COMPLIANCE ASSURANCE SYSTEM

WORKING GROUP REPORT

DECEMBER 9, 2020

EXECUTIVE SUMMARY

The Compliance Assurance System (CAS) Working Group, established in January 2020, builds upon the 2018 CAS recommendations found in the Safety Oversight and Certification Aviation Rulemaking Committee (SOC-ARC) Recommendation Report to the Federal Aviation Administration (FAA) by focusing on two objectives:

- Recommend how the FAA can recognize a CAS that uses a performance-based approach and consensus standards.
- Recommend how the FAA can conduct oversight of CAS to realize its benefits.

The concept of a CAS is to provide design approval applicants with the option of implementing a system-based approach to determining compliance, in lieu of (or in combination with) the traditional transactional approach to certification. The mission is to create an interdependent group of processes and people working collectively to provide confidence that all applicable certification requirements for design approval have been fulfilled. As a CAS holder, a design approval applicant would be responsible for determining compliance to FAA regulations and standards (such as TSO standards) and would accomplish such determinations under a system-approach to design compliance. The applicant would use a compliance assurance system, or CAS, as the basis for making such determinations rather than discrete findings of compliance by the FAA (or a designee).

A design approval applicant's use of a CAS in determining compliance would mitigate the risk of non-compliances escaping the design approval process. The FAA has discretion today to rely on an applicant's certification of compliance when the FAA makes its own finding of compliance. However, without an applicant having an auditable *system* in place for determining compliance, the FAA does not exercise this discretion as much as it otherwise could. The systems-based approach offered by CAS, combined with ongoing FAA oversight of an applicant's CAS, would provide the FAA with the confidence needed to rely on a CAS holder's compliance determinations.

This proposal is meant to take a systems-approach to compliance assurance. The CAS holder would be required to have an auditable system that meets the requirements and attributes outlined in this report, and this auditable system would permit the FAA to audit the CAS holder's system on an ongoing basis to verify that it meets the FAA's regulatory expectations. Designs that are certified as compliant by an applicant with an applicable, approved CAS will be expected to comply with the applicable FAA regulations.

CAS is designed to work cooperatively with Safety Management Systems (SMS). SMS focuses on protecting from hazards across the complete product lifecycle, whereas CAS focuses on compliance. However, SMS and CAS are both Assurance Systems built around systemic procedures, practices, and policies. SMS is not required to implement CAS, but there are synergies to be gained if one is in existence. Many of the elements between CAS and SMS could be repeated or reused. Similarly, CAS is not required to implement SMS. While 14 CFR part 5 requires that an SMS ensure compliance is met with the relevant regulatory standards, this part 5 SMS requirement could be met through a variety of means. CAS is intended to be one way a design approval applicant with an SMS could satisfy the compliance ensurance element of 14 CFR part 5, but this part 5 requirement could also be met through use of standard certification or ODA instead of a CAS.

CAS, ODA, and Standard Certification are all intended to achieve the same goal (compliance) with different approaches. CAS is focused on correct execution of pre-approved processes to ensure consistent compliance is developed using a System Approach. ODA and Standard Certification are more transactional on a Certification plan-by-Certification plan basis focused on finding compliance. ODA is not required to implement a CAS but does not conflict with CAS either. They are two methods that ultimately result in compliant design data. Many of the elements between CAS and ODA could be repeated or reused. An organization could easily have both a CAS and an ODA, using CAS for well-established processes and ODA for design processes that are still maturing.

In this report, the CAS Working group provides the SOC-ARC with a set of seven recommendations for industry and thirteen recommendations for the FAA for the two objectives. The recommendations are further divided into three categories of: Implementation, Oversight, and Pilot Program. These recommendations immediately follow this executive summary. This report also contains additional details behind the recommendations including substantive CAS requirements, conceptual design/implementation strategies, and potential working processes. The Industry Recommendations should be implemented within an applicant's CAS. The FAA recommendations help ensure that the rules are clearly articulated to Industry both for the CAS pilot program groups and ultimately the applicant.

Additionally, a cross functional flowchart is included to aid the SOC-ARC in understanding the different implementation strategies, as well as appendices to provide greater depth for key items within the report.

No.	Recommendation
Implementation – Industry	
II.1	A CAS must define and document: 1. Compliance assurance policy 2. CAS processes and procedures 3. Responsibilities, accountability, authority, competencies and training of CAS personnel 4. Compliance risk management 5. Compliance performance measurement, monitoring and assessment 6. CAS record retention, and 7. Interfaces with FAA oversight.
II.2	CAS applicants must have a process for identifying a method of compliance for each FAA applicable requirement that applies to the design, recognizing that a single method of compliance (e.g., one test or one calculation) might be capable of demonstrating compliance to more than one requirement, while other requirements may require more than one calculation or test to show compliance.
II.3	Applicants must perform an evaluation to determine if a project is within the authorized scope of the CAS and clearly identify which portions of the project will be covered by the CAS. 1. Projects partially in a CAS require project certification plans to contain a compliance matrix which classifies each compliance activity by those that will be performed by the FAA/designee or CAS. 2. For projects fully within the scope of the authorized CAS, applicants should be afforded flexibility in methods used for compliance planning, documentation and FAA project coordination.
II.4	CAS-authorized activities within a project should be conducted independent of the designee/FAA LOI for non-CAS aspects (e.g., prior to/regardless of Certification Plan/PNL acceptance).

No.	Recommendation
Implementation – FAA	
IF.1	The FAA should conduct a trial of draft CAS regulations through a pilot program to test their effectiveness and sufficiency in establishing a program that generates compliance data upon which the FAA may rely.
IF.2	The FAA should prototype the draft CAS regulatory structure as part of existing current FAA initiatives, such as those for minor changes and non-safety sensitive PMAs (including current eligibility expansion project).
IF.3	The FAA should ensure continued interaction and alignment between CAS rulemaking efforts and related programs (e.g. SMS, ODA, and ESO), for any changes to the draft CAS regulations based on the results of the pilot program or other efforts.
IF.4	The FAA should commission a joint regulator-industry team to identify and recommend the supporting FAA policy and guidance needed to fully implement a CAS.
IF.5	The FAA should encourage industry to develop consensus standard(s) that will support effective implementation of CAS.
IF.6	The FAA should create a repository of supporting materials developed by the Compliance Assurance Systems Working Group as useful information to help understand the recommendations. Store the relevant data and circulate the data as necessary to facilitate implementation, educate the public, and support better understanding of Compliance Assurance Systems.
IF.7	The FAA should ensure organizations with proven track records (e.g. ODA, PSP, MOA) are provided with a streamlined path to obtain CAS authorization in the applicable areas of expertise/proficiency.

No.	Recommendation
Oversight - Industry	
OI.1	CAS Performance must be assessed and monitored according to the required elements outlined in the CAS attributes (which call out proposed requirement language to set objectives and monitor performance).
OI.2	CAS holder must allow the FAA to conduct oversight of active programs as well as historical audits to check the integrity of the CAS System against the objectives. This includes making available all associated data for those programs.
OI.3	CAS holder must have an ability to challenge an FAA oversight finding.
Oversight - FAA	
OF.1	FAA should verify the CAS holder is continually monitoring, assessing, and managing the performance of its CAS. The FAA should perform the verification in a consistent manner, that is targeted based on both the FAA risk profile and the CAS holder's performance data and contains appropriate levels of oversight findings.
OF.2	The FAA should provide a common method of application for the performance objectives based on the tables of proposed measures and their priorities in this report. The recommended way would be through voluntary consensus standards.

No.	Recommendation
Pilot Program	
P.1	The FAA should develop an open ended and varied Pilot program that allows applicants (through scalable and tailored agreements with the FAA) to implement CAS requirements and mature effectiveness of the system. The Pilot program would also allow the FAA to mature their CAS requirements and oversight practices. Pilot program participants should represent various design approvals and organizational complexities.
P.2	The CAS Pilot should be organized and coordinated by a central FAA team (FAA CAS Program Team) to communicate, facilitate, and standardize CAS implementation across different applicants and FAA local offices while ensuring appropriate CAS scalability.
P.3	The FAA CAS Program Team should be cross-functional, comprised of members from different branches/divisions, and sized appropriately for the number of applicants participating in the Pilot.
P.4	The CAS Pilot should be organized into three phases: 1) CAS Organization and Definition Phase, 2) CAS Applicant Development and Implementation Phase, and 3) FAA CAS Oversight Phase. Phase 1 should emphasize drafting Pilot guidance materials and developing training. Phase 2 should include delivery of training and furnishing a gap analysis tool to applicants.

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1. INTRODUCTION

1.1 Background

The 2018 Safety Oversight and Certification Aviation Rulemaking Committee (SOC-ARC) Recommendation Report to the Federal Aviation Administration (FAA) provided several recommendations to the FAA. One of these recommendations focused on the concept of a CAS and was supported by details developed by a 2018 SOC-ARC CAS working group. The SOC-ARC formed a follow-on working group in 2020 to further develop recommendations related to CAS, specifically tasking the team to

> (1) provide recommendations on how the FAA can recognize a CAS that uses a performance-based approach and consensus standards, and
>
> (2) recommend how the FAA can conduct oversight of CAS to realize its benefits.

The team comprised both Industry and FAA Representatives, allowing collaboration of ideas and input to define and implement a CAS.

The report organization follows the team's strategy development, methodology, and coordination to respond to the requested tasks:

- Section 2 defines the methodology, including the team's formation of sub-teams to address particular topics, in addition to detailing the team's operating norms.
- Section 3 details the compilation of each sub-team's discussions.
  - Section 3.1 addresses CAS implementation recommendations.
  - Section 3.2 details CAS oversight recommendations.
  - Section 3.3 outlines a recommended pilot program the FAA could use to implement and mature CAS.
- Section 4 provides concepts of CAS processes that support the recommendations in Section 3, and it shows the flexibility, scalability, and interactions of the CAS design with existing certification processes.
- Section 5 closes the report by recommending next steps and highlighting the complexities and challenges that will need to be addressed through further work on CAS development.

- The Appendices provide supplemental information.
    - Appendix A supports Section 4 of the report.
    - Appendix B supports Section 3 as required elements of a CAS that could be leveraged from other existing systems (ODA, QMS – AS9100, SMS, etc).
    - Appendix C supports Section 3 providing the measures against those elements in Appendix B.
    - Appendix D supports Section 3 providing the full list of proposed draft regulation
    - Appendix E is the list of tasking received by this working group

1.2 List of Participants

Name	Company / Organization
Robert Collins (Co-Lead)	Textron Aviation
Steve Thompson (Co-Lead)	FAA (AIR-600)
Valerie Egan	Bell Textron
Julie Brightwell	Boeing
Martin Robinett	Boeing
Mike Gries	Collins
Mike Chick	Duncan Aviation
Sue McCormick	FAA (AIR-7D0)
Kevin Nyce	FAA (AIR-6D2)
Robert Murray	Garmin
Keith Candline	Gulfstream
George Jimenez	HEICO
Jake Soling	Honeywell
Jason Dickstein	MARPA
Kent Hollinger	MITRE
Bob Benjamin	Pratt & Whitney

2. METHODOLOGY

2.1 Team Forming

In conjunction with a SOC-ARC meeting in February 2020, the CAS Working Group met in person for the first and only time. During this all-day session, the team brainstormed a strategy to address the tasks assigned by the SOC-ARC. Discussions included review of prior CAS work accomplished (2018 CAS SOC-ARC report), the team's task scope, potential timelines, and planning (e.g. future meetings, meeting format). The team also began to lay out a framework for future CAS discussions, including in the areas of necessary elements of a CAS, CAS interfaces with existing systems, as well as CAS performance. Additional in-person meetings were planned but due to the COVID-19 pandemic, remaining meetings were conducted virtually.

2.2 Assigning Sub-Teams

As the team progressed in CAS discussions, it soon became evident that the full working group would need to divide itself into sub-teams to address specific topics of the CAS:

CAS System Design

- Requirements and Interfaces sub-team
- Regulatory Enablers sub-team
- Construction sub-team

Oversight of a CAS

- Performance sub-team
- Oversight sub-team

CAS Pilot Program

- Pilot sub-team

Figure 2.2 shows these CAS topics and the sub-teams created to address each of them. The CAS system design topic focuses mainly upon how a CAS would operate by design. The sub-teams addressing this topic explored what requirements and interfaces would be necessary, how to construct a CAS system, and what existing regulations could be leveraged, or future regulations created, to establish CAS. The second topic, the CAS oversight design, focuses mainly on how to conduct surveillance and oversight of a CAS system, both through applicants' internal monitors and through FAA oversight. These sub-teams explored what CAS performance measures and monitoring would be needed for successful management and oversight of CAS. Assessing performance based on risk would direct where to focus internal evaluations or FAA oversight of the CAS. All sub-team outputs have been integrated into the recommendations presented in this report and collectively form a potential path for implementing and overseeing CAS.

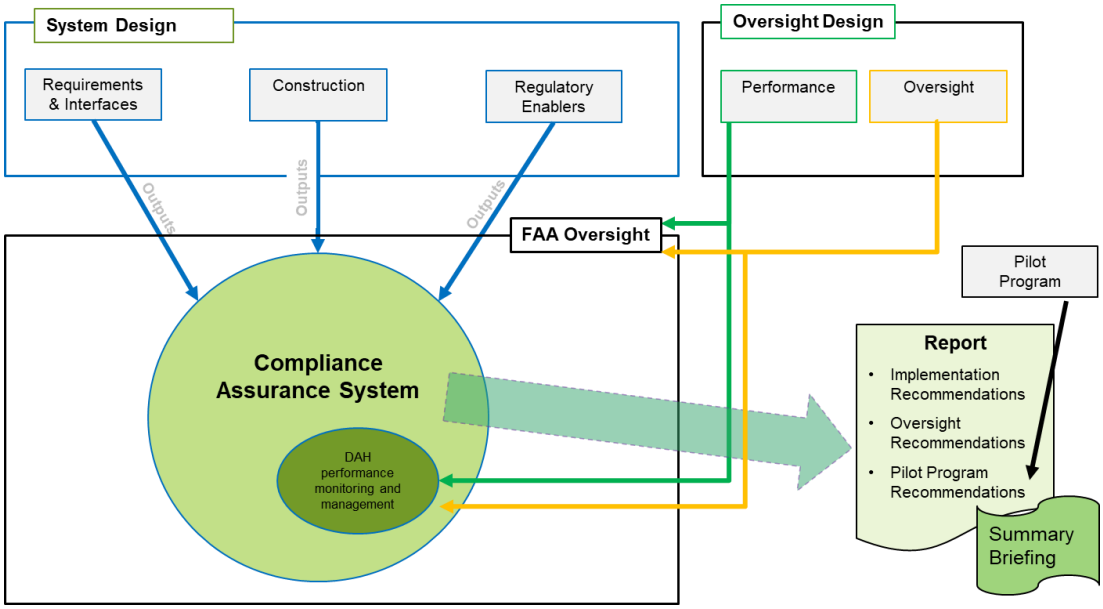


Figure 2.2

Each sub-team was guided by a team leader (from CAS working group members) who volunteered to facilitate scheduling meetings, communicating with sub-team members, compiling team decisions, and documenting outputs for the CAS report. Working group members typically participated on several sub-teams. This interconnectivity, along with regular meetings of the full working group and occasional joint meetings between specific sub-teams, ensured a consistent approach in the team's efforts to satisfy the overall objectives.

2.2.1 CAS System Design

2.2.1.1 Requirements and Interfaces sub-team.

This sub-team focused its efforts on determining what elements would be required for a CAS. To understand the systems that may interact with a CAS, as well as developing CAS requirements themselves, the Requirements and Interfaces sub-team adopted the following approach. The sub-team used a framework of CAS elements, discussed (see Figure 2.2.1.1a) by the full working group as the basis for elements a working CAS would need to contain. This framework helped to organize the work for the interfaces team. In Step 1 (see Figure 2.2.1.1.b) the team brainstormed what systems currently exist that may support the CAS elements and formed a strategy.

