audit training

[7] The Aircraft Certification Process Review and Reform (ACPRR) Aviation Rulemaking Committee (ARC) was chartered on August 13, 2012 in response to Section 312 of the FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, that required the FAA in consultation with the aviation industry to conduct an assessment of the aircraft certification and approval process under 49 U.S.C. Section 44704.

- Delegation expansion- Instructions for Continued Airworthiness
- Delegation expansion -Emissions
- Delegation expansion - Noise
- Validation process improvements
- International Continued Operational Safety improvements
- Update Part 21
- Project sequencing process improvement
- Expedited Rulemaking
- Consistency of regulatory interpretation
- Part 23 reorganization

3.2 Critical Path

Industry members have stated the FAA is impeding certification of new products and incorporation of safety improvements. Industry has described the concern as FAA involvement in the "critical path" of certification. The ODT has referred to the 2012 ARC Report and McKinsey report as evidence AIR does not have sufficient staffing/resources to meet what they have stated is a growing number of certification projects and continued operational safety needs.

4.0 Reason for Transformation Not Supported by Data

Data provided by the ODA scorecard[8] shows the FAA is currently delegating over 99 percent of all findings. The ODT plan appears to be removing the Safety oversight specialist from all but a small portion of certification process and relying on delegated approvals done by the type certificate holders or bilateral agreements that rely of foreign authorities who themselves delegate to individual designees and/or Delegated Organizations. The ODT plan is not data driven and no analysis has been provided showing this change will not adversely impact the current high safety level. As discussed later in this report, improvements are needed in the current process to correct flaws identified by the NATCA, NTSB, FAA Inspector General, and FAA legal Counsel. The ODT relied upon recommendations from the 312[9] ARC report as well as presentations provided by the McKinsey group.[10] Review of updated data provided in this report shows these references used out of date or invalid data to support the conclusion that the FAA does not have the resources to remain involved in certification and direct oversight of

[8] The ODA scorecard provides a measure of delegated findings.

[9] ARC Report, "Aircraft Certification Process Review and Reform, FAA Response to FAA Modernization and Reform Act of 2012, Public Law No. 112-95, Section 312, dated August 13, 2012.

[10] McKinsey presentations were based upon information provided by industry and not on actual historical data.

aircraft airworthiness. Data does not show expanded delegation is needed because of a lack of resources.

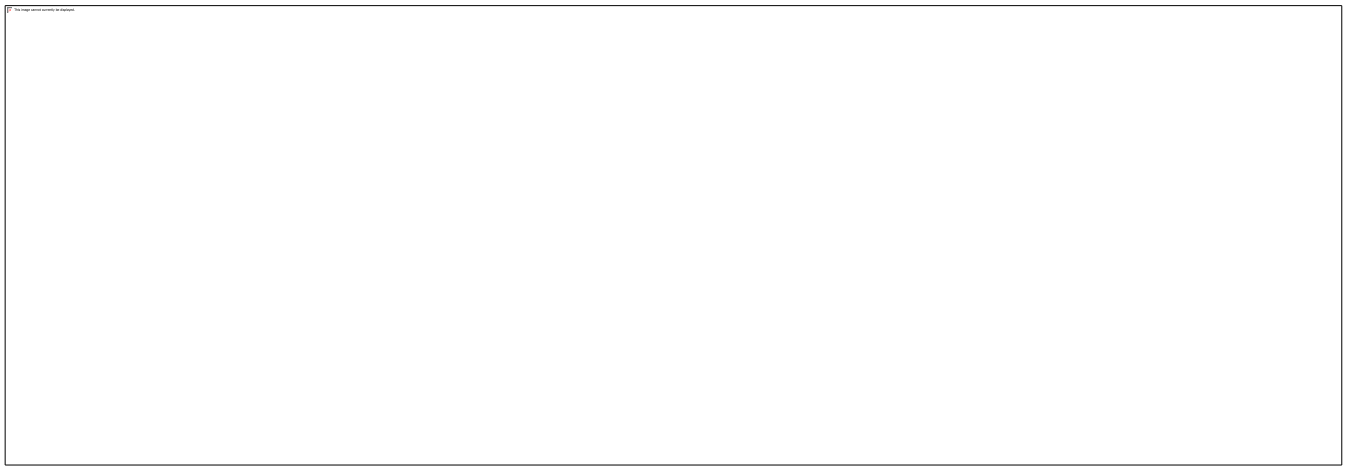
5.0 Historical Workload Trends- Conflict with 312 Report Conclusions

Review of the 312 report shows erroneous conclusions regarding workload and the inability of the FAA to address what was described as a growing number of certification projects. Congress had specifically asked for the FAA to provide predicted numbers of projects for 5, 10, and 15 years. The predicted number of projects projected by the ARC was based upon industry marketing information that was not consistent with historical industry trends. The report included a bar chart showing historical data indicating the number of certification projects for a 9 year period ending in 2012 was stable and not increasing. The ARC members concluded the reason the number of certification projects was not increasing was applicants were not applying due to project sequencing. This unsupported conclusion has been shown to be erroneous. Recent data for 2013 through 2015 added to the earlier data as shown below indicates no increase in certification activity and is consistent with historical trends. There is no increase in the number of certification projects and associated FAA workload.

Note that the McKinsey report to management, completed in 2015, also concluded an increasing number of certification projects. When NATCA questioned the statements made by McKinsey regarding the disparity between the historical trends and their conclusion, they stated the data came from industry marketing projections. In other words marketing hopes, not actual data was used as the basis for statements concluding workload was increasing. The ARC also made statements regarding increasing continued operational safety workload. Data was provided to the ARC, however they chose to exclude the data from the report. Updated data for the number of Airworthiness directives (ADs) published by the Transport Airplane Directorate is shown below. It also shows no increase in ADs.

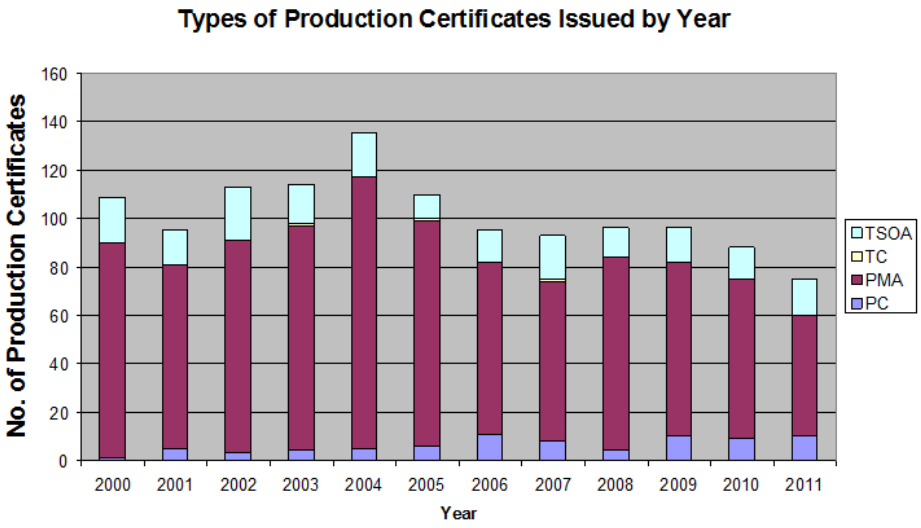
5.1 Historical Type-Certificate Data, Including Domestic, Foreign Approvals

5.2 Historical Airworthiness Directives, Transport Airplane Directorate



The number of Airworthiness Directives varies by year, driven primarily by safety initiatives that result in the need for safety improvements in the fleet[11.] The overall trend since 1990 shows no increase. The FAA ODA scorecard[12] shows we are in fact delegating over 99 percent of compliance findings and the FAA is not delaying certification of products. More importantly, recent events that occurred since the 2012 reauthorization act shows removing FAA engineering from oversight, removing the second set of eyes, could have dire safety and economic consequences.

Production Certificates



Data for the number of production certificates was provided to the 312 ARC by technical support specialists that also showed a stable workload and no increasing trend. The ARC did not include this data in their report.

6.0 Inaccurate Data Used by ODT, Provided to Congress in 312 Report

Inaccurate and out of date data is being used by the ODT as the basis for recommending further delegation of certification. Inaccuracies in the data and invalid conclusions in the ARC 312 report occurred because the FAA relied on data and recommendations provided by an ARC that had unbalanced participation. No FAA technical specialists were involved in the ARC. While the FAA Charter signed by Administrator Huerta for the 2012 ARC stated the arc should consist of members from the Directorates, Headquarters and selected aircraft certification

[11] Safety initiatives such as the aging airplane program, fuel tank safety rule, Electrical Wiring Installation Safety result in fleet wide AD actions and significant numbers of ADs. Other factors such as backlogs of ADs caused by the Federal Register holding refusing to publish ADs also results in variation in ADs over time.

[12] The FAA scorecard provides a measure of the magnitude compliance findings are delegated to the ODA.

offices, only one FAA representative was on the ARC. Mr. Ali Bahrami, the manager of the Transport Airplane Directorate was co-chair of the ARC. No technical specialists or experts with experience in certification oversight were included in the ARC. The ARC signed by Administrator Huerta that stated the ARC membership should consist of as follows:

> 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.

During Mr.Bahrami's tenure at the Transport Airplane Directorate he spearheaded expanded delegated authority to manufacturers. For example on the 787 certification program over 95 percent of the findings were delegated to Boeing. Ironically, 5 months after signing of the ARC report as Co-Chair, recommending more delegation, the first grounding of a US transport Airplane since 1979 occurred. The 787 was grounded due to fires resulting from failure of lithium batteries. Seven months later Mr. Bahrami left the FAA to become a VP for the AIA and in this role he has continued his support for expanded delegation and has subsequently represented AIA in testimony given to Congress.

7.0 FAA Engineering and Inspector Staffing

FAA managers have continually stated that we do not have enough resources to remain involved in the critical path of certification. They sight lack of budget and staffing. However, review of the headcount within AIR shows significant increases in the number of employees. Managers allocated budget and made staffing decisions that did not include increasing the certification staff. Appendix 18 includes data showing the increase in overall staffing.

8.0 Deficiencies in Current Delegation Process

The proposed transformation does not address significant flaws identified by NATCA, the FAA Inspector General, FAA Legal Counsel, and the NTSB in the current delegation process. The 312 ARC report was issued about 5 months before the first grounding of a US airliner since 1979, and therefore did not consider flaws in the current FAA Oversight and delegation process that have been identified by engineers represented by NATCA who were intimately involved in the 787 certification program. Unprecedented delegation occurred during the 787 program where over 95 percent of the compliance findings were delegated to the applicant. Delegation has been expanded further since the certification of the 787 and today the ODA scorecard shows over 99 percent of the findings are delegated to the ODAs.

8.1 NATCA meeting with AIR Managers

Following the grounding of the 787 engineers represented by NATCA expressed concerns the overreliance on delegation was reducing safety. The NATCA Safety Committee requested a meeting with senior AIR managers to discuss concerns with expanded delegation. NATCA members, including Steve Hanson the National Safety Committee Chair, met with (AVS-1)

Peggy Gilligan, (AIR-1) Dorenda Baker and (AIR-2) Frank Paskiewicz in August of 2013 and provided a list of concerns and recommendations regarding the flawed delegation process that led to the grounding of the 787 [13]. While FAA managers in attendance stated some of the issues had merit and to provide a formal response within 30 days, no response was provided to NATCA. In addition, NATCA was not included as a stakeholder in gathering information being used for the Transformation plan. The past actions show a pattern of disregard for NATCA concerns and lack of AIR engagement in collaborative or PDI efforts.

8.2 Concerns and Deficiencies Not Limited to Unions

Concerns regarding expanded delegation and deficiencies in the current ODA process are not limited to Unions. The current ODA process has significant deficiencies as documented by the FAA Inspector General O (Inspector, October 15, 2015) reports[14,] NATCA presentations to senior FAA managers, as well as evidence gathered by FAA engineers and inspectors. It should be noted that a white paper developed by Doug Anderson, manager of the Airworthiness Law Branch, AGC-210[15], an attorney with firsthand knowledge of failures of the current delegation system, provides supporting evidence the concerns expressed by the Unions have merit. The three unions have identified key deficiencies[16] in the existing certification process and the proposed transformed organization and have offered recommendations to improve the Transformation in order to maintain the safest time in US aviation history.

8.3 Need for Dedicated Designee Oversight -Boeing ODA Shortfalls

Appendix 2 provides a list of examples of concerns with the current Boeing ODA, and recommendations for improving designee oversight including AR training and proficiency requirements. Prior to implementation of the Delegated Organization concept, DERs were the eyes and ears of the FAA and provided direct feedback to the agency regarding ongoing safety and certification/compliance issues. The ODA process currently discourages ARs from contacting the FAA directly and report Continued Operation Safety events or safety issues to the FAA engineers. ARs are not directly involved in the determination of safety level of COS events.

8.4 ODA appointment of ARs without direct involvement of FAA engineering- Conflicting Responsibilities

The ODA selects ARs and experience shows some recent AR appointees do not have good understanding of the regulations, regulatory history and intent of the regulation, or the applicable

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[13] Appendix 11: NATCA Safety Committee Presentation August 28, 2013 . Powerpoint presentation was provided to FAA managers that included a list of recommendations to improve the oversight function,

[14] See Appendix 6 and 7

[15] Appendix 7: ACHIEVING COMPLIANCE WITH AIRWORTHINESS STANDARDS, Doug Anderson Manager, Airworthiness Law Branch, AGC-210, June 2016

[16] Key deficiencies and recommendations are provided in the introduction of this document and the Appendix 2.

FAA policy. AR salary increases and career advancement decisions are tied to the ODA management decisions and it does not appear that ARs that contradict Company positions are rewarded for such actions.

The ODA organization makes certification decisions, not the AR. This leads to a potential decision making process influenced by a "Group Think" mentality. There is no personal accountability or monetary motivation for ARs to contradict Company management positions that do not support expenditures to upgrade noncompliant designs or do testing needed to demonstrate compliance. ARs are reluctant to take contradictory positions or bring up issues within the ODA for fear of retaliation. In several cases ARs have refused to answer compliance related questions when in meetings with the FAA and ODA management. This reflects their fear of retaliation if they express a view that contradicts the company position.

9.0 Grounding of the 787: Key Lesson Learned

On January 16, 2013, six months after the industry 312 ARC report to congress recommended expanded delegation, the first US built transport airplane was grounded since the DC-10 in 1979. The grounding of the 787 shows how over reliance on companies to make critical compliance findings can, and has had dire consequences. As discussed below, the FAA did not focus FAA oversight resources based upon principles of risk based resource targeting. Internal FAA emails show managers put pressure on employees to indiscriminately delegate over 95 percent of the compliance findings.

9.1 Lack of Risk-Based Targeting of Oversight

The 787 was the first new transport built by Boeing since the 777 in 1993. The airplane incorporated all new technology and was globally produced using a new business model approach. The 787 incorporated new technology in key areas including composites, electrical powered systems, lithium batteries, centralized airplane computer controls, etc. Boeing changed their business model to include awarding contracts for the design and manufacturing of entire airplane systems. For example the all new composite wing was designed and built in Japan. This resulted in the Boeing engineers and ARs having much less knowledge of the system design details because they were not responsible for the design. Boeing also greatly expanded their global supply chain such that control of manufacturing quality was high risk. The prime supplier of the system often subcontracted to sub tier suppliers resulting in a chain of suppliers with

certification and engineering responsibilities. When the 787 airplane rolled out on July 8, 2007, it was unlike any other Boeing airplane. In past certification programs like the 757 and 767 the airplane would roll out of the factory and would typically take flight within 5 weeks. The 787 had little wiring, plumbing, or systems installed in the airplane[17] when it rolled out, and it was not until Dec 15 2009, nearly a year and a half before it would take flight. Although the FAA knew of these high risk factors, managers pushed to force delegation of over 95 percent of the certification to Boeing[18]. The FAA even delegated the compliance finding for first time approvals including the special conditions for the lithium batteries to Boeing[19].

9.2 787 Battery: Over-Reliance on Delegation

The certification requirements in the 1940's stated batteries must be located in an enclosure and vented overboard. Lead acid batteries produce hydrogen and acid that can damage the airplane. The introduction of lithium ion batteries, that can produce toxic, corrosive and flammable gases, as well as leak flammable electrolyte, resulted in the FAA developing special conditions to address this new technology. At the first meeting with Boeing one FAA certification specialist stated the battery needed to be housed in a fireproof enclosure that was vented overboard. Boeing did not agree with this position and because of concerns for added weight, cost and impact on the program schedule. As a result of this disagreement FAA engineers added requirements to the special conditions to preclude venting of any smoke, electrolyte etc. into the pressurized portion of the airplane, believing an enclosure would be required. However the FAA delegated the finding to Boeing and the AR made the erroneous assumption that venting was not possible so no enclosure was needed.

10.0 Safety Saves: Removing the Second Set of Eyes

The ODT plan and the announced agreements with foreign authorities will shift FAA engineering resources currently involved compliance oversight from 40 percent to 15 percent of total AIR resources. Reducing engineering oversight will result in a reduction in safety. FAA engineering involvement in evaluating the design of airplanes routinely results in design changes leading to safety enhancements. These safety "saves" are many times on design features that many would consider to be routine and somewhat "low risk". In some cases the design may have been previously approved by a foreign authority. In other cases the ODA has stated they would follow the existing means of compliance. However direct involvement of FAA engineers resulted in a finding that was not consistent with the foreign authority or the ODA. This resulted in design and safety enhancements. Some examples are discussed in detail below.

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[17] Aljazeera article http://www.aljazeera.com/investigations/boeing787/2014/09/fake-boeing-787-rollout-201491151725717514.html

[18] Internal FAA Emails support this statement

[19] Appendix 5, Seattle Times Article.

10.1 787 Common Cause: Thrust Loss Due to Water

The 787 the center fuel tank feeds both engines during takeoff. Boeing engineers decided to deviate from past design practice and move the fuel pump inlets up off the bottom of the fuel tank and aft in the tank. This reduced the weight and complexity of the design. FAA engineers questioned this design approach since fuel contaminated by water would pool up at the low point in the tank and shift aft to the fuel pumps when the airplane rotated during takeoff. This would have resulted in loss of all engines and an accident. Boeing redesigned the fuel pump inlets to stagger the inlets so the water would be detected prior to airplane takeoff.

10.2 787 Common Cause: Thrust Loss, Fuel-System Contamination

Another example was the lack of indication for impending bypass of the fuel filters and possible clogging of the fuel oil heat exchanger, resulting in overheat of the engine oil system. Contamination from lint collecting in the fuel tanks during the production process was observed during flight test. As a result of FAA involvement, Boeing implemented design changes to provide indication to address this issue. The FAA also required modifications to the indication system to notify the flight crew of fuel leaks and potential for lack of fuel to complete the flight. The low fuel indication was enhanced because of direct FAA involvement in the design.

10.3 Embraer Fuel Vents in Lightning Zone

In another certification project the FAA engineer identified the unsafe condition to the applicant and the foreign authority. The fuel tank vents located on the fuselage were in a location where lightning could ignite the vapors and cause a fuel tank explosion. As a result of FAA involvement in review and certification of this previously approved airplane design, modification to the vent system was made to install flame arrestors. Airworthiness Directives were issues on the previously approved airplane. These design flaws were caught by a second set of independent eyes.

10.4 Embraer Fuel-Line Water

During certification design review the FAA engineer found the fuel feed lines on the airplane had a low point where water could collect and cause ice in the fuel lines that could lead to interruption of the fuel supply to the engines. The design was modified.

10.5 767 Tanker: Fuel-Tank Dry-Bay Fuel Line

During review of the proposed tanker design the FAA engineers pointed out the need to address a design shortfall in the 767 dry bay. The original type design was approved with a high pressure fuel line routed inside the dry bay. Boeing initially argued this design was compliant. However after the BASOO stated in a letter the design was not compliant, the design was changed. Recently a 767 equipped with the original design experienced an uncontained engine failure during takeoff in Chicago that sent a piece of engine debris through the lower wing skin severing the fuel line in the dry bay and casing a fuel leak in the dry bay fuel tank wall. This

resulted in a large uncontrolled fire showing the involvement of FAA engineers in the design review and certification process resulted in a safety save.

10.6 A340: Rear-Center Tank

Airbus located a fuel tank directly aft of the center landing gear. The regulations require the landing gear to break free of the airplane without damaging the fuel tank and causing a fuel leak. However EASA found the design compliant. This design did not meet FAA regulations nor was it consistent with FAA MOC for auxiliary fuel tanks. As a result of direct involvement of FAA engineers in the certification process, Airbus incorporated design improvements to mitigate this safety issue.

10.7 Dassault Falcon: Fire-Extinguishing System and Hydraulic-System Shutoff Means

The proposed fire extinguishing system was designed to only provide protection below a defined airspeed. The manufacturer had used limitations in the flight manual to require the flight crew to slow the airplane before discharging the fire extinguishing agent. On another Dassault model, the engine did not have a hydraulic shutoff valve, therefore mil oil could be added to an engine fire. In both of these cases the design was modified. Both of these design details were previously accepted by the foreign authority.

11.0 Getting the FAA Out of the Critical Path

11.1 Expanded Reliance on Foreign Authority Findings

The US fleet is currently made up of a large number of foreign manufactured airplanes produced by companies such as Embraer, Airbus, Bombardier, and Dassault. The 312 ARC also recommended further expansion of reliance on bilateral agreements with foreign authorities. This would reduce foreign authority involvement in our domestic manufacturer certification programs. US manufacturers currently are required to pay foreign authorities for services to receive foreign approval of their products. In addition, certain foreign authorities have recently become more intimately involved in certification, requesting significant technical information. US manufacturers appear to be concerned over loss of control of proprietary information as well as an unleveled playing field since they must pay for certification services while foreign manufacturers get free services from the FAA. These are valid concerns that should be addressed. However, the recommendations of the ARC currently being implemented by Dorenda Baker will lead to eliminating or significantly reducing FAA engineering oversight of foreign aircraft that make up an increasing portion of the US fleet. The FAA has also inferred a lack of resources in a recent announcement that certification of foreign aircraft will be essentially delegated to foreign regulatory authorities when they stated, “Industry growth has increased the level of domestic certification activity, and validation projects from emerging States of Design are placing growing resource demands”.

The announcement of "Plans for international growth" includes significant expansion on reliance of foreign bilateral agreements where the FAA would accept the approval done by the foreign authority. In many cases the plan will effectively remove FAA specialists, the "second set of eyes", from oversight of foreign transport airplane type design approvals. Here is an excerpt from an announcement on Aug 31, 2016, in the FAA News and Update sent to all FAA employees. (Highlight added for emphasis)

"The continued globalization of the aviation industry has prompted collaboration among the world's civil aviation authorities to harmonize regulatory systems. Industry growth has increased the level of domestic certification activity, and validation projects from emerging States of Design are placing **growing resource demands** on other authorities. By maximizing the use of existing U.S. bilateral partnerships with our CMT partner countries, **we can reduce the amount of effort** all of the agencies currently expend on validation programs.

Strong partnerships are a key to consistent safety standards around the world. As leaders in the global aviation community, the CMT members are pioneering a strategy that focuses on confidence-building initiatives and risk-based validation principles **to accept partner certification activities with limited or no technical involvement. This is a significant expansion** of previous initiatives, which allows the authorities to maximize their reliance on the certificating authority as much as possible."

The legal basis for reliance on foreign authority findings of compliance described above has been clarified as shown in the letter provided in Appendix 9. The minimum level of FAA involvement has not been finalized, but clearly the FAA management desire is to significantly reduce the FAA engineering compliance oversight of foreign aircraft that make up a large part of the US transport fleet.

12.0 Factors for Focusing Resources in "Critical Path" of Certification

12.1 Discussion of Specific ODT Recommendations

While Congress has made further delegation a priority, the previous discussion shows they have not been informed of shortfalls of the current ODA process and the risks introduced by expanding delegation to the point of CDO and applicant only findings. Industry has argued getting the FAA out of the "critical path" is needed however no data has been presented showing undue burden to industry nor a critical point analysis to show what stages of the certification process introduce the highest risk of a non-compliant or an unsafe design being approved. The agency has identified stakeholders consisting of industry however employees intimately involved with certification have not been included in the discussion regarding expansion of the delegation to the point of applicant only findings. Events described in this report indicate the current delegation process is flawed and in fact involvement of the FAA in the critical path has identified significant safety issues and in some cases resulted in design improvements. In a number of

circumstances the ODA has not been effective at requiring compliant designs and no design improvements have been made.

12.2 FAA Involvement Today

The FAA has delegated the majority of compliance findings to companies like Boeing. For example on the 787 over 95 percent of the project was delegated to Boeing. The ODA scorecard[20] shows the vast majority of certification is already delegated and only high risk items are retained. Retained items typically fall into 3 categories consisting of new technology, regulatory/policy deficiencies and non-compliant design shortfalls. Further reduction in Compliance oversight proposed by the ODT would result in removal of the FAA from high risk portions of the certification process and greatly increase the potential for non-compliant or unsafe airplanes entering passenger service.

12.2.1 New Technology Items

These are typically considered high risk due to the introduction of new technology such as composites wing and fuselage structures, folding wing tips, composite engine fire zone fan case, lithium batteries[21]. These issues are identified by FAA engineers during design reviews or in some cases by the ODA and in certain cases where no regulation exists, special conditions are developed for the new design.

12.2.2 Regulatory and Policy Deficiencies

These occur when applicants choose to propose means of compliance for legacy designs that contradict previously published policy, e.g. In Advisory Circulars, or safety issues that have occurred resulting in the need for application of issue papers to address regulatory shortfalls[22] E.g. 777 fuel system icing, engine ice crystal icing, rotor lock. For example, today the FAA currently applies 38 issue papers to each project for the Propulsion discipline alone. Many of these issue papers exist because of decades of gridlock in the issuance of amendments to the regulations and issuance of policy. For example the FAA issued special conditions for High Energy Radiated Fields (HERF) for 21 years. More recently, the introduction of composites resulted in the need for numerous special conditions on the 787, A350 and Bombardier C-series. None of these special conditions has been adopted in the CFR due to regulatory backlog. Ironically industry routinely opposes FAA amendments to the Code of Federal Regulations

[20] The ODA scorecard provides data measuring the degree in which the FAA has retained compliance findings and been directly involved in what industry has labeled the “critical path”.

[21] Over delegation occurred on the 787 battery design when the FAA delegated the compliance finding for the new technology lithium batteries to Boeing. The AR found the batteries met the special conditions, however review showed this finding was in error after grounding of the 787 occurred.

[22] The FAA issues Airworthiness Directives to correct unsafe conditions in the fleet and in some instances these unsafe conditions reveal deficiencies in the current FARs. Project specific issue papers are applied to identify deficiencies in the accepted means of compliance, and in some cases the “no unsafe feature” provision of section 21.21 is invoked to apply new regulatory requirements to prevent the unsafe condition in new type designs.

adopting new regulations, one of the causes of the FAA being in "the critical path". It should be noted the FAA has developed a process to enhance efficiencies and minimize involvement where previously applied issue papers are wrapped up in a reference issue paper called the collector issue paper. The applicant can use the previously accepted MOC without processing a new issue paper on the subject and this is standard practice on many certification projects. However special conditions and equivalent safety finding must still be processed on every project. If applicants use previously agreed means of compliance there is little FAA involvement in the "critical path". The PDI team supports reducing the number of issue papers applied to certification projects through amending the existing regulations. We recommend processing an amendment similar to the 1977 Airworthiness review that would include amending large groups of regulations at one time rather than the piece meal approach currently employed by the Agency.

12.2.3 Non-Compliant Design Shortfalls

The majority of FAA involvement in the critical path occurs due to behavior and decisions made by industry/applicants during development of new and derivative airplane designs. In many instances industry chooses to not to upgrade airplane designs to meet current regulatory standards or current policy. In some instances they request equivalent safety findings and exemptions, or propose novel compliance means that must be processed through an issue paper. These upgraded safety standards are commonly the result of accidents and incidents. For example features of the 737 MAX were developed in 1964. As previously noted, since that time accidents have resulted in upgraded standards. The 737 flight control system has a single string rudder control[23]. The refueling system is controlled by a single float switch that is vulnerable to single failures that can cause fuel spillage onto the ramp area and the potential for uncontrolled fire. The regulatory requirement includes the need for a fail safe design that can be checked prior to each refueling. The engine mount on the APU is aluminum and is not fireproof as required by the regulation. The wiring to the fuel tank float switch is routed in an aluminum conduit that does not meet fail safe requirements of section 25.981 to prevent ignition sources in the fuel tanks[24]. Rather than upgrading the design to be compliant the Boeing ODA argued the designs were either compliant or provided equivalent safety to compliant designs. Boeing also proposed using fuel tank temperatures above the regulatory required limit of400 degrees F. They proposed a 500 degree F maximum temperature. These issues required extensive FAA involvement in the "critical path". Unfortunately the Boeing ODA failed to meet their obligation as a delegated organization to present a compliant design and show compliance to the regulations. In fact the ODA argued and disagreed with FAA direction provided in issue papers on each of these subjects. In the end each of these non-compliant design features was or is in the process of being approved by FAA managers. (FAA technical specialists responsible for finding compliance disagreed with the findings and non-concurred with the management position) The ODA did not

[23] Following the Sioux City DC-10 accident the FAA tasked an industry advisory group to develop new policy and standards to address uncontained engine failure. The group developed an AC that included specific requirements for protecting the flight controls in all 3 flight axis. The legacy 737 design did not meet this standard.

[24] Following the TWA 800 accident caused by a fuel tank explosion the FAA amended section 25.981 to mandate fail safe fuel tank ignition prevention features. The legacy 737 float switch design does not meet this requirement.

find these designs non-compliant and require Boeing to upgrade the designs to be consistent with current regulations and existing policy. Industry groups that include Boeing have made statements to the FAA and Congress that the FAA is in the critical path and delaying these projects.

The unions do not agree with the assertion by industry that the FAA needs to get out of critical path because the FAA is slowing innovation and introduction of new technology and safety enhancements. No data has been provided that supports this assertion. In fact, experience from certification projects as indicated by the ODA scorecard and assessment of the work flow shows the FAA has not been the limiting factor in achieving type design approval. FAA certification engineers, flight test pilots routinely work overtime and weekends to support certification efforts. A case study of the 787 provides an understanding of the value added by FAA involvement and the risks associated with over reliance on delegation.

12.2.4 Early FAA Involvement

The ODT plan includes reallocation of resources into the Policy and Innovation Division and to get FAA involvement in the certification path early in a product development phase, prior to program initiation. Ideally this approach would be effective at establishing certification standards for new technology and compliance means prior to a company initiating a certification program. In fact early agreement on the certification standards was the approach used by the FAA and Boeing to establish the certification requirements for the 747. The type board meeting minutes for this airplane program back in the 1960s showed high level Boeing and FAA managers with decision making authority were present at the meeting and major decisions were made to establish certification requirements, including the need for special conditions. Boeing committed to design improvements and standards at the meeting and the program took action to meet the standards. If you contrast this with the certification activity on the 737 MAX noted above you see the certification basis for the derivative airplane was established early in the program, however Boeing did not commit to developing a compliant design early in the program and this resulted in the need for numerous issue papers and FAA involvement in the certification process. The Unions support early involvement in certification programs to establish the certification basis and means of compliance. However early involvement does not reduce the need for FAA involvement in high risk certification findings at the time in the certification process where companies are under extreme pressure to meet delivery commitments. Experience gained on the 787, lessons learned and a risk assessment would lead to the conclusion removing the FAA engineers from the compliance demonstration during and near the end of a certification program could result in a reduction in the level of safety.

Appendix 1: Employee Transition Process Recommendation for New AIR Organization

For consideration in follow-on PDI

Precursors to Employee Transition

The organization must be defined before any reassignment of personnel can take place. The definition of the organization must include:

1. All positions in the new organization must be identified so all affected Bargaining Unit Employees (BUE) have the opportunity to be selected for new job openings or modified positions.
2. Job functions must be defined for each position.
    a. In specifying positions in organizational units, "desired team makeup" should be addressed
    b. If a mixture of expertise in specific product types is desired across the team, or if a mixture of experience levels is desired across the team, those factors should be included in the definition of positions for the new organization).
3. "Basic qualifications," grade levels, and bargaining unit eligibility/ineligibility must be specified for each position in a manner consistent with those job functions and must be consistent across the divisions regardless of geographic location of the position.
4. Geographic requirements (if any) must be specified for each position ("desired team distribution" should be considered in specifying geographic requirements for organizational units)

Implementation Planning

1. The timing and sequencing of the organization changes needs to be defined and provided to the BUE prior to implementation.
2. The timing and sequencing of the employee transition process must be defined
3. Manager assignments need to be identified and communicated to BUE prior to implementation.

Impacted employees must be identified and notified of the impact on their job and provided a list of positions for which they are eligible:

1. employees whose jobs are NOT impacted by the reorganization are assigned to positions in the new organization
2. employees whose jobs ARE impacted by the reorganization must be notified
3. "vacant" positions are identified across the organization to which impacted employees MAY select based upon the transition procedures described below.
4. BUE whose job function is eliminated or significantly modified by the transformation and is not qualified for new job openings created by the transformation will be provided

training needed so they can meet minimum qualifications to select available job openings. Training may consist of formal training or on the job training done through temporary job assignments. If training cannot be completed before the job opening is announced, the BUE may select the job provided they commit to successfully complete the training within 1 year of the training being available.

Transition Process

A process for soliciting volunteers must be defined and executed to identify the initial job assignment for impacted BUEs and non-BUEs. This process will only be used for a "time-limited period" to support initial transition of employees. After this period, normal HRPM processes will be used to execute HR actions.

Placement of Bargaining Unit Employees

1. BUEs may volunteer for any lateral position for which they qualify. If no lateral position is available, the employee may volunteer for or be placed in a downgraded position while retaining current pay grade. Qualifications and geographic requirements must be met (team makeup should be addressed as part of the qualifications and geographic requirements for individual positions; employees may elect to self-fund relocation to a different geographic location when volunteering for specific positions, provided office space requirements can be accommodated by the agency)
2. Seniority, as agreed by the union and management , will be the factor used to determine placement of qualified bargaining unit volunteers in bargaining unit positions.
3. Management, in coordination with union representatives, will assign a position for any BUE who elects not to volunteer for any position, or any BUE who does not meet the minimum qualifications for any available position.

Placement of Non-Bargaining Unit Employees and Filling Other Vacancies

1. Non-BUEs may volunteer for any lateral position for which they qualify. If no lateral position is available, the employee may volunteer for or be placed in a downgraded position while retaining current pay grade. Qualifications and geographic requirements must be met. Seniority, as defined by management, will be used to place qualified non-bargaining unit volunteers in non-bargaining unit positions.
2. Traditional competitive bidding processes will be used for "new positions" and positions for which no qualified volunteers are identified.

Appendix 2: Boeing Organization Delegation Authority Oversight Deficiencies

Powerpoint Presented to Jeff Duven, Chris Spangenberg, Dec. 2, 2016

Boeing ODA Oversight

PDI Information Sharing

Mike Dostert

December 2, 2016

Areas Needing Improvement

- BASOO resources targeted toward approval of designs, not oversight
- BASOO employees and organization do not prioritize and focus resources on documenting and pursuing ODA performance issues
  - Supervision record information submitted but not pursued
  - Administrative tools are burdensome and time consuming and require extensive documentation which results in specialists not taking the time to document the issues.
  - Reported issues need to be pursued by BASOO specialists
  - Employees have stated submitting supervision records is a waste of time
    - Management will take no action against Boeing
- ARs selected by ODA
  - ARs identified by ODA responsible for regs who have not demonstrated proficiency
- ARs fear retaliation and do not take firm stand against ODA management
  - Taking position against management may result in reassignment or loss of promotion/pay raise
- ODA uses a voting process to establish position- in most cases compliance is not something that should be "voted on"
  - Either compliant or not compliant
- ARs not held personally accountable, organization responsible for decisions.
- Boeing Company goes around ODA to appeal ODA or FAA positions

Examples

- Boeing angled/Side Facing Seats
  - Video clearly shows seats did not meet intent yet compliance using previous MOC believed appropriate.
- Trent Engine wiring meeting EWIS
  - AR/ODA stated EWIS did not apply to engine wiring.
    - Clear demonstration that AR did not know reg.
- Tanker HFC125 Cert
  - Boeing given specific direction to modify test plan and to have FAA observe Testing
  - Conducted test without addressing FAA concerns and without FAA participation
- 737 Max Rudder Cables
  - ODA stated complying with AC but they were told by FAA they were not and have persisted with position that they comply using the AC MOC.
  - ARs continually argued probability of engine failure-rule requires assumption of engine failure
  - Flight Controls AR would not address direct FAA question during meeting in front of Boeing Managers-feared retaliation
  - AR argued MOC not in AC, showing lack of knowledge of reg and MOC.
- 737 LEAP Composite Fan Case
  - AR developed test plan and had facility available to address FAA request for additional testing
  - AR not supported by Boeing management and ODA
  - Testing not conducted
  - AR removed by Boeing management from project participation
- 737 MAX Fuel Tank Surface Temperature Limits
  - ODA/ARs do not follow guidance in AC or FAA Position in Issue Paper
  - ODA/ARs want to exceed temperature limit set by Amdt. 25-11 without time limit

Examples (Cont)

- 737 Engine Ground Starts
  - Boeing failed high-altitude ground starts; software changes identified as corrective action
  - Despite AR non-concurring with proposal to cert by analysis rather than re-test, Boeing brought proposal to FAA
  - FAA concurred with AR and rejected proposal
- Fuel Shutoff Valve Actuators
  - New supplier design with latent single failure approved, resulting in AD on multiple models
  - Inadequate AR review of design change
- 737 Max APU Mount
  - AR took position 4th mount did not have to meet specific fireproof requirement.
  - Claimed only needed during an engine case burn through or rotor burst so rule did not apply
- 737 Max Refueling Float Switch
  - Design has single latent failure that can result in fuel spill in airplane servicing area
  - Design is not compliant and does not provide equivalent safety
- 787 Battery
  - AR made incorrect assumption that battery could never fail because charging system failures were the only cause of battery outgassing and fire.
  - Not consistent with requirement of the special conditions
- 787/747-8 GE ICI AFM Limitation Relief
  - Doug Lane and John Hamilton did not agree with direction given by FAA/BASOO regarding non compliance that had been identified and agreed to by ANM management
  - engaged ANM-100 and ANM-110 to go around BASOO finding
  - Position and information provided was found to not be applicable to ICI project
  - Boeing ultimately petitioned for an exemption.

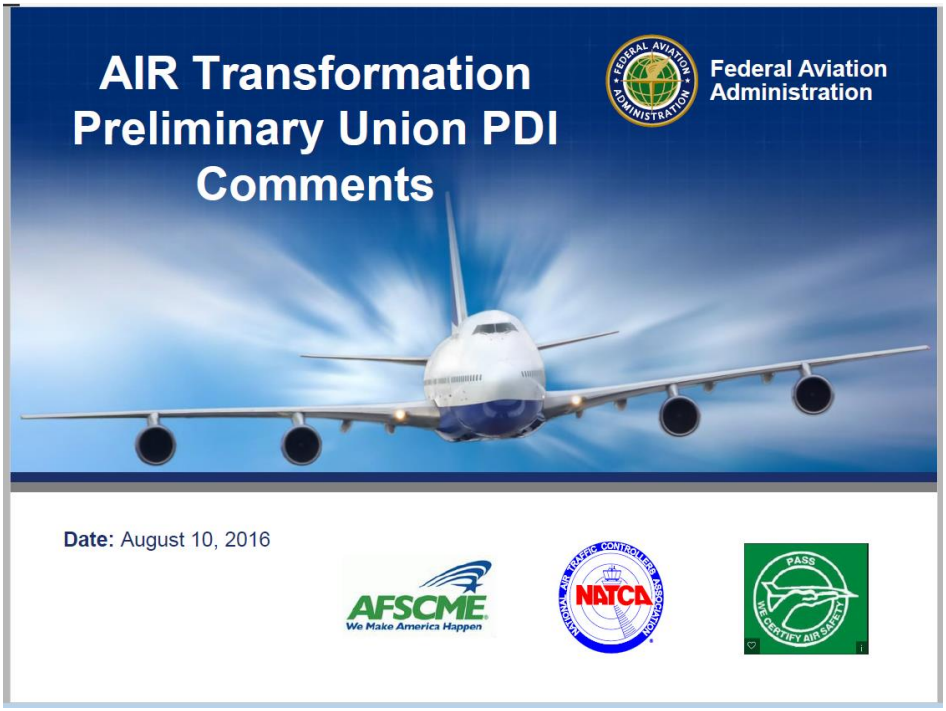
Recommendation

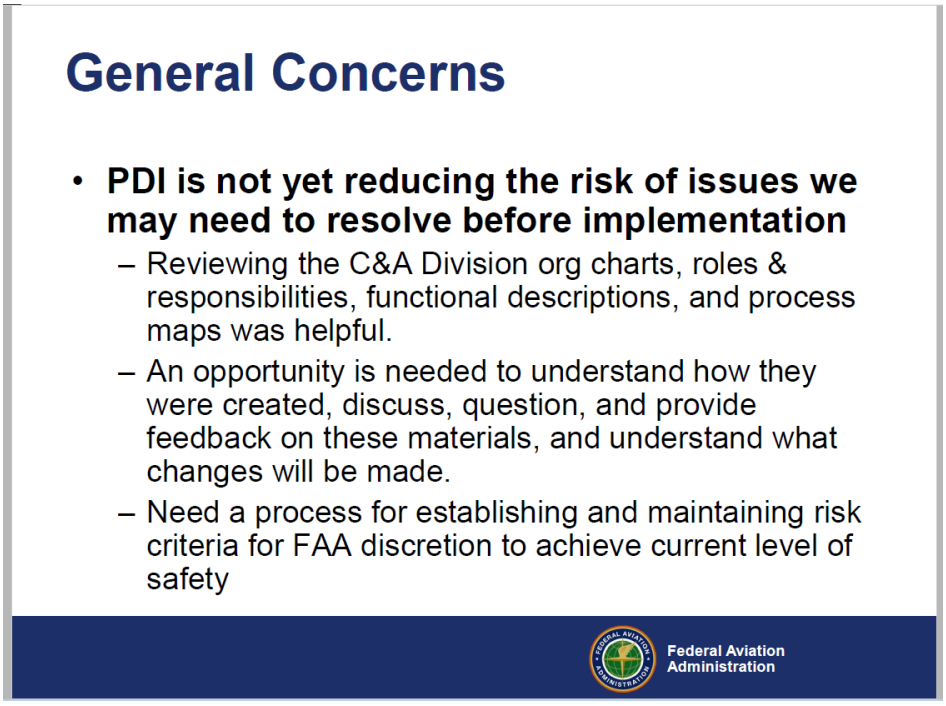
- Establish team to
  - investigate and do root cause analysis to establish cause of ODA performance issues
  - Develop recommended improvements in current process to address each issue.
  - Incorporate improvements into “transformed” organizational structure

- NATCA and PASS have stated designee oversight as a deficiency that must be addressed in the new organizational structure.

Appendix 3: Air Transformation Preliminary Union PDI Comments

The following is a PDI Team Powerpoint Presentation to ODT Kansas City, August 2016





Union Support

- Proposed Reorganization with Divisional approach
- Enhanced Policy and Innovation function with emphasis on new technology
- Early involvement in certification projects
  - Recommend Grey Beard Panel made up of CSTA, Policy and Innovation specialists, certification division identify design deficiencies, new technology and establish Cert Basis
- Reduction in Issue Papers through development of public compliance library and Issuance of rules to update FARs
- Combining foreign and domestic certification
- Investment in Work Force
  - Establishing agency technical fellow specialist job positions
  - Upgrading certification engineer positions based upon responsibilities
- Incentivizing Applicants to Comply
  - Require all non compliant design features to be brought into compliance

Federal Aviation Administration

Union Concerns

- *Concept of further removal of FAA from oversight*
  - *Industry claim of FAA is delaying certification unfounded.*
  - *ODA report card does not support this claim*
  - *99 % of companies get 99% of their certification projects done in a timely manner. There may be points of delay due to company needing more time to test, but not systemic FAA delays.*
  - *FAA is not delaying implementation of safety enhancements and has improved regs and policies*
  - *Data shows current ODA concept flawed. E.g. 787 Battery approval and DOT IG and GAO reports*
- *Assumption that safety will not be reduced by proposed removal of FAA from certification process*
  - *FAA certification engineers and mfg inspectors are focused on safety and not profit…we help industry to find design and certification deficiencies which adds value to the company's aircraft and to meet the minimum safety regulations…*
  - *FAA engineers routinely find design flaws while directly involved in certification process*
  - *ODAs are not functioning as independent oversight function*
  - *New business model results in sub-contracting entire system designs and diminished knowledge of airplane design by applicant engineers. The is the very time the FAA should be increasing involvement, not proposing applicant only findings.*
- *"The critical path" is the portion of the process when companies are under the greatest pressure and they inadvertently compromise compliance/safety. We are under-estimating the importance of FAA involvement in that critical path.*

Federal Aviation Administration

Union Concerns (cont.)

- *Cannot support the proposed approach of inspecting "quality in" through audits rather than up front confirmation design is compliant.*
  - *Being proactive has helped the traditional certification process achieve the current safety record*
  - *Any approach must maintain FAA involvement in "high risk" approvals*
- *Proprietary compliance libraries-*
  - *Will drain FAA and industry resources and lead to non standardized MOC.*
    - *prone to non-standardization & duplication of FAA work;*
    - *prone to become high workload both FAA and Industry.*
  - *Not allow public comment on policy,*
  - *This should be discouraged.*
  - *The improvement to the current certification process should be common public policy libraries*
- *Cannot support "Applicant only findings" This concept does not appear to be legal. And, if so, must be limited only to use of test data (such as military testing) for very simple components/findings*
- *FAA Resources not focused to hold ODA accountable for failure to meet conditions of ODA*
  - *Applicants do not provide service instructions for identified unsafe conditions to support AD actions*
  - *Present designs that are non compliant and refuse to make design changes*
  - *Delay action until the end of the program to force FAA approval*
- *Cannot support an Organizational structure that will stove pipe COS – may need to means to maintain technical competency of COS engineers.*

Union Concerns (cont.)

- *Loss of technical specialist knowledge of certified products*
  - *Proposed concept removes FAA engineers from certification path,*
  - *Loss of technical knowledge will lead to effectively make COS decisions*
  - *Loss of technical skills and knowledge needed to conduct certification audits*
- *Brain Drain*
  - *Inability to hire and retain qualified personnel. Current FAA training is inadequate.*
- *Employee Burn Out*
  - *Employees do not like audit work and full time audit will lead to burn out*
  - *Possible need for rotational positions to help supplement staffing needs and career development*
- *Inequity in job descriptions and pay grades for identical work*
- *Ability of employees to transition to new Divisional Organization*
  - *Will jobs be bid, request for volunteers, based upon seniority?*
  - *Need agreement on method of how jobs will be filled.*
- *AIR management Safety Culture*
  - *Management focus appears to be driven by congressional concerns resulting from misinformation provided by manufactures.*
  - *Lack of push back and providing data driven response to Congress*
  - *Failure to use the 787grounding as an opportunity to understand the risks of over delegation and need for balance. Open items from DOT IG & GAO reports.*
  - *Failure of management to hold industry accountable for meeting obligations under ODA*
- *Designee oversight must be separate from company oversight*
  - *Need separate branch responsible for designee selection and oversight.*
  - *Enhanced Selection process and oversight of ARs by FAA*

Employee Transition Precursors

- **Define the organization:**
  - Define all positions and functions
  - Define "basic qualifications", grade levels, and bargaining unit eligibility/ineligibility consistent with job functions
  - Define “desired team makeup" and, as needed, geographic requirements for organizational units
- **Define the transition plan:**
  - Timing and sequence for organization changes
- **Evaluate demographics:**
  - Identify employees whose jobs don’t significantly change
  - Identify employees whose current jobs do not exist in the future organization
- **Educate the workforce about the options available in the new organization**

Federal Aviation Administration

Employee Transition “Values”

- **Allow employees whose jobs don’t change to maintain their current job**
- **Give employees equitable opportunity to pursue positions for which they are qualified, based on seniority.**
- **Maintain stability of organization in transition to new assignments.**
- **Establish future assignments WELL in advance of transition to allow time for individuals to prepare for new jobs and to facilitate smooth transition of work.**

Federal Aviation Administration

Training

- Need for training improvements
- Need for standardized certification training, including recurrent training (both open to public)
- Need for training to qualify for higher level positions
- Need to identify key aspects of on the job training for new hires
- Need for training on new and novel technologies and allow for industry training of federal employees

Federal Aviation Administration

Initial Recommendations

- **Support Amending Part 25 - issuance of single rulemaking package similar to 1974 Airworthiness review-**
  - Demonstrates FAA leads world in new standards
  - Incorporates existing safety requirements and policy into the regulations and eliminates numerous issue papers and perceived FAA involvement in critical path.
  - Need Industry commitment that they will not impede rulemaking efforts.
- **Support issuance of MOC policy**
  - **Streamline policy release**
    - Previously applied policy adopted without ACO and Industry comment, with request for comment.
    - Issue under Policy and Innovation Division signature with request for comments
- **Early establishing initial cert Basis**
  - Require applicant to provide mature design concepts early
  - Proactive approach to reviewing R&D data and develop how to grant certification credit
  - Strongly recommend all standards, special conditions, issue papers etc. be identified on every major cert program by a team of grey beard panels from Policy and Innovation branch and passed on to certification center.
  - Team made up of CSTA, Policy Innovation Specialists, Academia,
  - Responds to Findings from Battery Investigation
- **Establishing Technical Fellow Engineering Positions within Policy and Innovation Branch for each technical discipline**

Federal Aviation Administration

Expanded Delegation

- ***Need to maintain balance, Financial vs Safety***
- ***Historical Data does not support further delegation and in fact shows need to address deficiencies in current ODA.***
  - *Eclipse, 787 lessons learned!, 737 MAX examples*
- **"Applicant Only" Finding for complex airplane and engine type certification is not justified and is high risk from a safety and long term industry viability perspective.**
  - 787 was 95 percent delegated
    - First airplane grounded since 1979
    - High risk, new technology battery finding delegated to applicant
  - Lithium Battery certification on 787 got the FAA out of the critical path. We established the cert criteria and delegated the finding to Boeing. The AR determined the design was compliant, test data showed a damaged battery would discharge flammable, toxic, corrosive vapors.
  - The proposal by ODT to get FAA out of the critical path must provide concrete measures to prevent what happened on the LI battery cert. The proposed process is not robust and does not have checks and balances needed to prevent a repeat of the Li battery safety issue.
  - Applicant only findings may be appropriate for military or R&D developed data and on simple, low risk items. However, is it even legal?

Federal Aviation Administration

Current ODA Deficiencies – Safety Culture

- **Current deficiencies need to be addressed before expansion of oversight**
- **Current ODA process is flawed**
  - **Delegation to organization results in no personal accountability**
  - **ODA selects ARs and we are seeing lack of knowledge by ARs**
  - **AR pay raises tied to assessments done by company managers**
  - **Companies incentivized to develop non compliant designs and delay issues to end of project**
  - **AD actions are delayed for years because Boeing refuses to commit resources to develop service bulletin (Ref. FRM enforcement case)**
- **AIR Safety Culture must change to force ODA to comply with requirements of ODA.**
  - **Industry argues Its not about compliance, its about industry arguing, its safe enough**
  - **ODA is not held accountable for non compliance. Too many open issues for big ODAs.**
  - **Only 3 out of 46 employees in BASOO doing Oversight…need more employees!**
  - **Examples:**
    - **Supervision records not a priority of BASOO**
    - **Providing service instructions for ADs is required for ODA, Boeing does not provide instructions for years and no enforcement action taken**
- **AIR Management has not embraced safety reporting process and independent review of safety decisions that would provide a degree of balance in the AIR safety system.**

Federal Aviation Administration

Reduced level of Safety

- **Transformation Process Proposed based upon faulty assumptions**
  - Direct FAA Engineering involvement does not add safety
- **Data does not show FAA is in the critical path.**
  - Scorecard shows we are delegating 99 percent of the findings today
  - FAA is not holding up certification or innovation
  - Items that are retained are new technology or considered high risk, based upon an RBRT approach
  - What data has industry provided to support the claim the FAA is delaying projects and is unnecessarily costing them money or preventing innovation?
  - Antidotal claims by industry of FAA holding up introduction of new technology and delaying projects, not supported by review of data. (Ross Landes red binder data)
- **FAA involvement adds second set of eyes that catches design and safety issues. Part 21 CDO ARC agreed with this!**

Reduced Level of Safety (cont.)

- **Reduction in safety**
  - FAA involvement adds second set of eyes that catches design and safety issues. E.g. (787 center tank fuel feed) EMB fuel tanks lightning, 767 Tanker dry bay fuel line) new material for engine (talk to Tim)
  - Concept based on "inspecting in quality" through use of post certification audits will result in introduction of large numbers of non-compliant airplanes into fleet
  - Concept focused on limiting audits
    - Where does the data to measure how applicant is doing come from??
- **Loss of technical competency, ODA and FAA**
  - Lack of employee direct involvement in certification results in inability to do COS and Audits. FAA "training" is heavily OTJ, so direct involvement is key!
  - Current industry business models contract out entire systems, resulting in applicants not having knowledge of system design, sub tier suppliers control design and compliance information.

BACKUP

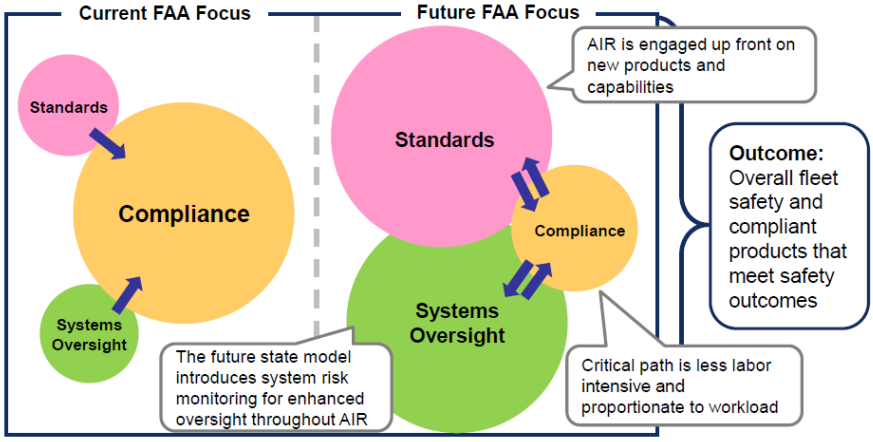
Union Engagement and Outreach

Proactive and consistent engagement and outreach with AFSCME, NATCA, and PASS will allow for continuous feedback and collaboration throughout detailed design. Selected activities for engagement will include:

Activity	Description / Objectives	Frequency
Dedicated Organization Design Labor Liaison	• Appoint dedicated labor liaison to collaborate with unions, providing a single POC for union questions and engagement	Ongoing
Union Notification Process	• Determine roles, process, and timelines for union notification and feedback to streamline union notification process	Up front
Frequently Asked Questions (FAQs)	• Upon completion of Q&A responses, release a copy of all questions and answers related to AIR Transformation to union leaders	Ad hoc
Status Updates	• Provide the union representatives with a status report on AIR reorganization activities • Identify specific opportunities for PDI/collaboration initiatives based on discussion	Monthly
Specific PDI / Collaboration Initiatives	• Prioritize potential bargaining union issues and areas of interest as they arise and assign specific issues with chartered teams	As needed

Refresh Certification Strategy

AIR's future state model will streamline compliance activities and promotes **early and iterative actions** between industry partners and AIR.



*Note: size of circle indicates workload and time spent

The Ugly

- **Do not support**
  - Applicant only findings. Probably not legal. Limit to simple parts and acceptance of military and R&D data.
  - Development of proprietary compliance libraries
    - Could lead to non standard MOC/unlevel playing field, major workload for FAA with no overall improvement to certification process
- **Reduction in safety**
  - FAA involvement adds second set of eyes that catches design and safety issues. E.g. 787 center tank fuel feed, EMB fuel tanks lightning, 767 Tanker dry bay fuel line
  - Concept based on "inspecting in quality" through use of post certification audits will result in introduction of large numbers of non-compliant airplanes into fleet
  - Certification of airplanes with safety issues including missing issues currently caught by FAA engineering involvement
  - Reactive means going back to "tombstone" approach to certification
- **Loss of technical competency**
  - Lack of employee direct involvement in certification results in inability to do COS and Audits, as well as quicken the certification process

Appendix 4: Pre-decisional Involvement Charter

Aircraft Certification Service

Subject - AIR Transformation

Pre Decisional Involvement (PDI) Charter

Background:

Aviation is undergoing great changes. The aviation industry is a complex web of international networks and business arrangements. The technological advances are continuing to accelerate. The public, industry, and other government entities continue to increase their expectations of the FAA – and our ability to respond and adapt quickly to these changes. The Aircraft Certification Service's (AIR) traditional regulatory model and organizational structure will need to adapt to keep pace. AIR 2018 is the future vision for AIR which was designed to address the challenges brought on by four drivers for change 1) Globalization of Aviation, 2) Industry Growth, 3) Velocity of Change, and 4) Heightened Expectations. This roadmap was developed to outline a path to accomplish AIR 2018. It includes the four AIR 2018 focus areas: Safety, People, Organizational Excellence, and Globalization.

Aircraft Certification Service (AIR) is currently transforming to meet the vision outlined in the AIR: 2018. *Graphic 1* outlines the elements that have been defined by management to help AIR achieve transformation, and will shape the direction for activities moving forward.

Graphic 1: AIR Transformation

1

AIR has chartered an Organizational Design Team (ODT) to develop element 12 in the transformation. To accomplish element 12, the ODT must address strategic elements 1-8, ensuring that AIR's organization supports a refreshed certification strategy. The ODT must also consider the other elements envisioned by AIR Transformation (elements 9-11 and 13-15). The ODT team charter is provided for reference in Appendix A. Additional information about elements 1-11 are included in the ODT team charter. Additional information about elements 14 and 15 are provided in Appendix B. Element 13 has not yet been developed in any formal documentation.