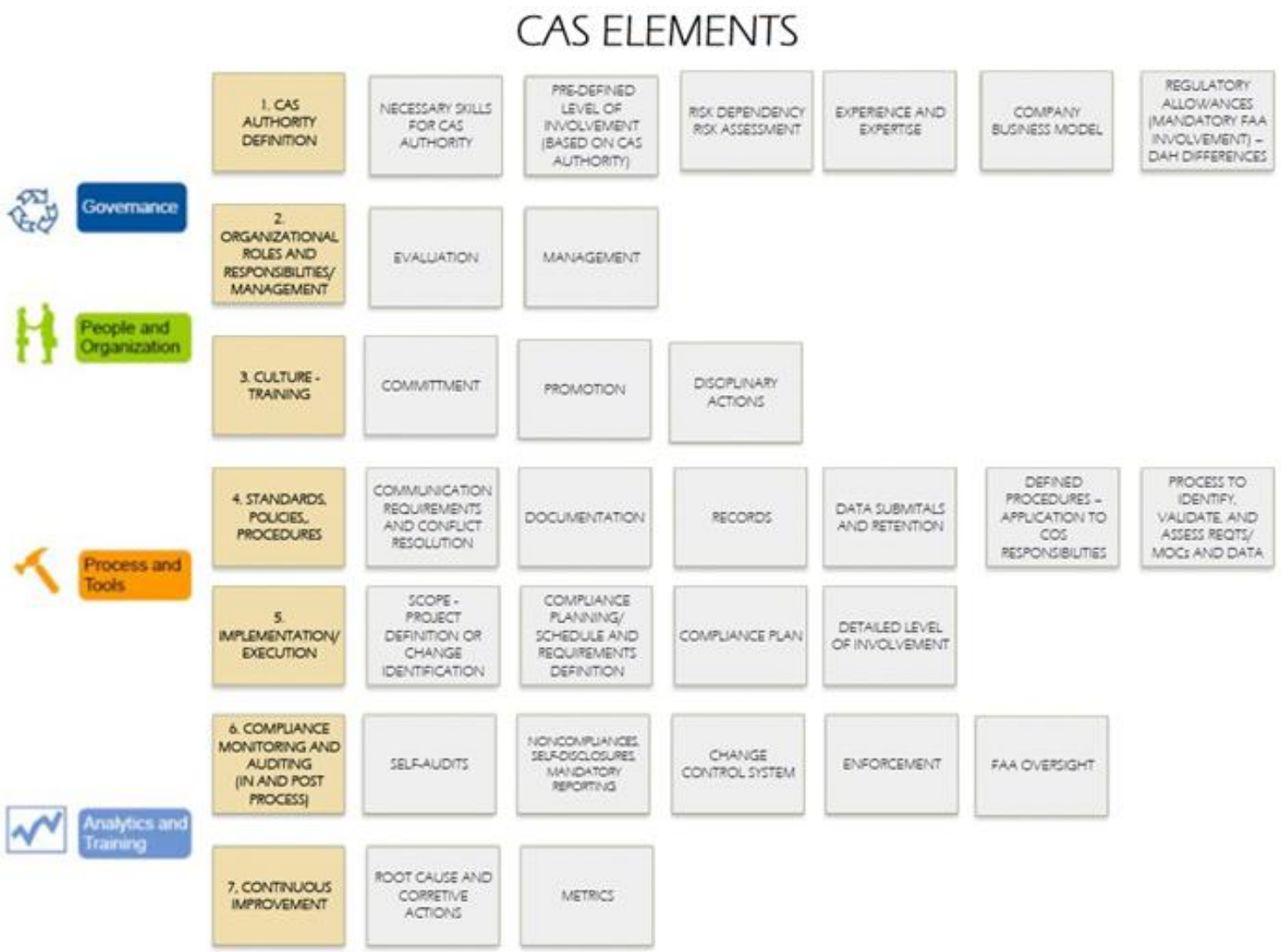


Figure 2.2.1.1a

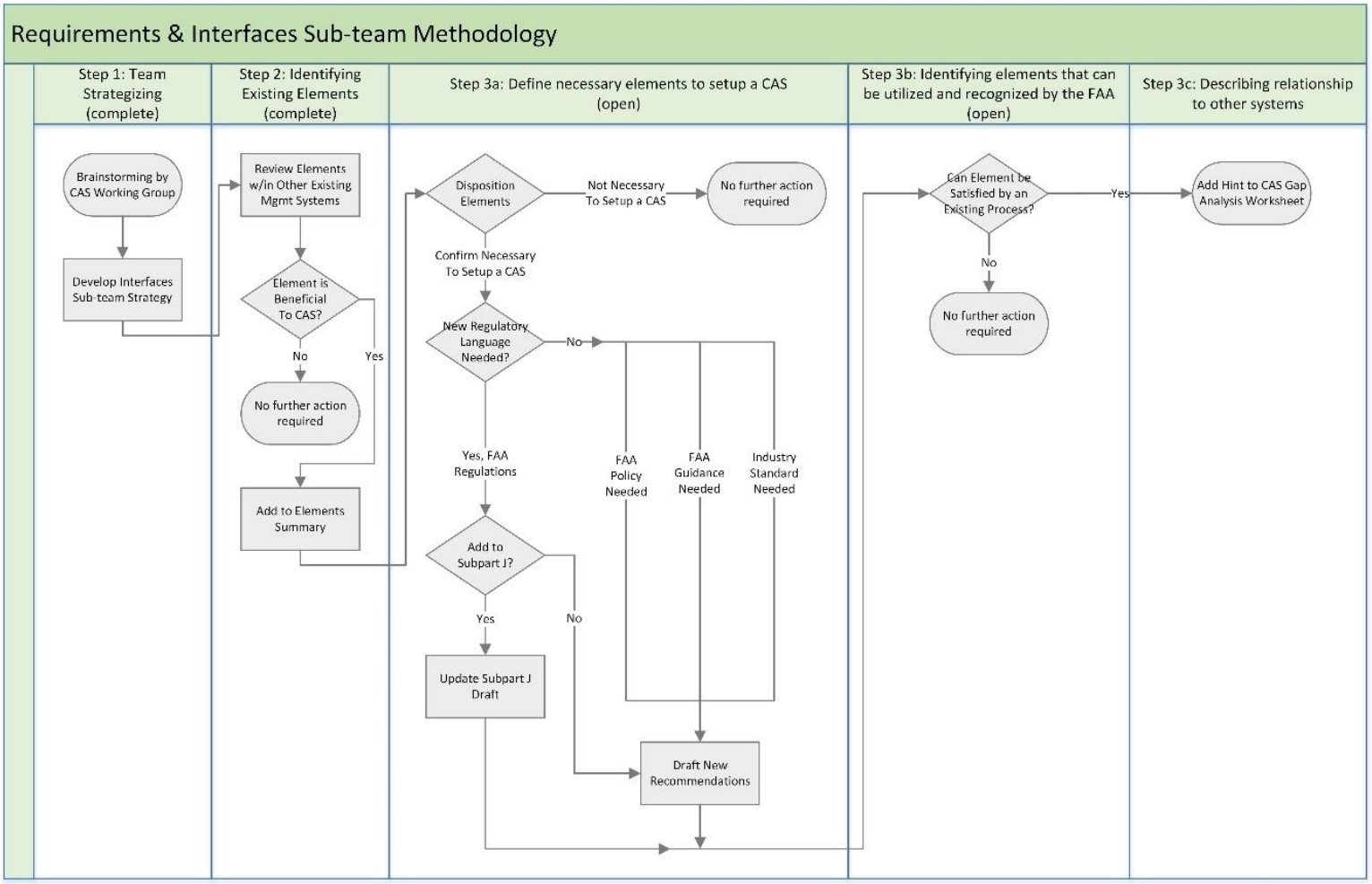


Figure 2.2.1.1b

Several existing systems were selected for a deeper study including but not limited to the following:

- Safety Management System (SMS),
- Quality Management System (QMS),
- Organization Designation Authorization (ODA),
- Partnership for Safety Plan (PSP),
- Draft version of Advisory Circular (AC) 21-51 (*Applicant's Showing of Compliance and Certifying Statement of Compliance*

A list of existing system attributes was derived as a result of this study, and divided among the team members to research potential CAS requirements. Team members researched documents from the various systems and returned with proposed requirements for a CAS. Over the course of several months, the team refined the proposed requirements harmonizing the language into a single document. As meetings progressed, requirements were added underneath the original CAS elements. Other requirements not fitting into the initial CAS elements categories led the team to create additional CAS elements. The resulting requirements compilation is the team's effort to leverage and promote as many sharing requirements of existing systems that would interface with a CAS as well as creation of new requirements of a CAS.

2.2.1.2 Construction Sub-team

The construction sub-team was assigned to focus on how industry would implement CAS including how CAS could be scaled based on an applicant's proficiencies. The team discussed processes for methods of compliance and how these processes would be standardized by an applicant. Evaluating the inter-dependencies of the Applicant systems and how CAS-authorized activities should be conducted were thoroughly detailed, ending with recommendations for planning and streamlining CAS authorization.

2.2.1.3 Regulatory Enablers Sub-team

The Regulatory Enablers sub-team addressed the "propose follow-on regulatory structure if substantial improvements can be realized" task. This sub-team began by reviewing and discussing the existing 14 CFR part 21 in its entirety to identify regulatory aspects that should be considered in a structure for CAS. The sub-team then developed the draft regulatory text and associated explanatory information provided in this report.

2.2.2 Oversight Design

2.2.2.1 Performance Sub-team

The Performance sub-team efforts resulted in developing recommendations for how to measure an applicant's CAS performance. The strategy for developing measures started by evaluating how the CAS holder organization or the FAA would assess CAS performance. This means each necessary CAS Element would need to be present and performing its intended function. For each appropriate CAS Element identified, there is at least one means or metric to evaluate its presence and effectiveness.

2.2.2.2 Oversight Sub-team

The Oversight sub-team discussed how a CAS would be evaluated by the CAS holders as well as the FAA. This included a focus on ensuring that a process assurance model with audit focus was used rather than a compliance showing / finding process. The team also discussed the FAA's focus of audit would be on the company audits and resolutions rather than transactionally on projects. Finally, the team discussed the on-going risk based oversight model used to scale oversight appropriately to ensure harmonization.

2.2.3 CAS Pilot Sub-Team

The Pilot sub-team discussed recommendations that the FAA could adopt to work with applicants to implement CAS. CAS introduces processes that would not only be new to the applicant but also new to FAA local offices. Because coordinated activities would be needed, the team discussed ways to best manage and deploy a CAS initiative to applicants with voluntary agreements working with local FAA offices.

2.3 Sub-Team Interactions

Even though the sub-teams were given key focus areas to develop, there were several instances where one sub-team would be dependent upon what another sub-team was developing. In these cases, sub-teams would coordinate joint meetings to address these dependences.

2.4 Working Group Meetings

Bi-weekly working group meetings were held with all sub-teams. During these meetings, CAS issues, questions, decisions, and requests from the sub-teams were proposed, discussed, and vetted by the larger group. In addition to focused discussions, this group meeting allowed team leaders to manage the goals, assignments, deadlines, and milestones.

2.5 Compiling CAS Report

Sub-teams worked both independently and jointly, producing recommendations for a working CAS framework which includes system requirements, potential regulations, interfaces, and processes. Additionally, oversight recommendations were developed for performance monitoring, internal evaluation, and FAA oversight. In August 2020, the high level and preliminary recommendations were presented to the SOC-ARC. As a result, a follow-on meeting was held in September 2020 with interested members of the SOC-ARC to further explain and detail some of the CAS complexities that could not be presented in the August meeting due to time constraints. With guidance and direction provided by the SOC-ARC, recommendations have been finalized and a report generated to present the detailed work of the CAS working group.

3. DISCUSSION AND RECOMMENDATIONS

3.1 CAS Implementation

3.1.1 Industry Implementation Recommendations

3.1.1.1 Recommendation II.1 - CAS Framework

A CAS must define and document:

1. Compliance assurance policy
2. CAS processes and procedures
3. Responsibilities, accountability, authority, competencies and training of CAS personnel
4. Compliance risk management
5. Compliance performance measurement, monitoring and assessment
6. CAS record retention, and
7. Interfaces with FAA oversight.

3.1.1.1.1 Additional Information

3.1.1.1.1.1 CAS Required Elements found in other interfacing or parallel Systems

The CAS framework is a standalone system separate from SMS, QMS or ODA systems. As discussed in the methodology section, existing interfaces/environments (e.g. SMS, EASA DOA, ODA, …) were reviewed with the intent to leverage existing systems in establishing the CAS framework to minimize process duplication and maximize use of systems already in place. The intent of the CAS framework establishes recommendations to define and document the Elements shown below and their Sub-Elements described in Appendix B:

	Element
1	CAS Definitions
2	Compliance assurance policy
3	Compliance assurance accountability and authority
4	Designation and responsibilities of required compliance assurance management personnel
5	Compliance risk management applicability
6	System analysis and compliance issue identification

	Element
7	Compliance risk assessment and control
8	Compliance performance monitoring and measurement
9	Compliance performance assessment
10	Accountable Executive Review
11	Continuous Improvement
12	Non-compliances and Corrective Action
13	CAS Oversight
14	Competencies and training
15	Compliance assurance communication
16	CAS documentation
17	CAS records
18	Design Assurance

3.1.1.1.1.2 Suggested Next Steps

The Requirements and Interfaces' sub-team successfully completed a comprehensive review of existing elements within various management systems (e.g. quality management systems, safety management systems). Outcomes from this review identified the elements that could potentially benefit a CAS framework (Figure 2.2.1.1.b, Step 2 and Appendix B of this report).

Despite the completion of the above step, additional efforts are necessary to meet the remainder of the sub-team's objectives. In particular, a deeper review and disposition of the identified elements needs to be conducted as shown in Figure 2.2.1.1.b Step 3a. During this process, it will need to be decided which of the identified elements belong in new regulatory language, policy, guidance, or an industry standard. The following classification system is recommended:

Category	Description
CAS Regulations	The element should be considered for integration into the working group's recommended CAS regulatory language (Reference Section 3.1.2.1.1.7 of this report).
FAA Regulations, Other	The element should be considered for integration into OTHER existing or newly developed regulatory language.
FAA Policy	The element should be considered for integration into an existing or newly developed order.
FAA Guidance	The element should be considered for integration into an existing or newly developed FAA guidance document.
Industry Standard	The element should be considered for integration into an existing or newly created industry standard.

Once a consensus has been reached on the above, a final evaluation should be performed to identify which of those elements might already be satisfied by an applicant's exiting systems (Figure 2.2.1.1.b, Steps 3b and 3c). One of the outcomes of this evaluation should inform a CAS gap analysis tool with integrated guidance on potential means of compliance. For this exercise, the following classification system is recommended:

Category	Description
Able to be leveraged, as is	Indicates the possibility that an element can be satisfied by an applicant's existing process, as is.
Able to be leveraged, with some modification	Indicates the possibility that an element can be satisfied by an applicant's existing process, with some modification to the existing process.
Not able to be leveraged	Indicates that a new process may need to be defined and implemented by an applicant in order to satisfy a CAS requirement.

3.1.1.2 Recommendation II.2 - Method of Compliance Process

CAS applicants must have a process for identifying a method of compliance for each FAA applicable requirement that applies to the design, recognizing that a single method of compliance (e.g., one test or one calculation) might be capable of demonstrating compliance to more than one requirement, while other requirements may require more than one calculation or test to show compliance.

3.1.1.2.1 Additional Information

The intent of this recommendation is to highlight the expectation that a successful CAS holder must implement (a) process(es) describing design practices, inspections, analyses, tests, etc., that consistently and reliably generate compliant design data. The expectation is that a CAS minimizes the transactional nature of traditional compliance showings by the applicant followed by in-process findings of compliance by a recognized authority (FAA, DER, ODA Unit Member). Consequently, there must be a clear definition of what constitutes a compliant design within the process such that execution of that process by the applicant consistently results in compliance and is sufficient and reliable as the basis for design approval. Examples might include, but are not limited to the following:

1. A test or inspection prescribed by an approved CAS methodology yields the expected result; therefore, compliance is assured.
2. Analysis using a specific calculation/assessment methodology yields expected results; therefore, compliance is assured.
3. A design executed using the processes approved per the CAS authorization yields a compliant design for the related FAA requirement.

This working group envisions an applicant would standardize their process(es) of identifying the method of compliance for those areas that they are authorized. Authorization is expected to be achieved through a formalized approval process with the applicant's local FAA office. A library containing all the approved methods of compliance should be created and actively maintained by the applicant, to ensure prescribed methods of compliance are accessible and applied consistently every time they are followed.

3.1.1.3 Recommendation II.3 - Project Scope Assessment

Applicants must perform an evaluation to determine if a project is within the authorized scope of the CAS and clearly identify which portions of the project will be covered by the CAS.

1. Projects partially in a CAS require project certification plans to contain a compliance matrix which classifies each compliance activity by those that will be performed by the FAA/designee or CAS.
2. For projects fully within the scope of the authorized CAS, applicants should be afforded flexibility in methods used for compliance planning, documentation and FAA project coordination.

3.1.1.3.1 Additional Information

The intent of this recommendation is to emphasize the flexibility and scalability of CAS utilization once it is granted, for as many projects as possible. Processes should be in place to define the coexistence of CAS capability with traditional FAA/ODA/TSOA project scope interactions.

Elements of a project eligible under the applicant's CAS authorization must be included in project planning documentation submitted to the FAA (e.g., the Certification Plan) so it is clear those elements, applicable to the project, are not overlooked. Conversely, when a project includes only FAA requirements for which the applicant is authorized to execute under the CAS, the applicant should have the flexibility to establish a different approach to project coordination. This could be a more streamlined format of FAA project notification, similar to the level of notification provided for in a No-PNL scenario for ODA projects, to be defined via the applicant's CAS agreement with their FAA counterpart.

3.1.1.4 Recommendation II.4 - CAS Independence

CAS-authorized activities within a project should be conducted independent of the designee/FAA LOI for non-CAS aspects (e.g., prior to/regardless of Certification Plan/PNL acceptance).

3.1.1.4.1 Additional Information

The intent of this recommendation is to ensure that those elements of a project eligible for CAS execution are not to be delayed, or held up from proceeding, by the planning phase. In the ODA scenario, certain project activities are deemed to be completed "at risk" and others are prohibited completely, until a certification plan is accepted; whereas, per this recommendation, in a CAS scenario, the applicant would not be required to defer CAS compliance actions while a certification plan is pending.

3.1.2 FAA Implementation Recommendations

3.1.2.1 Recommendation IF.1 - Draft CAS Regulations

The FAA should conduct a trial of draft CAS regulations through a pilot program to test their effectiveness and sufficiency in establishing a program that generates compliance data upon which the FAA may rely.

3.1.2.1.1 Additional Information

3.1.2.1.1.1 Overview

One of the tasks (Objective A, Task 6) assigned to the CAS Working Group was to, "Propose follow-on regulatory structure if substantial improvements can be realized." In response, the working group offers the proposed regulations below as a starting point for FAA consideration, with the understanding that experience gained through a pilot program will be critical to evolving the regulatory language. Lessons learned and best practices gained from the pilot program should drive improvements to the draft regulatory text prior to the FAA initiating formal rulemaking.

3.1.2.1.1.2 Summary

This is a set of proposed rules for FAA-regulated design organizations.

Design organizations would be responsible solely for determining compliance to FAA regulations and standards (such as TSO standards). Design organizations would accomplish such determinations under a system-approach to design compliance. They would use a compliance assurance system, or CAS, as the basis for making such determinations.

Use of a CAS as part of the design approval application process would mitigate the risk of non-compliance posed by such a design approval application. Statutory law permits the FAA to rely on the design organization's certification of compliance when the FAA makes its own finding of compliance, but the *de facto* reason that the FAA can comfortably rely on the design organization's certification of compliance is because the design organization's CAS adequately mitigates non-compliance risk.

This proposal is meant to take a systems-approach to compliance assurance. The design organization is required to have an auditable system that meets the goals of this proposed regulation, and this auditable system permits the FAA to be able to audit the design organization's CAS implementation to identify whether it meets the FAA's regulatory expectations. When the design organization's CAS meets the FAA's regulatory expectations, then the designs that are certified as compliant by the design organization will be expected to comply with the applicable FAA regulations.

Under this proposal, a design organization is an optional alternative. Until otherwise decided by the FAA, traditional mechanisms for design application and approval remain in place.

The SOC-ARC is proposing changes to the FAA's regulations governing certification procedures for products and articles to add a design organization regulation. The heart of this design organization regulation is a compliance assurance system. The purpose of the compliance assurance system is to use a systems-based approach to confirm that a design is fully compliant with the applicable regulations (this includes a systemic approach to the identification of the relevant regulations). Thus, the proposed regulations describe the processes that are expected to be included in the system, and that surround the compliance assurance system, to constitute an effective design organization.

A properly constructed compliance assurance system should allow the design organization to confidently certify, based on its compliance assurance processes, that a design fully complies with all applicable FAA regulations and standards necessary to warrant issue of a design approval. If implemented properly, the FAA should be able to rely on this design organization certification as a basis for the FAA's own finding of compliance in issuing a design approval.

The compliance assurance system is meant to perform a limited role: determining compliance in a systemic manner upon which the FAA may rely, and that permits the FAA to audit the system in order to verify systemic compliance. It is not meant to replace a design approval nor is it meant to replace a production approval. The scope of a compliance assurance system is limited to compliance with identified standards, so it is also not meant to replace a safety management system, where such a system has been implemented.

3.1.2.1.1.3 Current Regulations and Proposed Scope of Change

Under current regulations, a design approval applicant does not need a design organization and the applicant does not need to use a formal process for developing the design (and under this proposal, design organizations would remain optional).

When a design is submitted to the FAA for review under the traditional model, the FAA is responsible for scrutinizing the application and using the data submitted to make a finding of compliance. The FAA has modified the traditional model through various mechanisms, including the designation of private persons to make findings on behalf of the FAA (like Designated Engineering Representatives (DERs) and Organization Designation Authorization (ODA) holders); but in all cases, the FAA finding has traditionally been made through data analysis by FAA employees or designees.

The proposed rule[1] does not change the current design application standards. Instead it offers an option in which the applicant would create the design application in the context of an FAA-approved system. This would permit the FAA to audit the design organization system, in a manner analogous to the way that the FAA audits production systems. If the design organization system is developed properly and the FAA audits confirm that the system continues to function properly then the FAA may have confidence that the properly functioning design organization will yield compliant designs.

[1] During development of this subpart, the team used the term “Subpart J” to reference this proposed subpart. This was chosen because subpart J is currently available, and this would align with the location of the corollary EASA design organization regulations. This is a tentative identification and it is not meant to restrict the FAA from locating the subpart in some other location or designating/identifying the subpart in some other manner.

Because the existing design regulations are not being replaced, the existing system will continue to be available for as long as the FAA chooses to support it, even after the implementation of design organization regulations.

We believe that it is possible that all design applicant entities might be required to implement design organizations in the future – this would be analogous to the current system in which production organizations rely on production quality assurance, today – but this change to the FAA's oversight system would not occur until the FAA makes the strategic decision to move to such a model, based on significant experience with, and confidence in, compliance assurance systems. Thus, any such change would be in the distant future.