Pre Decisional Involvement:

This charter establishes an AIR Transformation Pre Decisional Involvement (PDI) team to work with the ODT and provide a preliminary assessment of AIR transformation topics beyond the scope of the ODT. The PDI team is a cooperative effort between FAA management and AFSCME, PASS, and NATCA to work together to transform AIR to address today's ever changing aerospace certification environment, while continuing to improve AIR's efficiency and effectiveness in fulfilling its safety mission. If the agency decides to extend the ODT, then the parties agree to extend this charter. If the agency determines that there is a need for other teams to work on AIR Transformation during the timeframe of this charter, this AIR Transformation PDI team will be used as a forum to determine an appropriate level of Union predecisional involvement in those teams and any charters for those teams. The agency remains committed to work with the Unions via PDI throughout AIR Transformation.

Although this work is a cooperative effort between FAA management and the Unions, the outcomes are only recommendations. The team is established under the Aviation Safety (AVS) Labor Management Forum Charter and the AVS PDI document. All rights and privileges afforded under the applicable collective bargaining agreements (CBAs), FAA policy, and relevant law, including employees' rights to Union representation, will be adhered to when implementing any of the team's recommendations. In accordance with the applicable CBAs, management will appropriately notify the Unions and negotiate any decisions to implement changes in AIR.

AIR Transformation PDI Team Members:

Lead FAA Management Representative: Michael Linegang.

Lead Union Representatives are:

AFSCME: Moin Abulhosn; PASS: James Pratt; and NATCA: Tomaso DiPaolo

The AIR Transformation PDI team (and their designees) will be able to contact and bring in other Representatives as subject matter experts as necessary. All Representatives will work in accordance with this PDI charter and the applicable CBAs. The AIR Transformation PDI team and the ODT will work collaboratively and strive for consensus on decisions in accordance with the AVS Pre Decisional Involvement (PDI) document and the Aviation Safety (AVS) Labor Management Forum Charter.

Purpose:

The AIR Transformation PDI team will be predecisionally involved and :

a. Work with the ODT to develop outcomes of the referenced AIR ODT charter, as described in Key Deliverable #1;

b. Identify additional aspects of AIR Transformation, beyond the scope of the ODT charter, that merit management-union engagement. Appendix C provides an initial listing of topics that may be recommended by the AIR Transformation PDI team for additional management-union engagement. Key Deliverable #2 addresses this topic.

Key Deliverables:

1. The ODT and AIR Transformation PDI teams will strive to reach consensus on all aspects of any deliverable, however, dissenting opinions (if any exist) will be noted in any ODT deliverable. At a minimum, the AIR Transformation PDI team will have the opportunity to concur with or provide a dissenting opinion on any ODT final deliverables. The Team members will work together to educate the workforce on the joint conclusions and dissenting opinions documented by the teams.

2. Six months after the enactment of this charter, the AIR Transformation PDI team will provide recommendations identifying additional aspects of AIR Transformation, beyond the scope of the ODT charter, that merit management-union engagement.

Team Process:

The AIR Transformation PDI team will meet at least once per week via phone, video, or face-to-face. A schedule of regular team meetings will be agreed upon by all team members. At the request of any union member, a meeting may be limited to "union representatives only". If a team member cannot attend a meeting, they may designate an alternate representative.

Key objectives for weekly meetings include: identifying information needs, agreeing on action items, reporting status on action items, and approving draft materials recommended for distribution to bargaining unit employees.

The team is expected to review the AIR:2018 Roadmap and AIR Transformation program materials to identify additional topics for engagement, discussion, and resolution between labor and management. The team is expected to work together to collect information via interviews, or any other suitable means, from relevant stakeholders. The team should seek input from sources in all Directorates - DC and Oklahoma City - as well as the aerospace industry. The team is free to use discretion on the number of people from each organization it gathers information from. Bargaining unit employees may be used as subject matter experts, and selected by the union.

The AIR Transformation PDI team will also participate in at least one meeting with the full ODT each week. The ODT Project Manager will set the agenda for joint meetings, with input from the AIR Transformation PDI team. With the concurrence of the ODT Project Manager, the AIR Transformation PDI team will attend ODT face-to-face meetings in-person.

When working with the full ODT, ODT and AIR Transformation PDI team members will be treated as peers. ODT and AIR Transformation PDI team members will participate in a respectful and constructive manner, consider the input of all team members, and seek to resolve differences of opinion. AIR Transformation PDI team members are encouraged to:

i. Review draft materials, identifying anticipated impacts regarding the new AIR structure, processes, and governance,

ii. Make recommendations regarding organizational diagrams. Initial discussions with the ODT are expected to focus on assuring organizational structures support new certification processes. But as the organization design and certification processes become more mature, recommendations may also include more specific topics, such as: office titles, manager:employee ratios , and series, grade/payband levels for employees.

iii. Make recommendations for ensuring that any changes to the AIR structure will at least maintain the current efficiencies and certification output, including continual operational safety functions;

iv. Make recommendations for minimizing impacts to managers or employees while assuring effectiveness of new processes.

AIR management can request support from the AIR Transformation PDI team for any ODT subteam or Transformation-related meeting or activity. The AIR Transformation PDI team may fulfill any such request directly, or through the assignment of union or management representatives.

A facilitator may be requested to assist in any meetings. The AIR Transformation PDI team and ODT team will attend PDI/Collaboration training as soon as practical.

The AIR Transformation PDI team will provide a monthly email update to the Labor-Management Pair, identifying any critical issues. Upon concurrence from all AIR Transformation PDI team members, subteams may be chartered to address specific issues. The AIR Transformation PDI team may also recommend the formation of other teams by the Labor-Management Pair.

The members of the team recognize that discussion of some topics will require the sharing of information that is sensitive and/or confidential for either or both sides. When possible, team members will indicate when they are sharing information in this category. In such cases, it is imperative that the both union and management respect those boundaries when sharing information outside of the team. Further, each member of the team acknowledges the importance of maintaining discretion when

discussing team activities outside of the team regardless of whether a topic has been deemed "sensitive and/or confidential".

Communication with Bargaining Unit Employees:

The parties will work together collaboratively to present material to BUE's as a joint management-union communication, including documented dissenting opinions. Draft materials being developed by the ODT will be provided to the AIR Transformation PDI team for review and comment before they are distributed to Bargaining Unit Employees.

Resources:

The team activity will be by primarily by teleconference, video conference, or by email as needed. Any travel requirements will be funded by AIR management. Team members representing the unions will be granted full-time official duty time in support of this effort. Additional union representatives will be granted official duty time when called upon to support the activities identified in this charter. The management representative will allocate approximately 25% time in support of this chartered activity. All team members will be treated as equals and allowed access to all information and meetings pertinent to this activity.

Labor-Management pair will attend the kick-off and wrap-up meetings in person. The ODT and PDI Charter team will jointly attend PDI/Collaboration training (either the one or two day training).

Measure of Success:

Acceptance of the final report by AIR-1 constitutes a successful conclusion of the team's activities. In accordance with the applicable CBAs, management will appropriately notify the Unions and negotiate any decisions to implement changes to the AIR structure or other changes to working conditions associated with AIR Transformation.

Team Attributes:

The team should have a clear understanding of:

1. The current overall strategic direction of the aviation industry and the FAA;
2. AIR 2018; and
3. The AIR Organizational Design Concept (AODC).

Team members agree to: leave organizational rank at the door; value all member comments; be respectful of others; keep focused; be creative; be open; demonstrate integrity for the good of the whole; contribute ideas and opinions; listen to others and challenge each other if these commitments are not followed.

Boundaries and Considerations:

The team will consider the following in their recommendation:

1. No FAA Employee should lose grade/pay band;
2. No FAA employee should be forced to be relocated nor to change their current duty station within AIR.

Signatures of Labor-Management Pair: Dated: 6/9/16

Dorenda D. Baker,
Director, Aircraft Certification Service

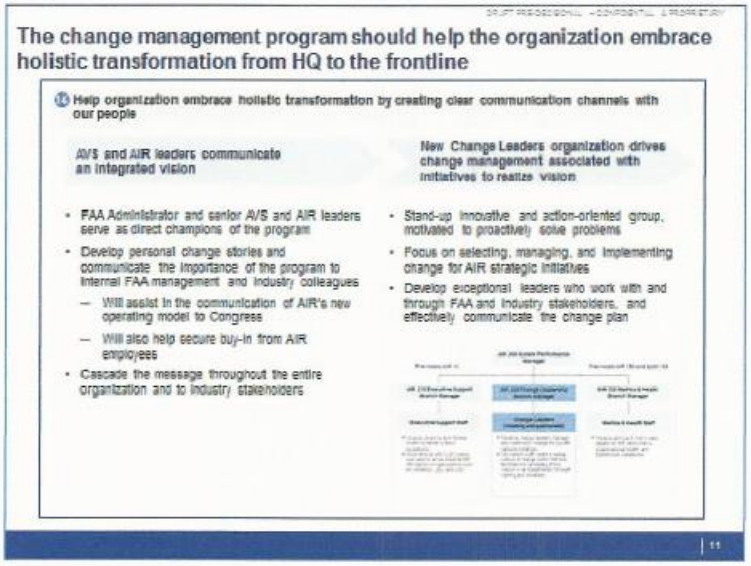
Moin Abulhosn (AFSCME) Tomaso DiPaolo (NATCA) James Pratt (PASS)

Appendix A – ODT Charter

(See attached .pdf)

Appendix B – Additional AIR Transformation Elements 14 & 15

Change Management Element:



The change management program should help the organization embrace holistic transformation from HQ to the frontline

14 Help organization embrace holistic transformation by creating clear communication channels with our people

A/S and AIR leaders communicate an integrated vision

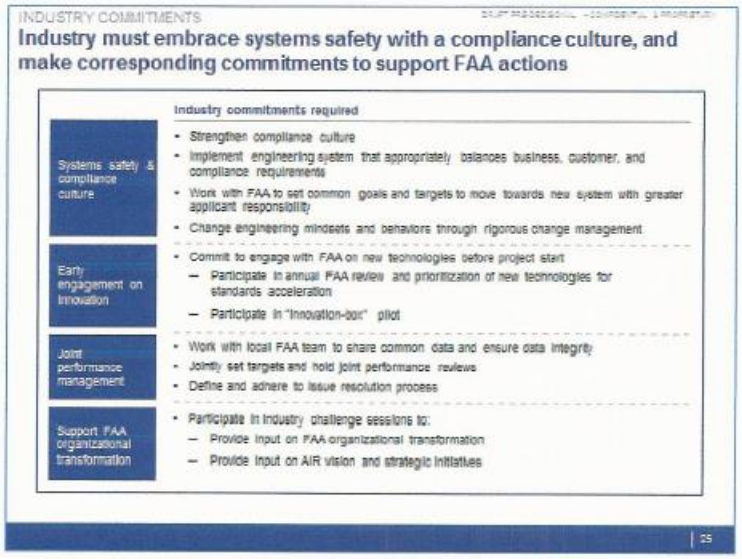
- FAA Administrator and senior A/S and AIR leaders serve as direct champions of the program
- Develop personal change stories and communicate the importance of the program to internal FAA management and industry colleagues
  - Will assist in the communication of AIR's new operating model to Congress
  - Will also help secure buy-in from AIR employees
- Cascade the message throughout the entire organization and to industry stakeholders

New Change Leaders organization drives change management associated with initiatives to realize vision

- Stand-up innovative and action-oriented group, motivated to proactively solve problems
- Focus on selecting, managing, and implementing change for AIR strategic initiatives
- Develop exceptional leaders who work with and through FAA and industry stakeholders, and effectively communicate the change plan

11

Industry Commitments Element:



INDUSTRY COMMITMENTS

Industry must embrace systems safety with a compliance culture, and make corresponding commitments to support FAA actions

	Industry commitments required
Systems safety & compliance culture	• Strengthen compliance culture • Implement engineering system that appropriately balances business, customer, and compliance requirements • Work with FAA to set common goals and targets to move towards new system with greater applicant responsibility • Change engineering mindsets and behaviors through rigorous change management
Early engagement on innovation	• Commit to engage with FAA on new technologies before project start – Participate in annual FAA review and prioritization of new technologies for standards acceleration – Participate in "innovation-box" pilot
Joint performance management	• Work with local FAA team to share common data and ensure data integrity • Jointly set targets and hold joint performance reviews • Define and adhere to issue resolution process
Support FAA organizational transformation	• Participate in industry challenge sessions to: – Provide input on FAA organizational transformation – Provide input on AIR vision and strategic initiatives

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Appendix C – Additional topics

Below is a listing of topics that may be recommended by the AIR Transformation PDI team for additional management-union engagement. This list is not comprehensive and does not imply any limitation on topics that may be recommended for further engagement:

1) How will managers and employees transition into the new AIR structure

2) Training on the new AIR structure and new AIR processes for all managers and employees. This may include:

   a) Training for AIR managers, employees, or designees on new and novel aircraft technologies, improved new hire education, recurrent training to help with back-to-basics engineering, safety management systems training, or other topics.

   b) How applicants can be encouraged or trained to improve their certification processes, so that better data is submitted, resulting in less review time by the agency.

3) Tools needed to support AIR Transformation. This may include computer systems like ASKME EDPA, and assessment as to whether tools are required vs nice to have.

4) Functions that need to be improved to address the globalization of engineering, as well as manufacturing, of aircraft.

5) Control of type designs by the suppliers.

6) Equitable compensation for similar and complex functions regardless of geographical location.

7) Developmental opportunities and processes that should be considered for facilitating career advancement within and across the future AIR organization.

8) Intent is not to negatively impact the current safety levels and certification service.

Appendix 5: Seattle Times Article Re: 787 Testing Delegation

FAA, Boeing Delegated Much of 787 Testing

Originally published April 25, 2013 at 10:48 am Updated April 25, 2013 at 9:15 pm

Link to article.

Left to right: Dorenda Baker, director of the Aircraft Certification Service of the Federal Aviation Administration; Ali Bahrami, Manager of the Renton-based FAA Transport Airplane Directorate (TAD); Steve Boyd, Manager, TAD Airplane and Flight Crew Interface Branch, and Mike Sinnett, vice president at Boeing Commercial Airplanes and chief project engineer of the 787 program, are sworn in to testify during a hearing at the National Traffic Safety Board in Washington, D.C.

By Dominic Gates
Seattle Times aerospace reporter

Federal regulators certifying the safety of the 787's lithium-ion batteries never visited the battery's manufacturer in Japan nor the company that designed the surrounding battery system in France, according to testimony at an investigative hearing Wednesday.

That was one of the jobs entrusted to Boeing employees who were handling much of the Federal Aviation Administration's detail work on certification of the plane's new technology, officials at the companies told the National Transportation and Safety Board (NTSB) hearing.

The hearing shed new light on how regulators delegated to Boeing — and Boeing in turn delegated to its hierarchy of suppliers — much of the responsibility for testing and certifying the plane's design.

Thales of France, which designed the battery system, was responsible for providing test data and paperwork to Boeing for certification.

But lacking any experience in certifying lithium-ion batteries, Thales in turn depended on the expertise of battery maker GS Yuasa of Japan, said Thierry Queste, a 787 project manager with the French company.

Boeing officials insisted that, despite the outsourcing to Thales of the design work for the first large lithium-ion batteries on a commercial airliner, its engineer's maintained control.

"Boeing was involved and had complete oversight of the suppliers throughout," senior Boeing systems engineer Jerry Hulm told the NTSB panel.

And FAA officials were equally adamant that their technical experts were "heavily engaged" in the 787's certification.

However, the FAA oversight role portrayed by agency officials in many respects was indirect — almost like a back-seat driver, with Boeing up front — because of an enormous disparity in resources between the jet maker and its regulator.

The head of the Renton-based FAA certification office, Ali Bahrami, said he has 20 to 25 staff working full time on the 787. The entire airplane-certification division of the federal agency has fewer than 1,300 employees nationwide to cover at least six current new airplane-certification programs as well as ongoing airworthiness issues.

So the FAA relies in large part on 950 engineers who are paid by Boeing but work as FAA "authorized representatives" to oversee and approve the certification of the 787 and other Boeing jets.

It was such authorized reps who traveled to Japan to witness and sign off on GS Yuasa's battery-certification tests.

"It would be virtually impossible to keep up with industry" without this extensive delegation of oversight to the manufacturer, said Dorenda Baker, director of the FAA's national aircraft-certification unit.

The revelations came on the second day of an investigative hearing in Washington, D.C. The inquiry arose out of a battery fire on a 787 parked at Boston's Logan International Airport in January, and an incident a week later when a smoldering battery in-flight forced an emergency landing and slide evacuation in Japan.

The FAA subsequently grounded the Dreamliner — a directive lifted only this week after three months of paralyzed airplanes.

A detailed analysis of the safety risks of the new battery system was required to prepare for certification, and company officials described it as a collaborative effort.

Boeing identified the potential impact of anything going wrong at the airplane level, and the suppliers assessed the risks of their particular pieces going wrong.

"Every step of the way, safety reviews were held by all parties," said Thales program manager Sandra Voglino.

Those efforts — “top down and bottom up,” in Hulm’s words — combined to create projections that, for example, a battery wouldn’t create a smoke hazard more than once in 10 million flight hours. Though approved by the FAA, that assessment didn’t pan out in service. Yet Hulm believes the process wasn’t flawed.

“I don’t know, except for 20/20 hindsight, what we could have done differently,” he said.

The testing needed to win certification was also developed and carried out in close collaboration. “Many of the suppliers are in-house, sitting across the row from our engineers,” Hulm said.

Queste emphasized that Thales is “in permanent contact with Boeing, GS Yuasa and Securaplane,” the maker of the battery charger.

Interviewed by phone after the hearing, NTSB chairman Deborah Hersman said that her team has recently visited Thales in France and will go to Japan to visit GS Yuasa.

She said she hopes to publish a final report by year end that will reach conclusions about whether all the parties to the 787 battery system certification — including “at the regulator, contractor and subcontractor levels” — had the necessary resources and expertise to do the job.

Hersman seems determined to push hard for answers. At one point in Wednesday’s hearing, a Boeing lawyer objected to the direction of the panel’s questioning, which he characterized as speculation that the cause of the January battery incidents was a “design defect.”

Hersman politely acknowledged his point, then resumed the line of questioning.

Dominic Gates: (206) 464-2963 or dgates@seattletimes.com; on Twitter: @dominicgates.

Appendix 6: FAA Office of Inspector General Audit Report

Report Number: AV-2016-001 Date Issued: October 15, 2015

Office of Inspector General

Audit Report

FAA LACKS AN EFFECTIVE STAFFING MODEL AND RISK- BASED OVERSIGHT PROCESS FOR ORGANIZATION DESIGNATION AUTHORIZATION

Federal Aviation Administration

Report Number: AV-2016-001 Date Issued: October 15, 2015

Memorandum

U.S. Department of Transportation

Office of the Secretary of Transportation

Office of Inspector General

Subject:	**ACTION:** FAA Lacks an Effective Staffing Model and Risk-Based Oversight Process for Organization Designation Authorization Federal Aviation Administration Report Number AV-2016-001	Date:	October 15, 2015
From:	Matthew E. Hampton Assistant Inspector General for Aviation Audits	Reply to Attn. of:	JA-10
To:	Federal Aviation Administrator		

The U.S. civil aviation industry is vital to the Nation's economy and encompasses more than 200,000 aircraft, 1,600 approved manufacturers, and 5,400 aircraft operators, among others. Recognizing that it is not possible for Federal Aviation Administration (FAA) employees to

oversee every facet of such a large industry, public law[25] allows FAA to delegate certain functions, such as approving new aircraft designs and certifying aircraft components, to private individuals or organizations. Designees perform a substantial amount of critical work on FAA's behalf. For example, one aircraft manufacturer approved about 90 percent of the design decisions for all of its own aircraft.

FAA created the Organization Designation Authorization (ODA) program in 2005 to standardize its oversight of organizations (e.g., manufacturers) that are approved to perform certain functions on its behalf. In June 2011, we reported[26] that FAA needed to improve its oversight of the ODA program, including better monitoring of ODA personnel and training of FAA engineers. Since then, the ODA program has continued to evolve. Currently, there are approximately 80 delegated authorities that approve work for FAA at airlines, aircraft manufacturers, and repair facilities. In May 2012, a joint Government-industry report recommended that FAA expand and fully use the program to help manage its workload and keep pace with emerging aviation technologies that require certification.[27]

Representative Peter DeFazio requested that we review FAA's staffing and oversight of the ODA program's delegated organizations. In particular, Representative DeFazio expressed concerns as to whether FAA has the resources and risk-based tools in place to provide effective oversight of the ODA program. Accordingly, our audit objectives were to assess FAA's (1) process for determining staffing levels needed to conduct ODA oversight and (2) oversight of delegated organizations' program controls.

We conducted our work in accordance with generally accepted Government auditing standards. Exhibit A details our scope and methodology, and exhibit B lists the organizations we visited or contacted.

Results in Brief

FAA lacks a comprehensive process for determining staffing levels needed to provide ODA oversight. Although the Agency uses a staffing model to aid in identifying staffing needs, the model does not yet include detailed ODA data on important workload drivers such as a company's size and location, type of work performed, past performance, and project complexity and volume. Additionally, although FAA uses the model to help determine overall staffing needs, the Agency does not use it to forecast staffing needs at the field certification office and oversight team levels. Instead, a committee of managers allocates staffing using the model's overall results, which are based on average amount of time spent on ODA oversight regardless of company size, and a discussion of individual office needs. Without a comprehensive, data-driven

[25] 49 U.S.C § 44702 (d).

[26] FAA Needs To Strengthen Its Risk Assessment and Oversight Approach for Organization Designation Authorization and Risk-Based Resource Targeting Programs (OIG Report No. AV-2011-136), June 29, 2011. OIG reports are available on our Web site at http://www.oig.dot.gov/.

[27] 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.

approach, FAA cannot be assured that it has the right number of people in the right places to effectively oversee the ODA program.

FAA's oversight of ODA program controls is not systems- and risk-based[28] as recommended by an aviation rulemaking committee.[29] Instead, in planning and performing oversight, FAA certification offices use minimum requirements in program guidance, primarily a checklist completed annually and a biennial audit. FAA's current guidance provides little direction as to how to accomplish the checklist and does not provide details on how to shift from a focus on individual projects and company personnel to overseeing processes and systems. For example, one checklist item directs FAA team members to review changes to FAA regulations and policies with ODA personnel rather than assess the company's overall system and processes for providing personnel this information. Further, FAA has not provided oversight teams with tools or guidance on data they should use to identify highest risk areas. As a result, FAA's oversight is not data-driven and fully targeted toward the areas of highest risk. Another gap in FAA's oversight pertains to companies that produce and supply components to other manufacturers. FAA performed oversight of only 4 percent of personnel conducting certification work on FAA's behalf at suppliers in fiscal year 2014. Recognizing the need to improve its oversight, FAA is developing a new ODA oversight process, but it will not be implemented until 2016 at the earliest.

We are making recommendations to improve FAA's staffing and oversight of the ODA program.

Background

Since 1956, FAA has developed various forms of organizational delegation to meet specific needs. FAA created the ODA program in 2005 to standardize its oversight of organizational designees[30]. The program was fully implemented in November 2009 when FAA required all delegated organizations to transition to FAA's new ODA policy. Figure 1 illustrates the development and evolution of organizational delegation since the inception of the program.

[28] Systems-based oversight shifts from focusing on individual project engineering work to holistically assessing whether ODA companies have the people, processes, procedures, and facilities in place to produce safe products, thus allowing FAA to focus its oversight on the highest risk areas, such as new, innovative aircraft designs.

[29] Aircraft Certification Process Review and Reform (ACPRR) Aviation Rulemaking Committee, a joint FAA and industry group, formed in response to a congressional mandate to study the aircraft certification process.

[30] Organizational designees are companies (e.g., aircraft manufacturers) that FAA has approved to perform certain functions on its behalf, such as determining compliance with aircraft certification regulations. The organization is responsible for overseeing the employees who perform the delegated functions.

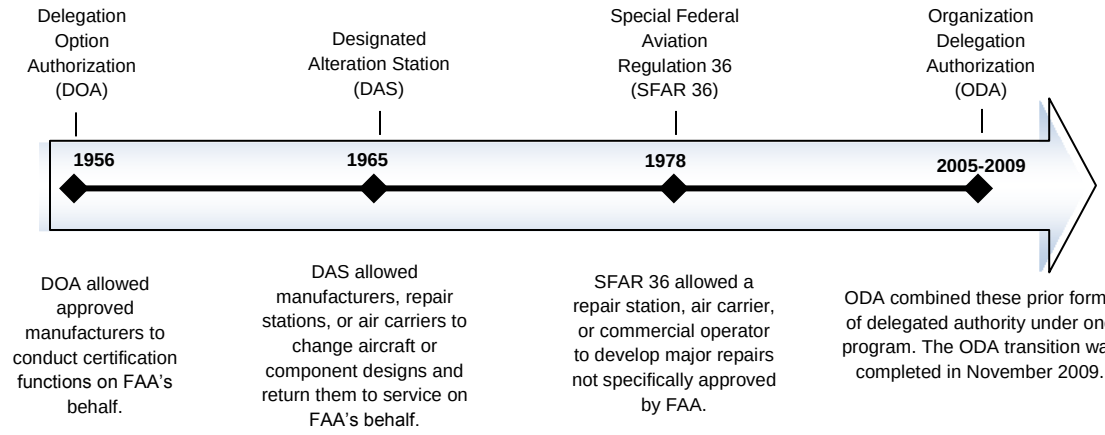

Figure 1. Development of Organizational Delegation

Source: OIG analysis of FAA documents.

To oversee a diverse aviation manufacturing industry, FAA employs about 700 engineers and 250 inspectors in over 30 certification offices across the country, who are responsible for overseeing over 1,600 manufacturers, about 80 of which are ODAs.[31]

Only one ODA company, Boeing, has a dedicated oversight office due to its high level of project volume and complexity, with the remaining ODAs overseen by engineers and inspectors in Aircraft Certification Offices and Manufacturing Inspection District Offices. These team members are not dedicated to ODA oversight and may be responsible for overseeing more than one ODA company as well as other certification and manufacturing activities, such as individual designees[32] and proposed certification projects for companies that do not participate in the program.

FAA Lacks a Comprehensive Process for Determining Adequate Staffing Levels for Effective ODA Oversight

FAA uses a model, known as the Aviation Safety Staffing Tool and Reporting System, to identify staffing needs for making budget requests. However, the current model does not have detailed ODA data, is not used to forecast staffing needs at the field office level, and does not include the staffing needs for the largest field office, which is dedicated to providing oversight for Boeing. Instead, a committee of managers[33] allocates staff to directorates[34] using the model's

[31] There are eight types of ODA programs. The focus of our audit was on FAA offices that oversee delegated organizations that manufacture aircraft (production certification), approve new aircraft designs (type certification), and changes to existing designs (supplemental type certificates).

[32] Private individuals authorized by FAA to perform certain functions on its behalf such as determining compliance with aircraft certification regulations.

[33] The Aircraft Certification Management Team consists of the Director and Deputy Director of the Aircraft Certification Service, and the four directorate managers, and representatives from the Design, Manufacturing and Airworthiness Division, International Policy Office, and the Planning and Program Management Division.

overall results, which are based on the average amount of time spent on oversight, and their technical knowledge of individual field office needs.

According to FAA, Agency managers base specific office- and team-level staffing decisions for ODA oversight on a company's size and location, type of work performed, past performance, and project complexity and volume rather than the staffing model results because the model does not include these factors. FAA managers at two of six offices expressed concerns that there are not enough labor distribution codes to adequately reflect all of their specific workload drivers, such as time spent on other certification activities versus ODA oversight. This can hinder FAA's ability to accurately forecast future staffing needs and respond to changing workload demands. As a result, all ODAs, regardless of size and complexity, are treated equally in FAA's staffing model. According to FAA, the Agency is continuing to work on developing staffing standards to more effectively perform ODA oversight.

In addition to the lack of detailed ODA data on workload drivers, FAA only uses the model to project staffing needs nationally and by directorate rather than at the office and ODA team level. Although FAA added a feature to the model in December 2014 that offers office-level forecasts for aircraft certification offices, the Agency currently does not use this feature and relies on directorate managers to make office-level staffing decisions, sharing resources when needed. In addition, FAA does not use this information to staff ODA oversight teams within offices because the model is based only on an average amount of time spent on oversight, and there are disparities between large and small ODAs. The lack of office- and oversight team-level model results may lead to missed opportunities to identify potential staffing shortages at individual offices. For example, team leaders at four of the six oversight offices we reviewed expressed concern with staffing levels and a backlog of projects awaiting approval. It is uncertain when and if the new feature will help office managers better determine their needs when making staffing decisions.

While sharing resources can be an efficient option to help address staffing shortages, the process can be cumbersome, time consuming, and does not assure each office will have the staffing it needs. At one office, an FAA manager requested additional staff but was denied and directed to negotiate an agreement with another office to share resources. It took about 6 months to establish an initial agreement—and the agreement will offer only limited additional oversight coverage because it only includes oversight visits to one geographic area near the company's main facility.

Finally, the largest ODA oversight office—which is dedicated to Boeing and encompasses about 40 staff—is not currently included in FAA's staffing model. A key FAA manager responsible for developing the Agency's aviation safety budget requests told us that FAA did not include this office initially because Boeing is a large and unique organization, and the Agency wanted to improve other parts of the model before adding it. FAA expects to add this office to

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[34] FAA's Aircraft Certification Service has four directorates: the Transport Airplane Directorate in Renton, Washington; the Rotorcraft Directorate in Fort Worth, Texas; the Small Airplane Directorate in Kansas City, Missouri; and the Engine and Propeller Directorate in Burlington, Massachusetts.

the model by October 2015 and have an initial forecast available by fiscal year 2016. Until then, FAA does not know whether it has adequate staffing levels needed to meet workload requirements at the largest ODA oversight office or how the inclusion of its largest office will impact overall staffing numbers.

FAA's Oversight of ODA Program Controls is Not Systems- or Risk-Based

FAA's ODA oversight has evolved since the program was implemented in 2009, but it is not systems- and risk-based, which FAA and industry agree are key attributes for effective oversight of this complex program. Systems-based oversight requires a shift from focusing on individual projects to holistically assessing whether ODA companies have the people, processes, procedures, and facilities in place to produce safe products, thus allowing FAA to focus its oversight on the highest risk areas, such as new, innovative aircraft designs. Although FAA has revised its ODA guidance twice, engineers and inspectors still do not have sufficient guidance and risk-based tools to meet program requirements and focus on highest risk areas. Further, FAA has not provided sufficient oversight of ODA personnel performing work on FAA's behalf at manufacturing suppliers and offsite facilities. Recognizing that transitioning to a risk-based oversight process is a cultural shift, FAA is developing a new oversight system for the ODA program.

FAA's ODA Oversight Process Does Not Use a Risk-Based Approach

FAA has established two types of oversight—an 18-item supervisory checklist[35] required annually and a team audit[36] required every 2 years. However, inspectors and engineers are not fully performing systems- and risk-based oversight of ODA controls due to the lack of adequate guidance, risk-based tools, and robust data analyses. Instead, FAA oversight focuses on meeting the minimum ODA oversight requirements by completing the checklist items annually and the biennial audits.

As a result, ODA oversight team findings are often not related to high-risk issues—e.g., issues that could directly impact the potential loss of critical systems or other safety concerns. Our review of the biennial team audits conducted by FAA in fiscal years 2013 and 2014 at five ODAs found that roughly half of the 123 findings were minor issues (i.e., paperwork errors). For example, FAA found that a company was using its marketing name rather than its official name on a technical document.

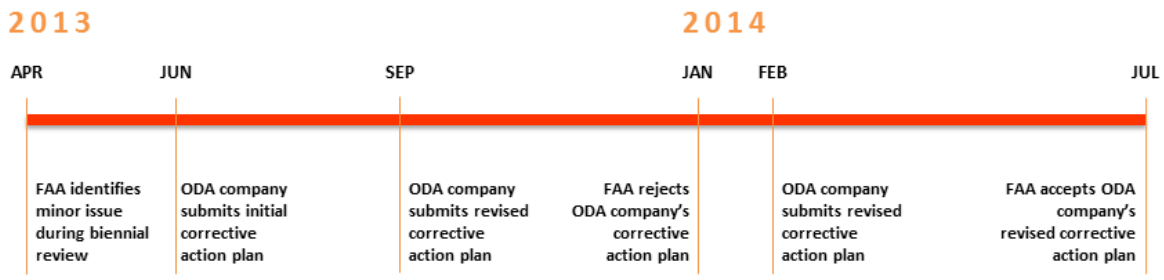
Similarly, during our review, industry representatives expressed concern that FAA's focus was often on paperwork, not on safety-critical items. For example, in reviewing airworthiness certificates as part of annual oversight, one FAA manufacturing inspector cited an aircraft manufacturer for incorrectly including the company name with the aircraft model number rather than *only* the aircraft model number as specified on the form. While the inspector was

[35] Annual supervision record.

[36] Delegated Organization Inspection Program (DOIP).

technically correct, the event went through the Letter of Investigation process, which requires documented corrective action. In another example, during a biennial review of an ODA company, FAA found a project folder that contained informal notes attached that should have been removed before the files were finalized and closed. It took over a year for the ODA company and FAA to resolve this minor issue, as shown in figure 2.

Figure 2. Timeline for FAA To Resolve Minor Issue With ODA Company Project Files



Source: OIG analysis of FAA documents.

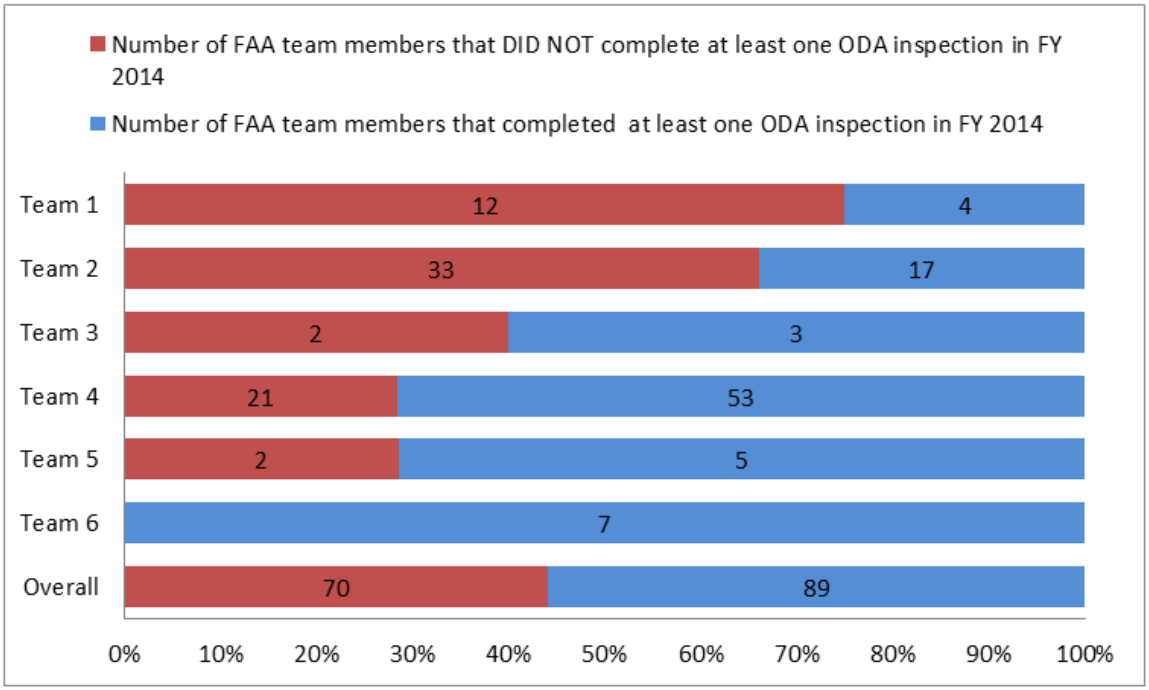
Furthermore, FAA has yet to fully transition to systems-based oversight, which industry experts agree is a more effective approach to overseeing the ODA program. In May 2012, an aircraft certification rulemaking committee reported that FAA's slow shift to a systems-based approach to certification is limiting the Agency's ability to realize the key benefits of ODA—i.e., to improve the efficiency and lower the cost of certification processes. According to industry representatives, a systems-based approach should include robust safety oversight of authorized organizations with direct FAA involvement in critical projects that include novel aspects of certification, such as new types of aircraft or components. According to FAA, this approach should also focus oversight on areas where the ODA company is not experienced or proficient. Industry officials further stated that success in this effort requires effective implementation of a risk-based approach to better use industry and governmental resources.

FAA Guidance Is Not Sufficient To Ensure Engineers and Inspectors Meet Requirements and Focus on Risk

FAA guidance provides little direction as to how engineers and inspectors should complete their ODA oversight checklist and lacks a focus on risk. Most checklist items are focused on activities of individual company personnel rather than overseeing the ODA system. For example, one checklist item directs FAA inspectors and engineers to review and discuss changes in FAA regulations and policies with ODA personnel. In contrast, FAA has established risk-based tools on the manufacturing side for identifying high-risk areas and determining the FAA involvement level for non-ODA holders. However, no such tools currently exist for ODA oversight.

We also determined that 70 of 159 (44 percent) FAA inspectors and engineers on the 6 ODA oversight teams we reviewed did not complete the minimum required number of inspections in fiscal year 2014 (see figure 3).

Figure 3. Number of Completed and Non-Completed Inspections



Source: OIG analysis of FAA data.

According to FAA officials from the ODA policy office, each ODA team member is required to complete at least one checklist item annually. However, ODA team members we spoke to were confused about this requirement. FAA guidance states that each team member must evaluate each of the items applicable to their technical discipline/specialty area. However, FAA teams were interpreting Agency guidance to mean that their team only needed to complete one inspection for each technical specialty their team covered (e.g., one inspection related to flight testing), rather than completing one inspection per team member.

FAA also does not provide guidance regarding how many and which ODA employees are selected as part of their oversight reviews. FAA engineers and inspectors no longer have to provide oversight of every person performing work on FAA's behalf because it is now the responsibility of the ODA company to review the work of each individual. FAA team members may target areas based on their assessment of safety risk and past performance, or randomly select ODA company personnel for oversight. However, the Agency does not provide guidance on an appropriate sampling method or what factors should be considered (e.g., project activity or complexity) in evaluating the level of oversight for personnel performing work on FAA's behalf. One inspector responsible for oversight of nearly 400 manufacturing personnel performing work on FAA's behalf reviewed the work of only 9 personnel during fiscal year 2014. According to OIG's statistician, an appropriate sample would include almost 60 personnel[37]. The inspector

[37] To achieve a confidence level of 90 percent with a precision of plus or minus 10 percent.

stated that the small sample size was chosen in part due to resource and travel constraints rather than statistical reliability.

Further, in sampling ODA company personnel, FAA was not using a risk-based approach to select personnel for oversight. For example, at the four ODA companies we reviewed that certified aircraft or engines, FAA was not maintaining data that would allow it to target oversight on personnel who were authorized to issue airworthiness certifications, a critical last step before releasing an aircraft for flight.

FAA Is Not Performing Adequate Data Analyses Needed to Target High-Risk Areas for Oversight

FAA has not provided guidance on the data ODA teams should be reviewing to identify higher risk areas. Instead, FAA's policy only provides general guidance for ODA team members to consider quality of past work or previously identified problems that occurred on aircraft in operation. As a result, at the six oversight offices we visited, only one was using data to plan and perform inspections. However, this office has had to develop a data-analysis system on its own due to the lack of Agency guidance and is only in the initial stages of this effort.

While FAA collects and analyzes data from biennial audits at the national level and issues a report annually[38],the analyses do not provide ODA team members with adequate information to target their oversight. It does not include all work they perform, such as annual oversight findings. Additionally, the analysis lacks detail to aid in targeting high-risk areas for oversight. For example, FAA determines the total number of discrepancies identified in procedures manuals, but does not specifically categorize the types of discrepancies or prioritize their significance. In addition, although FAA's annual report stated that FAA will disseminate the results and recommendations to the workforce, the ODA teams we met with were not using the information.

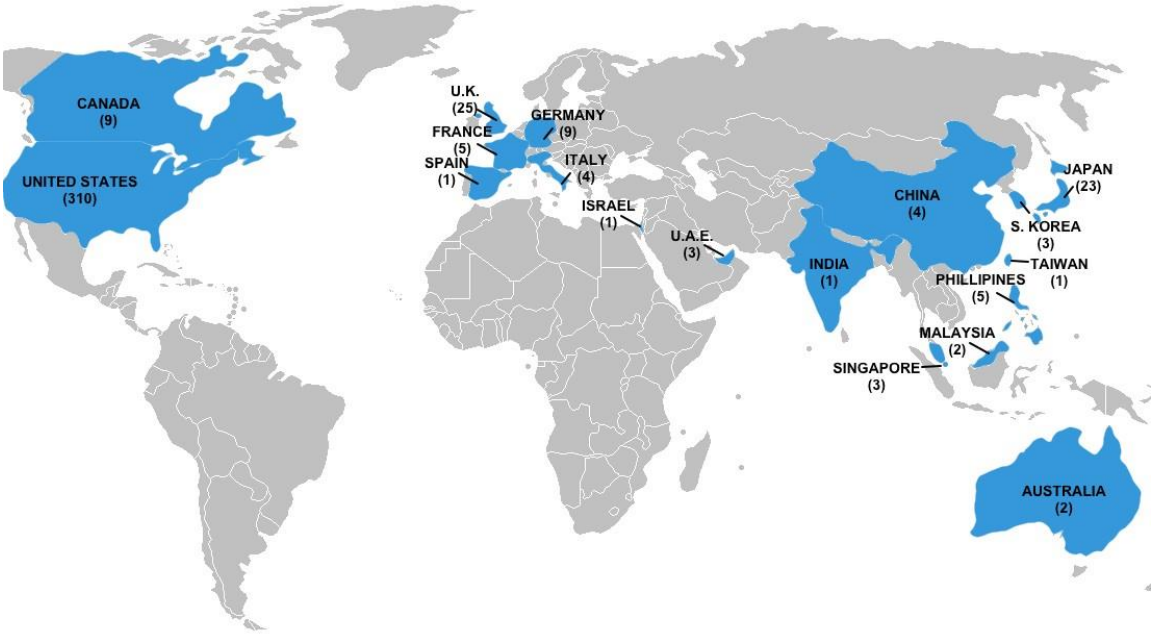
Further, FAA oversight offices we reviewed were not consistently using ODA company self-audits to target their oversight. FAA requires companies to perform self-audits and provide the results to the Agency. Self-audits can contain useful information that could point to a need for additional oversight. For example, four company self-audits we reviewed identified employee concerns about undue pressure, which could lead to rushing safety-critical tasks to meet production schedules. Although FAA guidance states that FAA teams must review self-audit reports for possible trends, the extent and process used for this review differed among the offices we reviewed. As a result, FAA is missing an important opportunity to target higher risk areas for enhanced oversight and improve ODA company processes.

Gaps Exist in ODA Oversight at Suppliers and Other Locations

[38] The Office of Aviation Safety (AVS) Organization Designation Authorization (ODA) System Evaluation Report is issued annually.

ODA companies often rely on external suppliers—firms that produce and supply components to other manufacturers—and facilities located away from their main facility to support manufacturing activities. As shown in Figure 4, 411 company personnel perform work on FAA's behalf, located at suppliers, with 101 of those based in foreign countries.

Figure 4. ODA Employees at Supplier Locations



Source: OIG analysis of six ODA companies reviewed.

However, as shown in Table 1, FAA only performed oversight of 4 percent of these company personnel who perform work on FAA's behalf, exclusively at domestic locations. This leaves a critical portion of ODA work without FAA oversight.

Table 1. FAA Oversight of ODA Personnel at Suppliers

ODA Company	ODA Personnel at Suppliers	Personnel Reviewed
1	257	16
2	118	0
3	24	0
4	6	0
5	6	0
6	0	0

ODA Company	ODA Personnel at Suppliers	Personnel Reviewed
Total	411	16

Source: OIG analysis of FAA records.

Oversight of suppliers is critical because suppliers often provide major aircraft components to ODA companies. For example, the ODA company personnel on site at a supplier that builds fuselages for one aircraft type did not receive any ODA-related oversight by FAA team members during fiscal year 2014.

For international locations, it is unclear if and how FAA will conduct ODA oversight. FAA has a pilot initiative underway to oversee priority international suppliers by a dedicated team of Agency inspectors located across the country. These inspectors will travel overseas to review the priority international suppliers with an occasional follow-up for corrective action compliance. However, according to an FAA official, the Agency determined early on that this concept would not include oversight of ODA functions at international locations.

Recognizing the need to enhance ODA oversight at supplier facilities, one office we reviewed has reached an agreement for another office to provide additional oversight of ODA personnel located at suppliers. However, the agreement is not comprehensive as it will only include company personnel at domestic suppliers and ones near the company's main facilities. It will not be until fiscal year 2016 that FAA will add more locations and key offsite facilities.

Moreover, it is uncertain whether the new agreement will be effective because FAA's ODA oversight office is relying on the manufacturing oversight office to identify risks, which may not necessarily apply to ODA activities. For example, ODA activities do not take place at certain facilities at all times. While there is a formal process on the manufacturing side to hand off inspection work to other FAA offices, no such corresponding process exists for ODA oversight. FAA's current guidance only provides an expectation that oversight teams should coordinate with other offices as needed. According to FAA officials, other agreements with different organizations will be required to include domestic suppliers outside of the local geographic area and international suppliers.

Transitioning to a Risk-Based Oversight Process Presents Cultural Challenges and Paradigm Shifts

Oversight of ODA represents a major cultural shift in the way FAA inspectors and engineers perform their work, from overseeing individual designees and performing project engineering work to overseeing organizations performing the work on FAA's behalf. In our June 2011 report, we recommended FAA provide training on ODA's new enforcement requirements. While most team members have now received this training, FAA officials told us problems still exist. For example, during site visits to offices to review ODA oversight practices, FAA has identified issues such as the perceived inability to impose penalties and resolve disagreements between FAA management and oversight teams. FAA policy officials also discovered that the two offices

they have visited thus far are not fully using a systems approach and barriers such as policy and training gaps exist.

Recognizing the need to improve its oversight, FAA policy officials stated that the Agency is developing a new oversight process that will represent a significant change in its approach, including identifying system elements and developing new evaluation criteria. FAA is prototyping the new process in one oversight office, but it will not be implemented until 2016 at the earliest. In addition, in response to recommendations from the aircraft certification rulemaking committee regarding a continued lack of audit skills among ODA staff, the Agency began offering additional training in December 2014. This should assist team members in transitioning from direct project involvement to a more systems- and risk-based oversight model.

Conclusion

The aviation industry is critical to our Nation's economy, and an efficient certification process enables aircraft manufacturers and others in the industry to quickly introduce new equipment and technology into the marketplace. Delegation is an essential part of meeting FAA's certification goals. However, robust FAA oversight that is systems-based and targeted to high-risk areas is necessary to ensure that ODA companies maintain high standards and comply with FAA safety regulations. Shifting to an oversight approach that is systems- and risk- based will take time and require sustained management attention. Ensuring adequate staffing levels and providing inspectors and engineers with the necessary guidance and tools will be key to successfully transitioning to a new oversight approach. Unless FAA leverages available tools such as company self-audits and FAA assessment results to target its oversight, the Agency cannot increase efficiency while closely monitoring the highest-risk areas of aircraft certification.

Recommendations

To enhance the effectiveness of FAA's oversight of ODA, we recommend the Agency:

1. Determine what additional model inputs and labor distribution codes are needed to identify ODA oversight staffing needs and report the results to the Aircraft Certification Management Team.
2. Develop a process to assess the model results at the office level for potential staffing shortages, determine the validity of the results, and include in a regular written report to the Aircraft Certification Management Team.
3. Develop and implement system-based evaluation criteria and risk-based tools to aid ODA team members in targeting their oversight.
4. Clarify guidance to ODA oversight staff on the minimum oversight requirements for each oversight team member.
5. Provide guidance on data that ODA team members should be analyzing on an ongoing basis, enhance its national summary of biennial audit results to include more specificity, and disseminate it to ODA teams to use in planning their oversight.

6. Clarify guidance to engineers and inspectors on actions to take in response to self-audits and develop a process to validate that the audits are being used to identify trends that warrant a need for oversight.
7. Provide guidance on the level of sampling required to achieve effective oversight of ODA company personnel performing key aircraft certification functions, and issue sampling guidance to field offices.
8. Develop agreements and a process for sharing resources to assure that ODA personnel performing certification and inspection work at supplier and company facilities receive adequate oversight.
9. Require annual assessments of audit training provided to ODA oversight personnel for effectiveness and report the results of the assessment on an annual basis to the Aircraft Certification Management Team.

Agency Comments and Office of Inspector General Response

We provided FAA a copy of our draft report on August 26, 2015, and received its response on September 24, 2015, which is attached as an appendix to this report. FAA concurred with recommendations 1, 2, 3, 4, 6, and 9 as written and provided appropriate target action dates. Based on FAA's response, we consider these six recommendations resolved but open pending completion of planned actions.

FAA partially concurred with recommendations 5, 7, and 8. FAA officials stated that they agreed with the intent of the recommendations but requested we make clarifying changes, as detailed in the Agency's response. However, FAA did not provide its rationale for the requested changes or describe its planned alternative courses of action to address our findings. In addition, requested changes to recommendations 5 and 7 do not fully meet the intent of our recommendations. For recommendation 5, FAA removed a key part related to enhancing its national audit results summary report. For recommendation 7, FAA changed our reference to effective oversight from ODA company personnel to certification functions. We require further details from FAA on recommendation 8 to determine whether FAA's changes still meet the intent of the recommendation. As a result, recommendations 5, 7, and 8 will remain open and unresolved pending receipt and review of additional information from FAA.

Actions Required

We consider recommendations 1, 2, 3, 4, 6, and 9 resolved but open pending completion of planned actions. For recommendations 5, 7, and 8 we request that FAA provide its rationale and planned alternative actions for our consideration. In accordance with Department of Transportation Order 8000.1C, we request FAA provide this information within 30 calendar days of the date of this report. Until then, we consider recommendations 5, 7, and 8 open and unresolved.

We appreciate the courtesies and cooperation of FAA representatives during this audit. If you have any questions concerning this report, please call me at

(202) 366-0500 or Robin P. Koch, Program Director, at (404) 562-3770.

cc: DOT Audit Liaison, M-1 FAA Audit Liaison, AAE-100

Agency Comments

Federal Aviation Administration

Memorandum

Date: September 24, 2015

To: Matthew E. Hampton, Assistant Inspector General for Aviation Audits From: H. Clayton Foushee, Director, Office of Audit and Evaluation, AAE-1

Subject: Federal Aviation Administration's (FAA) Response to Office of Inspector General (OIG) Draft Report: FAA Oversight of Organization Designation Authorization (ODA)

The ODA program is vital in accomplishing required FAA certification approvals for U.S. aircraft, powerplant, and component manufacturers, as well as for numerous other applicants required to achieve FAA approval of aircraft modifications and repairs. Since the program was first introduced in 2009, FAA has continued to evolve the ODA program, and without it, U.S. aircraft production and repair activities would be unacceptably delayed. The Agency is committed to continuously enhancing its oversight of the program, but the ever expanding magnitude of the U.S. aerospace industry requires that the Agency delegate an increasing number of oversight functions through the ODA program. The FAA is currently implementing policy and training improvements that will enhance ODA oversight. These changes include a greater emphasis upon risk-based approaches to the surveillance of ODA holders, which will result in better utilization of FAA inspector resources and more effective oversight.

The FAA has reviewed the draft report and offers the following comments in response to the OIG's findings and recommendations:

1. The FAA continues to address ODA program recommendations developed in response to the FAA Modernization and Reform Act of 2012 (P.L. 112-95). These

activities focus on a systems approach to oversight of ODA, including the use of risk-based tools and improvements in oversight and auditing training.

2. The next significant change to ODA oversight policy will incorporate a risk-based systems oversight approach and will serve as the basis for future systems-based FAA certification process improvements.

The FAA concurs with OIG recommendations 1, 2, 3, 4, 6, and 9, as written, and partially concurs with recommendations 5, 7, and 8. With regard to the latter three recommendations, the Agency agrees with the apparent intent of those recommendations and suggests the following word changes for clarification. With these clarifications for recommendations 5, 7, and 8, the Agency would fully concur with all recommendations.

1. Recommendation 5: Provide guidance on data that ODA team members should be analyzing on an ongoing basis, disseminate its national summary of biennial audit results to ODA teams for their consideration in audit planning.
2. Recommendation 7: Provide guidance on the level of review required to achieve effective oversight of ODA performance of key aircraft certification functions.
3. Recommendation 8: Develop agreements and a process for sharing resources to assure adequate oversight of ODA activities at supplier and company facilities.

The FAA plans to complete action on recommendation 4 by December 31, 2015; recommendations 5 and 8 by March 31, 2016; and recommendations 1, 2, 6 and 7 by August 31, 2016. For recommendation 9, FAA has recently implemented a new audit skills training curriculum and will have sufficient data to complete its first annual assessment by December 31, 2016. Recommendation 3 will require significant changes in ODA oversight guidance resulting in a revision to ODA Order 8100.15, and will be completed by March 31, 2017.

We appreciate this opportunity to offer additional perspectives on the draft report. Please contact H. Clayton Foushee at (202) 267-9000 if you have any questions or require additional information about these comments.

Appendix 7 : White Paper – Incentivizing Compliance-Achieving Compliance with Airworthiness Standards

ACHIEVING·COMPLIANCE·WITH·AIRWORTHINESS·STANDARDS¶

SUMMARY¶

The·current·type·certification·(TC)·process·incentivizes·holders·to·develop·designs·that·are·not·fully·compliant·with·airworthiness·standards·or·for·which·such·compliance·is·not·appropriately·substantiated.·Unless·a·design·creates·an·unsafe·condition,·holders·usually·have·no·obligation·to·correct·non-compliances,·and·it's·faster·and·cheaper·to·develop·designs·if·compliance·is·not·a·priority.··This·paper·proposes·two·ways·to·encourage·greater·compliance·and·substantiation.··First,·the·Federal·Aviation·Administration·(FAA)·has·effective·regulatory·tools·it·can·use·to·rebalance·incentives·during·the·design·phase·to·support·greater·compliance,·and·second·the·FAA·can·engage·in·Part·21·rulemaking·to·change·the·certification·process·to·enhance·compliance·and·substantiation.¶

PROBLEM¶

The·FAA's·authority·to·issue·type·certificates·approving·aircraft·designs·is·found·in·49·U.S.C.·§·44704.·For·this·discussion,·there·are·two·important·points·about·this·statute.·First,·while·the·FAA·has·authority·to·delegate·its·approval·authority·to·designees·who·act·as·our·agents[1],·we·do·not·have·authority·to·authorize·private·entities·to·approve·designs·independently;·Congress·gave·this·authority·exclusively·to·the·FAA.··Second,·the·statute·limits·the·circumstances·under·which·the·FAA·can·exercise·this·authority·to·"when·the·Administrator·finds·that·the·aircraft·…·meets·the·regulations·and·minimum·standards·prescribed·under·section·44701(a)·of·this·title."·Despite·this·restriction·on·our·authority,·we·often·do,·in·fact,·unknowingly·approve·designs·that·do·not·comply·with·these·"minimum·standards·required·in·the·interest·of·safety"[2]·and·become·aware·of·the·non-compliance·only·post-certification.¶

For·safety-related·non-compliant·conditions,·14·C.F.R.§°21.99·requires·TC·holders·develop·design·changes·to·support·airworthiness·directives.··But·for·all·other·non-compliant·conditions,·Aircraft·Certification·Service·(AIR)·practice·permits·continued·delivery·of·airplanes·without·obtaining·binding·commitments·to·correct·the·non-compliant·condition.·¶

This·occurs,·in·part,·because·the·requirements·for·obtaining·a·design·approval[3]·do·not·match·the·requirements·for·obtaining·an·airworthiness·approval.[4]··Applicants·for·design·approvals·must·show·compliance·with·airworthiness·requirements,·but·airworthiness·approvals·only·require·the·applicant·to·show·that·the·product·conforms·to·its·approved·type·design·and·is·in·condition·for·safe·operation.··Thus,·while·the·airworthiness·approval·assumes·that·a·non-compliant·design·would·not·receive·a·TC,·this·assumption·is·incorrect·and,·as·a·result,·airworthiness·certificates·are·approved·despite·a·significant·number·of·non-compliances·with·airworthiness·standards.¶

¶

[1]·49·U.S.C.·44702(d).¶

[2]·49·U.S.C.·44701(a)(1)¶

[3]·See·14·C.F.R.§§·21.21·and·21.97.¶

[4]·See·14·C.F.R.§§·21.183·and·21.329.¶

1¶

This is particularly true for new aircraft programs. For example, Attachment 1 shows a significant spike in non-compliances (98) for the Boeing Model 787 in 2011, which is the year its original TC was issued. That same year also shows a significant spike in non-compliances (24) for the Boeing Model 747 when the Model 747-8 was TC'd. ¶

These spikes most likely are attributable in part to the applicant/holder's commercial interest in developing safe (perhaps only minimally safe) but potentially non-compliant and under-substantiated designs because fully compliant and substantiated designs require more time and resources to develop. These spikes may also result, in part, from the time pressures associated with launching new aircraft programs and a lack of robustness in compliance systems. Accordingly, to successfully mitigate market pressures and to achieve greater compliance and substantiation, the FAA would need to change its TC processes and practices. ¶

Current FAA processes also raise significant issues of compliance with U.S. treaty obligations under the Chicago Convention and with International Civil Aviation Organization (ICAO) requirements[5] because the FAA is not requiring these non-compliances to be identified on export certificates of airworthiness and accepted by the importing state. ¶

2009 REGULATORY RESPONSE ¶

The FAA attempted to address this issue by regulation (Amendment 21-92) in 2009 with the adoption of 14 C.F.R § 21.20, which requires that applicants for TCs (including amended or supplemental TCs) ¶

(i) → show compliance with applicable requirements; ¶
(ii) → provide the FAA the means by which such compliance has been shown; and ¶
(iii) → provide a statement certifying that the applicant has complied with the applicable requirements. ¶

Section 21.20 was intended to "emphasize that the applicant is responsible for satisfying all applicable requirements"[6] and "expedite the type certification approval process by ensuring that an applicant's submission package is complete prior to the FAA making the compliance determination."[7] ¶

However, the level of non-compliance shown in Attachment 1 indicates that this regulation has not achieved its intended effect, at least for holders of Organization Designation Authorizations (ODAs). There are several reasons why Section 21.20 has not been effective. First, as implemented in FAA Order 8100.15B, TC applicants are not required to provide the certifying statement of their compliance until ¶

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[5] See Chicago Convention Article 39: "Any aircraft or part thereof with respect to which there exists an international standard of airworthiness or performance, and which failed in any respect to satisfy that standard at the time of its certification, shall have endorsed on or attached to its airworthiness certificate a complete enumeration of the details in respect of which it so failed." ¶
See also ICAO Annex 8 § 1.3.1: "There shall be an approved design consisting of such drawings, specifications, reports and documentary evidence as are necessary to define the design of the aircraft and to show compliance with the design aspects of the appropriate airworthiness requirements." ¶

[6] 71 FR 58914 ¶

[7] 74 FR 53368 ¶

just before the FAA's issuance of a "certificate of completion". In practice, this leads to applicants submitting their certifying statements after all FAA compliance findings have been made.[3] This turns the intent of §°21.20 on its head because it allows the applicant to rely on the FAA's (and its designee's) findings of compliance rather than allowing the FAA to rely on the applicant's compliance certification.