3.1.2.1.1.4 Anticipated Benefits of a Design Organization

If properly implemented, these regulations would permit a prospective design applicant to implement a design organization, and to use the systems of that design organization to build their design. By developing the design in the context of the design organization procedures, the applicant would be able to demonstrate with a high level of confidence that the design fully complies with all the applicable FAA regulations and standards. Benefits to the applicant would include:

- A greater level of assurance of compliance;
- Better management control of compliance mechanisms
    - the system would create better records, permitting better internal oversight
    - the system would be based on documented processes, which would provide a system-level mechanism for making changes
    - the system would be auditable to ensure proper implementation of processes
- Better management control of the compliance demonstration timeline (because FAA involvement would be limited only to the identified areas of FAA Level of Project Involvement);
- Better predictability, including the ability to rely on processes and methods of compliance that standardize review (limiting the ability of individual opinions to diverge from FAA compliance expectations); and

- A documented and government-approved system that could be used for legal defense in certain civil liability cases where the conformity to process helps to show a lack of negligence.

The FAA would also reap benefits from a properly implemented design organization. These benefits are expected to include:

- Compliance: The CAS is expected to reduce the risk of non-compliance by using a systems-based approach to determine compliance.
- Safety: The emphasis on compliance to FAA regulations means that there is an increased likelihood of compliance; because of the relationships between FAA regulations and safety, this helps to support the FAA's ultimate safety goal. This helps to drive safety.
- Safety Culture: The reliance on a process-oriented approach to compliance helps to promote a safety culture, and safety cultures are believed to be beneficial to achievement of safety goals like accident reduction.[2]
- Oversight effectiveness and efficiency: The FAA has recognized that auditing systems is more effective and efficient than measuring compliance on an article-by-article basis.
    - Where either the CAS holder or the FAA identifies a problem, a systems approach allows more effective correction of the root cause in a way that not only addresses the occurrence but the system as a whole, thereby improving safety systemically across the design activities conducted within the compliance assurance system.
    - If the FAA audits the design organization, and finds that the organization's compliance assurance system is functioning properly and meets FAA expectations, then this allows the FAA to better leverage its workforce; the improved efficiency should result in a greater level of FAA resources that can be devoted to the highest-level safety risks.

[2] D. Parker, M Lawrie, and P Hudson, *A framework for understanding the development of organizational safety culture*, 44 Safety Science 551 (2006).

3.1.2.1.1.5 Statutory Basis

49 U.S.C. § 44704(e) permits the FAA to issue a design organization certificate that allows the certificate-holder to certify compliance. The FAA is permitted to rely on certifications of compliance by such a design organization when making compliance determinations. 49 U.S.C. § 44704(e)(3).

3.1.2.1.1.6 Conventions Used

For each proposed regulatory section (and in 21.257, for each regulatory subsection), the section-by-section analysis identifies the regulatory text in a box, and that text is then followed by a discussion related to that text. The entire proposed subpart can be found in Appendix D.

This report uses the term "determination" to describe the compliance effort of the design organization. The regulations require the FAA to make certain findings of compliance as a precondition to issue of certain design approvals, and this report uses the term "finding" to describe the effort of the FAA (consistent with the use of the term in the FAA's current regulations). These are both different from the design approval applicant's regulatory obligation to "show compliance." While the design organization determination may be related to the showing of compliance – such as where the design organization witnesses a showing - the design organization determination of compliance may also be separate from the showing of compliance.

3.1.2.1.1.7 Section-by-Section Analysis

§ 21.251 - Applicability.

This subpart prescribes - (a) Procedural requirements for issuing Compliance Assurance System certificates; and (b) Rules governing holders of those certificates.

This section explains the scope of the rules found in the subpart. It clarifies the limited scope of the subpart.

§ 21.252 - Eligibility.

Any interested person may apply for a Compliance Assurance System certificate.

This section explains that any interested person may apply for a certificate.

§ 21.253 - Application.

> Each applicant for a Compliance Assurance System certificate must apply in a form and manner prescribed by the FAA.

This section explains that a design organization applicant must apply in the form and manner prescribed by the FAA.

The FAA is expected to prescribe acceptable means through application forms or other guidance, just as it does with other comparable rules.

It is likely that industry will develop one or more specifications/standards for meeting the requirements of this subpart and will submit them to the FAA for review. The FAA may (in its discretion) accept such specifications/standards as acceptable methods for meeting the requirements of this subpart.

§ 21.254 - Definitions.

For the purposes of this subpart:

(a) *Applicable Requirements* means standards prescribed under or pursuant to this subchapter for which compliance may be found by the FAA and includes airworthiness standards prescribed in 14 CFR parts 23 through 39 and Technical Standard Order requirements.

(b) A *Compliance Assurance System* is a system that is intended to ensure that, for each statement of compliance issued by the Compliance Assurance System certificate holder, the corresponding design has been shown to comply with the Applicable Requirements. The Compliance Assurance System ensures this by implementing the elements described under this subpart.

(c) A *Compliance Assurance System Person* means a Person (defined in 14 CFR §1.1) having a specified role in the Compliance Assurance System.

(d) *Method of Compliance Library* means a collection of practices or procedures accepted by the FAA and utilized by a Compliance Assurance System certificate holder for establishing that a design meets the Applicable Requirements.

(e) *Process* means a series of related tasks or methods that accomplish an objective within the Compliance Assurance System. Processes must be recorded in a permanent form, such as in written procedures.

(f) *Project* means any activity that is intended to generate compliance data under a Compliance Assurance System.

This section establishes a set of definitions for terms used in the subpart, and limits applicability of the definitions only to the subpart.

The term “Applicable Requirements” is a general description of whichever standards are the basis for the CAS’ determinations of compliance. This term was chosen, rather than “regulations” or “airworthiness standards,” so that the CAS processes could be applied to a TSOA activity, where the applicable standards are published in a TSO rather than in a regulation. This term is defined to permit repeated use of a complicated concept without repeating complicated descriptive language.

The term “Compliance Assurance System” is defined for the purpose of establishing what the CAS is supposed to be. By providing this definition, the regulation also clarifies what a CAS is not supposed to be. A CAS is merely a systems approach that allows the CAS holder to (1) ensure that data complies with the requirements for which compliance may be found by the FAA, (2) certify that compliance, and (3) do so using a systems-based approach that can be audited by the FAA.

The term “Compliance Assurance System Person” is defined to allow the regulations to identify the discrete person-resources used in the CAS, and to direct the CAS to apply certain regulatory standards to those persons. It uses “person” as the term is defined in section 1.1 so that Compliance Assurance System Persons could be natural persons (typically identified by title rather than by a specific individual’s name) or corporate bodies (for example, a laboratory that is identified for certain types of testing, or an engineering firm that provides certain design support). This term is defined in order to permit repeated use of a complicated concept without repeating complicated descriptive language.

The term “Method of Compliance Library” clarifies that the library is a collection of procedures for establishing that a design meets the applicable requirements. The definition is purposely broad in scope, to forbear from unnaturally limiting what may be found in the library. Because there are existing methods of compliance used by the FAA, the choice to create such a library is an option, but not a requirement. We anticipate that an applicant who develops such a library will identify procedures for showing compliance, and the FAA will review such procedures. If the FAA agrees that the procedure will be an effective method for demonstrating compliance, then it will accept the procedure as an effective method of compliance.

The term *Process* is used in section 21.257 to reflect the information that must be recorded to define the system. It is defined to mean a series of related tasks or methods that accomplish an objective – essentially the process is something that turns inputs into outputs. Processes must be recorded in a permanent form, such as in written procedures, but processes may include other permanent forms, like a computer program.

The term *Project* means any activity that is intended to generate compliance data under a Compliance Assurance System. Examples include TC projects, STC projects, PMA projects, TSOA projects, and any other data-approval projects that fit within the scope and ratings of a CAS. The use of the term "project" is not meant to interfere with the FAA's use of project numbers (which are not assigned to all situations in which the FAA makes compliance findings).

The team considered trying to define "major" and "minor" changes to a CAS in order to distinguish the way that these were communicated by the holder to the FAA. These definitions were rejected for two reasons: (1) it appeared that distinguishing different reporting criteria was unnecessary, and (2) the historical distinctions between such concepts in other parts of the regulations have been vague, and this vagueness in the distinctions has resulted in unwanted confusion.

§ 21.255 - Organization.

(a) Each applicant for or holder of a Compliance Assurance System certificate must provide the FAA with a document -

(1) Describing how its organization will ensure compliance with the provisions of this subpart;

(2) Describing for each Compliance Assurance System Person,

(a) assigned responsibilities; and

(b) the functional relationship of the Person to management and other organizational components; and

(3) Identifying an accountable manager.

(b) The accountable manager specified in paragraph (a) of this section must be responsible within the applicant's or Compliance Assurance system certificate holder's organization for, and have authority over, all Compliance Assurance System operations conducted under this subpart. The accountable manager must confirm that the procedures described in the compliance assurance documentation required by § 21.258 are in place and that the Compliance Assurance System certificate holder satisfies the requirements of the applicable regulations of this subchapter. The accountable manager must serve as the primary contact with the FAA.

This section clarifies that the CAS is an organization, and that the organization must have a written description.

The written description must provide a general description of how the organization will ensure compliance with the provisions of this subpart (specific processes will be described separately, in the manual, so this may be a cross-reference to the manual). The organization document must identify each Compliance Assurance System Person by its assigned responsibilities. The organization document must identify the functional relationship between each Compliance Assurance System Person and management / other organizational components; this will typically be accomplished through an organizational chart, but applicants may find other effective ways to illustrate these relationships.

This regulation requires the organization to identify its accountable manager. An organization must have an accountable manager in order to provide a single point of contact for the FAA, who is accountable to the FAA for the continued compliance of the organization (to the applicable rules of this subpart). The accountable manager may have other duties associated with other accountable manager regulations (for example, the design organization accountable manager may also be the accountable manager for purposes of 14 C.F.R. § 21.135).

The regulation explains the responsibilities of the accountable manager. The accountable manager must serve as the primary contact with the FAA.

§ 21.257 – General Requirements

Each applicant for or holder of a Compliance Assurance System certificate must establish and describe in writing a Compliance Assurance System. This Compliance Assurance System must:

Each applicant for a CAS certificate must establish and describe in writing a compliance assurance system. Each holder of a CAS certificate must maintain this written system. This system must accomplish each of the elements described in the subsections of this General Requirements section.

The General Requirements are meant to reflect the minimum elements necessary to create a system that assures compliance and upon which the FAA may rely. They are analogous to the comparable standards found in 14 C.F.R. § 21.137 for production systems. Like the comparable standards found in 14 C.F.R. § 21.137, an important consideration was the ability of the FAA to successfully audit the compliance assurance system to these elements.

The intent in developing these elements was to remain focused on the elements that were necessary to the system. As consequence some "useful" elements were rejected for inclusion in this section because - while beneficial - those elements were not considered to be "necessary" to create an auditable system upon which the FAA may confidently rely. Further development, including the expected pilot project for this effort, may identify other elements deemed necessary by the FAA.

While the title of the section, "General Requirements," is part of the regulation, the italicized title of each subsection within 21.257 (shown below) is not part of the regulation; the titles are only placed into this section-by-section analysis for convenience, and to the extent the titles are inconsistent with the text, the regulatory text controls.

§ 21.257(a) *Identify Compliance Assurance System Person Roles*

(a) identify by title or corporate name each Compliance Assurance System Person.

The system must identify by title or corporate name each Compliance Assurance System Person. It is expected that individuals who are Compliance Assurance System Persons in the Compliance Assurance System might be defined in the system by titles or roles, rather than by names, so that mere changes in personnel are not necessarily changes to the system.

The term "Person" is meant to have the definition found in section 1.1 of the FAA regulations. The term "Person" is used to indicate that the Compliance Assurance System should be made up of one or more entities that can be identified, for example they could be identified on an organizational chart (which is one way, but not the only way, to capture the information required by this element). There could be only one individual in a small CAS. Each Compliance Assurance System Person could be an individual, or it could be an entity (such as an outside corporate entity providing compliance assurance support, like a testing laboratory).

An element like this is needed in order to identify who exactly is involved in the process, who is authorized to make determinations and decisions reflecting compliance on behalf of the organization, and who has responsibilities within the organization.

An intent of this subsection is to recognize company capability. The identification in this element helps to define what gives the organization the ability to determine compliance. If the organization changes – particularly if it changes the resources assigned to the CAS - then the company might change in its compliance assurance capabilities (shifting to a higher or lower level of capability reflecting the available and committed resources).

In addition, the FAA approves the CAS applicant, so they need to know what they are approving. This identification facilitates the FAA's understanding of the CAS System that is the subject of the application.

Not all Compliance Assurance System Persons are equally important to the CAS, nor do all Compliance Assurance System Persons have the same function(s) in the CAS. Therefore, changes to Compliance Assurance System Persons may have varying impacts on the effectiveness of the CAS.

§ 21.257(b) *Select and Manage Compliance Assurance System Persons to Perform the Roles*

(b) describe a process for assessing and identifying Compliance Assurance System Persons, and a process for internal management of these Compliance Assurance System Persons.

The system must describe processes for (1) assessing Compliance Assurance System Persons, (2) identifying and selecting who can be a Compliance Assurance System Persons, and (3) managing these Compliance Assurance System Persons.

The 21.257(a) element identifies roles in the System ("who does what"). This 21.257(b) element builds upon the foundation laid by subsection (a) by describing the processes for assessing those who might perform the roles ("how do we make sure they are right for the job"), the processes for selecting the persons ("how do we tell them that they are right for the job, and who else needs to know"), and the processes for internal management of them ("how do we make sure they properly perform the job").

The Compliance Assurance System Persons might be individuals, entities, or even a combination of these. The System should have a method for determining what qualifications are necessary within the Compliance Assurance System Persons, and for identifying who is qualified to serve as a Compliance Assurance System Person. There needs to be a mechanism for performing oversight, which mechanism might include internal auditing, in order to ensure that the Compliance Assurance System Persons continue to maintain their qualification to perform within the system and continue to perform properly within the system.

In a very small CAS, oversight of Compliance Assurance System Persons may be simple; but as the CAS gets bigger, using more Compliance Assurance System Persons with a wider variety of distinct roles, the management process typically gets more complicated. The exposition of the process for assessing and identifying Compliance Assurance System Persons is meant to provide the FAA with an objective view of what the organization expects to do to make sure it uses, and continues to use, the right Compliance Assurance System Persons. The exposition of the process for internal management of these Compliance Assurance System Persons is likewise meant to show the FAA how the organization expects to manage the Compliance Assurance System Persons to ensure that their performance is appropriate. Each of these provide the FAA with objective standards against which to audit and measure performance.

Traditional oversight methods, like auditing, are prima facie valuable in today's world, but the regulatory language should be broad enough to facilitate new FAA oversight models and management models in the future.

An earlier draft of this language used the term “appoint,” and this term was rejected because it suggested that the appointments would be potentially subject to a high degree of FAA management, like ODA authorized representative appointments. This term was replaced with “identify” in order to help clarify that the selection of a CAS Person is performed by the design organization according to its own written processes.

§ 21.257(c) *FAA Level of Project Involvement*

(c) describe a process for identifying the FAA level of involvement in each project.

The system must describe a process for identifying the anticipated FAA level of involvement in each project. This should include a method of notification to the FAA about new projects.

This element will be a systems-level discussion of how the Compliance Assurance System determines FAA level of involvement in projects. It might describe criteria for determining where FAA has no project-level involvement (such as regulations for which the organization may determine compliance without FAA involvement); and it might describe criteria identifying where FAA always retains project-level involvement (this could be based on certain regulations or it could be based on certain type of projects, or certain phases of projects).

These first two sets of rules will likely only cover narrow subjects where the answers are obvious, leaving significant subjects where the anticipated FAA level of project involvement is not necessarily obvious. Thus, this element should typically include “rules of engagement” for identifying the FAA level of involvement in each project for all other anticipated compliance determinations.

The organization will need to judge the project-level risk based on the rules and guidelines found in this element. This may influence what the organization’s compliance privileges and obligations are on the project. The FAA involvement may depend in part on the project-level risk. If the design organization is assessing compliance on a project that is very much like something, they do all the time, then FAA level of involvement may be much lower than FAA level of involvement in a project doing something completely novel.

In each case, it is likely that this element will explain how the Compliance Assurance System identifies projects that are subject to a lower or higher level of FAA involvement. It is also likely that these rules of engagement will change over time as the FAA and CAS holder gain more experience and can assess where the FAA needs to have a higher or lower level of project involvement.

One of the goals of these regulations is to allow the FAA to withdraw from in-project involvement in analyses that do not add safety value, so that the FAA can focus its resources on the analyses for which FAA involvement remains necessary to add safety value. In a design organization, having clear guidelines on what the FAA expects to remain involved-in, and what the FAA no longer needs to explicitly review, and how to distinguish between these categories, can be very useful in the smooth day-to-day operation of the organization's CAS.

An earlier draft of this language included an explicit statement that FAA engagement was only necessary in this process where the CAS processes stated that it was necessary, and that otherwise FAA involvement would not be required where the written processes provided clear guidance about FAA level of project involvement. This was removed because it was deemed unnecessary, but it might need to be stated in appropriate advisory guidance to prevent the sort of overreach that this process is meant to avoid.

The scope of authority of the CAS, and its scalability, may be related to the FAA's level of involvement. For a less advanced CAS (such as a new and inexperienced system), it is possible that the FAA might accept a very broad scope of authority for the system (it can cover many subjects), but the FAA might retain a higher level of inspection and test (level of involvement) as part of its initial oversight process; if the FAA is satisfied that the CAS is operating as expected, then the FAA may diminish this level of involvement on a planned schedule as certain development milestones are reached – the result of this process would be for the FAA's project level of involvement to evolve over time, with applicable amendments to this element.

The organization should have the ability to expand the range of subjects on which its CAS can determine compliance and should be able to continue to minimize FAA level of involvement as the design organization gains experience and demonstrates capability.

In summary, this element is a process for defining when the FAA is comfortable with the entity judging compliance itself. Defining when the FAA level of involvement remains higher, helps the entity to know its limits. This process helps to establish a stable and predictable mechanism for compliance. The FAA will continue to audit the process, and retains discretion to audit all processes, but the FAA may not need to remain involved in project-level compliance findings when the FAA-accepted procedure dictates that the FAA retains no project-level-of-involvement.

As a final note, the use of the term "project," in this subsection (and in this description) is meant in a colloquial sense to reflect all applications and efforts under this rule, and it is not meant to reflect (nor be related to) the FAA's use of project numbers, which apply to certain efforts (like TC applications) but not to other efforts (like TSOA applications) within the scope of this rule.

§ 21.257(d) *Notification*

(d) describe a method of notification to the FAA about new projects

The system must describe a method for notifying the FAA about new projects.

It will be important for the CAS to identify the "application date" from the applicant's application or other FAA-accepted mechanism for opening a project. This date will serve as the relevant point in time for determining certification basis. If the applicant did not otherwise communicate this date to the FAA, then the CAS must have a way for communicating the start of the project to the FAA.

§ 21.257(e) *Selection of Applicable Requirements*

(e) describe a process for identifying each Applicable Requirement that applies to the design for each project

The system must describe a process for identifying each Applicable Requirement that applies to the design for each project.

Identifying FAA Applicable Requirements is a task officially performed by the FAA. But in real life projects it is already normal for the applicant to be prepared with a proposed list of Applicable Requirements when the applicant brings the project to the FAA's attention.

Identifying the Applicable Requirements is an important baseline. Once compliance requirements are identified, then it becomes possible to begin thinking about how to find compliance with those regulations.

The FAA needs to know the way that the company is identifying the right requirements to which to find compliance, so the FAA can confirm that the process is robust, and so the FAA can audit the process to ensure it is carried out correctly.

A CAS certificate holder might be able to review, determine and certify the compliance of data independent of a specific project. This would permit the FAA to conveniently approve such data. This FAA-approved data could become part of a library of approved data.

The library of approved data could then be used in subsequent projects, subject to (1) a conclusion that the determination of compliance was to a regulation that is part of the subsequent project's certification basis, and (2) a conclusion that the present project fits within any scope or limit imposed on the prior determination of compliance. In such a case, following the process in this element would require identification of the regulations (and revision levels) to which the data has been found compliant.