Second, ODA Unit members are often not effective in identifying non-compliances because they frequently participate in developing the non-compliant design. Boeing refers to this as "wearing two hats," and supports this practice by arguing that their Unit members are the most knowledgeable of the FAA's requirements and so are able to ensure the design complies during the development process. However, even for highly qualified and ethical Unit members, this practice creates an inherent conflict of interest (COI) by having the member act as both an agent of the TC applicant and a representative of the FAA. This conflict is compounded by their supervisors also serving dual roles. This is precisely the type of COI that 14 C.F.R § 183.57(c) was intended to prohibit. Section 183.57(c) provides that "The ODA Holder must .... Ensure that no conflicting non-ODA Unit duties or other interference affects the performance of authorized functions by ODA Unit members."[4]

The Part 21 Aviation Rulemaking Committee (ARC) and its supporters within the FAA disagree with this assessment of the problem. They argue that, while compliance with airworthiness standards is the objective, failure to comply does not create safety issues as long as the resulting design does not create unsafe conditions. And even if, on rare occasions, unsafe conditions are created, our ability to identify them and address them through the issuance of airworthiness directives (ADs) is sufficiently robust that the overall level of safety is acceptable. They argue that overemphasis on ensuring compliance (both during and after the certification process) imposes unnecessary costs and inefficiencies on industry without commensurate improvements in safety.

Based on this assessment, they recommend that the FAA should remove itself, including its designees, from the certification process. Instead the FAA should rely on industry, through the establishment of certificated design organizations, which would be required to implement safety management systems (SMS), to perform all certification functions, including issuance of FAA approvals or their equivalent. The FAA's role would be to perform inherently governmental functions, such as establishing certification bases, and to oversee these organizations to ensure that their systems are effective and, if not, under

[3] See, e.g., Attachment 2, Boeing's process flow chart.

[4] On a related issue, 49 USC 44704(e) authorizes the FAA to issue certificates for "Certificated Design and Production Organizations" (CDPOs). While Congress gave the FAA authority to authorize CDPOs to "certify compliance" with applicable requirements, and authorized the FAA to rely on those certifications, it did not change the exclusive authority of the FAA to issue approvals under that section. But in 2014 the part 21 Aviation Rulemaking Committee (ARC) demanded that the FAA revise part 21 to establish certificates for "Design Organizations" (DOs) that could issue approvals without FAA involvement. See, § 6.8 of Report dated October 5, 2014. This would be contrary to Congress' express intention that the FAA retain this exclusive authority.

the·ARC's·"accountability·framework,"·to·require·corrective·action.··The·FAA·would·also·retain·its·function·of·issuing·airworthiness·directives·to·address·unsafe·conditions.¶

TWO·PHASE·PROPOSAL·TO·STRENGTHEN·COMPLIANCE·AND·SUBSTANTIATION¶

As·discussed·previously,·under·current·law·and·international·obligations,·the·FAA·does·not·have·authority·to·establish·the·system·desired·by·the·Part·21·ARC.··The·following·discussion·also·assumes·that,·as·a·matter·of·policy,·it·is·desirable·to·maintain·the·level·of·safety·provided·by·a·system·that·places·a·high·priority·on·compliance·with·airworthiness·standards·that·meet·international·standards·and·that·have·been·shown·to·be·cost-effective.··For·non-compliances·that·the·FAA·is·likely·to·determine·create·unsafe·conditions,·it's·clearly·not·in·the·TC·holder's·interest·to·submit·such·designs·because·the·FAA·can·mandate·through·an·AD·that·the·holder·address·the·unsafe·condition.··Additionally,·the·holder·may·be·subject·to·warranty·claims·and·other·customer·repercussions.··¶

For·other·non-compliances·identified·after·type·certification,·there·is·rarely·any·significant·consequence·for·the·TC·holder·once·the·non-compliance·is·identified.··Under·the·current·system,·if·any·corrective·action·is·required,·the·TC·holder·is·free·to·correct·the·non-compliance·at·its·convenience·without·threatening·delivery·schedules.··While·such·corrective·action·incurs·cost,·that's·often·preferable·to·the·cost·of·having·a·sufficiently·robust·compliance·system·to·ensure·compliance·and·potentially·delaying·the·original·certification·by·expending·the·time·and·resources·to·submit·a·compliant·design·in·the·first·place.··¶

To·achieve·a·higher·degree·of·compliance,·and·substantiation·of·compliance,·with·airworthiness·requirements,·AIR·has·to·address·the·causes·of·noncompliance·and·change·the·certification·process·to·better·encourage·applicants·to·submit·compliant·and·substantiated·designs·in·the·first·instance.··¶

AIR·could·undertake·a·two-phase·process·to·shift·applicant·incentives.··Phase·1·would·use·existing·regulatory·tools,·policies,·and·oversight·of·ODA·management·to·require·applicants·to·certify,·to·either·the·FAA·or·its·designees,·compliance·for·all·submissions·for·approval·(i.e.,·"showings").··Phase·2·would·use·the·upcoming·Part·21·rulemaking·to·develop·explicit·and·enforceable·requirements·for·applicants,·not·only·to·certify·the·compliance·of·their·submissions,·but·also·to·be·held·accountable·for·incorrect·certifications·and·to·require·corrective·action·to·remediate·non-compliant·designs.·¶

This·two-phase·approach·to·shifting·applicant·incentives·is·consistent·with·the·FAA's·Compliance·Philosophy,·which·is·premised·on·the·importance·of·ensuring·regulatory·compliance·and·certificate·holders·equating·regulatory·compliance·with·attainment·of·other·essential·business·objectives.·¶

Phase·1·—·Existing·Regulatory·Tools¶

¶

Apart·from·the·merits·of·the·Part·21·ARC's·recommendations,·from·the·high·level·of·industry's·participation·in·the·ARC,·it·may·be·inferred·that·these·recommendations·reflect·the·opinions·of·industry·leadership,·which·would·tend·to·validate·the·previous·problem·description.¶

FAA should require certifications of compliance from the applicant before the FAA or its designees review and approve submissions of design data. This places the responsibility for compliance on the applicant so that the FAA would be able to rely on these certifications and is also consistent with Congressional intent in the adoption of § 44704(e).

To achieve this objective, AIR should:

- Establish a policy that the FAA and its designees (including ODAs) will not review data submissions unless the applicant has certified that the submission complies with applicable requirements. The FAA can achieve this in the ODA context by requiring the ODA procedures manuals include such a policy. Since, in accordance with 14 C.F.R § 183.53(c)(3), the ODA procedures manual includes responsibilities for both the ODA Unit and the ODA Holder, the manual could also require that the Holder provide such certifications with every submission to the ODA Unit. Under § 183.57(a) the ODA Holder is required to comply with its procedures manual, so failure to submit such certifications would be an enforceable violation.

- Mitigate the COI for ODA Unit members by prohibiting them from performing non-ODA duties, which would be consistent with the explicit requirement of § 183.57(c).

- Require ODA Holders to perform proper root cause analyses of non-compliances and implement effective corrective actions. This would be consistent with the FAA's Safety Management System (SMS) principles, does not require rulemaking, and can be implemented through revisions to ODA procedures manuals under current regulations.[11]

To address adherence with the Chicago Convention, AIR could use its certification processes[12] to ensure that any non-compliance identified post-certification is properly and transparently addressed. The two most relevant processes are:

- The Equivalent Level of Safety (ELOS) finding - When a non-compliance is identified, AIR should make a formal finding of whether the affected design provides an ELOS and reference that finding in the Type Certificate Data Sheet (TCDS) for the affected product.

- Exemption process - If the level of safety is not equivalent, AIR can require that the TC holder petition for exemption as a condition for issuing export certificates of airworthiness. For ODA Holders, the FAA can also impose the requirement to petition for exemption through the ODA procedures manual. Based on its assessment of the non-compliance's significance to safety, AIR can issue either a time-limited exemption that requires the

[11] Boeing already performs these analyses, but according to BASOO, it typically identifies only superficial symptoms rather than root causes, and results in ineffective corrective actions such as "more training."

[12] See Attachment 3, which depicts the certification processes.

design be brought into compliance or a permanent exemption if bringing the design into compliance is not in the public interest. However, this assessment should not overly emphasize cost and thereby incentivize applicants to submit non-compliant designs that are very expensive or disruptive to correct. Rather, the exemption must be in the public interest, not just the private interests of the holder.

Phase 2 – Part 21 Rulemaking

The Part 21 ARC report is critical of the FAA's designee system:

> The current U.S. certification processes require applicants to show compliance with all applicable airworthiness requirements, then relies on FAA resources, company DERs, and ODA UMs to review and verify the applicant showing to find compliance. For every applicant action, there is a corresponding need for an FAA reaction. This "show" and "find" process is repeated for nearly every discrete individual airworthiness requirement. Consequently, this certification process can be time consuming for larger and more complex projects. (at p. 4)

However, the ARC failed to recognize that Congress provided this system to leverage FAA resources in making the necessary findings to support the TC approvals that only the FAA can issue. The ARC also failed to recognize that the quality assurance function served by designees today (although not completely successfully) is a necessary component of any effective production entity, including producers of designs. Adopting the "systems approach" recommended by the ARC would necessarily include such a quality assurance function. And, to be effective, this function would have to be insulated from the pervasive COIs that exist in the ODA system. Nevertheless, the ARC does not describe how it would achieve this independent quality assurance function, other than a general discussion of SMS that acknowledges that "SMS is not a substitute for compliance with FAA regulations[13]." And, as discussed previously, Boeing's applicant quality assurance function is not a model of effectiveness.

As a part of rulemaking to update Part 21, AIR should ensure that the "accountability framework" proposed by the Part 21 ARC establishes ways to hold TC applicants, including Design Organizations (DOs), accountable for compliance by addressing each of the proposals described in Phase 1 and condition the authority of the DO on compliance with those new requirements. Beyond that, the Part 21 rulemaking should provide enforceable requirements that allow the FAA to verify compliance and take action to ensure compliance. Because DOs would not have authority to issue their own approvals, the DOs should be required to have an effective, capable, and independent designee system with authority to verify the DOs certifications of compliance. The FAA would retain the same authority to oversee this designee system to ensure its effectiveness and to take action to correct deficiencies. Such a system would provide a meaningful "accountability framework," instead of the merely theoretical one proposed by the Part 21 ARC. Unlike the ARC's recommendations, this proposal is also consistent with ICAO Annex 19 and the FAA's own SMS principles and provides a means for reconciling the existing conflicts between the FAA's obligations and the Chicago Convention, as well as ICAO Annex 8.

[13] See Section 5.1.1 of Part 21 ARC Report

Appendix 8: FAA Office of Inspector General Audit Report

Report Number: AV-2011-136 Date Issued: June 29, 2011

Office of Inspector General

Audit Report

FAA NEEDS TO STRENGTHEN ITS RISK ASSESSMENT AND OVERSIGHT APPROACH FOR ORGANIZATION DESIGNATION AUTHORIZATION AND RISK-BASED RESOURCE TARGETING PROGRAMS

Federal Aviation Administration

Report Number: AV-2011-136 Date Issued: June 29, 2011

Memorandum

U.S. Department of Transportation

Office of the Secretary of Transportation

Office of Inspector General

Subject:	INFORMATION: FAA Needs To Strengthen Its Risk Assessment and Oversight Approach for Organization Designation Authorization and Risk-Based Resource Targeting Programs Federal Aviation Administration Report Number AV-2011-136	Date:	June 29, 2011
From:	Jeffrey B. Guzzetti Assistant Inspector General for Aviation and Special Program Audits	Reply to Attn. of:	JA-10

Jeffrey B. Guzzetti

To: Federal Aviation Administrator

The Federal Aviation Administration (FAA) is responsible for overseeing numerous aviation activities designed to ensure the safety of the flying public. Recognizing that it is not possible for FAA employees to personally oversee every facet of aviation, public law[39] allows FAA to delegate certain functions, such as approving new aircraft designs, to private individuals or organizations. Designees perform a substantial amount of critical work on FAA's behalf—for example, at one aircraft manufacturer, they made about 90 percent of the regulatory compliance determinations for a new aircraft design.

FAA created the Organization Designation Authorization (ODA) program in 2005 to standardize its oversight of organizational designees[40]. ODA was fully implemented in November 2009 when FAA required all delegated organizations to transition to the new ODA policy. FAA also deployed its Risk Based Resource Targeting (RBRT) system in 2007 to assist FAA engineers in deciding which aircraft certification projects represent the highest risk and therefore need more FAA oversight.

Representative Daniel Lipinski requested that we review these two aircraft certification initiatives. He expressed concern that ODA allows companies to choose individuals who perform work on behalf of FAA[41] with little or no FAA oversight and that RBRT precludes certification engineers from reviewing projects that are deemed low or medium risk. He was also concerned that these two programs were not in compliance with current laws and regulations[42]. Accordingly, our audit objectives were to determine (1) the role FAA plays in the selection process for individuals who perform work under the Agency's ODA program, (2) the adequacy of FAA's oversight of the program, and (3) the effectiveness of FAA's RBRT program.

We conducted this review between August 2009 and May 2011 in accordance with government auditing standards prescribed by the Comptroller General of the United States. We visited aircraft manufacturers and FAA Aircraft Certification Offices (ACO)[43] for both small and transport category airplanes. Due to the nature of Representative Lipinski's request, we focused on delegated organizations that approve new aircraft designs (type certification) and changes to existing designs (supplemental type certificates). An air transportation consultant assisted us in assessing the effectiveness of ODA and RBRT. Exhibit A details our scope and methodology. Exhibit B lists the entities we visited or contacted.

Results in Brief

[39] 49 U.S.C. § 44702.

[40] Organizational designees are companies (e.g., aircraft manufacturers) that FAA has approved to perform certain functions on its behalf, such as determining compliance with aircraft certification regulations. The organization is responsible for overseeing the employees who perform the delegated functions.

[41] Under ODA, these individuals are known as unit members.

[42] Based on our review, we did not find any conflict with 49 U.S.C. § 44702 and 14 C.F.R. Part 21.

[43] FAA offices responsible for engineering oversight of aircraft manufacturers.

Under the ODA program, FAA has significantly reduced its role in approving individuals who perform work on FAA's behalf by further delegating this approval to private companies (e.g., aircraft manufacturers). Under previous forms of organizational delegation, FAA approved each appointment of personnel working for these companies. Now, once the Agency approves the company's selection process, ODA company representatives select these personnel, known as unit members, without FAA concurrence. While FAA maintains some involvement with the selection process during an ODA holder's first 2 years, it is unclear how FAA will be involved beyond that timeframe. Because FAA has not provided clear, written guidance on how to oversee unit member appointments, there are inconsistencies in how ACOs interpret FAA's role and track unit members and in how manufacturers select those personnel. For example, only three of the five ACOs we visited consulted an FAA database to pre-screen prospective unit members' performance histories, and FAA engineers in the field expressed confusion about whether this check would continue beyond an ODA's first 2 years. With less FAA involvement in the selection process, there is also potential risk that an ODA company could appoint unit members with inadequate qualifications or a history of poor performance to approve certification projects.

While the ODA program is relatively new, we identified potential vulnerabilities in FAA's oversight and training. Beyond the change in the unit member selection process, FAA's ODA oversight methods (e.g., initial project review, site visits, and technical evaluations) are similar to those used for past forms of organizational delegations. Therefore, FAA will likely face many of the same challenges with ODA. Past FAA audits discovered "after the fact" that delegated organizations had either neglected a critical rule or did not properly demonstrate compliance, calling into question how adequately FAA reviews new engineering project plans submitted by delegated organizations. For example, during initial project review, an FAA engineer failed to detect that a manufacturer's certification plan did not demonstrate compliance with specific aviation regulations governing design and construction of aircraft flight controls. Under ODA, FAA engineers will also have expanded enforcement responsibilities, but the Agency has not ensured that they are adequately trained to perform these duties. As a result, FAA engineers may not detect and enforce all regulatory noncompliances.

Finally, RBRT has not been effective for measuring risk and directing FAA engineers' oversight efforts to high-risk projects because it relies on subjective input from engineers, does not contain detailed data, and has experienced repeated technical difficulties. Engineers reported numerous problems with the system, including a tendency to identify projects as low risk regardless of inputs that suggested higher risk factors, such as a lack of company experience with the design. FAA removed RBRT from active use in August 2009 to undergo revisions identified during its pilot phase. FAA plans to reintroduce RBRT in late fiscal year (FY) 2011. In the interim, FAA engineers will continue to determine which projects to review using subjective judgment.

We are making a series of recommendations to FAA to improve its oversight of ODA programs and the RBRT system.

Background

Historically, FAA has relied on a variety of organizational or individual designee programs to meet its responsibility to hold the aviation industry accountable to its safety standards. A designee can be a person or an organization who witnesses inspections or tests on FAA's behalf. For example, one type of designee is known as a Designated Engineering Representative (DER)[44]. To gain FAA approval of a new aircraft design, a manufacturer must demonstrate compliance to hundreds of detailed Federal Aviation Regulations. FAA has the option to thoroughly examine test data, accompanying analysis, and conclusions of DER approvals; spot check a few calculations or data points; or simply accept the report at face value.

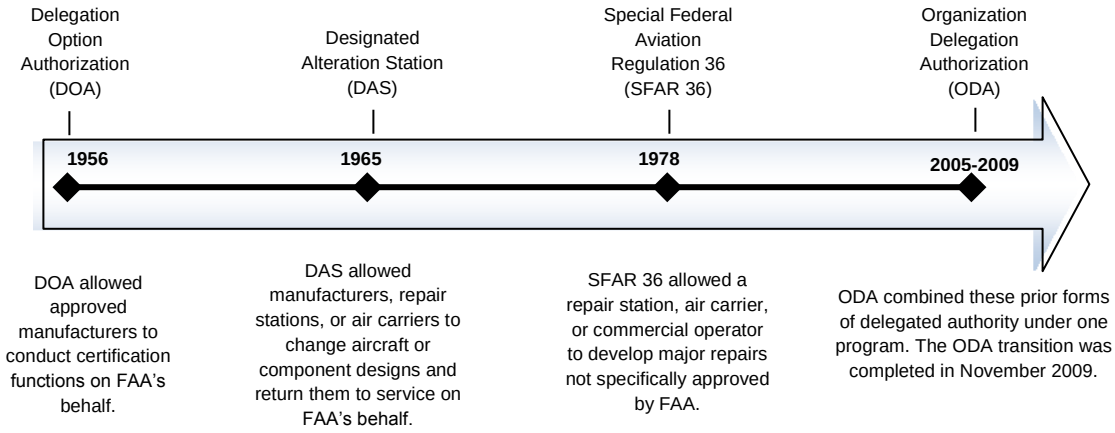
Organization Designation Authorization

Since 1956, FAA has developed various forms of organizational delegation to meet specific needs. In 2005, FAA created the ODA program to consolidate these types of organizational delegations under one program and standardize oversight[45]. By November 2009, all 67 companies that had applied for ODA had completed the transition as required by FAA. As of November 2010, there were 84 authorizations at air carriers, aircraft manufacturers, repair and maintenance facilities, and aircraft modification companies. Figure 1 illustrates the development of organizational delegation.

[44] DERs are non-FAA employees authorized to approve information, on behalf of FAA, related to aircraft structure, engines, power plants, propellers, flight characteristics, systems, and equipment.

[45] The ODA program is authorized in the Code of Federal Regulations, 14 C.F.R. Part 183, and FAA steps for approving ODA programs are governed by internal FAA policies.

Figure 1. Development of Organizational Delegation



Source: OIG analysis of various FAA documents

By implementing ODA, FAA has reduced the numbers of both organizational delegations and individual designees. According to FAA, managing an organization is more efficient than managing the activity of many individual designees. Table 1 details changes in the number of individual and organizational designees since 2004.

Table 1. Change in the Number of Engineering and Manufacturing Designees

Individual Designees	May 2004	November 2010
Designated Engineering Representatives	2,725	2,052
Designated Manufacturing Inspection Representatives	1,249	1,181
Designated Airworthiness Representatives	359	422
TOTAL	4,333	3,655
Organizational Designees	May 2004	November 2010
Organizational Designated Airworthiness Representatives	86	0
Designated Alteration Station	31	0
Delegation Option Authorization	6	0
Special Federal Aviation Regulations No. 36	12	0
Organization Designation Authorization	0	84
TOTAL	135	84

Source: OIG analysis of FAA data

Risk-Based Resource Targeting

In September 2007, as another way to leverage limited FAA engineering resources, FAA implemented a policy to allow RBRT in deciding which new engineering projects to review. RBRT is a process that evaluates the risk associated with non-compliance with FAA regulations that govern six "business processes" FAA oversees, including aircraft or aircraft component design.

Using a series of assessment questions, FAA inspectors and engineers rate the likelihood and severity of the risk of the organization failing to comply with FAA regulations. This risk assessment is expressed as a number from 1 to 5 and characterized as low, medium, or high. The higher the risk, the more direct FAA oversight of the project or activity is recommended.

Delegation of Personnel Selection Authority to Private Companies

FAA's role in selecting unit members will gradually decline under the 2009 ODA policy, as ODA holders can start selecting unit members without FAA's input 2 years after receiving their approval. Also, we identified inconsistencies in how ACOs interpret policy on unit member screening requirements and in how they track unit members. Further, at one of the three manufacturers we visited, where FAA allowed an ODA company to proceed with self-selection, problems arose that demonstrate the challenges FAA may face as its role in unit member selection declines.

FAA Role in Selecting Personnel Who Perform Work on Its Behalf Will Decline Over Time

Under the ODA program, FAA has significantly reduced its role in approving individuals who perform work on its behalf by delegating this approval to private companies (e.g., aircraft manufacturers). Under previous forms of organizational delegation, FAA approved each appointment of personnel working for these companies. Now, ODA company representatives select these personnel, known as unit members, without FAA concurrence once the Agency approves the company's selection process. FAA's ODA policy calls for a 2-year period before the ODA holder can self-select unit members. However, it also permits FAA to allow an ODA holder to proceed with self-selection sooner *if the company has demonstrated a capability to do so*.

Implementation and Interpretation of FAA's Role in the Unit Member Selection Process Is Inconsistent Across FAA

FAA's ACO personnel are not consistently pre-screening prospective unit members' performance histories and have different interpretations of how long to continue pre-screening after the ODA holder is granted approval. We found this is largely due to a lack of clear guidance on FAA's ODA policy[46]. FAA engineers

and managers at the five ACOs we reviewed expressed confusion over the need for pre-screening. First, only three of the five ACOs used FAA's Designee Information Network (DIN) to pre-screen unit members' performance histories. The DIN is a system for tracking all aircraft certification designees and delegations so ACOs can look for any prior negative experience with the individual in question and share the information with the ODA holder. Second, some FAA program managers we met with asserted that pre-screening will continue beyond the 2-year

[46] FAA Order 8100.15 contains the policy guidance for implementing ODA.

phase while FAA engineers in the field stated that pre- screening is only required for the first 2 years. If proposed unit members are not screened, an individual with a history of poor performance as a DER could be authorized to perform critical aircraft certification functions.

Finally, FAA's ACOs are not consistently tracking (i.e., collecting and maintaining data on) unit member performance because there is no FAA policy requiring them to do so. One ACO we visited tracks ODA unit members by name in the DIN, while others did not track them at all. FAA Headquarters officials state that they would not allow an individual designee with poor past performance to serve as a designee or ODA unit member. However, if these ODA employees are not tracked by name, it is unclear how FAA or the ODA will know if a prospective unit member has a poor performance history. This lack of visibility into the background of prospective unit members will further diminish FAA's ability to conduct effective oversight of ODA companies and their unit member selection process.

FAA's Process Does Not Prevent ODAs from Selecting Unit Members With Past Performance Problems

While FAA has the authority to remove unit members based on performance issues, its guidance does not clearly define how individual offices should do so. We identified instances in which FAA did not act quickly to remove questionable unit members and appointed an individual to a key ODA position despite FAA engineers' objections. FAA is losing the direct supervisory connection it historically relied on with DERs; as a result, there is a greater risk that individuals with a history of poor performance could continue to carry out critical aircraft certification functions.

For example, FAA engineers cited troubling performance issues with a unit member and insisted that the manufacturer remove his authority to perform work under the ODA. FAA engineers were concerned with the unit member's integrity because he was advocating a position that directly opposed FAA rules on an aircraft fuel system in favor of the manufacturer. Specifically, the unit member determined that an aircraft type was in compliance with FAA fuel system rules but ignored other language in the rules that, according to FAA engineers, made it clear that the aircraft type did not comply. According to ODA regulations, when acting as a representative of FAA, the ODA is required to perform in a manner consistent with FAA policies, guidelines, and directives. When performing a delegated function, designees are legally distinct from and act independent of the organizations that employ them. The manufacturer disagreed with the FAA engineers' assertions but, after nearly a year of discussions, temporarily suspended the unit member's authority. During that year, the unit member continued to approve certification data on FAA's behalf. After our visit, FAA took action to permanently remove the unit member.

In another instance, the manufacturer sought input from FAA on whom to appoint to a key ODA position. However, according to FAA engineers, the person that FAA managers ultimately approved was the one who received the most objections from the FAA engineering staff.

The manufacturer also promoted a prior DER to a first-level ODA management position despite a considerable record of negative feedback from FAA. FAA performance evaluation

records noted that he showed a consistent lack of integrity, unsound judgment, and an uncooperative attitude towards FAA. FAA noted that this person should never be considered for appointment as a representative or authority in any assignment on behalf of FAA or within the company's delegated organization. Yet, according to FAA engineers we spoke with, the company hoped to eventually promote this individual to ODA Administrator—the company employee with overall responsibility for the ODA and its unit members.[47]

FAA Has Not Addressed Oversight or Training Weaknesses That Could Impact The ODA Program

Weaknesses in FAA's oversight of past forms of delegated authority and in ODA transition training could prevent successful ODA implementation. Our review indicated that FAA audits[48] of prior forms of FAA's delegated authority (before ODA) revealed lapses in FAA's initial review of engineering projects. Inadequate ODA transition training resulted in FAA engineers being unprepared to carry out their expanded oversight and enforcement responsibilities under ODA. As a result, FAA engineers may not detect and enforce all regulatory noncompliances.

OIG Review of Prior FAA Audit Findings Show Lapses in Initial Oversight of Aircraft Design and Modification

FAA's past audits of manufacturers that held prior forms of delegated authority— which are now ODA holders—identified instances of non-compliance with regulations after these companies had certified aircraft components as compliant. Our analysis of FAA audit findings from 2005 to 2008 disclosed 45 instances that indicated FAA had *not* carefully reviewed the certification plan in advance. This upfront review of the certification plan is a key component of FAA oversight of engineering projects. For example:

- A manufacturer did not have evidence that critical tests on a new aircraft engine component were ever performed.
- A manufacturer's certification plan did not indicate that it complied with specific aviation regulations governing design and construction of aircraft flight controls.
- A manufacturer did not comply with regulations addressing the supplemental oxygen system for passengers and crew or emergency evacuation and escape routes.

These "after the fact" findings raise questions about the effectiveness of FAA's initial oversight of certification plans that the ODA holder submits. FAA's ODA policy requires engineers to perform one supervisory visit to companies they oversee per year and a more comprehensive technical audit every 2 years.

[47] As of January 2011, this individual has not been appointed as the ODA Administrator.