§ 21.257(f) *Validation of Applicable Requirements*

(f) describe a process for independently validating the list of Applicable Requirements that apply to the design to ensure it is both complete and correct.

The system must describe a process for validating the list of Applicable Requirements that applies to the design.

The prior process (in subsection 21.257(e)) identified each Applicable Requirement; this element is meant to provide a check to ensure that the list of Applicable Requirements is correct and complete. It is necessary because an incorrect definition of the applicable regulations can either cause unnecessary work (if the list includes unnecessary regulations) or it can yield safety jeopardy if applicable requirements are omitted, and therefore compliance to those requirements is never tested.

This is meant to be a review process. It is different from the *ab initio* selection of regulations. It might be implemented as a checklist of questions like:

What did you consider?

What thought process(es) did you apply?

Understanding the thought process of the selector of the requirements helps to assess whether they approached the issue in a correct manner.

Review is meant to be independent of the original subsection (e) selection. Review should follow a set process; it should not just be an *ad hoc* approach; it must be a controlled process of reviewing to a set of criteria for evaluating the initial selection of requirements.

In an earlier draft, this element included a requirement to use the process in this element for re-validating changes to the regulatory basis or regulatory assumptions; but it was decided that this process for scrutinizing such changes should be part of the Change Control System.

§ 21.257(g) *Methods of Compliance*

(g) describe a process for identifying methods of compliance for all Applicable Requirements that apply to the design.

The system must describe a process for identifying the methods of compliance. There must be a method of compliance for each FAA Applicable Requirement.

The methods of compliance are the ways that industry demonstrates that a design meets the requirements. A single method of compliance (e.g. one test or one calculation) might be capable of demonstrating compliance to more than one Applicable Requirement, and some Applicable Requirements might require more than one calculation or test to show compliance.

Methods of compliance can be the most disputed issue of a project, and therefore a process for adequately identifying the correct methods helps to ensure that they are properly identified in a manner that can be justified, and that is acceptable to the FAA.

Documenting that method for choosing, and the results of that choosing, will provide both clarity and auditability. Having the process adequately documented provides the CAS certificate holder with the ability to oversee this work and ensure it is developed consistent with the plan for supporting this work. Auditability is important, so having it tied to specific methods permits a closed loop system to verify that the CAS certificate holder has correctly identified the methods.

Having the methods documented provides accountability of each CAS Person because it removes the ambiguity of what success looks like. The people executing the required process to establish a compliant design will know what they are expected to do. This gives them credibility to stand behind their work.

The United States' bilateral partners have assessed the FAA system and accepted it. This element is the way that the United States will articulate to other authorities how CAS certificate holders will demonstrate compliance in a way that is consistent with the FAA's system to remain acceptable to bilateral partners.

§ 21.257(h) *Verification of Compliance*

(h) for each Applicable Requirement identified to be relevant to a design, describe a process for assessing the data that purports to show compliance, to verify that compliance is shown.

The system must describe a verification step. Under such a verification step, for each Applicable Requirement identified, the process needs to require verification that the applicant's FAA approved process for establishing a compliant design under the CAS was followed accurately.

This verification step is an important part of the reason that the FAA is allowed to rely on the design organization's certification when it makes its finding. A properly completed verification should mitigate non-compliance risk in the same way that the FAA's traditional finding mitigates non-compliance risk.

Even if we trust the process, it is normal to have checks that verify that the process is leading to a correct result. Typically, no one blindly trusts a process without such checks. This element formally implements the idea of checking to ensure that the method of compliance process correctly determined compliance.

In a traditional model, the applicant for a design approval is required to show compliance ("showing").[3] In response, the FAA is permitted to make any tests or inspections it deems necessary to find compliance ("finding").[4]

[3] 14 C.F.R. §§ 21.33(b), 21.310(b).
[4] 14 C.F.R. §§ 21.33(a), 21.310(a), 21.610.

The design organization's Compliance Assurance System modifies this traditional model. It allows the FAA to rely on the certification offered by the design organization in cases where the risks of non-compliance are mitigated to such a low level that the FAA is satisfied that the applicant's substantiation alone is sufficient to provide a sufficient likelihood of compliance.

After a CAS has verified the processes were followed, an FAA auditor should be able to look at the design organization's CAS records to see how the method of compliance led to a compliant design. This FAA auditing process will be an important part of the assurance that the CAS is working as expected and will support the FAA's reliance on the determination of a CAS.

§ 21.257(i) *Ensuring Persons Have the Right Skills*

> (i) describe one or more processes for ensuring appropriate skills are represented within the Compliance Assurance System:
>
> (1) A process for identifying the technical skills necessary for each Person who has compliance assurance responsibilities in the Compliance Assurance System, and updating that identification to reflect changing circumstances (such as a process change that makes a skill no longer necessary);
>
> (2) A process for ensuring that each Person who has compliance assurance responsibilities within a Compliance Assurance System meets the technical skills identified for that role in this subsection;
>
> (3) A process for ensuring that each Person who has compliance assurance responsibilities within a Compliance Assurance System continues to meet the technical skills identified for that role in this subsection, e.g. through testing, recurrent training to maintain an appropriate technical skill level, on-the-job training, etc.

The system must describe processes for ensuring appropriate skills are represented within the Compliance Assurance System. These processes allow the CAS certificate holder to select the right CAS Persons without FAA involvement in the selection, and without the need for FAA to manage those CAS Persons.

Subsection (a) of this section requires identification of roles, and subsection (b) of this section talks about selecting Persons to fill those roles and managing those Persons. This subsection (i) works with those two prior subsections to illustrate the formal mechanism for ensuring that people or entities are competent before they are entrusted with roles within the system.

Remember that CAS Persons can include corporate entities. Whether the CAS Person is a person or entity, it still needs to feature the right skill set to get the job done.

The first step (the first sub-element) in this element is to identify the skills needed. The process should also show how the CAS will identify the skill(s) needed in order to accomplish the tasks of the CAS.

There are many changes in aviation, and changes can infuse new risks. They can also change the facts and control systems upon which the CAS relies. Industry needs to ensure that the CAS continues to function properly within the environment of these changes. In order to accomplish this, the skill set of the CAS (and its CAS Persons) needs to evolve to meet the changing expectations and environment in which the CAS operates. Therefore, this first step also is required to show how the needed skills are assessed and updated. This helps to ensure that the CAS skill set does not remain static, as the expectations and environment of the CAS grow and change.

In a CAS with more than one CAS Person, the total sum of the skill required by the CAS might be divided into roles, and different CAS Persons might fulfill different roles. The first sub-element will help to facilitate the identification of the critical roles in the CAS. The identified skills should be assigned to the roles, so that it is clear what skills each CAS Person requires.

The second sub-element shows how the CAS will demonstrate competence of CAS Persons. Their competence should be judged against the required skills associated with their roles.

The third sub-element shows how the CAS will maintain competence of CAS Persons. This might be through recurrent training, periodic testing to ensure competence levels, or some combination of mechanisms. The goal is to maintain competence to the required skills associated with the Person’s roles, and as those skills change (either because of a change in the roles or because of new skills deemed necessary to the role), to ensure competence in the new skills required of the CAS Person.

§ 21.257(j) *Change Control System*

> (j) describe a change control system to identify all design changes that arise between the time that design compliance parameters are first identified, and the time that final design compliance is determined. This system shall:
> (1) assess each design change's impact on the list of Applicable Requirements; and
> (2) assess compliance of the changed design to the Applicable Requirements.

The CAS must describe a Change Control System.

The scope of this change control system is for all design changes that arise between the time that design compliance parameters are first identified, and the time that final design compliance is determined. This is project-level change and it is different than a system for managing change in the CAS itself. A CAS certificate holder could choose to implement this Change Control System process as one component of a larger system that manages many different types of change.

The reason this element is important is because project parameters can change during the course of the project.

The role of the Compliance Assurance System is to ensure compliance to Applicable Requirements. If the project parameters change in a way that affects the methods for determining compliance, then this system is responsible for identifying each such change and assessing how it impacts the compliance determinations.

For example, the launch customer can change their requirements. These sorts of changes can impact compliance. This step requires an assessment to identify whether the proposed change to the project will impact the assessment of compliance. If it does, then it should force a modification to the system in order to properly reflect any changes that do impact compliance. Thus, the impact of project changes on the determination of compliance is managed within the compliance system.

In many existing companies, there are processes in place for change impact assessment whenever an engineering change is introduced into the system. This process is analogous to such a change impact assessment program, but it is limited in scope to an assessment of how the change impacts the determination of compliance.

§ 21.257(k) *Method of Compliance Library*

> (k) if a method of compliance library will be used, then describe a process for managing the method of compliance library, including amending the library, maintaining the library, and reflecting new and changed FAA policies in the methods of compliance found in the library.

A Method of Compliance Library is optional, but if the design organization chooses to have one, then it must have a process for controlling the library.

A Method of Compliance Library is a compilation of documented methods of compliance authorized by (or published by) the FAA in any form. It may also include other compliance tools and procedures as authorized by the FAA. Once a tool or procedure is authorized by the FAA, it should be useable within the parameters that were authorized by the FAA.

The CAS needs to determine on a project basis whether a compliance method found in the Methods of Compliance Library is applicable to the specific intended use on the project. Therefore, a compliance method might incorporate FAA-authorized assumptions and/or limitations.

As an example, in a galley project, the compliance library might include a method for performing pull-tests and it might have a data presentation template that is completed with the determinations that need to be made in each galley project. An authorized method of compliance might identify a set of data to be acquired, a process for assessing the data, and minimum standards for the data to meet in order to be considered compliant.

The FAA may need to implement corollary mechanisms (such as their own library of authorized compliance methods to serve as an internal resource, or procedures that the FAA uses for assessing compliance methods) to ensure that compliance method authorizations are decided on a uniform and consistent basis.

§ 21.257(l) *Records*

(l) describe a process for identifying records that are required to be made and retained. The process should identify:
(1) What records need to be kept by the Holder;
(2) What records need to be transmitted by the Holder to the FAA;
(3) Who is responsible for creating the record;
(4) Who is responsible for keeping the record;
(5) What are the record retention requirements; and,
(6) How the Holder will ensure that records are made and kept in compliance with applicable regulatory requirements.

The CAS must describe a process for identifying records that are required to be made and retained.

Records are necessary in order to permit the FAA to effectively audit the Compliance Assurance System. Those records will need to follow a uniform mechanism in order to (1) standardize FAA oversight of Compliance Assurance Systems and (2) permit the FAA to obtain appropriate OMB approval of records requirements.

Minimum records standards should be clearly outlined in the regulation in order to ensure that they are approved under an OMB approval (consistent with the Paperwork Reduction Act), but the details of how to meet those standards should be left to the CAS.

It is believed that future industry standards may help to coordinate record-keeping expectations in this area.

§ 21.257(m) *Perform Audits*

(m) describe a process for internal auditing of the Compliance Assurance System to ensure it is functioning according to the system's expectations.

The system must describe a process for internal auditing of the CAS to ensure it is functioning according to the system's expectations. This section is meant to address the compliance of the system elements – as they are implemented - to the written system requirements. This element is meant to assess compliance to the written system; how that system performs is the subject of the next subsection (subsection (n)).

In an earlier draft of this subsection, the audits were focused on the CAS Persons. That language was dropped to clarify that the scope of the audits is the entire CAS and not just the CAS Persons.

§ 21.257(n) Monitor and Measure Performance

(n) describe a process for collecting data and analyzing processes and systems to monitor and measure the performance and efficiency of the Compliance Assurance System.

The system must describe a process for collecting data and analyzing processes and systems to monitor and measure the performance and efficiency of the Compliance Assurance System.

The audits described in subsection (m) are meant to ensure that the implementation meets the written requirements of the CAS. This section differs in that it meant to collect data for performance monitoring of the system (rather than mere compliance monitoring). Measuring the performance and efficiency of the system under this subsection is meant to provide both the FAA and the design organization with the ability to monitor whether the CAS is working effectively and efficiently.

If data shows that the CAS is not working effectively or efficiently, then the design organization may choose to modify the CAS to improve efficacy or efficiency.

The data collected under this element is subject to review by the FAA (at the FAA's discretion) during regular oversight. The FAA may use this data to make future improvements in the regulations or policy surrounding design organizations. For example. if the data shows that many similarly-situated CAS implementations are failing to meet FAA performance expectations (even when the systems are technically compliant), then this could cause the FAA to analyze the data and identify both a root cause and a corrective action that might apply to the entire range of design organizations. Similarly, if the data shows that some CAS implementations are performing more effectively or more efficiently that other similarly-situated CAS implementations, then the FAA may investigate to see how it could offer "lesson-learned," or other guidance in order to enhance the efficacy or efficiency of the CAS implementation that are not performing as well.

The data that is used to support this analysis may be collected in a system that (1) is integrated with and/or (2) relies upon data collected as a part of the internal auditing system described in subsection (m).

It is possible that subsections (m) and (n) might be combined into a single subsection accomplishing the purposes of both subsections.

§ 21.258 – Compliance Assurance Documentation

> Each applicant for or holder of a Compliance Assurance System certificate must provide documentation describing its Compliance Assurance System to the FAA for approval. The documentation must be in the English language and retrievable in a form acceptable to the FAA.

This section requires that the compliance assurance system be described in documentation. The FAA approves the documentation.

The option to put this material in various places and merely require documentation (rather than a single manual) was considered in order to allow flexibility. There seemed to be no objection to organizing the documentation in this way. The group also considered whether this documentation could be integrated with other manuals. There seemed to be no objection to merging this documentation with other manuals, so long as it met FAA requirements; it appears that there is a modern trend toward integrated management systems manuals, in which the design organization procedures become merely an element of the overall manual.

When we say that the documentation must be "retrievable in a form acceptable to the FAA," we mean the same thing as when the FAA used these words in the regulatory preamble to the Part 21 production regulations published in the Federal Register. *Production and Airworthiness Approvals, Part Marking, and Miscellaneous Amendments; Final Rule*, 74 FR 53368, 53379 (October 16, 2009) (explaining that "form acceptable" means that the manual must be stored in a medium that can be retrieved both by the holder and by the FAA).

§ 21.259 - Compliance Assurance Facilities Outside the United States

> Neither an applicant for nor holder of a Compliance Assurance System certificate may identify a CAS Person located outside of the United States unless the FAA finds no undue burden in administering the applicable requirements of Title 49 U.S.C. and this subchapter.

This section requires an undue burden assessment prior to granting permission to use a CAS Person located outside the United States. This allows the FAA to manage non-US participation in such systems.

There are several reasons why the FAA may need to manage non-US participation in such systems. These include the need to ensure that the FAA has adequate resources to provide oversight to the system, the need to ensure that non-US participation does not violate US law, the need to ensure that non-US participation does not violate foreign law, the need to ensure that non-US participation does not violate agreements with other nations, and the desire to optimize resource use which may mean that the FAA chooses to make use of non-US resources through other means (including through means outlined in bilateral or multilateral agreements).

§ 21.260 - Inspections and Tests

> Each applicant for or holder of a Compliance Assurance System certificate must allow the FAA to inspect its Compliance Assurance System, facilities, and technical data, and witness any tests, including any inspections or tests at a compliance assurance facility, necessary to determine compliance with this subchapter.

This section emphasizes that the FAA may make, engage in, or witness any inspection/test that it feels is necessary in order to determine compliance with this subchapter. This applies both to initial certification and also to ongoing oversight.

§ 21. 261 - Issuance.

> Upon finding that the applicant complies with the requirements of this subpart, the FAA shall issue a Compliance Assurance System certificate with appropriate ratings.

This section merely explains that the FAA shall issue a Compliance Assurance System certificate, with appropriate ratings, after finding that the applicant complies with the requirements of this subpart.

Prior language restricting CAS applicants from bilateral trading partners was removed in favor of the language of section 21.259.

§ 21. 262 - Ratings.

(a) The following ratings are issued under this subpart:

1. product rating;
2. modification rating;
3. article rating;
4. Any other rating approved by Administrator

(b) An applicant may apply for, and be granted, more than one rating.

(c) Ratings may be limited to only certain activities under the rating. An applicant shall be entitled to be rated for any activity for which it demonstrates that its Compliance Assurance System is adequate to ensure that, for the applicant statement of compliance, the corresponding design has been shown to comply with the Applicable Requirements.

(d) The Compliance Assurance System Certificate Holder's privileges shall be limited to the scope of the rating, and the activities under that scope.

The statute authorizes the FAA to issue ratings for design organizations. Such ratings would allow the FAA to manage the compliance assurance systems such that the systems would be limited in their scope to competencies identified by the FAA. This same approach has been used for managing repair stations' scope of competencies through ratings. Just as repair station ratings are intended to be broad in their scope, so too do the drafters intend the ratings of a design organization to be broad in scope.

Similarly, the drafters intend that ratings should be available to applicants who meet the CAS requirements and should not be used as a mechanism to prevent qualified smaller applicants from enjoying the privileges and responsibilities of a CAS.

The initial list of ratings includes the following:

A product rating, under which a design organization would be permitted to assess the compliance data for a complete product (airframe, engine or propeller).

An article rating, under which a design organization would be permitted to assess the compliance data for articles intended to be installed in type-certificated products (including articles intended to be approved under TSOA or PMA).

A modification rating, under which a design organization would be permitted to assess the compliance data for a modification to an approved design. Note that the design change could be minor or major; the compliance-determination-model would be the same regardless of the major/minor category.

The fourth category, "any other rating approved by Administrator," might be the most important category. The group anticipated that there would be other scopes to design organizations. Specific discussions included approval of process specifications and repair specifications. Under policy, a Repair Specification Designated Engineering Representative (RS-DER), possibly supported by other DERs, makes a finding of compliance concerning data supporting such a specification, and this finding of compliance forms part of the basis of a Flight Standards analysis that may result in the specification being added to the repair station's operations specifications (which then authorizes the repair station to use the process specification or repair specification). An FAA-approved design organization with an appropriate rating could make a determination of compliance in support of Flight Standards District Office (FSDO) activity, and the FSDO could rely on this determination in its own analysis concerning the process specification or repair specification.

Similarly, a design organization could determine compliance of repair data, in support of an FAA-issued 8110-3 form (or other record) recognizing the compliance of the data. This could be useful because the United States does not have a single mechanism for approving third-party repair data, and this could help to standardize the mechanisms for preparing such data for approval.

An applicant may apply for, and be granted, more than one rating.

§ 21. 263 - Duration

A Compliance Assurance System certificate is effective until surrendered, suspended, revoked, or the FAA otherwise establishes a termination date.

This section establishes that a CAS certificate is effective until surrendered, suspended, or revoked.

§ 21. 264 - Transferability

The holder of a Compliance Assurance System certificate may not transfer the Compliance Assurance System certificate.

This section establishes that a CAS certificate may not be transferred by the CAS certificate holder. One reason for this is because the certificate is based on the competencies of the applicant, and a transferee may not have the same competencies. This might not limit the FAA's ability to accomplish a transfer, when the FAA judges that the transfer would not change the way that the system complies with this subpart, property rights are not abridged, and the transfer would serve the interests of safety.

§ 21. 265 – Privileges and Administrator's Reliance

(a) The holder of a Compliance Assurance System certificate may certify to the FAA that a products or article complies with Applicable Requirements. Such products or articles must be described within the scope of the holder's ratings. The certification is subject to the limits of the holder's Compliance Assurance System Certification.

(b) The Administrator may rely on a certification of compliance by a Compliance Assurance System certificate holder when making a finding under this subchapter.

The holder of a Compliance Assurance System certificate has only one privilege. This mirrors the limited scope of the responsibility under the subpart. A CAS certificate holder may certify to the FAA that data (associated with a product or article) complies with the Applicable Requirements.

This privilege is limited to such products or articles as are described within the scope of the holder's ratings. This is meant to emphasize that the certificate holder is not entitled to any CAS-related deference for data outside of the ratings.

This certification of compliance is different from the comparable statement certifying compliance made by a design approval applicant under 21.20(b). The FAA does not rely on that design approval statement without making a correlative finding. Under the design organization statute, the FAA may rely on the CAS holder's certification of compliance as the basis for a finding of compliance, with no further investigation (except normal systemic oversight).

The CAS holder's certification privileges are subject to the limits of the holder's ratings.

The FAA may rely on a certification of compliance by a Compliance Assurance System certificate holder when making a finding under this subchapter. Although this may seem like a benefit to the CAS certificate holder, this is not actually a privilege of the certificate. Rather it is a response to the CAS certificate holder's privilege that is authorized by statute.

The FAA is expected to audit CAS certificate holders and such audits should allow the FAA to confidently rely on the product of such systems (compliance determinations).

§ 21. 266 - Responsibility of Holder.

> The holder of a Compliance Assurance System certificate must -
>
> (a) Amend the document required by § 21.255 as necessary to reflect changes in the organization and provide these amendments to the FAA.
>
> (b) Maintain the Compliance Assurance System in compliance with the data and procedures approved for the Compliance Assurance System certificate;
>
> (c) Ensure that each completed design for which the Compliance Assurance System certificate holder certifies compliance meets the Applicable Requirements;
>
> (d) Perform its Compliance Assurance System functions in accordance with the documentation described in § 21.258, and
>
> (e) Retain its Compliance Assurance System certificate and make it available to the FAA upon request.

The holder of a compliance assurance system certificate has a number of responsibilities in addition to the responsibilities elsewhere stated.

The holder of a compliance assurance system certificate must update the organization document (described in section 21.255) to reflect changes in the organization and it must provide these updates to the FAA.

The holder of a compliance assurance system certificate must maintain the CAS in compliance with the CAS documentation. The CAS documentation will include the procedures that the FAA approved for the CAS certificate holder. The holder of a compliance assurance system certificate must also follow the CAS documentation.

When the holder of a CAS certificate certifies compliance, it is responsible for ensuring that the design complies with the Applicable Requirements.

§ 21. 267 - Amendment of Compliance Assurance System Certificates

To add a rating, a holder of a Compliance Assurance System certificate must

(1) apply for an amendment to a Compliance Assurance System certificate in a form and manner prescribed by the FAA, and

(2) comply with §§ 21.257, 21.258, and 21.260

This section explains how to add a rating. The process involves application for the amendment and a demonstration of continued compliance with the §§ 21.257 (General Requirements), 21.258 (Documentation), and 21.260 (FAA Inspections and Tests).

§ 21.270 - Changes in Compliance Assurance System.

After the issuance of a Compliance Assurance System certificate -

(a) The holder of a Compliance Assurance System certificate shall notify the Administrator within 48 hours of any change that could affect the FAA's ability to oversee the Compliance Assurance System, or affect the certificate holder's ability to continue to meet the requirements of this subpart

(b) The holder of a Compliance Assurance System certificate shall submit in a form and manner acceptable to the Administrator each change to the Compliance Assurance System

This section explains how to make changes other than rating changes. This process was the subject of much debate.

After debate on whether to define "major" and "minor" changes, it was decided that all changes would be treated as equal. This decision was made for two reasons: (1) it appeared that distinguishing different reporting criteria was unnecessary, and (2) the historical distinctions between such concepts in other parts of the regulations have been vague, and this vagueness in the distinctions has resulted in unwanted confusion.

The section now requires the CAS holder to notify the FAA within 48 hours of any change that could (1) affect the FAA's ability to oversee the Compliance Assurance System, or (2) affect the certificate holder's ability to continue to meet the requirements of this subpart.

While changes do not need to be approved before they are implemented, any change that was identified as unacceptable would likely need to be retracted, or else the FAA may exercise its discretion to refuse to rely on the product of an unacceptable CAS.

3.1.2.2 Recommendation IF.2 - Application of CAS Principles to Existing FAA Policy Initiatives

The FAA should prototype the draft CAS regulatory structure as part of existing current FAA initiatives, such as those for minor changes and non-safety sensitive PMAs (including current eligibility expansion project).

3.1.2.2.1 Additional Information

The FAA should apply the CAS principles contained in the draft regulatory text to existing policy initiatives where appropriate. Areas such as approval of minor changes to type design and non-safety sensitive Parts Manufacturer Approvals (PMAs) represent potential building blocks to implementation of a CAS with broader scope. Such initiatives provide opportunity for the FAA and industry to prototype principles outlined in the draft CAS regulatory text provided in this report.

3.1.2.3 Recommendation IF.3 - Alignment of CAS and Related Programs

The FAA should ensure continued interaction and alignment between CAS rulemaking efforts and related programs (e.g. SMS, ODA, and ESO), for any changes to the draft CAS regulations based on the results of the pilot program or other efforts.

3.1.2.3.1 Additional Information

Effectively implementing and overseeing compliance assurance systems will require that the FAA continue to consider these systems in the context of other related aircraft certification initiatives. For example, the working group anticipates that a CAS would be one acceptable way for an applicant to satisfy Safety Management Systems (SMS) requirements under 14 CFR 5.3(c) for ensuring compliance, if such requirements are applied to a designer. In addition, while a CAS and an Organization Designation Authorization (ODA) are independent and either can exist without the other, applicants who have both a CAS and an ODA will have important interactions between the two systems as illustrated in this report. Furthermore, methods for regulatory oversight of a CAS should be developed in concert with the FAA's broader approach to evolving

systems oversight. Because of this relationship between compliance assurance systems and other FAA initiatives, it will be important for the FAA to ensure continued alignment across related programs. For example, any changes to the proposed CAS implementation or oversight framework stemming from lessons learned during the pilot program should not be made in isolation. Rather, such changes should be considered in the broader context of SMS, ODA, ESO, and any other related aircraft certification initiatives.

3.1.2.4 Recommendation IF.4 - Identification of Supporting Policy and Guidance

The FAA should commission a joint regulator-industry team to identify and recommend the supporting FAA policy and guidance needed to fully implement a CAS.

3.1.2.4.1 Additional Information

The CAS Working Group did not have an opportunity to identify the new or modified FAA policy and guidance that would be needed to fully implement and oversee a CAS. The FAA's part 21 Road Map Regulatory/policy matrix[5] may be a good starting point for identifying where existing guidance and policy should be revised, and/or new guidance or policy should be created, to complement issuance of CAS regulations. Such guidance and policy will be important to ensuring effective and consistent implementation and oversight of a CAS. Continued work in this area should be conducted under the Safety Oversight and Certification Advisory Committee or alternative industry-FAA forum.

3.1.2.5 Recommendation IF.5 - Development of Consensus Standards

The FAA should encourage industry to develop consensus standard(s) that will support effective implementation of CAS.

3.1.2.5.1 Additional Information

While industry has a primary role in initiating and developing consensus standards, the FAA should encourage industry to focus efforts on development of consensus standards that will support effective and consistent implementation of CAS. Such consensus standards could be used as the basis for guidance through FAA acceptance or other means of recognizing the standards for use in implementing a CAS.

[5] https://www.faa.gov/aircraft/air_cert/design_approvals/dah/media/dah_subpart_matrix.pdf#page=1

3.1.2.6 Recommendation IF.6 - Availability of CAS Working Group Materials

The FAA should create a repository of supporting materials developed by the Compliance Assurance Systems Working Group as useful information to help understand the recommendations. Store the relevant data and circulate the data as necessary to facilitate implementation, educate the public, and support better understanding of Compliance Assurance Systems.

3.1.2.6.1 Additional Information

The CAS Working Group recommends that its working files be preserved and made available to any future teams that will further the development of these ideas. Having access to editable versions of files in Word, Visio, etc. will facilitate future CAS activities. These materials may also prove useful in creating communication products or conducting other change management activities.

3.1.2.7 Recommendation IF.7 - Streamlined Path to Authorization

The FAA should ensure organizations with proven track records (e.g., ODA, PSP, Memorandum of Understanding (MOU)) are provided with a streamlined path to obtain CAS authorization in the applicable areas of expertise/proficiency.

3.1.2.7.1 Additional Information

The intent of this recommendation is to encourage the FAA to recognize applicants having already established a working relationship through an established ODA or other similar agreement, thus expanding on the proficiency and trust that has already been demonstrated and therefore not requiring as much rigor to establish CAS authorizations as might be necessary for a less experienced applicant.

3.2 Oversight of CAS

The previous working group called out a need to:

- Recommend a CAS oversight framework
- Define the methods to measure CAS performance
- Identify information and methods to be used to tailor oversight

Oversight of the CAS has the goal to ensure that the Systems within it have a means of self-checking that completeness of the processes have occurred and that correctness of the data produced is ensured. This checking is done both internally through the CAS as well as from oversight by the FAA. It is also important that a proper root cause and corrective action protocol is established when issues are found in this completeness and correctness check to ensure the health of the CAS is maintained. Ensuring completeness and correctness of the identified process in conjunction with root cause and corrective action create a process assurance model that is used to provide confidence of compliance rather than the current approach of determining compliance through a company show. The preapproval by the FAA of these processes provides the necessary path for determining compliance in a way that is sufficient and reliable as the basis for FAA design approval, without a requirement for discrete compliance findings by the FAA (or designee) as a condition for FAA certificate issuance or design approval. In the remainder of this section, this working group has created a set of recommendations for Industry to guide the internal checks as well as a set of recommendations for the FAA to guide oversight by the FAA.

3.2.1 Industry Oversight Recommendations

The industry recommendations on oversight cover the need for the company to ensure it is checking important parameters, that configuration management is in place such that the data can be re-created as it was viewed at the time of the internal checks, that the data and records are made available to the FAA, and that the company recognizes that the oversight audits can look at any and all records. It is the company's responsibility to audit itself, and the FAA will be auditing those internal audits to ensure the company is catching the right things and resolving issues found appropriately. This dynamic further requires that the internal audit process of the entire CAS system should be at minimum twice the frequency of the FAA Audits to ensure trends can be assessed and to provide sufficient data for the FAA to review that the Internal CAS audits are catching and resolving the right things. This section will include alignment of performance

measurements to the elements and provide details for measures to consider when performing a GAP assessment while setting up a new CAS or System, evaluating data in Audits, and continuously measuring and monitoring data to ensure a healthy CAS.

3.2.1.1 Recommendation OI.1 - CAS Monitoring Requirements

CAS Performance must be assessed and monitored according to the required elements outlined in the CAS Attributes (which call out proposed requirement language to set objectives and monitor performance)

3.2.1.1.1 Additional Information

Measuring the CAS performance starts by evaluating how the CAS holder organization or the FAA would assess CAS performance. This means each necessary CAS Element is present and performing its intended function. For each appropriate Element we identified in Section 3.1 above, at least one means or metric to evaluate its presence and effectiveness should exist. In order to achieve this, each measure was assigned a measurement type:

(1) Gap Analysis for implementing and sustaining CAS processes
(2) Audits of a functioning CAS, and
(3) Continuous Monitoring CAS operations

The next subsections will list out the measures by these three categories. Appendix C contains the trace matrix to the elements identified in Section 3.1. as well as more details.

3.2.1.1.1.1 GAP Analysis

When evaluating a process for the first time or a change to a process it is important to check aspects from planning, coordination, maintenance, responsibilities, process assurance, and configuration management. The following is a list of considerations identified that line up to the elements identified in Section 3.1:

- Confirm evidence of communication plans in policy and that communication has actually happened as outlined.
- Confirm signature with current roles within CAS.
- Confirm that a performance monitoring system exists, and it is working appropriately.
- Confirm that evidence exists that data is being collected for each of the required measures

- Confirm that a performance monitoring system is working appropriately and according to established requirements.
- Confirm that a process exists and is working effectively to react to non-compliances identified, control and correct them, evaluate and address root cause, and implement actions required to prevent similar non-compliances from occurring in the future.
- Confirm that a process exists to monitor the design approval environment for changes and that changes are being identified and managed.
- Confirm that a risk management process exists and is applied appropriately throughout the design and certification process.
- Confirm that evidence exists that risks are being identified and managed appropriately.
- Confirm that actions are carried out as appropriate based on performance information collected.
- Confirm that communication plans are outlined in policy and evidence that it has been implemented.
- Confirm that organization has and is following a configuration or conformity management plan.
- Confirm that RAA (Responsibility, Accountability, Authority) and qualifications for participants are outlined in policy
- Confirm that records/database exist of required resources and people that fill those spots.
    - Check that those are maintained and accurate.
- Confirm that risk management process is appropriately capturing new potential or actual compliance issues and managing them appropriately.
- Confirm that the required elements are in the internal CAS policy

3.2.1.1.1.2 CAS Audits

CAS Audits can be broken into two phases: per process execution and periodic audits.

Per process execution checks that correctness and completeness has been ensured. The correctness check should be embedded within the process and performed using the RAA discussed in the GAP analysis section above. The completeness check is performed by the CAS person based on the criteria defined within the process. It is important to note that neither of these roles are finding compliance and therefore are not delegated. The qualifications required should

be identified within the policy and the individuals are identified accordingly. This lack of delegation is an important element to ensure CAS remains focused on ensuring proper process execution to determine compliance rather than creating data that shows compliance that can later be found.

Periodic audits of the entirety of the CAS system is the second phase of audits and is intended to look for and correct issues found within a given system and across the entirety of the CAS. These checks should include the following considerations and be conducted by the CAS person(s):

- Confirm that activities performed are in accordance with privileges outlined in CAS approval and procedures manual
- Confirm that activities performed are in accordance with privileges outlined in CAS approval and procedures manual
- Confirm that audit records are maintained and that audits are being executed as planned.
- Confirm that audits are happening on schedule and per plan.
- Confirm that CAS Holder Accountable Executive has conducted timely periodic reviews of CAS performance in accordance with required processes.
- Confirm that documentation exists as outlined in policy.
- Confirm that organization has and is following a Design and Development Plan
- Confirm that periodic goals and thresholds exist for identified performance measures, and that a process is in place to ensure that performance deficiencies are corrected based on performance assessments.
- Confirm that required records are kept in an auditable location.
- Confirm that the qualifications of personnel performing design reviews is aligned with requirements outlined in policy.
- Confirm that the training/qualification requirements are outlined in policy, and that records are kept to be able to ensure that workforce meets these requirements.
- Evaluate FAA agreement with company-performed audit findings and corrective actions that were identified.

3.2.1.1.1.3 Continuous CAS Monitoring

CAS health will be measured by ensuring that monitors are in place to look for trends within findings as well as to look for items that can invalidate current methods of compliance. The following is a list of measures that should be included within the continuous health check of the CAS:

- Airworthiness directives
- Airworthiness directives involving a non-compliance
- FAA agreement with applicant's CAS use assessment/proposal for compliance showing
- Monitor corrective action closures and implementation
- Monitor corrective actions created, including how many are created, what types of things are they for, and whether there are repeats.
- Monitor employee reports in the confidential reporting system, and number that result in non-compliances or corrective actions.
- Monitor internal audit findings, including number of findings, what types of findings, whether there are repeat findings.
- Number of design changes due to COS reports
- Number of times a MOC was updated after initial application
- Time needed to make design changes after an issue identifies that one is needed
- Timeliness of audits and corrective action identification and implementation.
- Track actual non-compliances reported
- Track design changes as the design progresses: how many, what are they, underlying reason for a change.
- Track number of Vendor design and manufacturing issues discovered at incoming inspection and later
- Track potential non-compliances reported

3.2.1.2 Recommendation OI.2 - Historic Data Availability

CAS holder must allow the FAA to conduct oversight of active programs as well as historical audits to check the integrity of the CAS System against the objectives. This includes making available all associated data for those programs.

3.2.1.2.1 Additional Information

Through the course of Audits, type data will be generated, issues discovered and resolved, checklists will be filled out, an often type data will be updated. It is important for the company to understand that any internal audit discoveries need to be available to the FAA and not just the type data generated. Furthermore, the original data as audited needs to be made available so the FAA can see proper resolution of the root cause and corrective action. Checklists and Audit records will be the primary source of any FAA audit, but without the data that was audited in its original state, it will not be possible for the FAA to ensure the CAS Internal Auditing process is working properly.

3.2.1.3 Recommendation OI.3 - Finding Challenge

CAS holder must have an ability to challenge an FAA oversight finding

3.2.1.3.1 Additional Information

Similar to other methods of issue elevation in FAA guidance, it is important that the CAS contain issue elevation protocols so that challenges to oversight findings can be made without fear of retribution. Auditing is an area of ambiguity based on the auditor's experience and the quality of provided checklists. Sometimes findings are not appropriate and or not at appropriate levels based on risk. This recommendation is to ensure a protocol is put in place to handle this elevation within the CAS internal policy.

3.2.2 FAA Oversight Recommendations

On the FAA side, oversight strategy will be aligned with the risk model concept. FAA Oversight is focused on the company audits and internal checks rather than directly on the projects themselves. As this form of auditing will be new for many at the FAA, FAA Oversight should be based on guidance and training to ensure consistency. It should also be targeted meaning that the risk profile and the holder's performance should guide the depth and direction of the audit. And finally, it should have appropriate levels of findings to ensure that not all issues identified in the Audit require the same level of priority for improvements and instead should be evaluated against its impact to aircraft safety.

3.2.2.1 Recommendation OF.1 - Targeted Oversight

FAA should verify the CAS holder is continually monitoring, assessing, and managing the performance of its CAS. The FAA should perform the verification in a consistent manner, that is targeted based on both the FAA risk profile and the CAS holder's performance data and contains appropriate levels of oversight findings.

3.2.2.1.1 Additional Information

A full functioning CAS includes oversight provided by both company internal resources and the FAA. Oversight determination should originate with risk methodologies that focus upon severity and likelihood probabilities. With these two factors, a company's internal CAS assessment and the FAA's CAS oversight should follow suit when applying risk. Currently, the FAA has several oversight risk models. Two examples include risk models for production oversight and delegation (ODA). While these models vary how oversight is applied and conducted, they follow targeting of risk through severity and likelihood. Because the CAS applies mainly to design and compliance activities, adopting a risk model similar to one found in the proposed FAA Order 8100.15 Rev C can harmonize and align CAS assessments and oversight. This risk model is scalable and flexible such that the model can be applied to companies without an ODA. Companies operating an ODA may be able to leverage existing systems and resources to conduct CAS assessments.

Currently, the FAA has an initiative to establish a risk model that spans across production, delegation, and design. This initiative, called Evolving System Oversight (ESO) also follows a risk methodology similar to those described previously. However, the timeline for ESO implementation will most likely not be available at the launch of the CAS pilot. It is recommended that a risk methodology similar to an ODA risk method be adapted for oversight planning and execution. The interim CAS oversight risk model has not been developed. The processes and formulas needed to target and conduct oversight will need to be addressed and developed by a follow-on team. Once FAA ESO implementation has been adopted, the interim CAS oversight risk model would transition to the ESO risk model.

3.2.2.2 Recommendation OF.2 - Common Approach to Oversight

The FAA should provide a common method of application for the performance objectives based on the tables of proposed measures and their priorities in this report. The recommended way would be through voluntary consensus standards.

3.2.2.2.1 Additional Information

Guidance will need to be developed to ensure that performance objectives are established and implemented in a consistent manner. This working group suggests establishment of performance objectives through voluntary consensus standards. The tables of proposed measures and their priorities in Appendix C of this report provide a foundation for either decision.

3.3 Pilot Program

3.3.1 Pilot Program Recommendations

3.3.1.1 Recommendation P.1 - Develop Pilot Project

The FAA should develop an open ended and varied Pilot program that allows applicants (through scalable and tailored agreements with the FAA) to implement CAS requirements and mature effectiveness of the system. The Pilot program would also allow the FAA to mature their CAS requirements and oversight practices. Pilot program participants should represent various design approvals and organizational complexities.