[48] FAA completed the transition to ODA in November 2009. Since technical audits of ODA performance are conducted every 2 years, we did not have enough examples under ODA from which we could draw conclusions about the quality of FAA oversight.

Therefore, it can be a year or longer before FAA engineers perform additional oversight through an annual visit or a technical audit.

FAA Has Not Adequately Prepared Its Engineers To Carry Out Their Expanded Enforcement Responsibilities Under ODA

FAA has not ensured that its engineers are adequately trained to manage oversight of the ODA program. Under ODA, FAA's certification engineers have increased capability to cite companies with violations of the Federal Aviation Regulations when an ODA holder does not comply with its FAA-approved ODA procedures manual. FAA engineers can now initiate an enforcement action for non- compliance with the procedures manual, which could lead to civil penalties. This is an important change from prior forms of delegated authority in which most non- compliance issues related to the procedures manual were not regulatory violations.

However, FAA managers and engineers cited concerns to us that they never received training or that FAA's training course does not fully inform them of their responsibilities under ODA. For example, engineers stated that they had no past experience in compliance and enforcement activities and were unsure of their role in any enforcement activities. One engineer even stated that he does not have any compliance and enforcement responsibility under ODA. Also FAA's training is geared toward Flight Standards and manufacturing inspectors—not engineers, who will be overseeing ODA holders. Engineers working within FAA's new oversight organization for large ODA holders with multiple certification locations also expressed concerns. These engineers, as well as ACO engineers, told us that this new oversight concept has been poorly communicated, leaving them uncertain about their role.

RBRT Has Not Been Effective in Assessing Engineering Project Risk

RBRT does not contain detailed data, such as accidents, to assess the risk of noncompliances with regulations, and engineers do not accept the RBRT process due to numerous technical difficulties. RBRT contains risk assessment formulas based on experts' opinions rather than an objective, automated analysis of accident or incident data. As a result, RBRT has not been effective for measuring risk and directing engineers' oversight efforts to higher risk projects. Even if FAA is able to successfully address these shortcomings, it still must train and prepare engineers to effectively use RBRT.

RBRT Does Not Include Objective, Detailed Data

RBRT does not meet seven of nine risk assessment principles in FAA's own risk assessment policy (see table 2)[49]. One principle is for the system to include all relevant data available. However, there is no automated mechanism to leverage data outside of the user's potentially subjective knowledge. For example, RBRT does not contain any data related to actual aviation accidents resulting from manufacturing defects. A fully developed risk-based system would be able to retrieve data directly from FAA's own accident and incident databases.

[49] FAA Order 8040.4 defines FAA's principles for risk assessment.

Table 2. FAA Risk Assessment Principles

FAA Risk Assessment Principles	RBRT Consistent with Principle	Comment
Scientifically Objective	No	RBRT in its current state is purely
Unbiased	Yes	If the user is unbiased
Include All Relevant Data Available	No	No automated mechanism to leverage data outside users' personal knowledge
Use Default/Conservative Assumptions Only if Situation Specific Info Not Available	No	The same risk level is assigned to all regulations with no differentiation for those with direct and substantial impact to safety
Reasonably Detailed and Accurate	No	An accurate assessment is not possible given that currently all regulations are assigned the same risk rating
Address Both Severity and Likelihood	Yes	none
Quantitative to the Maximum Extent Possible	No	RBRT represents a quantitative processing of subjective judgment; however, there is little or no data-driven
Flexible	No	The RBRT tool requires the same tedious data input for all projects regardless of relevance to safety
Assumptions Documented	No	Users are clearly not aware of assumptions fundamental to RBRT design

Source: OIG and consultant analysis of FAA data

Our analysis as well as that of our external consultant concluded that RBRT has data shortcomings. In addition to our determination that RBRT is driven by subject matter experts' opinion rather than objective data, our consultant found that RBRT risk assessments are of limited value in differentiating projects by safety risk for resource targeting. For example, when originally introduced, the system did not differentiate the potential safety impacts of noncompliance with various regulations[50]. Therefore, RBRT treated the potential impact of non-

compliance with the regulation governing design of critical flight controls the same as non-compliance with the regulation requiring installation of a no-smoking decal. In another example, we reviewed a RBRT risk assessment that was rated as low risk by RBRT even though the company involved in the assessment was a new company that would require a higher level of FAA oversight.

Further, FAA's risk assessment policy calls for a plan that identifies *specific* hazards that may be encountered in the overall certification process, analyzes the likelihood of their occurrence, and determines their severity. However, RBRT uses vague hazard statements rather than describing specific hazards that could endanger an aircraft, such as sudden

[50] According to FAA officials, the system that will be reintroduced in late FY 2011 will have this capability.

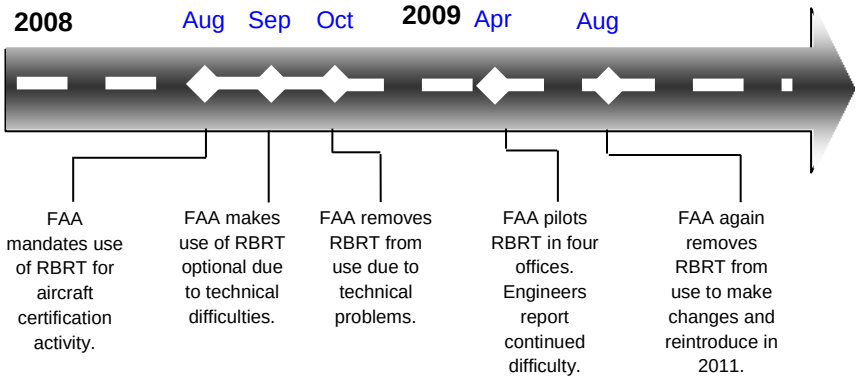
depressurization or lightning strike[51]. For example, the hazard statement for aircraft design is, "If the [aircraft design] process is not effectively completed, it may result in a non-compliant design of an aviation product (aircraft, engine, or propeller) that may contribute to the cause of a fatal accident." While identifying all hazards that put an aircraft at risk is an enormous task, it would greatly enhance RBRT's effectiveness. Although FAA has acknowledged that a risk assessment tool based upon objective data is superior to the current subjective model, it does not expect to populate RBRT with more objective data before late 2014 to 2015 at the earliest. According to FAA officials, their plan to prioritize regulations in the next release of RBRT will better define risks and hazards.

RBRT Has Experienced Significant Technical Difficulties

FAA did not ensure that the RBRT tool was fully functional before requiring its use. FAA mandated the use of RBRT for all certification activity in August 2008; however, the Agency poorly executed its deployment. Once it was in widespread use by certification engineers, the RBRT tool experienced a number of technical difficulties, including slow system functionality and system "freezes.[52]" Engineers stated it could take weeks to months to complete an RBRT risk assessment. After being removed and reintroduced, RBRT continued to experience technical difficulties, frustrating FAA engineers and causing FAA to take the system back offline to undergo modifications. RBRT is currently not in use, and FAA plans to reintroduce RBRT in late FY 2011. Until FAA deploys

RBRT, FAA engineers will continue to determine which projects to review using only their subjective judgment. Figure 2 describes the timeline of RBRT's deployment in greater detail.

Figure 2. Timeline of RBRT Deployment



Source: OIG analysis of FAA data

[51] FAA defines safety hazards as a condition, event, or circumstance that could lead to or contribute to an unplanned or an undesired event.

[52] According to FAA officials, the issues with slow functionality and system freezes were largely due to the lack of Information Technology (IT) capacity within FAA. Until this issue is resolved at the Agency level, IT programs will not run at optimum efficiency.

FAA Has Not Effectively Prepared Engineers To Use the RBRT Tool

FAA did not effectively train engineers and managers on RBRT, which resulted in confusion among engineers we interviewed on how to implement RBRT. For example, FAA's intent is to allow low-risk projects to be approved without a required data review—a concept known as "applicant showing only." However, FAA did not adequately train engineers on this concept. The initial training given to engineers using RBRT consisted of briefing slides that did not fully address the engineers' concerns regarding the level of involvement expected for each risk level. Engineers told us that they would never accept a project proposal without reviewing data.

Conclusion

As the aviation industry continues to expand, FAA must continue to adapt its role in oversight efforts, including the use of designees to perform work on its behalf. While FAA's effort to reduce the number of individual designees is a good step toward efficiency, decreasing its involvement in selecting unit members is not without risk. Unless FAA has the necessary training and tools in place to conduct effective oversight, it cannot be assured that ODA organizations are fully complying with FAA's safety requirements or that unit members are qualified to perform critical safety tasks. To best target limited oversight resources to the highest risk projects, FAA must continue efforts to develop a sound risk assessment process and inform personnel of how to utilize the system.

Recommendations

We recommend that FAA:

1. Revise its ODA policy to require a full 2-year transition for unit member self- selection.
2. Develop explicit guidance on the process to remove an ODA unit member in a timely fashion and require all ODA holders to include this standardized removal process in their approved ODA procedures manual.
3. Track unit member appointments in its Designee Information Network (DIN) database or another method in order to identify unit members with known performance issues and require engineers to cross-check names with the database beyond the first 2-year required timeframe.
4. Develop enforcement training and guidance that is pertinent to the unique requirements of the certification engineering discipline.
5. Improve the new oversight structure for large ODA holders by:
    a. developing training for FAA engineers and disseminating comprehensive procedures on the new oversight structure for large ODA holders.
    b. assessing the effectiveness of the new oversight structure before implementing it at other large ODA holders.
6. Improve the RBRT tool by:

a. enhancing the risk assessment process so that it uses more automated data, such as accidents resulting from manufacturing defects, to accurately differentiate higher risk projects that likely pose the most safety risk.
b. thoroughly testing and validating it to ensure that it is fully functional.
c. ensuring that engineers are properly trained before requiring its use and relying upon its results.

Agency Comments And Office Of Inspector General Response

We provided FAA with our draft report on May 3, 2011, and received its response on June 1, 2011. FAA's response is included in its entirety as an appendix to this report. FAA concurred or partially concurred with all of our recommendations, and its response meets the intent of most of them. However, we are concerned with the timeframe for issuing new guidance on the process for approving and tracking ODA unit members. Additionally, we are requesting that FAA expand its planned actions for recommendation 3 and clarify information regarding its actions planned for recommendation 5a.

Specifically, in response to recommendations 1, 2, and 3, FAA proposes to revise its guidance regarding the ODA transition period, procedures for unit member removal, and the requirement to cross-check names with FAA databases by September 30, 2012. However, because these recommendations affect the core tenets of the ODA program, we believe that FAA should issue interim guidance to immediately enhance its oversight until the Agency is able to issue permanent changes to its guidance. Additionally, for recommendation 3, FAA stated that it is impractical to maintain all ODA unit members in an FAA database but agreed to track unit members that have been removed due to performance-related issues. However, as we reported, unit members can experience performance issues for a prolonged period before removal. Given that poor performing unit members could leave on their own before removal, FAA should expand its action by including ODA unit members that are experiencing performance issues, but have not yet been removed. Accordingly, we are requesting that FAA provide additional planned actions and target dates for recommendations 1, 2, and 3 and consider these recommendations open and unresolved.

For recommendation 5a, FAA states that it plans to revise its policy to clarify that new offices are responsible for developing and conducting training for their staff. However, the target date for this action is not clear. Additionally, given that FAA is making individual offices responsible for enhancing training and procedures, we request that the Agency clarify how it will ensure consistency in training and procedures across these new offices. We are requesting that FAA likewise provide additional planned actions and target dates for this recommendation and consider it open and unresolved as well.

Actions Required

FAA's planned actions and target dates for recommendations 4, 5b, and 6 are responsive, and we consider these recommendations resolved but open pending completion of planned actions. The remaining recommendations remain unresolved pending further action by FAA. We request

that FAA provide, within 30 days of this report, additional actions to resolve recommendations 1, 2, and 3, along with estimated target completion dates. Also, we request that FAA clarify its target date and actions to enhance training and procedures for recommendation 5a. We appreciate the courtesies and cooperation of FAA representatives during this audit. If you have any questions concerning this report, please call me at

(202) 366-0500 or Robin Koch, Program Director, at (404) 562-3770.

cc: FAA Associate Administrator for Aviation Safety Director, Aircraft Certification Service

Anthony Williams, AAE-001 Martin Gertel, M-1

Agency Comments

Federal Aviation Administration

Memorandum

Date: JUN 1 2011

To: Jeffrey B. Guzzetti, Assistant Inspector General for Aviation and Special Program Audits

From: Clay Foushee, Director, Office of Audit and Evaluations, AAE-1 Subject: OIG Final Report: FAA Needs to Strengthen its Risk Assessment and

Oversight Approach for Organization Designation Authorization and Risk Based Resources Targeting Programs

While organizational delegation is not new to the FAA or the aviation industry, FAA is continuing its efforts to strengthen the program, provide meaningful and consistent oversight, and ensure it addresses the most important issues relating to aviation safety. In the process of improving this program, FAA is seeking to make the most efficient use of its resources, by redeploying assets previously devoted to less constructive oversight activities, and apply a risk based framework for directing the activities of its Designees. FAA recognizes that its efforts are a work in process, and has efforts underway that will provide better training, ongoing program evaluations, and policy and information technology (IT) improvements.

RECOMMENDATIONS AND RESPONSES

Recommendation 1: Revise its ODA policy to require a full 2-year transition for unit member self selection.

FAA Response: Concur. The FAA will revise its guidance by September 30, 2012 to require the organization management team (OMT) to review selections made in the first two years or longer, if necessary. We will continue to communicate the role of the OMT in performing oversight of an ODA's unit member selection to ensure the processes are being properly established and exercised.

Recommendation 2: Develop explicit guidance on the process to remove an ODA unit member in a timely fashion and require all ODA holders to include this standardized removal process in their approved ODA procedures manual.

FAA Response: Concur. Although the FAA believes that unit member (UM) removal clearly falls under the established corrective action procedures, the FAA will add policy and procedures to specifically address UM removal. This information will be included in Change 1 to 8100.15A by September 30, 2012.

Recommendation 3: Track unit member appointments in its Designee Information Network (DIN) database or another method in order to identify unit members with known performance issues and require engineers to cross-check names with the database beyond the first 2-year required timeframe.

FAA Response: Concur in part. It is impractical for the FAA to maintain all ODA UM names in an FAA database. However, since an ODA holder is responsible for their unit member management and we already require ODA holders to report the names of UMs removed for performance reasons that constitute misconduct, we could track only those unit members who have been removed due to performance-related issues. We propose to issue policy that will require these removed UMs to be tracked in DIN so that they may be precluded from future designee or UM selection. Order 8100.15 currently requires that proposed UMs are cross-checked with existing FAA databases beyond the initial 2- year timeframe. This is being clarified in Order 8100.15A. The proposed change will be included in Change 1 to 8100.15A by September 30, 2012**.**

Recommendation 4: Develop enforcement training and guidance that is pertinent to the unique requirements of the certification engineering discipline.

FAA Response: Concur. Aviation Safety (AVS) will ensure that pertinent portions of the existing FAA Academy Compliance & Enforcement course address ODA certificate management. AVS will also provide more information in the designee management course lesson on ODA oversight by December 31, 2012.

Recommendation 5: Improve the new oversight structure for large ODA holders by:

A. developing training for FAA engineers and disseminating comprehensive procedures on the new oversight structure for large ODA holders.
B. assessing the effectiveness of the new oversight structure before implementing it at other large ODA holders.

FAA Response: Concur. The establishment of the Boeing Aviation Safety Oversight Office (BASOO) and Gulfstream Aviation Safety Oversight Office (GASOO) constitutes a new organizational structure, not a new oversight structure. Oversight roles and processes remain unchanged but may be divided among more staff members in these offices. AVS will revise its policy to clarify that these new offices are responsible for developing and conducting training for

their staff and the people that interact with them. In addition, AVS will develop guidance defining best practices for proper oversight of ODAs by June 2012. We will then assess the effectiveness of the existing oversight offices (BASOO and GASOO) against this guidance before we implement any future organizational changes of a similar nature. We will have a plan developed to assess the existing oversight offices by September 2012. We will then perform the assessment and document any proposed changes, to policy or structure, in fiscal year (FY) 2013.

Recommendation 6: Improve the RBRT tool by:

A. Enhancing the risk assessment process so that it uses more automated data, such as accidents resulting from manufacturing defects, to accurately differentiate higher risk projects that likely pose the most safety risk.
B. Thoroughly testing and validating it to ensure that it is fully functional.
C. Ensuring that engineers are properly trained before requiring its use and relying upon its results.

FAA Response to 6.A: Concur. It has been the intention of the FAA to continuously improve the RBRT process. The implementation of the AVS Safety Management System (SMS) will establish a methodology to collect appropriate data to transition from a qualitative to a quantitative risk management system. There are several process initiatives within AVS SMS to provide data to support RBRT in the future. To get to that point though, we also need to begin using RBRT in a qualitative form to standardize the risks on which our workforce should focus. We have revised the RBRT tool to use the regulation prioritization data that differentiates and prioritizes the severity of all the regulations. This will help the workforce better use the tool to focus on specific regulations that are higher risk. New process and IT tools being developed to support the transition of RBRT to a fully quantitative process include All Lessons Learned (accident database) expected in mid-FY 2012; Aircraft Certification Audit Information System, expected by the end of FY 2012; the Engineering Design Approval process, expected in FY 2013; the Designee Management System, expected by the end of FY 2013; Manufacturers SMS; and potential rulemaking for Part 21 SMS beginning in FY 2013.

All of these processes currently under development will collect the objective data needed to support RBRT in the future.

FAA Response to 6.B: Concur. The new IT solution is currently in the user-acceptance testing phase. This new solution is being tested more vigorously than the last, based on the lessons learned from the prototype tool. Validation of the process has occurred multiple times in the past four years. The process was initially challenged by a large user community, after which several changes were made. The improved process and tool were then used in a prototype environment, during which we found additional changes and learned about the IT limitations. We will continue to take full advantage of testing and validation practices, as necessary, to deploy future data tools mentioned in 6A, and anticipate implementation by September 30, 2014. Additionally, there are

targeted reviews scheduled by the process owner to review the user feedback being collected along with management recommendations, which will drive continuous improvement of the tool.

FAA Response to 6.C: Concur. New training is being developed to provide the work force with the necessary knowledge to use the RBRT IT tool. This training will take many forms. First, we are developing a computer-based learning package that will be available to all employees. This computer-based package will be available two months before planned implementation to allow adequate time for the work force to access the training. There is also a plan to conduct an orientation presentation to all field offices, detailing the process and demonstrating the IT tool. These orientations will take place in the month before projected launch, so as to make sure the information on how to interface with and use the tool stays fresh in the minds of the field employees. To support the use of RBRT, we will also be issuing policy and Quality Management System work instructions, detailing when and how to use the tool for those who may have missed the orientation sessions. This information will be published and have an effective date no later than September 30, 2011. Additionally, AVS has been conducting a "road show" for the workforce on our discretionary function authority and what it means. This training is also in support of RBRT in that it lays the foundation for the management options RBRT provides. These discretionary function briefings are scheduled to be completed by December 31, 2011.

Appendix 9: Memorandum Reliance on Foreign Authority Bilateral Agreements for FAA Certification

Federal Aviation Administration

Memorandum

Date: DEC 2 2 2016

To: Chris Carter, Manager International Division, AIR-400

From: Mark W. Bury Deputy Chief, Enforcement & Regulations AGC-3

Subject: Issuance of Type Certificates and Supplemental Type Certificates Under 14 CFR § 21.29

On August 27, 2015, this office concurred with your memorandum on the referenced subject, which included the following:

> In accordance with section 21.29, the FAA may issue a TC [type certificate] or STC [supplemental type certificate] based upon a foreign certificate when the foreign civil aviation authority certifies that a product's design meets the airworthiness requirements of the foreign authority's certification system. The regulation also authorizes the FAA to prescribe any additional requirements to ensure that a product meets an equivalent level of safety with applicable U.S. airworthiness requirements.

It appears that this language, and our concurrence with it, may have been misinterpreted as allowing approval of foreign TCs and STCs when they do not meet FAA standards or their equivalent.

The FAA's statutory authority to issue is found in 49 U.S.C. 44704(a):

> (a) Type Certificates.-
> (1) Issuance, investigations, and tests.-The Administrator of the Federal Aviation Administration shall issue a type certificate for an aircraft, aircraft engine, or propeller, or for an appliance specified under paragraph (2)(A) of this subsection *when the Administrator finds that the aircraft*, aircraft engine, propeller, or appliance is properly designed and manufactured, performs properly, and *meets the regulations and minimum standards prescribed under section 44701(a) of this title.* On receiving an application for a type certificate, the Administrator shall investigate the application and may conduct a hearing. The Administrator shall make, or require the applicant to make, tests the Administrator considers necessary in the interest of safety. (Emphasis added)

As indicated by the highlighted language, our statutory authority to issue TCs is limited to circumstances in which the FAA finds compliance with FAA standards. Section 21.29 also authorizes issuance of TCs based on findings of equivalency to those standards:

(a) The FAA may issue a type certificate for a product that is manufactured in a foreign country or jurisdiction with which the United States has an agreement for the acceptance of these products for export and import and that is to be imported into the United States if—

(1) The applicable State of Design certifies that the product has been examined, tested, and found to meet— …

(ii) The applicable airworthiness requirements of this subchapter as designated in §21.17, or the applicable airworthiness requirements of the State of Design *and any other requirements the FAA may prescribe to provide a level of safety equivalent to that provided by the applicable airworthiness requirements of this subchapter as designated in §21.17*; (Emphasis added)

The highlighted language is necessary to meet the statutory requirement that TCs be issued only when the FAA finds compliance with standards issued in accordance with the statute.
Based on discussions with AIR staff and review of a proposed revision to the Technical Implementation Procedures (TIP) between the FAA and EASA, it appears that the material quoted above from the August 27, 2015, memorandum may have been misconstrued. We understand that some AIR staff may read this language as allowing FAA approval of foreign TCs based solely on compliance with the foreign civil aviation authority's certification that a product's design meets the airworthiness requirements of the foreign authority's certification system, and that the FAA need not exercise its authority to prescribe any additional requirements to ensure that a product meets an equivalent level of safety with applicable U.S. airworthiness requirements.

To clarify, in situations where, because of a regulatory difference between the FAA's standards and those of a foreign authority, the FAA's standards require a higher level of safety than the foreign authorities, as stated in the highlighted language of § 21.29 above, the FAA must prescribe additional requirements to achieve a level of safety equivalent to the applicable FAA standards. Otherwise, the FAA would not meet the statutory requirement of § 44704 that the TC meet the FAA's standards. While I appreciate your desire to minimize the FAA resources needed to approve foreign TCs, we must not do less than what is required by statute and our regulations.

cc: Dorenda Baker, AIR-1

Appendix 10: 787 Battery _NTSB Safety Recommendations

787 Recommendations Lessons Learned

Safety Recommendation A-14-036 Panel of Independent Experts

Recommendation: TO THE FEDERAL AVIATION ADMINISTRATION: Develop a policy to establish, when practicable, a panel of independent technical experts to advise on methods of compliance and best practices for certifying the safety of new technology to be used on new or existing aircraft. The panel should be established as early as possible in the certification program to ensure that the most current research and information related to the technology could be incorporated during the program.

Safety Recommendation A-14-113 Supplier Manufacturing Oversight

Recommendation: TO THE FEDERAL AVIATION ADMINISTRATION: Develop or revise processes to establish more effective oversight of production approval holders and their suppliers (including sub-tier suppliers) to ensure that they adhere to established manufacturing industry standards.

From: FAA

To: NTSB

Date: 2/24/2015

Response: -From Michael P. Huerta, Administrator: The Federal Aviation Administration (FAA) agrees with this recommendation. The FAA has already completed some modifications and has several additional activities underway in this area to include the following: 1. The FAA's Aircraft Certification Service (AIR) modified FAA Order 8 120.23, Certificate Management of Production Approval Holders. to: a. Mandate an increased focus on verifying that supplier control is exercised by all production approval holders (PAH); b. Emphasize the emerging need for rigorous supplier oversight with verification and accountability; and c. Streamline the method by which the auditor will document and record non-compliances pursuant to Title 14, Code of Federal Regulations Part 21 (part 21) known as the approved quality system, whenever such departures are discovered during audit activities at PAH facilities and their suppliers. 2. AIR has recently deployed an enhanced automation tool, the

Aircraft Certification Audit Information System (ACAIS), to support implementation of certificate management policies. 3. AIR is currently developing specific codification standards for ACAIS that would allow auditors to document and record non-compliances with improved accuracy and precision while maintaining consistency to specific requirements pursuant to part 21. 4. The FAA also has an active rulemaking effort that has proposed modification of part 21 to require that all PAH establish quality system processes that would ensure a supplier product conforms to PAH requirements. The rulemaking also proposes that a comprehensive supplier-reporting process is adopted and used to report back to the PAH on all nonconforming product, articles, or processes identified at any PAI-l's supplier or sub-tier supplier. The net effect of these initiatives would be an improved oversight system that directs FAA oversight to the areas of greatest risk in the PAH's system.

Safety Recommendation A-14-121 FAA and AR MOC Validation for New Technology

Recommendation: TO THE FEDERAL AVIATION ADMINISTRATION: Develop written guidance for your certification engineers and engineering designees about the use of traceability principles to verify that the methods of compliance proposed by type certification applicants for special conditions involving new technology are correct and complete.

From: FAA

To: NTSB

Date: 5/20/2016

Response: -From Michael P. Huerta, Administrator: The FAA is developing a revision to FAA Order 81 I 0.4C, Type Certification, as well as a new complimentary advisory circular (AC) that will provide procedural guidance to the applicant. The current draft AC expands on the applicant expectations for traceability between the applicant's showing of compliance and the certification requirements. The FAA is considering additional revisions to discuss the importance of traceability principles to address this recommendation. However, the draft revision to FAA Order 811 0.4C and the draft complimentary AC are still in the early stages of development. The development process, which requires field and public comment periods, can be lengthy. Based on current priorities, we expect to complete the revision to Order 81 I 0.4C and the AC by June 2016.

From: NTSB

To: FAA

Date: 5/12/2016

Response: CC# 201600220, dated May 12, 2016: The National Transportation Safety Board (NTSB) has reviewed the Federal Aviation Administration's (FAA) notice of proposed rulemaking (NPRM) titled "Revision of Airworthiness Standards for Normal, Utility, Acrobatic, and Commuter Category Airplanes," which was published at 81 Federal Register (FR) 13451 on March 14, 2016. The NPRM proposes to amend airworthiness standards for normal, utility, acrobatic, and commuter-category airplanes by removing prescriptive design requirements and replacing them with performance based airworthiness standards. The proposed standards would also replace the current weight and propulsion divisions in small airplane regulations with performance- and risk based divisions for airplanes with a maximum seating capacity of 19 passengers or less and a maximum takeoff weight of 19,000 lbs. or less. In addition, the NPRM proposes to adopt additional airworthiness standards to address certification for flight in icing conditions, enhanced stall characteristics, and minimum control speed to prevent departure from controlled flight for multiengine airplanes. On April 8, 2016, the FAA also published on its website draft Advisory Circular (AC) 23.10 titled "FAA Accepted Means of Compliance Process for 14 [Code of Federal Regulations] CFR Part 23." The draft AC provides guidance on how to submit a proposed means of compliance (MOC) with Part 23 for acceptance by the Administrator in accordance with proposed section 23.10, "Accepted Means of Compliance," in the NPRM. This letter provides comments on the NPRM. We will submit separate comments regarding draft AC 23.10. Related Safety Recommendations and Investigations We issued safety recommendations to the FAA and investigated accidents/incidents related to the following topics discussed in the NPRM: Certification One of the FAA's stated goals in this rulemaking is to encourage the introduction of new and innovative technology. Our investigation of the January 7, 2013, fire in the aft cabin of a Japan Airlines Boeing 787-8, JA829J, which was parked at a gate at General Edward Lawrence Logan International Airport, Boston, Massachusetts, focused on issues related to the safety of new technology introduced to aviation (specifically, new lithium-ion battery applications). Manufacturers and subtier vendors developed design and oversight criteria to be applied and then presented the criteria to the FAA. We found that there was insufficient guidance and education for FAA certification engineers during the type certification process to ensure compliance with applicable requirements. As a result, on December 1, 2014,

we issued the following safety recommendations to the FAA: A-14-119 Provide your certification engineers with written guidance and training to ensure that (1) assumptions, data sources, and analytical techniques are fully identified and justified in applicants' safety assessments for designs incorporating new technology and (2) an appropriate level of conservatism is included in the analysis or design, consistent with the intent of [AC] 25.1309 (Arsenal draft). [Classified "Open—Acceptable Response"] A-14-121 Develop written guidance for your certification engineers and engineering designees about the use of traceability principles to verify that the methods of compliance proposed by type certification applicants for special conditions involving new technology are correct and complete. [Classified "Open—Acceptable Response"] A-14-122 Once the guidance requested in Safety Recommendation A-14-121 has been issued, provide training to your certification engineers and engineering designees on the subjects discussed in the guidance. [Classified "Open—Acceptable Response"] A-14-123 Require applicants to discuss key assumptions related to safety-significant failure conditions, their validation, and their traceability to requirements and proposed methods of compliance during certification planning meetings for type designs involving special conditions. [Classified "Open—Acceptable Response"] We are concerned that with the revisions proposed in the NPRM, and procedures proposed in draft AC 23.10, the FAA's certification engineering staff will face increased demands to evaluate new technologies, and the FAA may face challenges similar to those encountered with the certification of the lithium-ion batteries in the Boeing 787.