The Pilot program purpose is to evaluate the CAS Working Group's (WG) recommended model and determine the feasibility of this framework's adoption by FAA. The Pilot program should lead to the identification of both best practices and lessons learned through collaborative work exchanges between an applicant and the FAA. The results of the Pilot may influence future decisions for FAA policy or regulations. The Pilot program will provide results for constructing strategic policy as well as recommendations for how both applicants and the FAA could interact to demonstrate a working CAS and its companion evaluation and oversight systems.

Evaluating these system models requires participation from both the applicant and the FAA. Because the CAS system requires interactions between the applicant and the FAA, both groups would need to provide resources to make the appropriate adoptions and adjustments to current systems. An applicant would need to overlay a set of CAS requirements to its current design and compliance systems. Additionally, applicants will also need to provide for CAS's companion continuous internal evaluation system. Local FAA ACOs/MIDOs having oversight of an applicant would need to adopt and adjust to a different set of oversight requirements as well. This Pilot addresses scalability, flexibility, and covers a spectrum of applicants of various sizes and complexities. Applicants should be chosen to represent a variety of design approval (TCs, STCs, TSOs, and PMA) holders with varying level of complexity within these designs. Pilot CAS boundaries could include but are not limited to processes within a certification program, similar design processes that cover multiple certification programs, location-specific design centers, or across an applicant's design systems. CAS boundaries are flexible and may be created by agreement between the applicant and the FAA. Depending upon the success of the Pilot program

and with FAA concurrence, the applicant and the FAA may choose to continue the CAS implementation forward to process maturation, modification or even expansion after the Pilot program has ended.

The Objectives of this Pilot program are to:

	Objectives
1	Determine the feasibility of implementing a CAS with applicants across industry.
2	Understand the mechanics of developing and implementing a CAS from both the applicant's and the FAA's perspective.
3	Develop a library of lessons learned and best practices concerning compliance assurance systems.
4	Identify potential obstacles to implementing, evaluating, or overseeing a CAS.
5	Validate expected results of implementing CAS, including but not limited to: (a) the anticipated benefits of CAS for both industry and the FAA. (b) the effectiveness of recommended CAS requirements. (c) the effectiveness of recommended performance measures and thresholds. (d) the efficiency and effectiveness of CAS interfaces with other systems, such as SMS, ODA, and QMS (where applicable). (e) the effectiveness of stakeholder interactions.
6	Use the resulting best practices and lessons learned to inform development of CAS policy and guidance.
7	Identify key considerations for development of an implementation plan for fully deploying CAS (beyond the Pilot participants).
8	Increase stakeholder buy-in to implementing CAS.

Expectations – The expectations of this Pilot program are:

	Expectations
1	Compliance to regulations becomes more systematic instead of transactional.
2	Successful Pilot programs continue to operate after the Pilot program officially ends.
3	Lessons learned and best practices are incorporated into FAA policy, guidance or regulation.
4	FAA and Applicant both find improved resource efficiencies.

	Expectations
5	CAS Pilot will be an open-ended project with decision-making occurring as the Pilot matures. This allows applicants who have made investments in their infrastructure to continue to realize benefits of implementing a CAS. If regulations are drafted and implemented, applicants with a Pilot CAS may need to assess and possibly adapt, update, and/or modify their CAS to comply with the regulation.

3.3.1.2 Recommendation P.2 - Central Pilot Team

The CAS Pilot should be organized and coordinated by a central FAA team (FAA CAS Program Team) to communicate, facilitate, and standardize CAS implementation across different applicants and FAA local offices while ensuring appropriate CAS scalability.

Depending upon the number of applicants participating in the Pilot, the FAA would need to establish a centralized team to standardize the program across these several applicants. This team would also need to engage local FAA offices with guidance for CAS processes. More complex design systems may choose to adopt CAS with boundaries instead of a full company-wide deployment.

Industry Executives – An industry executive's role in the Pilot decides whether the company they represent will be participating in the Pilot program. They may be members of the SOC-ARC but that is not a requirement to participate in the Pilot. These executives will sign or designate signature authority for a CAS Memorandum of Understanding between the FAA and the company they represent.

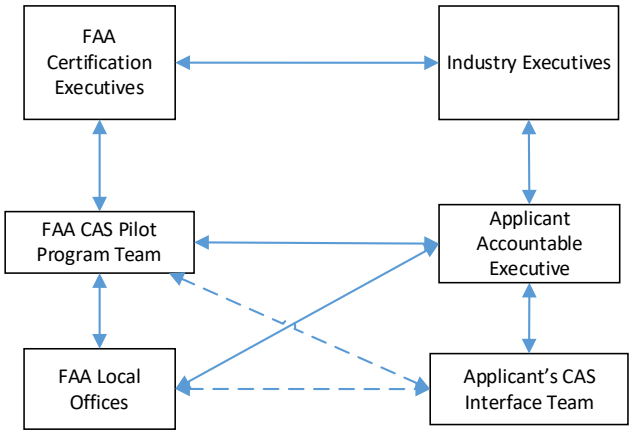


Figure 3.3.1.2a

Applicant Accountable Executive – The applicant's Accountable Executive is the individual appointed by the company to direct the resources and execute the processes of the Pilot program within the company. This person may also serve in the industry executive role described in previous paragraph, but this is not a requirement. This individual will be the primary contact with the FAA CAS Program Team and the local ACO for the CAS Pilot.

FAA Certification Executives – FAA Certification Executives provide guidance for the Pilot program strategy, Pilot program processes, and implementation. They commit resources and provide direction to the centralized FAA CAS Program Team. They sign or designate signature authority for a Memorandum of Understanding between the participating company and the FAA.

FAA CAS Pilot Program Team – The FAA CAS Pilot Program team consists of FAA individuals selected to work with applicants participating in the CAS Pilot program. The Team includes a team leader that reports to FAA Certification Executives about the progress of the Pilot. Team size is predicated upon the number and type of participants in the Pilot program. FAA CAS Pilot Program Team members should be given focus and priority for this assignment. Travel may be required of team members as the program engages both the applicant and the local ACO/MIDO offices. Even after the CAS introductory phase and roll-out of processes for each participant, the FAA CAS team should continue as a consulting team to help standardize practices. This team also serves as a clearing house for best practices, lessons learned, and programmatic questions that arise. Individuals selected for this team will need experience in aircraft certification and oversight activities.

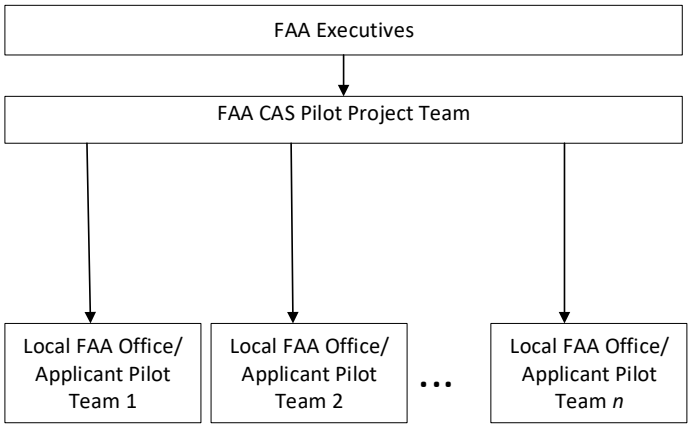


Figure 3.3.1.2b

Applicant's CAS Interface Team – The applicant's CAS Interface Team is formed by the applicant. The applicant's Accountable Executive guides this team. This team is responsible the implementation of the CAS and its companion internal evaluation system. This team works with the FAA CAS Pilot team as well as the local FAA ACO and MIDO.

Local FAA Office Team – The Local Office team is the FAA's equivalent to the applicant's CAS interface team. Working with the FAA CAS Pilot Team and the applicant, the ACO, MIDO, and AED will need to implement processes to conduct oversight of the CAS systems implemented by the applicant. This will require consultation with the FAA CAS Pilot team. The ACO, MIDO, and AED will need to determine the number of individuals required to interface with the FAA CAS Pilot Team as well as the Applicant's CAS Interface team. As a note, depending upon the state of FAA Aircraft Certification Service (AIR) refinement, the functions of the FAA CAS system oversight may reside either in AIR-700 Division or in the Systems Oversight Division AIR-800. This document will refer to ACO teams more by function and not by particular FAA office since AIR refinement has not been completed at the time this document was drafted.

The Pilot is organized to foster communication, facilitate execution, and streamline decision-making. Both FAA and industry executives provide guidance and resources. The FAA CAS Pilot Team will interface with the applicant's accountable executive and the local FAA ACO/MIDO/AED. FAA Local Offices will interface with the applicant's accountable executive. The applicant's accountable executive will be the focal for the applicant's CAS Interface Team. The applicant's CAS Interface Team may at times have contact with the FAA CAS Pilot team and FAA local offices for working level discussions.

3.3.1.3 Recommendation P.3 - Ensure Pilot Properly Represented

The FAA CAS Program Team should be cross-functional, comprised of members from different branches/divisions, and sized appropriately for the number of applicants participating in the Pilot.

Forming FAA CAS program team – This team is a cross functional team formed by FAA executives. Team members competencies should include but not be limited to experience in engineering (design and certification processes), manufacturing oversight, training development, program and change management, information and data systems, budgeting processes, and legal. Executives appoint a team lead who is accountable to provide feedback to management on program process. The team works together to organize and deploy CAS based upon principles, concepts, and recommendations provided by the CAS Working Group as well as work provided by the SOC-ARC. The team will on occasion need to adapt and adjust the outlined and recommended CAS requirements. The authority to make these changes should be given by chartering executives and should be part of the development and deployment process as best

practices evolve and lessons are learned.

3.3.1.4 Recommendation P.4 - Pilot Phased Approach

The CAS Pilot should be organized into three phases: 1) CAS Organization and Definition Phase, 2) CAS Applicant Development and Implementation Phase, and 3) FAA CAS Oversight Phase. Phase 1 should emphasize drafting Pilot guidance materials and developing training. Phase 2 should include delivery of training and furnishing a gap analysis tool to applicants.

The Pilot process described in the Figure 3.3.1.4a represents a high-level flow of the different phases and steps outlined to organize CAS deployment. Due to the open-ended nature of this process, FAA executives responsible for guiding and directing the team may conduct progress checks.

The 1.0 CAS Organization and Definition Phase (See Figure 3.3.1.4a) – This phase begins the Pilot program. FAA Executives make a commitment to move forward with Piloting CAS systems for applicants. During this phase executives form and charter a team, provide resources to this team, and oversee its progress.

Organizing Pilot project (establishing goals and objectives) (See Figure 3.3.1.4a Box 1.2) – This process starts the CAS program. The team begins establishing and setting project roadmaps, goals, objectives, expectations, schedules, communications, and milestones. The project team is not only responsible for technical deployment of CAS but also CAS change management. Introducing CAS will be a cultural shift for applicants as well as the FAA. The CAS project team should then conduct research of prior Pilot program initiatives to employ best practices and lessons learned (e.g. on-going SMS program). This step will result in program development and implementation plans (See Figure 3.3.1.4a Box 1.3).

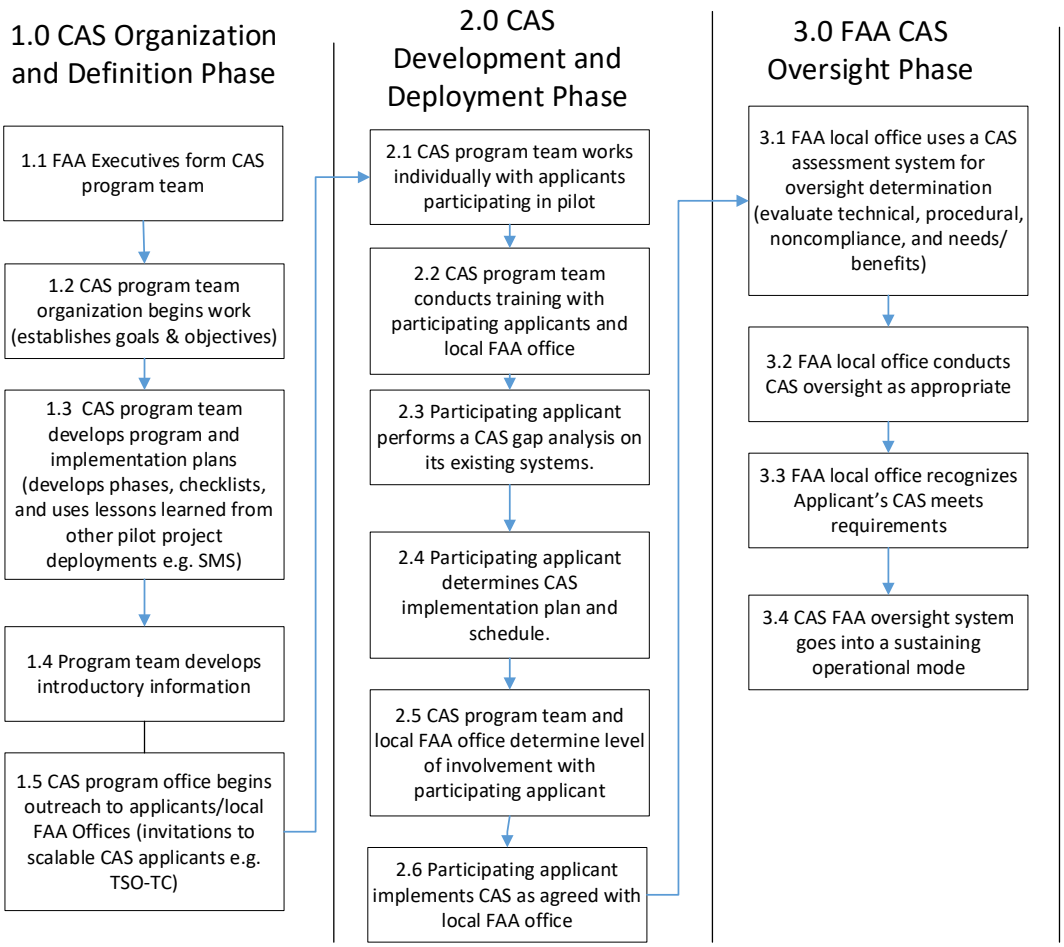


Figure 3.3.1.4a

Developing introductory information for industry (See Figure 3.3.1.4a Box 1.4) – Using the CAS requirements, in this part of the CAS Pilot process, the program team will need to develop information for applicants developing and deploying a CAS. These informational materials include introductory materials, CAS requirements and implementation guidance documents, training plans and initial training materials, checklists, and sample CAS templates.

A recommendation for CAS deployment is that the FAA host a web site to the public to complement the CAS outreach to industry. This website would contain the approved introductory information detailing CAS and associated information materials created during this process step.

During the CAS development, change management practitioners should be engaged to guide how to prepare, equip and support individuals and organizations successfully to adopt change.

As part of the CAS informational materials, one of the templates should be a gap analysis tool based upon the CAS requirements. This gap analysis is used by the applicant to determine which CAS elements already exist in its organization and is a snapshot in time. In addition to being an initial assessment tool, the template could also be used as an implementation plan tracking tool showing progress toward CAS maturity for each of the gap elements.

FAA outreach of CAS to Industry (See Figure 3.3.1.4a Box 1.5) – The final step of the CAS organization and definition phase begins an outreach program. Once prior processes have been completed and approved by FAA Certification Executives, the FAA project team begins outreach to applicants. During this phase, the FAA CAS program team will develop a basic MOU template to be used in documenting agreement between the FAA and an applicant. Specific details or unique requirements of the agreement can be tailored for each individual applicant. Unique agreements contribute to the scalability of the applicant's CAS development and deployment.

CAS Development and Deployment Phase (See Figure 3.3.1.4a) – In this phase of the Pilot, the FAA CAS Pilot team manages applicants that sign an agreement with the FAA to develop a CAS. This phase differs from the previous phase because the FAA CAS team begins working individually with applicants and the local FAA offices. Because each applicant and local FAA office may have different CAS implementation plans and schedules, etc., the FAA CAS Program team manages and tracks each applicant's CAS individually. The FAA CAS Program team reports progress to FAA executives and monitors CAS maturity across the deployed systems.

During this phase, the FAA CAS Pilot Project Team also coordinates across FAA local offices as a clearinghouse of best practices or lessons learned during deployments. Local FAA Offices may want to open secondary communications with other local offices to share detailed information too specific, not relevant, or pertinent to a larger group.

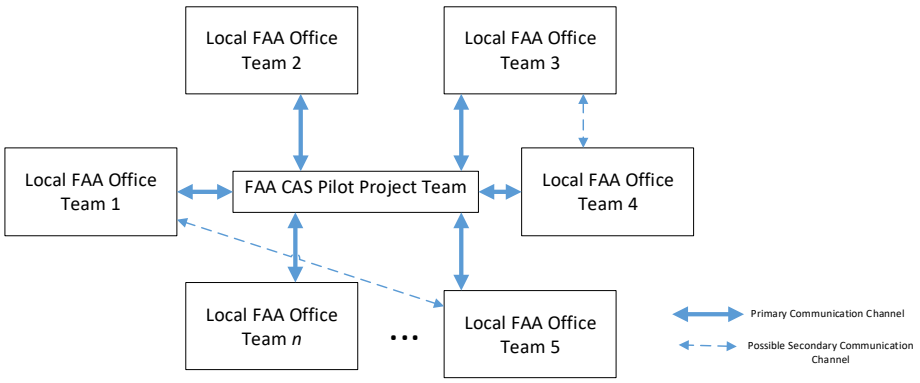


Figure 3.3.1.4b

FAA CAS Program Team works with applicants developing CAS (See Figure 3.3.1.4a Box 2.1) – After the FAA CAS Program team conducts successful outreach to an applicant and FAA local office together, coordinating an MOU between the applicant and the FAA local office is the next step. Legal reviews may also be involved in this process step. This MOU defines:

- CAS objectives and mutual understanding of the program,
- Applicant's CAS scope,
- roles and responsibilities,
- communication and coordination protocols,
- issue resolution,
- documentation requirements,
- performance measures requirements,
- continued compliance to regulations,
- progress checks and milestone reviews,
- best practices and lessons learned reviews
- Duration of the agreement or identify how the agreement may be terminated by either party.
- Periodic MOU review and update (as applicable) as part of a maintenance effort to capture changes of the agreement between parties. These reviews and updates also ensure continuation and support of the program when significant changes occur within either party.

The MOU is not intended to detail all the specific requirements of a CAS but instead provides overarching principles to follow. Each team member should read and understand the MOU. In addition to managing individual MOU agreements, the FAA CAS program team begins training preparations for both the applicant and the FAA local office.

Prior to an applicant's CAS deployment and implementation, both the applicant and local FAA office will need to understand the CAS elements and its requirements (See Figure 3.3.1.4c). The applicant's understanding originates from CAS guidance materials provided by the FAA CAS Program Team and associated training. In addition to understanding CAS requirements, the applicant will need to develop a plan to apply or construct the CAS requirements within its organization.

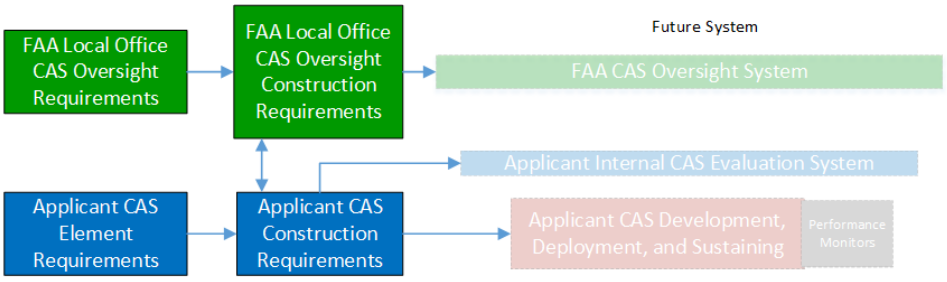


Figure 3.3.1.4c

CAS Program Team conducts training (See Figure 3.3.1.4a Box 2.2) – In this process step, the CAS program team conducts training for both the applicant and the local FAA office. Training should be organized to accommodate both the applicant and local office attending at the same time. Local FAA office-specific oversight training should be coordinated between the FAA CAS program team and the local office.

Applicant performs gap analysis and CAS implementation progress tracking (See Figure 3.3.1.4a Box 2.3) – In this step, a gap analysis is conducted. This analysis aids the applicant to determine and gauge the effort a CAS implementation requires and what elements need to be added. The FAA CAS Program Team should provide the applicant with a gap analysis template. This template also standardizes the analysis for comparisons to other applicants.

As the local FAA office resource availability allows, it is recommended that the applicant conduct its CAS Gap analysis with the participation of the FAA local office. Ultimately, it is the applicant's responsibility to provide a completed gap analysis to the FAA local office.

A tracking tool should be created to identify maturity levels of the applicant's progress toward meeting each CAS Requirement. The maturity levels are graduated and assessed into 5 levels:

- Not Performed (NP) - No action has been taken on this requirement.
- Planned (PLN) – A plan exists with actions to be taken or manuals affected, a scheduled completion date and a responsible individual or group identified to meet this requirement.

- Documented (DOC) – The policy and procedural guidance of this requirement are incorporated into company documents such as manuals, training material, and work instructions.
- Accomplished (ACC) – Resources are in place to accomplish all objectives of the element. Employees are expected to be trained and knowledgeable on the policies and procedures which were documented in the previous assessment level (DOC).
- Demonstrated (DEM) – This requirement of the applicant's CAS has been subjected to at least one round of evaluation/audit by the applicant (and validated by the applicant's internal evaluation system and the local FAA office's oversight of the CAS element).

Values can be assigned to each of these levels and an aggregate value or percentage can be determined to show progress over time. Samples have been provided of a tracking worksheet and time chart progress. The FAA CAS program team may tailor a tool as the CAS program deployment matures.

Progress Tracking Worksheet

		CAS Implementation Phase Assessment Level	Numeric Conversion	Element %	Overall %
CAS Requirements	CAS Requirement Description				39%
Element 1				36%	
Sub Element 1		ACC	75%	0.75	
Sub Element 2		NP	0%	-	
Sub Element 3		ACC	75%	0.75	
Sub Element 4		DEM	100%	1.00	
Sub Element 5		NP	0%	-	
Sub Element 6		NP	0%	-	
Sub Element *n*		NP	0%	-	
Element 2				25%	
Sub Element 1		PLN	25%	0.25	
Sub Element 2		PLN	25%	0.25	
Sub Element 3		PLN	25%	0.25	
Sub Element 4		PLN	25%	0.25	
Element 3				75%	
Sub Element 1		ACC	75%	0.75	
Sub Element 2		ACC	75%	0.75	
Element *n*				50%	
Sub Element n_1		DOC	50%	0.5	

Figure 3.3.1.4d

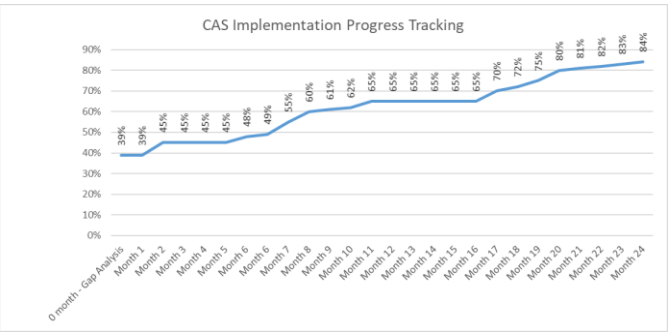


Figure 3.3.1.4e

Applicant provides implementation plan and schedule (See Figure 3.3.1.4a Box 2.4) – Once the applicant has determined where the gaps exist, a plan will need to be developed for how to implement required CAS elements. This plan should detail elements to develop and provide an implementation schedule to maturity.

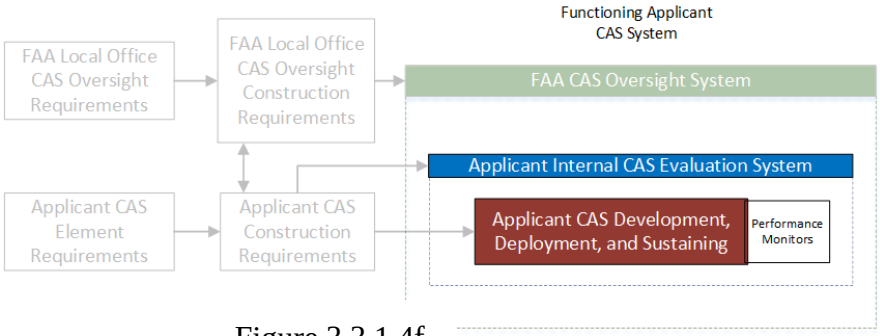


Figure 3.3.1.4f

FAA Level of involvement determined (See Figure 3.3.1.4a Box 2.5) – As the applicant begins CAS implementation, success also relies on determining the FAA's level of involvement. The level of involvement is based upon several factors: applicant experience, design complexity, project type, and design approval basis. The applicant works with the FAA CAS project team and the FAA local office to determine how the CAS implementation affects the applicant's compliance showings, applicant's compliance determinations, and the FAA-retained or delegated compliance findings (where applicable) of the defined design effort governed by the CAS processes. An appendix to the MOU may detail CAS operational boundary.

Applicant implements CAS with the agreed parameters (See Figure 3.3.1.4a Box 2.6) - At the end of this process step, the applicant's CAS has been implemented within the agreed scope and is fully functional (See Figure 3.3.1.4f).

FAA CAS Oversight Phase (See Figure 3.3.1.4a Boxes 3.1-3.4) – During this phase of the process, the applicant's CAS is operational with requirements in place as well as its internal evaluations monitoring the systems. FAA Local Offices conduct oversight based upon the risk model and processes developed for CAS oversight as part of the overarching Evolving System Oversight (ESO) Model (See Figure 3.3.1.4g).

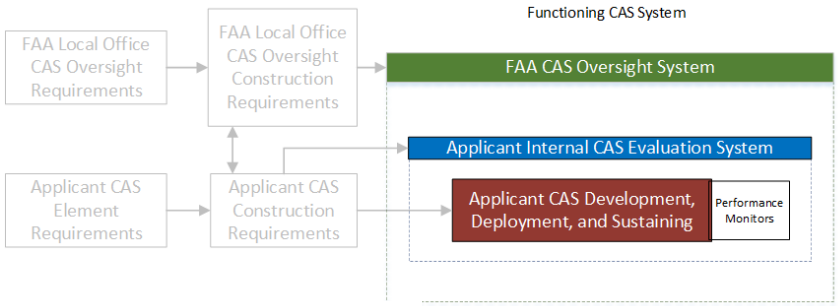


Figure 3.3.1.4g

The Pilot program ends when regulations, policy documents, or industry standards have been published or accepted, if the CAS program is deemed not feasible or the MOU is terminated by either party. Both FAA and Industry executives will make these decisions. In addition to CAS program feasibility, the outputs of CAS Pilot processes (e.g. design approvals) should be monitored for an agreed period of time with an awareness of what activities have been included in the Pilot activity. This monitoring is necessary if "containment" actions, or an evaluation of activities performed under the Pilot program are required.

4. SWIM LANE DIAGRAM

4.1 Purpose

The swim lane diagram (see Appendix A) was created as a visual aid to illustrate how a CAS-executed certification project might compare with an FAA or ODA-executed certification project. The diagram also depicts scenarios where some level of execution may be performed by the FAA and/or ODA. The remainder of Section 4 provides a general overview of the diagram.

4.2 Audience

This diagram is intended as a reference for all regulatory and industry persons involved in CAS framework development activities.

4.3 Scope

This diagram is one vision for how TC, STC, TSO, and PMA certification activities might be executed wholly or partially under a CAS.

4.4 References

- FAA Order 8100.15B, Organization Designation Authorization Procedures
- FAA Order 8110.4C, Type Certification
- FAA Order 8110.42D, Parts Manufacturer Approval Procedures
- FAA Order 8150.1D, Technical Standard Order Program
- Policy Statement AIR-21.93-TBD (draft), Classification of Changes to Type Design and Minor Change Agreements
- Policy Statement AIR-21.1601, Use of PMA for Minor Modification Articles on Products
- 14 CFR §21.93, Classification of changes in type design
- 14 CFR §21.95, Approval of minor changes in type design
- 14 CFR §21.97, Approval of major changes in type design
- 14 CFR §21.101, Designation of applicable regulations
- 14 CFR §21.319, Design changes (PMA)
- 14 CFR §21.619, Design changes (TSOA)

4.5 Entities

The diagram is comprised of three rows, also known as lanes, which represent the applicant, the ODA, and the FAA. Activities shown within the diagram vary between the lanes thus illustrating the changes in the responsible entities at each stage of a project.

4.6 Phases

At a high level, each column in the diagram represents the key phases in a typical certification process (largely based on FAA Order 8110.4). The first phase, *Determining Application Type and Potential Certification Path*, is internal to applicants and occurs prior to any FAA engagement. The last phase is the certificate approval issuance. All of the phases have been listed below for reference.

	Phase
1	Pre-Application Phase 1: Determining Application Type and Potential Certification Path
2	Pre-Application Phase 2: Identification of Anticipated FAA-LOI
3	Conceptual Design Phase 1: Familiarization Briefings
4	Conceptual Design Phase 2: Certification Plan
5	Compliance Planning: FAA Involvement
6	Compliance Showing
7	Compliance Finding
8	Certificate Approval Issuance

4.7 Certification Process Types

The diagram's color-coded flow paths maintain order and a clear separation of the certification process types (e.g. FAA in red, ODA in green, CAS in gold, common in black). Color-coding was also added to aid users in navigating the diagram. While this adds a layer of complexity to the visualization, it was necessary in order to ensure a clear distinction between the present (FAA, ODA) and future (CAS) certification process types as they are presented together in a layered fashion.

4.8 Order

The diagram follows a sequential order from left to right; however, the inclusion of several decision trees allows for the possibility of loops and/or different outcomes. This logic was added to illustrate how a project could be executed wholly under a CAS if all applicable requirements are within the applicant's CAS authorization, or partially, in conjunction with the FAA and/or ODA. See Section 4.10, Certification Scenarios.

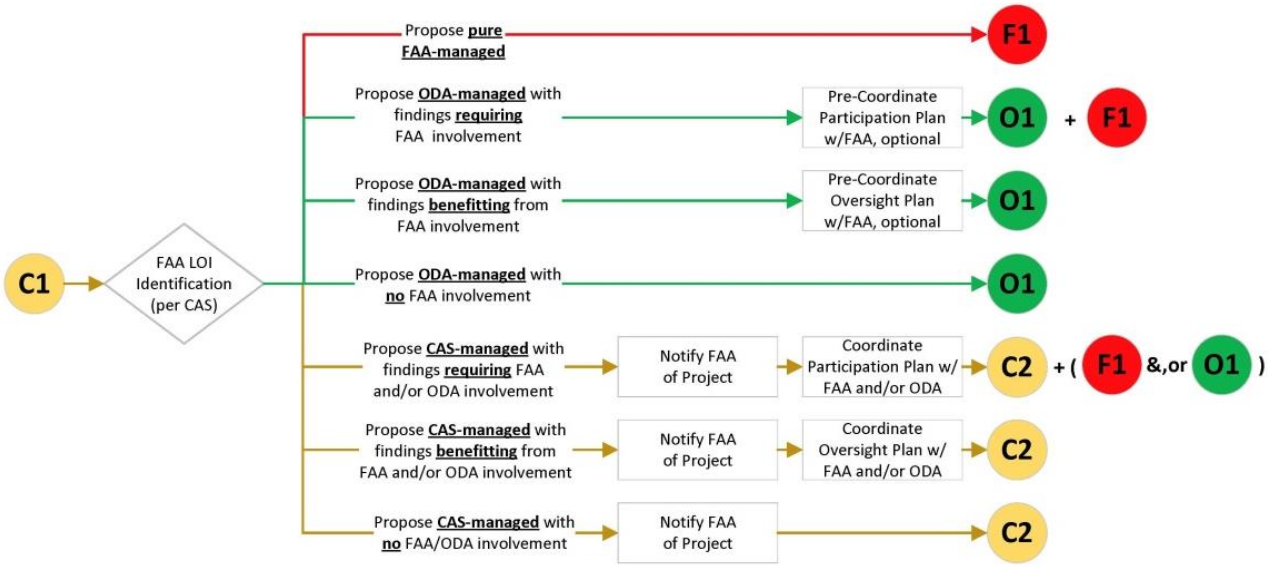
4.9 Symbols

The following symbols are used throughout the diagram:

Symbol	Meaning
	Start/End
	Activity
	Decision
	Document
	CAS Connector
	ODA Connector
	FAA Connector
	Familiarization Briefing Connector

4.10 Certification Scenarios

The CAS working group identified what it considered to be seven (7) possible certification scenarios. The scenarios were added to the diagram, particularly within any phase where an LOI assessment or a certification plan review activity occurs. They are portrayed as outputs to various decision blocks and ensure adjustments can be made to the certification path based on the outcome of these activities. The purpose of the scenarios is to illustrate how such activities are currently executed (FAA, ODA) and how they are envisioned to occur in the future (CAS). See figure below.



4.11 Brief Discussion on Supplementary Flowchart A

An auxiliary flowchart was included under Pre-Application Phase 1 to give users an idea of the anticipated decision-making process that will occur within a CAS organization at the commencement of a new certification project or design change. For organizations that are ODA holders, this process may already exist as a result of any limitations that were specified by the FAA within their FAA-approved ODA procedures manual.

Exemplifying this organizational logic is helpful for a few reasons:

(1) to illustrate how an ODA and CAS could co-exist within an organization provided that processes are in place for identifying which certification path to follow; and,

(2) to illustrate how such processes could include early engagement points with the FAA when the certification path is not clearly within ODA or CAS scope and authority.

4.12 Assumptions

The following assumptions were made to simplify the logic within the diagram:

4.12.1 FAA Level of Project Involvement

Applicant will have a formal process for identifying the anticipated FAA LOI in each project. The process will include:

- Criteria for determining where the FAA has no project-level involvement (such as regulations for which the organization may determine compliance without FAA involvement);
- Criteria for identifying where the FAA always retains project-level involvement (this could be based on certain regulations or it could be based on certain type of projects); and
- "Rules of engagement" where the anticipated FAA level of project involvement is not necessarily obvious.

4.12.2 No-PNL Agreement

For ODA holders, if an agreement for No-PNL projects is in effect, the applicant will have constructed their CAS be able to execute similar projects wholly within their CAS.

4.12.3 Minor Change Agreement

If minor change agreement is in place, the applicant will have constructed their CAS to be able to execute similar changes under that agreement wholly within their CAS.

5. CONCLUSION

In total, 20 recommendations, seven industry and thirteen FAA, are proposed by this working group and make up the major sections of this report. Each of these recommendations are broken up into additional information with considerations, more detail, and intent behind the recommendation. Some of the recommendations are straightforward requiring little additional information and others have large discussion sections around them. The recommendations were broken up into recommendations on implementation, recommendations on performance and oversight, and recommendations for a pilot program.

The following is a summary list of the recommendations to aid the reader in simplification of the recommendations. Full language of the recommendation as well as intent is in the report above.

For Implementation CAS must

- Define and document the elements
- Include processes for meeting applicable FAA certification requirements
- Clearly identify its boundaries on a program
- Run consistently program to program, independent of non-CAS aspect coordination

For Implementation the FAA should

- Conduct a trial of draft CAS regulations
- Evaluate proposed regulatory guidance against current FAA initiatives to ensure harmonization
- Ensure CAS continues to work with other related programs such as SMS, ODA, ESO
- Collaborate with industry to identify supporting policy and guidance needs
- Encourage a consensus standard that Industry should spearhead
- Create a repository of CAS Working Group Data for future initiatives
- Ensure a streamlined approach for companies with proven track records.

For Performance and Oversight CAS must

- Assess and monitor the required elements
- Ensure evidence of audits as well as program correctness and completion are maintained
- Document a proposed means to challenge regulatory oversight findings

For Performance and Oversight the FAA should

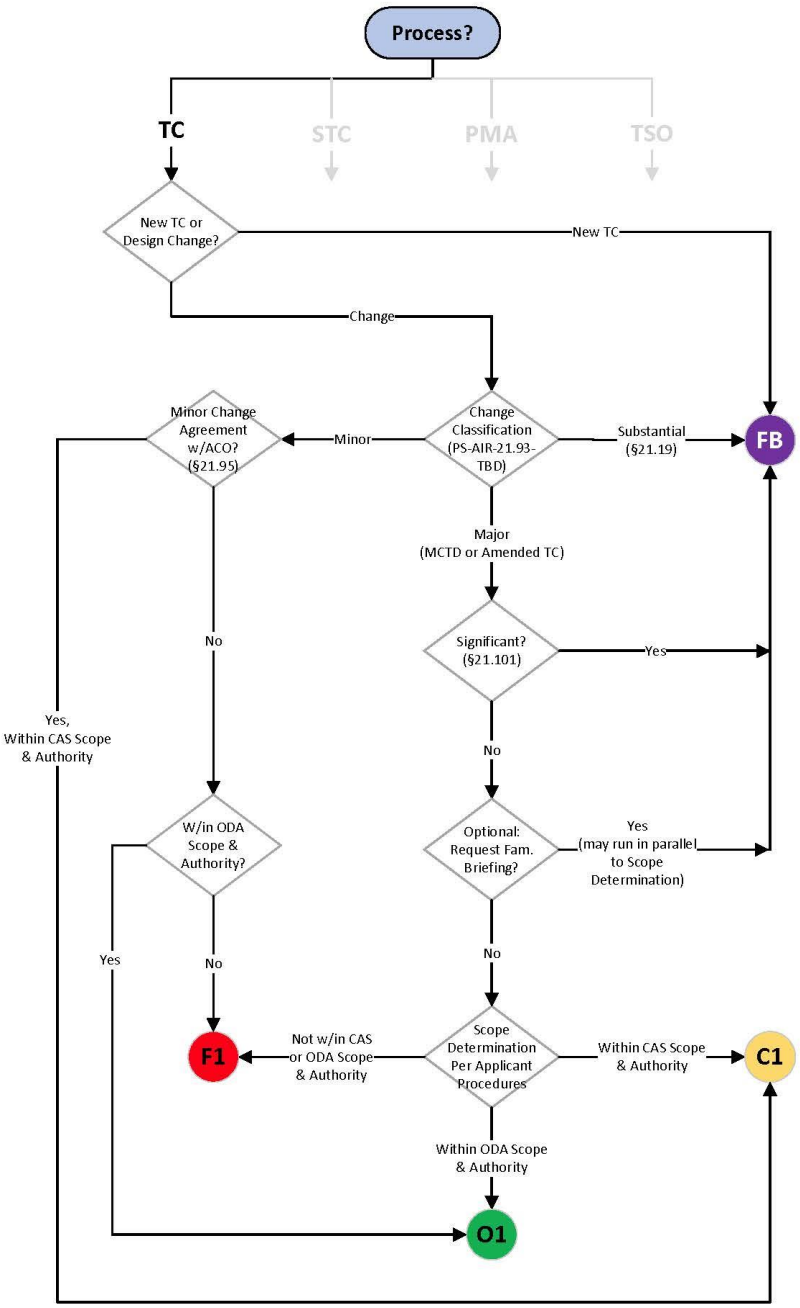
- Verify the company is properly auditing itself
- Provide a means for consistency within its audits across the entire FAA