From: NTSB

To: FAA

Date: 4/16/2015

Response: We note your position that the responsibilities discussed in this recommendation should be placed on the applicant rather than on FAA certification engineers and FAA designees. We issued these recommendations because we found in our investigation of the January 7, 2013, incident on the Japan Airlines Boeing 787 that critical assumptions and conclusions made in the safety analyses of GS Yuasa's and Thales (the suppliers of the components involved in the fire), which were used in Boeing's electrical power system (EPS) safety assessment, were neither fully delineated nor justified with appropriate data and engineering rationale. However, multiple independent reviews of the EPS safety assessment that Boeing-authorized representatives and FAA certification engineers had conducted did not reveal these

deficiencies. We believe that the review process for safety assessments should be designed to closely examine the data used to support conclusions and challenge assumptions, particularly those that could result in significant safety consequences if incorrect. We agree that the applicant has an obligation to show traceability, but when the FAA reviews and approves a systems safety assessment, that review should ensure that adequate traceability is present in the documents. Improving the guidance to applicants on the documentation of traceability needed may provide the needed guidance for FAA engineers and designees reviewing systems safety assessments. However, we believe that you also need to acknowledge the FAA's role in reviewing for traceability and consider whether the planned revisions to FAA Order 8110.4C and AC 25.1309 (Arsenal draft) described in your letter will provide sufficient guidance for thoroughly reviewing an applicant's systems safety assessment. Pending your making the revisions to FAA Order 8110.4C and AC 25.1309 (Arsenal draft) that you described and replying to us about the sufficiency of these documents as discussed above, Safety Recommendation A-14-121 is classified OPEN—ACCEPTABLE RESPONSE. Pending your incorporating guidance into the training programs for FAA certification engineers and engineering designees about how to review an applicant's systems safety analysis to ensure compliance with the traceability requirements, Safety Recommendation A-14-122 is classified "Open—Acceptable Response." Pending revisions to FAA Order 8110.4C and the creation of policy documents related to applicant responsibilities for showing compliance with the order, Safety Recommendation A-14-123 is classified "Open—Acceptable Response."

From: FAA

To: NTSB

Date: 2/24/2015

Response: -From Michael P. Huerta, Administrator: The FAA agrees that traceability between the applicant's showing of compliance and the certification requirements is important. However, the FAA believes that the burden is more appropriately placed on the applicant rather than on the FAA certification engineers and the FAA designees. Placing the burden on the applicant provides them with the assurance that they have addressed all requirements of the regulations, whether or not the FAA reviews the data. Per FAA Order 8 11 0.4C, Type Certification, the applicant is expected to provide traceability of their substantiation to the certification requirements. Per Order 81 00.4C, the applicant's substantiation "presents and explains the inter-relationship of

the evidence in a logical order leading from the requirement to the claim," where "evidence is certification data collected from FAA publications, certification testing, analysis, engineering examinations. similarity, and software design assurance, and any other data deemed acceptable by the FAA standards staffs." The FAA is currently revising Order 8110.4C and the guidance related to applicant responsibilities. Also, draft AC 25.1309-Arsenal expands on the applicant expectations for traceability between the applicant's showing of compliance and the certification requirements. However, the FAA will consider additional revisions to the draft to discuss the importance of traceability principles. Although the FAA agrees with the merit of applying traceability of the applicant's showing to specific requirements, the FAA also plans to consider reviewing the guidance for development of special conditions. Additional guidance to the certification offices may be warranted to ensure that the expectations for the applicant are clearly defined.

Safety Recommendation A-14-122 Training of Certification and Designee Engineers for Validating MOC for New Technology Items

Recommendation: TO THE FEDERAL AVIATION ADMINISTRATION: Once the guidance requested in Safety Recommendation A-14-121 has been issued, provide training to your certification engineers and engineering designees on the subjects discussed in the guidance.

Response: -From Michael P. Huerta, Administrator: As previously stated in our February 24, 2015, letter to the Board, once the procedural guidance for the applicant is incorporated into an AC, as described in our response to A-14-1 21, the FAA will incorporate a discussion, as appropriate, of the expectation of the applicant's showing of compliance into the training programs for our certification engineers and engineering designees.

From: NTSB

To: FAA

Date: 5/12/2016

Response: CC# 201600220, dated May 12, 2016: The National Transportation Safety Board (NTSB) has reviewed the Federal Aviation Administration’s (FAA) notice of

proposed rulemaking (NPRM) titled “Revision of Airworthiness Standards for Normal, Utility, Acrobatic, and Commuter Category Airplanes,” which was published at 81 Federal Register (FR) 13451 on March 14, 2016. The NPRM proposes to amend airworthiness standards for normal, utility, acrobatic, and commuter-category airplanes by removing prescriptive design requirements and replacing them with performance based airworthiness standards. The proposed standards would also replace the current weight and propulsion divisions in small airplane regulations with performance- and risk based divisions for airplanes with a maximum seating capacity of 19 passengers or less and a maximum takeoff weight of 19,000 lbs. or less. In addition, the NPRM proposes to adopt additional airworthiness standards to address certification for flight in icing conditions, enhanced stall characteristics, and minimum control speed to prevent departure from controlled flight for multiengine airplanes. On April 8, 2016, the FAA also published on its website draft Advisory Circular (AC) 23.10 titled “FAA Accepted Means of Compliance Process for 14 [Code of Federal Regulations] CFR Part 23.” The draft AC provides guidance on how to submit a proposed means of compliance (MOC) with Part 23 for acceptance by the Administrator in accordance with proposed section 23.10, “Accepted Means of Compliance,” in the NPRM. This letter provides comments on the NPRM. We will submit separate comments regarding draft AC 23.10. Related Safety Recommendations and Investigations We issued safety recommendations to the FAA and investigated accidents/incidents related to the following topics discussed in the NPRM: Certification One of the FAA’s stated goals in this rulemaking is to encourage the introduction of new and innovative technology. Our investigation of the January 7, 2013, fire in the aft cabin of a Japan Airlines Boeing 787-8, JA829J, which was parked at a gate at General Edward Lawrence Logan International Airport, Boston, Massachusetts, focused on issues related to the safety of new technology introduced to aviation (specifically, new lithium-ion battery applications). Manufacturers and subtier vendors developed design and oversight criteria to be applied and then presented the criteria to the FAA. We found that there was insufficient guidance and education for FAA certification engineers during the type certification process to ensure compliance with applicable requirements. As a result, on December 1, 2014, we issued the following safety recommendations to the FAA: A-14-119 Provide your certification engineers with written guidance and training to ensure that (1) assumptions, data sources, and analytical techniques are fully identified and justified in applicants’ safety assessments for designs incorporating new technology and (2) an appropriate level of conservatism is included in the analysis or design, consistent with the intent of [AC] 25.1309 (Arsenal draft). [Classified “Open—Acceptable Response”] A-14-121 Develop written guidance for your certification engineers and engineering designees about the use of traceability principles to verify that the methods of compliance proposed by type certification applicants for special

conditions involving new technology are correct and complete. [Classified "Open—Acceptable Response"] A-14-122 Once the guidance requested in Safety Recommendation A-14-121 has been issued, provide training to your certification engineers and engineering designees on the subjects discussed in the guidance. [Classified "Open—Acceptable Response"] A-14-123 Require applicants to discuss key assumptions related to safety-significant failure conditions, their validation, and their traceability to requirements and proposed methods of compliance during certification planning meetings for type designs involving special conditions. [Classified "Open—Acceptable Response"] We are concerned that with the revisions proposed in the NPRM, and procedures proposed in draft AC 23.10, the FAA's certification engineering staff will face increased demands to evaluate new technologies, and the FAA may face challenges similar to those encountered with the certification of the lithium-ion batteries in the Boeing 787.

From: NTSB

To: FAA

Date: 4/16/2015

Response: We note your position that the responsibilities discussed in this recommendation should be placed on the applicant rather than on FAA certification engineers and FAA designees. We issued these recommendations because we found in our investigation of the January 7, 2013, incident on the Japan Airlines Boeing 787 that critical assumptions and conclusions made in the safety analyses of GS Yuasa's and Thales (the suppliers of the components involved in the fire), which were used in Boeing's electrical power system (EPS) safety assessment, were neither fully delineated nor justified with appropriate data and engineering rationale. However, multiple independent reviews of the EPS safety assessment that Boeing-authorized representatives and FAA certification engineers had conducted did not reveal these deficiencies. We believe that the review process for safety assessments should be designed to closely examine the data used to support conclusions and challenge assumptions, particularly those that could result in significant safety consequences if incorrect. We agree that the applicant has an obligation to show traceability, but when the FAA reviews and approves a systems safety assessment, that review should ensure that adequate traceability is present in the documents. Improving the guidance to applicants on the documentation of traceability needed may provide the needed guidance for FAA engineers and designees reviewing systems safety assessments. However, we believe that you also need to acknowledge the FAA's role in reviewing

for traceability and consider whether the planned revisions to FAA Order 8110.4C and AC 25.1309 (Arsenal draft) described in your letter will provide sufficient guidance for thoroughly reviewing an applicant's systems safety assessment. Pending your making the revisions to FAA Order 8110.4C and AC 25.1309 (Arsenal draft) that you described and replying to us about the sufficiency of these documents as discussed above, Safety Recommendation A-14-121 is classified "Open—Acceptable Response." Pending your incorporating guidance into the training programs for FAA certification engineers and engineering designees about how to review an applicant's systems safety analysis to ensure compliance with the traceability requirements, Safety Recommendation A-14-122 is classified OPEN—ACCEPTABLE RESPONSE. Pending revisions to FAA Order 8110.4C and the creation of policy documents related to applicant responsibilities for showing compliance with the order, Safety Recommendation A-14-123 is classified "Open—Acceptable Response."

From: FAA

To: NTSB

Date: 2/24/2015

Response: -From Michael P. Huerta, Administrator: Once the guidance for the applicant is incorporated into draft AC 25.1309-Arsenal, per the FAA response to A- 14-12 1, the FAA will evaluate the option of incorporating a discussion of the expectation of the applicant's showing of compliance into the training programs for our certification engineers and engineering designees.

Safety Recommendation A-14-123 Key Assumptions for Safety Significant Failure Conditions

Recommendation: TO THE FEDERAL AVIATION ADMINISTRATION: Require applicants to discuss key assumptions related to safety-significant failure conditions, their validation, and their traceability to requirements and proposed methods of compliance during certification planning meetings for type designs involving special conditions.

From: FAA

To: NTSB

Date: 5/20/2016

Response: -From Michael P. Huerta, Administrator: As previously stated in our February 24, 2015, letter to the Board, the FAA is currently revising Order 811 0.4C and creating a draft AC provided guidance to the applicant responsibilities for showing compliance. The FAA will explore options to incorporate this recommendation into the new guidance.

From: NTSB

To: FAA

Date: 5/12/2016

Response: CC# 201600220, dated May 12, 2016: The National Transportation Safety Board (NTSB) has reviewed the Federal Aviation Administration's (FAA) notice of proposed rulemaking (NPRM) titled "Revision of Airworthiness Standards for Normal, Utility, Acrobatic, and Commuter Category Airplanes," which was published at 81 Federal Register (FR) 13451 on March 14, 2016. The NPRM proposes to amend airworthiness standards for normal, utility, acrobatic, and commuter-category airplanes by removing prescriptive design requirements and replacing them with performance based airworthiness standards. The proposed standards would also replace the current weight and propulsion divisions in small airplane regulations with performance- and risk based divisions for airplanes with a maximum seating capacity of 19 passengers or less and a maximum takeoff weight of 19,000 lbs. or less. In addition, the NPRM proposes to adopt additional airworthiness standards to address certification for flight in icing conditions, enhanced stall characteristics, and minimum control speed to prevent departure from controlled flight for multiengine airplanes. On April 8, 2016, the FAA also published on its website draft Advisory Circular (AC) 23.10 titled "FAA Accepted Means of Compliance Process for 14 [Code of Federal Regulations] CFR Part 23." The draft AC provides guidance on how to submit a proposed means of compliance (MOC) with Part 23 for acceptance by the Administrator in accordance with proposed section 23.10, "Accepted Means of Compliance," in the NPRM. This letter provides comments on the NPRM. We will submit separate comments regarding draft AC 23.10. Related Safety Recommendations and Investigations We issued safety recommendations to the FAA and investigated accidents/incidents related to the following topics discussed in the

NPRM: Certification One of the FAA's stated goals in this rulemaking is to encourage the introduction of new and innovative technology. Our investigation of the January 7, 2013, fire in the aft cabin of a Japan Airlines Boeing 787-8, JA829J, which was parked at a gate at General Edward Lawrence Logan International Airport, Boston, Massachusetts, focused on issues related to the safety of new technology introduced to aviation (specifically, new lithium-ion battery applications). Manufacturers and subtier vendors developed design and oversight criteria to be applied and then presented the criteria to the FAA. We found that there was insufficient guidance and education for FAA certification engineers during the type certification process to ensure compliance with applicable requirements. As a result, on December 1, 2014, we issued the following safety recommendations to the FAA: A-14-119 Provide your certification engineers with written guidance and training to ensure that (1) assumptions, data sources, and analytical techniques are fully identified and justified in applicants' safety assessments for designs incorporating new technology and (2) an appropriate level of conservatism is included in the analysis or design, consistent with the intent of [AC] 25.1309 (Arsenal draft). [Classified "Open—Acceptable Response"] A-14-121 Develop written guidance for your certification engineers and engineering designees about the use of traceability principles to verify that the methods of compliance proposed by type certification applicants for special conditions involving new technology are correct and complete. [Classified "Open—Acceptable Response"] A-14-122 Once the guidance requested in Safety Recommendation A-14-121 has been issued, provide training to your certification engineers and engineering designees on the subjects discussed in the guidance. [Classified "Open—Acceptable Response"] A-14-123 Require applicants to discuss key assumptions related to safety-significant failure conditions, their validation, and their traceability to requirements and proposed methods of compliance during certification planning meetings for type designs involving special conditions. [Classified "Open—Acceptable Response"] We are concerned that with the revisions proposed in the NPRM, and procedures proposed in draft AC 23.10, the FAA's certification engineering staff will face increased demands to evaluate new technologies, and the FAA may face challenges similar to those encountered with the certification of the lithium-ion batteries in the Boeing 787.

From: NTSB

To: FAA

Date: 4/16/2015

Response: We note your position that the responsibilities discussed in this recommendation should be placed on the applicant rather than on FAA certification engineers and FAA designees. We issued these recommendations because we found in our investigation of the January 7, 2013, incident on the Japan Airlines Boeing 787 that critical assumptions and conclusions made in the safety analyses of GS Yuasa's and Thales (the suppliers of the components involved in the fire), which were used in Boeing's electrical power system (EPS) safety assessment, were neither fully delineated nor justified with appropriate data and engineering rationale. However, multiple independent reviews of the EPS safety assessment that Boeing-authorized representatives and FAA certification engineers had conducted did not reveal these deficiencies. We believe that the review process for safety assessments should be designed to closely examine the data used to support conclusions and challenge assumptions, particularly those that could result in significant safety consequences if incorrect. We agree that the applicant has an obligation to show traceability, but when the FAA reviews and approves a systems safety assessment, that review should ensure that adequate traceability is present in the documents. Improving the guidance to applicants on the documentation of traceability needed may provide the needed guidance for FAA engineers and designees reviewing systems safety assessments. However, we believe that you also need to acknowledge the FAA's role in reviewing for traceability and consider whether the planned revisions to FAA Order 8110.4C and AC 25.1309 (Arsenal draft) described in your letter will provide sufficient guidance for thoroughly reviewing an applicant's systems safety assessment. Pending your making the revisions to FAA Order 8110.4C and AC 25.1309 (Arsenal draft) that you described and replying to us about the sufficiency of these documents as discussed above, Safety Recommendation A-14-121 is classified "Open—Acceptable Response." Pending your incorporating guidance into the training programs for FAA certification engineers and engineering designees about how to review an applicant's systems safety analysis to ensure compliance with the traceability requirements, Safety Recommendation A-14-122 is classified "Open—Acceptable Response." Pending revisions to FAA Order 8110.4C and the creation of policy documents related to applicant responsibilities for showing compliance with the order, Safety Recommendation A-14-123 is classified OPEN—ACCEPTABLE RESPONSE.

From: FAA

To: NTSB

Date: 2/24/2015

Response: -From Michael P. Huerta, Administrator: As discussed in our response to A-14-121, the FAA is currently revising Order 8110.4C and creating draft policy documents related to applicant responsibilities for showing compliance. The FAA will explore options to incorporate this recommendation into these new guidelines.

Safety Recommendation A-14-128 Boeing to Develop More effective Oversight of Primary and Sub-tier Suppliers

Recommendation: TO THE BOEING COMPANY: Develop or revise processes to establish more effective oversight of your suppliers (including subtier suppliers) to ensure that the product being manufactured adheres to established industry standards.

SUBJECT: Safety Recommendation History

From: NTSB

To: Boeing Company

Date: 3/1/2016

Response: From your March 31, 2015, letter, we learned that you are using a new tool called Joint Team Assessments (JTA) to focus oversight not only on direct suppliers, but also on their subtier suppliers. In our previous letter to you, we asked that you describe how the JTAs will ensure that such subtier suppliers are aware of, and in compliance with, all of your specifications. We were pleased to learn that Boeing supplier contracts require compliance with all its specifications and requirements by subtier suppliers, and require that all subtier contracts specify the same. We note that a JTA consists of representatives from Boeing and the prime supplier, who together visit the subtier supplier to verify this compliance and to assess the quality system of the subtier supplier. These procedures satisfy Safety Recommendation A-14-128, which is classified CLOSED—ACCEPTABLE ACTION.

From: Boeing Company

To: NTSB

Date: 1/4/2016

Response: -From Hillary Barr, Director, Product Safety, Chief Engineer, Air Safety Investigation: The Boeing supplier contract contains language which requires flow down of Boeing specifications and requirements if/when sub-tier suppliers will be utilized. This requirement to include flow down of Boeing specifications and requirements is also required to be included in sub-tier contracts. A Joint Team Assessment (JTA) consists of both a Boeing Supplier Quality (SQ) representative, assigned to a given (prime) supplier, as well as a quality representative from the prime supplier. Though Boeing has right-of-entry access to sub-tiers through our contract language, Boeing prefers to visit the sub-tier supplier with the prime supplier in order to reinforce the responsibility of the prime supplier to oversee its suppliers. Critical sub-tier suppliers are visited by the prime supplier and Boeing to perform a joint assessment of the quality system at that sub-tier supplier. Sub-tiers are selected for JTA's based on factors such as volume of work, complexity of work, programs supported and quality history. One of the first priorities at the start of an assessment is that the Boeing SQ representative/s verify that a contractual relationship is in place between the prime and sub-tier supplier that includes proper flow down of Boeing contract specifications and quality requirements by the prime supplier to its sub-tier suppliers. Considering the contractual requirements that Boeing has with our prime suppliers, the Joint Team Assessments and the First Article Inspections, Boeing is confident in the quality of components provided to us by our suppliers. Repeating your reference c) question to A-14-129: Please provide more information about how the gated process does this (how assumptions made in safety assessments are identified and validated). Boeing response: Within the development process, Boeing Commercial Airplanes uses a series of gated reviews to help ensure that the requirements are identified and validated, verification is planned and performed, and safety analyses are performed and reviewed. Throughout the process, assumptions are challenged at gated reviews by a cross-section of design experts to evaluate and confirm that designs are meeting expectations. In addition, technology readiness processes implemented in the development of new technologies are intended to test and evaluate the technology's feasibility prior to program commitment. The Boeing standard gated processes for development help evaluate and confirm that designs are program-ready and vetted by knowledgeable experts who challenge the development plan, processes, and design at hierarchical levels of integration throughout the development lifecycle of the product. These processes continue to evolve and improve, as our products do, in our efforts to provide ever safer and more reliable products. Please feel free to contact us if you have any questions.

From: NTSB

To: Boeing Company

Date: 6/16/2015

Response: We note that you have increased the focus and doubled the number of Quality Assessments conducted at your suppliers and that you are using a new tool called Joint Team Assessments to focus oversight not only on direct suppliers, but also on their subtier suppliers. Ensuring compliance of subtier suppliers is an important element of this recommendation. In our investigation of the January 7, 2013 incident at Boston's Logan Airport, we found that the design of the rivets in the cell headers did not comply with Boeing's specification for the battery, nor with other, similar industry standards, such as those of Underwriters Laboratories or the National Electrical Code. The design and manufacture of the subassembly of the cell headers was performed by a fourth-level subtier supplier. Boeing contracted with Thales, who contracted with GS Yuasa, who purchased the subassembly from a supplier. We ask that you describe how the Joint Team Assessments will ensure that such subtier suppliers are aware of, and in compliance with, all of your specifications. We further note that you are working to expand and strengthen industry standards addressing manuacturing quality issues, and that you intend to require your suppliers to meet these standards. Pending our receipt of a satisfactory answer regarding how the Joint Team Assessments will be able to ensure that all subtier suppliers, even those who may be far removed from Boeing, comply with your specifications; completion of the revisions to the industry standards; and the inclusion of the revised industry standards in Boeing contractual documents, Safety Recommendation A-14-128 is classified OPEN—ACCEPTABLE RESPONSE.

From: NTSB

To: Boeing Company

Date: 4/30/2015

Response: This safety recommendation is briefly mentioned in the following Federal Register comment. The National Transportation Safety Board (NTSB) has reviewed the Federal Aviation Administration's (FAA) notice of proposed special conditions titled "Special Conditions: Honda Aircraft Company, Model HA-420 HondaJet, Lithium-Ion Batteries," which was published in 80 Federal Register 19889 on April 14, 2015.

From: Boeing Company

To: NTSB

Date: 3/31/2015

Response: -From Paul R. Richter, Chief Engineer, Product Safety: In response to safety recommendation A-14-128, Boeing has increased the focus and doubled the number of Quality Assessments conducted at our suppliers to ensure they have acceptable processes, procedures, systems and staffing to conduct oversight of sub-tier suppliers. In addition, Boeing is utilizing a new tool called Joint Team Assessments to focus our oversight not only on direct suppliers, but to partner with them to assess conformance and compliance of their sub-tier suppliers. Boeing is working within the aerospace industry to expand and strengthen industry standards on quality that Boeing then flows down as requirements to our suppliers. These industry standards include the following: Delegation of Inspection Authority (AS9105) – The delegation of inspection authority to suppliers is a well-established process – but needs to have tight controls to be effective. This standard was first flowed as a requirement in 2014. It is in the process of re-release and the improved replacement, AS9117, Delegated Product Release Verification, will be flowed down in 2015. Operator Self-Verification (ARP9162) – The inspection of operations by the manufacturing operator can be a best practice – but it too requires careful oversight by the Quality function. This standard is being revised to AS9162 and will be released as a requirement in 2015. Foreign Object Debris (FOD) Prevention (AS9146) – Boeing is leading the industry team to develop and deploy a FOD prevention document that can be contractually flowed to our enterprise supplier base. The scope of the document defines supplier requirements for FOD prevention necessary to reduce the risk of FOD within Boeing products. This document captures the best practices of the industry and will be flowed as a contractual requirement in 2015. As a result of the NTSB investigation work, Boeing (through Thales) has instituted an active FOD / contamination monitoring and control plan, above and beyond the original manufacturing plan at GS Yuasa. Boeing and Thales are actively involved in conducting regular, on-going factory audits and on-floor inspections of GS Yuasa electrode and cell manufacturing areas. In response to safety recommendation A-14-129, Boeing continually reviews and updates processes and procedures for our designs and any new technologies that are incorporated into our airplane platforms. Boeing also continually evaluates industry standards for evaluating and testing new technologies. These standards were followed during the initial battery development related to methods to test cell failures. Since the initial development of the 787 battery, Boeing has implemented a new procedure for evaluating new technologies.

This procedure applies a gated process for evaluating new technology maturity and production readiness. Part of the technology evaluation process includes safety assessments of any new technology being considered for production. Though Boeing, Thales, and the industry have now elevated the understanding of the importance of testing battery cells while they were electrically connected, Boeing's overall safety assessments and requirements for the airplane were met. The 787 includes multiple layers of protections at the component, system, and airplane level to mitigate the effects of a battery failure. In particular, the battery system was designed so that if a battery failed and initiated venting of a cell, that failure would not result in a hazard to the airplane or its occupants. The January 2013 ANA in-flight battery failure demonstrated the efficacy of these original protections—the smoke from the failure was vented overboard, the airplane structure sustained no damage, the airplane landed safely. After the Japan Airlines 787 battery event, and based on information developed in part during that investigation, a comprehensive set of battery enhancements were put in place. These enhancements are described in Boeing's submission to the NTSB. As a result of these enhancements and the initiatives outlined in this letter, the 787 is an even safer and more reliable airplane than it was at the time of original certification.

From: Boeing Company

To: NTSB

Date: 2/24/2015

Response: -From Paul R. Richter, Chief Engineer, Product Safety, Commercial Airplanes, Boeing Company: We are continuing to evaluate these recommendations and expect to have a response for you by March 31.

Safety Recommendation A-14-129 Modify Process for Safety Assessment to Assure Conclusions are Validated and Deficiencies Corrected

Recommendation: TO THE BOEING COMPANY: Modify your process for developing safety assessments for designs incorporating new technology to ensure that the conclusions made are validated and that any identified deficiencies are corrected.

SUBJECT: Safety Recommendation History

From: NTSB

To: Boeing Company

Date: 3/1/2016

Response: Your March 31, 2015, letter described your implementation of a new procedure that applies a gated process for evaluating new technologies. In our previous letter, we asked how this process identifies and validates assumptions made in safety assessments. We were pleased to learn that Boeing's process includes a series of gated reviews to help ensure that design requirements are identified and validated, that verification is planned and performed, and that safety analyses are performed and reviewed. Throughout the process, assumptions are challenged by a cross-section of design experts who confirm that designs are meeting expectations. This process satisfies Safety Recommendation A-14-129, which is classified CLOSED—ACCEPTABLE ACTION.

From: Boeing Company

To: NTSB

Date: 1/4/2016

Response: -From Hillary Barr, Director, Product Safety, Chief Engineer, Air Safety Investigation: The Boeing supplier contract contains language which requires flow down of Boeing specifications and requirements if/when sub-tier suppliers will be utilized. This requirement to include flow down of Boeing specifications and requirements is also required to be included in sub-tier contracts. A Joint Team Assessment (JTA) consists of both a Boeing Supplier Quality (SQ) representative, assigned to a given (prime) supplier, as well as a quality representative from the prime supplier. Though Boeing has right-of-entry access to sub-tiers through our contract language, Boeing prefers to visit the sub-tier supplier with the prime supplier in order to reinforce the responsibility of the prime supplier to oversee its suppliers. Critical sub-tier suppliers are visited by the prime supplier and Boeing to perform a joint assessment of the quality system at that sub-tier supplier. Sub-tiers are selected for JTA's based on factors such as volume of work, complexity of work, programs supported and quality history. One of the first priorities at the start of an assessment is that the Boeing SQ representative/s verify that a contractual relationship is in place between the prime and sub-tier supplier that includes proper flow down of Boeing

contract specifications and quality requirements by the prime supplier to its sub-tier suppliers. Considering the contractual requirements that Boeing has with our prime suppliers, the Joint Team Assessments and the First Article Inspections, Boeing is confident in the quality of components provided to us by our suppliers. Repeating your reference c) question to A-14-129: Please provide more information about how the gated process does this (how assumptions made in safety assessments are identified and validated). Boeing response: Within the development process, Boeing Commercial Airplanes uses a series of gated reviews to help ensure that the requirements are identified and validated, verification is planned and performed, and safety analyses are performed and reviewed. Throughout the process, assumptions are challenged at gated reviews by a cross-section of design experts to evaluate and confirm that designs are meeting expectations. In addition, technology readiness processes implemented in the development of new technologies are intended to test and evaluate the technology's feasibility prior to program commitment. The Boeing standard gated processes for development help evaluate and confirm that designs are program-ready and vetted by knowledgeable experts who challenge the development plan, processes, and design at hierarchical levels of integration throughout the development lifecycle of the product. These processes continue to evolve and improve, as our products do, in our efforts to provide ever safer and more reliable products. Please feel free to contact us if you have any questions.

From: NTSB

To: Boeing Company

Date: 6/16/2015

Response: We note that, since the initial development of the 787 battery, Boeing has implemented a new procedure that applies a gated process for evaluating new technologies. We also are aware that you made comprehensive battery enhancements after the January 7, 2013, incident in Boston, which you described in your submission for our investigation of that event. We point out, however, that this recommendation is not specific to the issues with lithium batteries that we identified in that investigation, but addresses the general issue of how assumptions made in safety assessments are identified and validated. Please provide more information about how the gated process does this. Pending our receipt of this information, Safety Recommendation A-14-129 is classified OPEN—ACCEPTABLE RESPONSE.

From: NTSB

To: Boeing Company

Date: 4/30/2015

Response: This safety recommendation is briefly mentioned in the following Federal Register comment. The National Transportation Safety Board (NTSB) has reviewed the Federal Aviation Administration's (FAA) notice of proposed special conditions titled "Special Conditions: Honda Aircraft Company, Model HA-420 HondaJet, Lithium-Ion Batteries," which was published in 80 Federal Register 19889 on April 14, 2015.

From: Boeing Company

To: NTSB

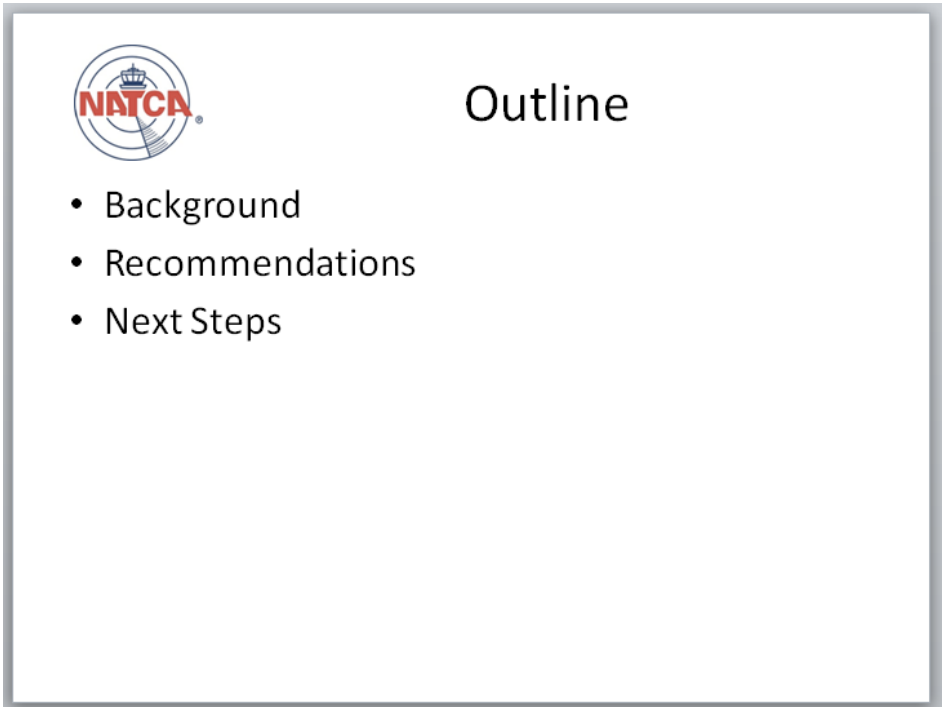
Date: 3/31/2015

Response: -From Paul R. Richter, Chief Engineer, Product Safety: In response to safety recommendation A-14-128, Boeing has increased the focus and doubled the number of Quality Assessments conducted at our suppliers to ensure they have acceptable processes, procedures, systems and staffing to conduct oversight of sub-tier suppliers. In addition, Boeing is utilizing a new tool called Joint Team Assessments to focus our oversight not only on direct suppliers, but to partner with them to assess conformance and compliance of their sub-tier suppliers. Boeing is working within the aerospace industry to expand and strengthen industry standards on quality that Boeing then flows down as requirements to our suppliers. These industry standards include the following: Delegation of Inspection Authority (AS9105) – The delegation of inspection authority to suppliers is a well-established process – but needs to have tight controls to be effective. This standard was first flowed as a requirement in 2014. It is in the process of re-release and the improved replacement, AS9117, Delegated Product Release Verification, will be flowed down in 2015. Operator Self-Verification (ARP9162) – The inspection of operations by the manufacturing operator can be a best practice – but it too requires careful oversight by the Quality function. This standard is being revised to AS9162 and will be released as a requirement in 2015. Foreign Object Debris (FOD) Prevention (AS9146) – Boeing is leading the industry team to develop and deploy a FOD prevention document that can be contractually flowed to our enterprise supplier base. The scope of the document defines supplier requirements for FOD prevention necessary to reduce the risk of

FOD within Boeing products. This document captures the best practices of the industry and will be flowed as a contractual requirement in 2015. As a result of the NTSB investigation work, Boeing (through Thales) has instituted an active FOD / contamination monitoring and control plan, above and beyond the original manufacturing plan at GS Yuasa. Boeing and Thales are actively involved in conducting regular, on-going factory audits and on-floor inspections of GS Yuasa electrode and cell manufacturing areas. In response to safety recommendation A-14-129, Boeing continually reviews and updates processes and procedures for our designs and any new technologies that are incorporated into our airplane platforms. Boeing also continually evaluates industry standards for evaluating and testing new technologies. These standards were followed during the initial battery development related to methods to test cell failures. Since the initial development of the 787 battery, Boeing has implemented a new procedure for evaluating new technologies. This procedure applies a gated process for evaluating new technology maturity and production readiness. Part of the technology evaluation process includes safety assessments of any new technology being considered for production. Though Boeing, Thales, and the industry have now elevated the understanding of the importance of testing battery cells while they were electrically connected, Boeing's overall safety assessments and requirements for the airplane were met. The 787 includes multiple layers of protections at the component, system, and airplane level to mitigate the effects of a battery failure. In particular, the battery system was designed so that if a battery failed and initiated venting of a cell, that failure would not result in a hazard to the airplane or its occupants. The January 2013 ANA in-flight battery failure demonstrated the efficacy of these original protections—the smoke from the failure was vented overboard, the airplane structure sustained no damage, the airplane landed safely. After the Japan Airlines 787 battery event, and based on information developed in part during that investigation, a comprehensive set of battery enhancements were put in place. These enhancements are described in Boeing's submission to the NTSB. As a result of these enhancements and the initiatives outlined in this letter, the 787 is an even safer and more reliable airplane than it was at the time of original certification.

Appendix 11: NATCA Safety Committee Presentation August 28, 2013

NATCA presented the following PowerPoint presentation to Peggy Gilligan, Frank Paskiewicz, Dorenda Baker.



Background

- NATCA BUEs are concerned about the current Organization Designation Authorization (ODA) process and potential expansion of the process to Certificate Delegation Organization (CDO)
- We believe there are a number of areas for improvement in our current certification and delegation processes
- The 787 certification gives us an opportunity to identify shortfalls and make corrections
- We want to share information in an open and collaborative exchange and work together to improve Aircraft Certification Service

Recommendation No. 1

- Promote direct communications between technical specialists in FAA Oversight Offices and the ARs in the DAH's ODA

Recommendation No. 2

- Reward employees for identifying safety issues during certification
  - Technical specialists for identifying safety issues
  - Managers for supporting the technical specialists

Recommendation No. 3

- Model the BASOO / Seattle ACO relationship more like the GASOO / Atlanta ACO:
  - GASOO performs program management functions
  - ACO provides technical specialists

Recommendation No. 4

- Prioritize staffing to fill vacant technical specialists positions
  - Having knowledgeable technical specialists helps make better oversight / delegation decisions

Recommendation No. 5

- Require all ARs to have expertise on systems for which they are delegated
  - Today's global business model resulted in reliance on chain of sub tier suppliers and engineering organizations
  - Boeing delegated design and certification functions to "partners"
  - Boeing ARs still responsible for certification, but had limited knowledge of the system designed by their "partners" (e.g. wing to body design flaw, battery cert., electrical panel)

Recommendation No. 6

- The Design Approval Holder's (DAH's) Delegation organization should be separate from their Design organization

Recommendation No. 7

- Use the FAA Flight Standards (AFS) model for reacting to DAH/applicants that are having difficulty

Recommendation No. 8

- Implement the Aircraft Certification Safety Action Program (ACSAP) recommended by the joint FAA / NATCA workgroup to provide a process to collaboratively resolve safety issues raised by employees, including concerns over delegation decisions

Future Concern

- Safety Management System and the perceived need by agencies to transition from delegation (DER, AR, ODA) to engineering organizations


Next Steps
• Identify opportunities to work collaboratively
• Timeline

Appendix 12: Employee Notice From Dorenda Baker Re: Expanded Reliance on Bilateral Agreements

The following is an Employee Notice by Dorenda Baker, Expanded Reliance on Bilateral Agreements for Certification of Foreign Aircraft, August 31, 2016

FAA worked with EASA to develop a Validation Improvement Roadmap 2022. has signed an agreement with ANAC, TCCA, EASA

News & Update

You are subscribed to News & Updates from the FAA Homepage. This information has recently been updated, and is now available.

International Partners Plan for Aviation Growth

August 31- The Certification Management Team (CMT), comprised of leaders from four civil aviation authorities, has published a strategy to develop and implement policies that streamline certification. The team includes the Federal Aviation Administration (FAA), Agencia Nacional de Aviação Civil (ANAC) of Brazil, European Aviation Safety Agency (EASA), and Transport Canada Civil Aviation (TCCA). The FAA and EASA also have established a bilateral Validation Improvement Roadmap (VIR) that defines the specific bilateral initiatives.

The continued globalization of the aviation industry has prompted collaboration among the world's civil aviation authorities to harmonize regulatory systems. Industry growth has increased the level of domestic certification activity, and validation projects from emerging States of Design are placing growing resource demands on other authorities. By maximizing the use of existing U.S. bilateral partnerships with our CMT partner countries, we can reduce the amount of effort all of the agencies currently expend on validation programs.

Strong partnerships are a key to consistent safety standards around the world. As leaders in the global aviation community, the CMT members are pioneering a strategy that focuses on confidence-building initiatives and risk-based validation principles to accept partner certification activities with limited or no technical involvement. This is a significant

expansion of previous initiatives, which allows the authorities to maximize their reliance on the certificating authority as much as possible.

The CMT Strategy and the FAA-EASA VIR support the FAA's Global Leadership Initiative, which is transforming how the FAA prioritizes and targets resources to engage with the international aviation community to improve safety, efficiency, and environmental sustainability through regulatory harmonization and partnerships.

###

Appendix 13: Section 312 Citation

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—

(!) the expected number of applications for product certifications and approvals the Administrator will receive under section 44704 of such title in the ! -year, 5-year, and I0-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 I louse 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 14: Section 312 ARC 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.

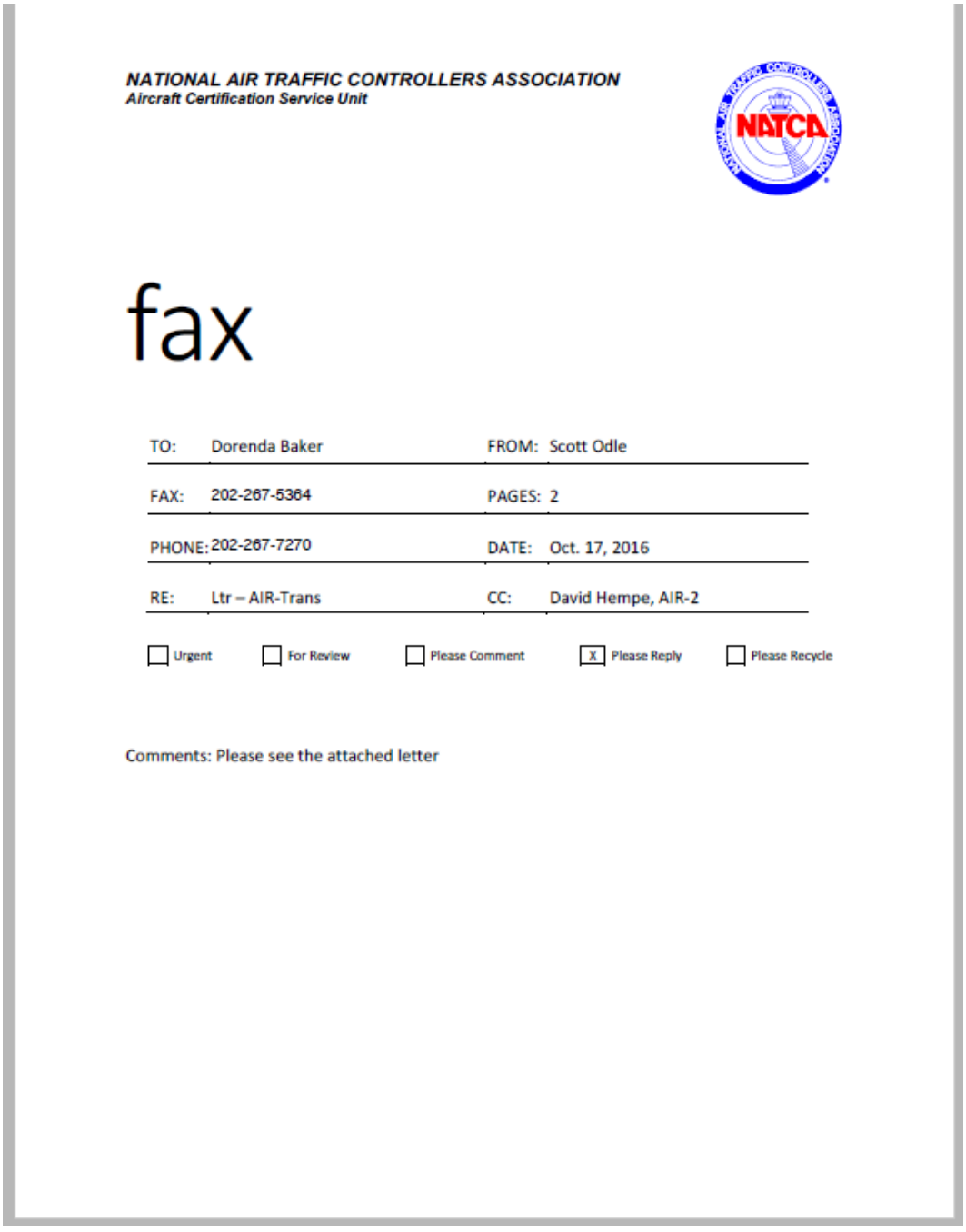
10. **DISTRIBUTION.** This charter is distributed to director-level management in the Office of the Associate Administrator for Aviation Safety, the Office of Aviation Policy and Plans, and the Office of Rulemaking.

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

Michael P. Huerta
Acting Administrator

Appendix 15: NATCA Letter Re: Participation in ODT2 per Article 48

Letter dated October 17, 2016, Scott Odle to Dorenda Baker (AIR-1), Participation in ODT2 per Article 48



NATIONAL AIR TRAFFIC CONTROLLERS ASSOCIATION
Aircraft Certification Service Unit

fax

TO:	Dorenda Baker	FROM:	Scott Odle
FAX:	202-267-5364	PAGES:	2
PHONE:	202-267-7270	DATE:	Oct. 17, 2016
RE:	Ltr – AIR-Trans	CC:	David Hempe, AIR-2

☐ Urgent ☐ For Review ☐ Please Comment ☒ Please Reply ☐ Please Recycle

Comments: Please see the attached letter

NATIONAL AIR TRAFFIC CONTROLLERS ASSOCIATION
Aircraft Certification Service Unit

Dorenda Baker
Director, Aircraft Certification Service (AIR-1)
800 Independence Avenue, SW
Washington, D.C. 20591

Dear Ms. Baker:

It is our understanding that the ACMT is/has met with AVS-1 this week in order to present the Organizational Design Team's (ODT) proposed concept for the new Aircraft Certification organization.

This concept was developed by the ODT on its own despite requirements under Executive Order 13522 for the Agency to engage the Unions in Pre-Decisional Involvement (PDI). This team also was formed and worked without union involvement despite the requirement of Article 48 of our Collective Bargaining Agreement. This resulted in decisions being made without pre-decisional involvement by the Union.

It is my understanding that a decision to go forward will be made shortly and the ODT (ODT-2) will then begin work on the next phase.

NATCA expects that in accordance with Article 48 of the Contract, the Agency will invite NATCA to participate in all teams associated with work going on related to AIR-Transformation. This includes the ODT (ODT-2). We also expect that the Agency will follow the Executive Order and involve the Union in a Pre-Decisional manner and not after the decision was made.

It is hoped that full pre-decisional involvement (PDI) and Article 48 involvement by the Union will result in better decisions and less concerns that would result in substantive, impact, and implementation bargaining under Article 7 of the Collective Bargaining Agreement.

Please contact us early enough to be able to appoint a NATCA representative prior to the start of any work by the ODT or any other team or workgroup.

Scott E Odle
NATCA-AIR National Representative.

Date October 17, 2016

CC:
Mike MacDonald, NATCA
David Hempe, AIR-2

Appendix 16: NATCA Letter Re: Requirement for Negotiating Directorate Management Reorganization

Letter dated October 20, 2016, Scott Odle to Dorenda Baker Requirement for Negotiating Directorate Management Reorganization

NATIONAL AIR TRAFFIC CONTROLLERS ASSOCIATION
Aircraft Certification Service Unit

fax

TO:	Dorenda Baker	FROM:	Scott Odle
FAX:	202-267-5364	PAGES:	3
PHONE:		DATE:	Oct. 20, 2016
RE:	Ltr – AIR-Trans	CC:	See letter

☐ Urgent ☐ For Review ☐ Please Comment ☒ Please Reply ☐ Please Recycle

Comments: Please see the attached letter

NATIONAL AIR TRAFFIC CONTROLLERS ASSOCIATION
Aircraft Certification Service Unit

Dorenda Baker
Director, Aircraft Certification Service (AIR-1)
800 Independence Avenue, SW
Washington, D.C. 20591

Dear Ms. Baker:

In recent discussions with NATCA's PDI members working on AIR Transformation it is our understanding that the Agency is looking at accelerating the AIR-Transformation change and that the Agency is meeting to get the go-ahead for this. It is our understanding that the Agency is looking to do a complete management reorganization implemented by as early as April 2017. This would include managers being realigned so they report to a functional head. Example, all ACO managers would report to one manager, all standards staffs would report to another, etc.

This plan (as we understand it) would essentially realign the manager responsibilities with the long term planned functional responsibilities. It has been indicated that, no employee responsibilities, or managers they report to would change at this time. We have been told that the thinking is this would allow the Agency to say we are not realigned along functional responsibilities and give more time to make the actual functional changes to implement expanded delegation, and changes that impact the employees.

It is our understanding that the Agency believes that this change will have no impact on the bargaining unit employees and that it can be done with no involvement from any of the Unions.

NATCA does not agree with this assessment. As one example, a change such as what is described would immediately impact the bargaining unit employees in many ways. It would impact how we do our jobs and how coordination on projects and other work is done. Numerous Orders, procedures, processes (QMS) would have to be changed prior to implementation (unless AIR decides to abandon its ISO certification) otherwise employees are in the position of not being in compliance with them. All of these changes would also have to be worked thru the Union.

A realignment, such as that described, also directly impacts the NATCA Collective Bargaining Agreement that was signed by this Agency. The CBA specifically calls out a NATCA representational structure that corresponds to the specific AIR organizational structure that exists today. The proposed change in the AIR management structure would no longer correspond to that which the Agency agreed to in the CBA. A change that affects the Union's representational structure is fully negotiable and cannot be unilaterally changed or implemented by the Agency.

This proposal and the upcoming decision to proceed are being made without the involvement of the Union despite the requirements of E.O 13522 which requires Pre-Decisional Involvement. In addition, the current PDI team believes that it inputs have not even been considered in the decision being made.

This change, as it has been described, clearly impacts the bargaining unit employees, the Union, and the Collective Bargaining Agreement. Therefore, the Agency would be required to provide proper notice to the Union and negotiate the change as well as the impacts and implementation procedures of the change, with NATCA prior to implementing any change.

I would welcome the opportunity to meet and discuss this change, AIR Transformation, and a going forward plan with you.

Scott E Odle
NATCA-AIR National Representative.

Date October 20, 2016

CC:
Mike MacDonald, NATCA
David Hempe, AIR-2
Micheal Linegang,
Mike Dostert, NATCA

Sent by FAX and email on Oct. 20, 2016

Appendix 17: Key Issues Identified by Unions and Provided to ODT in Kansas City

Union Support

a) Proposed Reorganization with Divisional approach
b) Enhanced Policy and Innovation function with emphasis on new technology
c) Early involvement in certification projects
    i) Unions Recommend "Grey Beard" Panel made up of Chief Scientist Technical Advisors, Policy and Innovation Division specialists, certification division specialists to identify design deficiencies, new technology and establish Cert Basis
d) Reduction in Issue Papers through development of public compliance library and Updating regulations through Issuance of Airworthiness Review rulemaking package.
e) Combining foreign and domestic certification in the Compliance and Airworthiness Division
f) Investment in Work Force
    i) Establishing agency technical fellow specialist job positions
    ii) Upgrading certification engineer position pay bands based upon expanded responsibilities of foreign aircraft
g) Incentivizing Applicants to Comply
    i) Require all non compliant design features to be brought into compliance regardless whether the deficiency results in an unsafe condition.

Union Concerns

1) Concept of further removal of FAA from oversight
    i) Industry claim of FAA is delaying certification unfounded.
    ii) ODA report card does not support this claim
    iii) 99 % of companies get 99% of their certification projects done in a timely manner. There may be points of delay due to company needing more time to test, but not systemic FAA delays.
    iv) FAA is not delaying implementation of safety enhancements and getting products to market.
    v) Data shows current ODA concept flawed. E.g. 787 Battery approval and DOT IG and GAO reports
2) Assumption that safety will not be reduced by proposed removal of FAA from certification process
    i) FAA certification engineers and mfg inspectors are focused on safety and not profit…we help industry to find design and certification deficiencies which adds value to the company's aircraft and to meet the minimum safety regulations…

ii) FAA engineers routinely find design flaws while directly involved in certification process
iii) ODAs are not functioning as independent oversight function
iv) Globalization and New business model results in sub-contracting entire system designs and diminished knowledge of airplane design by applicant engineers. The is the very time the FAA should be increasing involvement, not proposing applicant only findings.

3) "The critical path" is the portion of the process when companies are under the greatest pressure and they inadvertently compromise compliance/safety. ODT is under-estimating the importance of FAA involvement in that critical path.
4) Cannot support the proposed approach of inspecting "quality in" through audits rather than up front confirmation design is compliant.
   a) Being proactive has helped the traditional certification process achieve the current safety record. Finding safety issues before the design is approved by the ODA (CDO) avoids delivery and operation of large numbers of potentially unsafe/non compliant airplanes.
5) Any approach must maintain FAA involvement in "high risk" approvals
6) Do not support development of individual Proprietary compliance libraries-
   a) Will drain FAA and industry resources and lead to non standardized MOC.
   b) prone to non-standardization & duplication of FAA work;
   c) prone to become high workload both FAA and Industry.
   d) Not allow public comment on policy,
   e) Unions support common public policy libraries
7) Cannot support "Applicant only findings" This concept does not appear to be legal. And, if determined to be legal, must be limited only to use of test data (such as military testing) for very simple components/findings
8) FAA Resources not focused to hold ODA accountable for failure to meet conditions of ODA
   a) Applicants do not provide service instructions for identified unsafe conditions to support AD actions
   b) Present designs that are non compliant and refuse to make design changes
   c) Delay action until the end of the program to force FAA approval
9) Shortfalls in ODA System must be Fixed
   a) Designee oversight must be separate from company oversight
   b) Need separate branch responsible for designee selection and oversight.
   c) Enhanced Selection, competency and training processes of ARs by FAA, and associated oversight must be implemented.
10) Cannot support an Organizational structure that does not maintain means to maintain technical competency. The current structure will stove pipe Continued Operational Safety (COS) engineers so they are not involved with certification.
   a) Means must be provide to maintain technical competency of COS engineers.
   b) Proposed concept removes FAA engineers from certification path

c) Loss of technical specialist knowledge of certified products
d) Loss of technical knowledge will lead to inability to make sound COS decisions
e) Loss of technical skills and knowledge needed to conduct certification audits

11) Brain Drain
12) Inability to hire and retain qualified personnel. Current FAA training is inadequate.
13) Employee Burn Out
    a) Employees do not like audit work and full time audit will lead to burn out
    b) Possible need for rotational positions to help supplement staffing needs and career development
14) Inequity in job descriptions and pay grades for identical work
15) Ability of employees to transition to new Divisional Organization
16) Need agreement on method of how jobs will be filled.
    a) Will jobs be bid, request for volunteers, based upon seniority?
17) AIR management Safety Culture
    a) Management focus appears to be driven by congressional concerns resulting from misinformation provided by manufactures.
    b) Lack of push back and providing data driven response to Congress
    c) Failure to use the 787grounding as an opportunity to understand the risks of over delegation and need for balance. Open items from DOT IG & GAO reports.
    d) Failure of management to hold industry accountable for meeting obligations under ODA

Union Recommendations

1) Support Amending Part 25 - issuance of single rulemaking package similar to 1974 Airworthiness review-
    a) Demonstrates FAA leads world in new standards
    b) Incorporates existing safety requirements and policy into the regulations and eliminates numerous issue papers and perceived FAA involvement in critical path.
    c) Need Industry commitment that they will not impede rulemaking efforts.
2) Support issuance of MOC policy
    a) Streamline policy release
        i) Previously applied policy adopted without ACO and Industry comment, with request for comment.
        ii) Issue under Policy and Innovation Division signature with request for comments
3) Early establishing initial cert Basis
    a) Require applicant to provide mature design concepts early
    b) Proactive approach to reviewing R&D data and develop how to grant certification credit
    c) Strongly recommend all standards, special conditions, issue papers etc. be identified on every major cert program by a team of grey beard panels from Policy and Innovation branch and passed on to certification center.
    d) Team made up of CSTA, Policy Innovation Specialists, Academia,

e) Responds to Findings from Battery Investigation

Establishing Technical Fellow Engineering K band Positions within Policy and Innovation Branch similar to current Cabin Safety, Icing, Composites, Propeller etc. positions.

Appendix 18: AVS, AIR Staffing and Designee Oversight

Overall Employee numbers:

All numbers were obtained off of public internet websites and supplied by DOT/FAA

i.e.As of 9/30/08, source AHP-100, for AVS FY07 was 6842 and FY08 was 7013. From other faa orgs ref in the Fact Book, the Major Work Force Employment figures for AIR in FY07 was 1179, in FY08 was 1215, in FY09 was 1209. Reported in FAA Administrator's fact book.

i.e. As of 03/30/12, source AHP-100, for AVS FY11 was 7391 and FY12 was 7471. For the Major Work Force Employment figures for AIR in FY10 was 1273, in FY11 was 1273, and in FY12 (first quarter) was 1298. Reported in FAA Administrator's fact book.

Note: np means not published. Also, numbers did vary, so only the highest reported numbers are denoted in the table

AVS									
FY1997	FY98	FY99	FY2000	FY01	FY02	FY03	FY04	FY05	FY06
np	np	np	5864	6195	6422	6354	6570	6335	6562
FY 2007	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	
6842	7013	7230	7309	7391	7471	np	np	Np	
AIR									
FY1997	FY98	FY99	FY2000	FY01	FY02	FY03	FY04	FY05	FY06
np	np	980	992	1025	1123	1178	1141	1104	1180
FY 2007	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	
1179	1215	1266	1298	1295	1298-Q1	np	np	np	

Overall Employee numbers based upon job description and responsibilities:

1. Looking at the current information available to NATCA (summer of 2016):

a. There are approximately 530 engineers covered by NATCA. Of these, approximately 390 engineers are in aircraft certification offices or oversight offices supporting type certification and continued operational safety. In addition, there are approximately 135 engineers performing regulatory and policy work.
b. In regards to faa engineers overseeing ODA organizations, 390 engineers perform this work for both certification and oversight offices.

Overall Oversight Workload- Approval numbers over the years (np means not published):

AIR:	TCs & STCs								
FY1997	FY98	FY99	FY2000	FY01	FY02	FY03	FY04	FY05	FY06
np	np	1790	1680, revised to 845	917, then revised to 817	830	906	984	967	1346
FY 2007	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	
1912	1272	1194	np	np	np	np	np	Np	

AIR:	Other Design Approvals								
FY1997	FY98	FY99	FY2000	FY01	FY02	FY03	FY04	FY05	FY06
np	np	5960	5975, revised to 5294	5900	5820	11,540	14,146	12,126	12,894
FY 2007	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	
2941	3184	3054	np	np	np	np	np	np	

AIR:	New AD's Issued								
FY1997	FY98	FY99	FY2000	FY01	FY02	FY03	FY04	FY05	FY06
np	np	474	510, revised to 509	529	389	339	417	496	414
FY 2007	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	
1036	461	325	np	np	np	np	np	Np	

AIR: Designees	NOTE:does not include	ODAs nor UMs							
FY1997	FY98	FY99	FY2000	FY01	FY02	FY03	FY04	FY05	FY06
np	np	4594	4384, revised to 4847	4750	4813	5049	5146, revised to 4761	4634	4071
FY 2007	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	
3969	3967	3921	np	np	np	np	np	np	

Citation:

Overall Employee numbers are based upon the FAA's Administrator's Fact Book:

i.e http://libraryonline.erau.edu/online-full-text/books-online/FAAFactBook2012.pdf

i.e. https://permanent.access.gpo.gov/lps112214/lps112214/www.faa.gov/about/office_org/headquarters_offices/aba/admin_factbook/index.htm

Overall employee numbers based upon job description and responsibilities are from information supplied to NATCA from the agency.