For the pilot program the FAA should

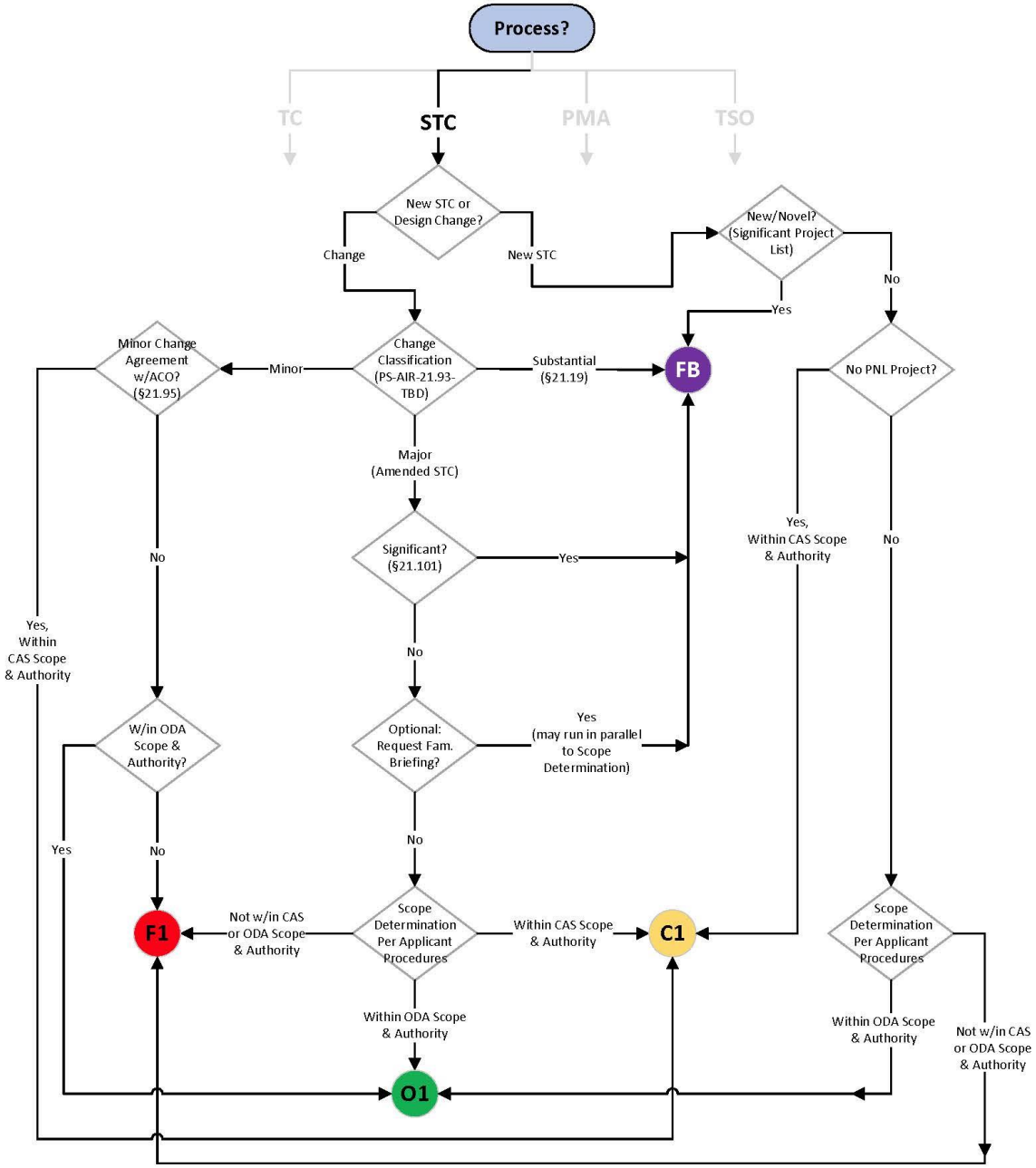
- Develop an open ended and varied program
- Ensure a central team coordinates the entirety of the program
- Ensure the central team is cross-functional
- Organize the pilot program into three phases with goals of
    - Drafting guidance and developing training
    - Vetting Company Implementation and Oversight
    - Vetting FAA oversight training and guidance

APPENDIX A. SWIMLANE DIAGRAM

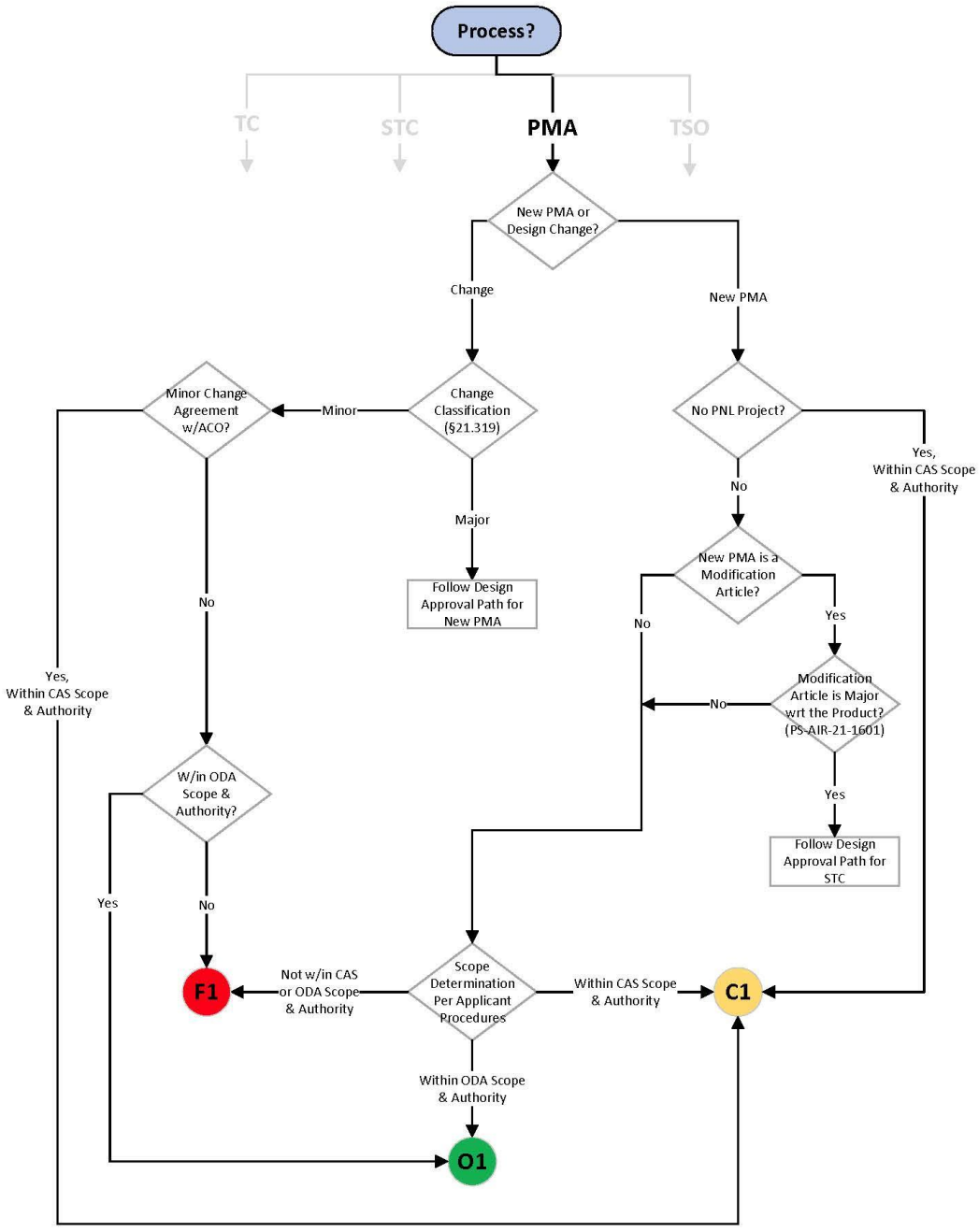
SUPPLEMENTARY FLOWCHART A.1 (TC)
(Determining Application Type and Primary Cert Path)



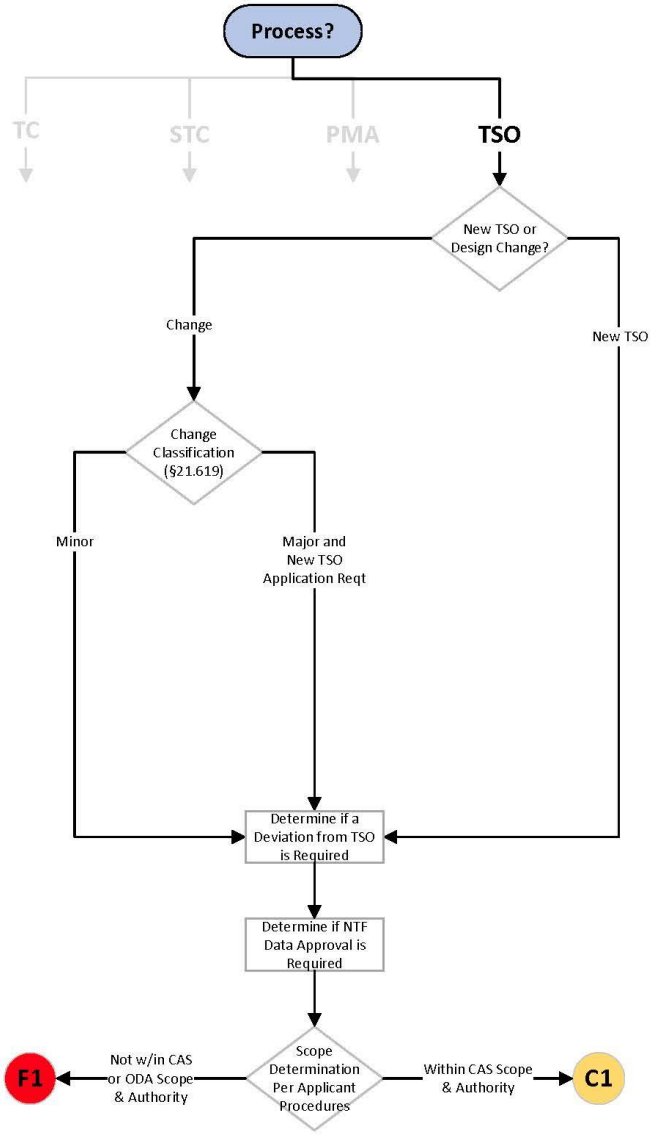
SUPPLEMENTARY FLOWCHART A.2 (STC)
(Determining Application Type and Primary Cert Path)

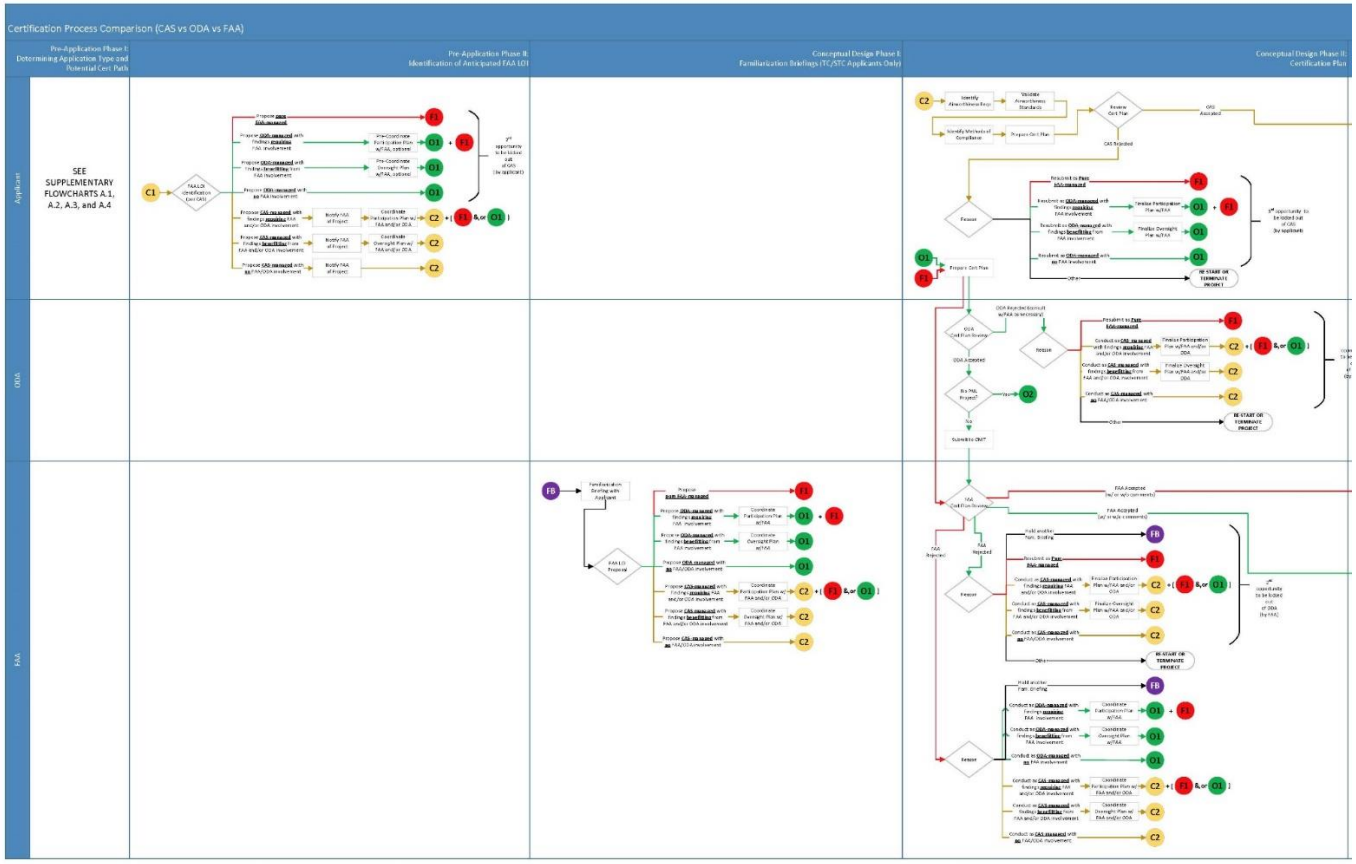


SUPPLEMENTARY FLOWCHART A.3 (PMA)
(Determining Application Type and Primary Cert Path)



SUPPLEMENTARY FLOWCHART A.4 (TSO)
(Determining Application Type and Primary Cert Path)

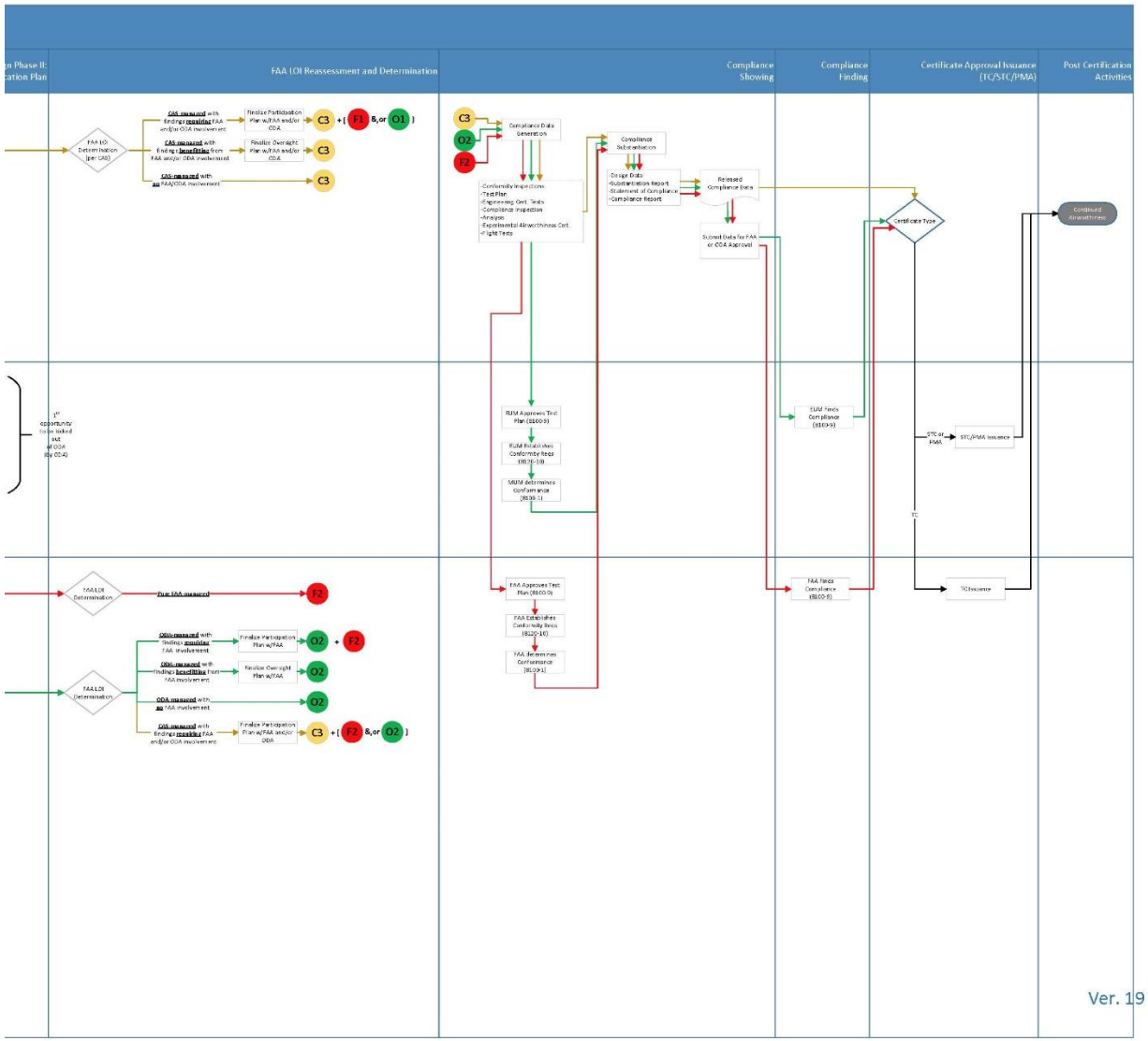




Visio-CAS Swimlane-v19.pdf

Visio-CAS Swimlane-v19 (SuppA

Note: The diagram above and on the next page are a part of the swim lanes. However, for readability the two diagrams have been embedded into this report as the first pdf file. Also embedded as the second pdf file are the supplementary flowcharts A.1 –A.4.


FAA LOI Reassessment and Determination
Compliance Showing
Compliance Finding
Certificate Approval Issuance (TC/STC/PMA)
Post Certification Activities
Ver. 19

APPENDIX B: CAS ELEMENTS AND SUB-ELEMENTS

B.1 CAS Definitions

Compliance assurance means processes within the CAS that function systematically to ensure the performance and effectiveness of risk controls and that the organization meets or exceeds its compliance assurance objectives through the collection, analysis, and assessment of information.

Compliance assurance objective means a measurable goal or desirable outcome related to compliance.

Compliance assurance policy means the CAS holder's documented commitment to compliance, which defines its compliance assurance objectives and the accountabilities and responsibilities of its staff in regard to compliance.

Compliance Assurance System (CAS) means the formal, top-down, organization-wide approach to assuring compliance is shown to applicable regulations, managing non-compliance risk, and assuring the effectiveness of risk controls. It includes systematic procedures, practices, and policies for the management of non-compliance risk.

Compliance performance means realized or actual compliance accomplishment relative to the organization's compliance assurance objectives.

Compliance Risk Management means a process within the CAS composed of describing the system, identifying the potential or actual compliance issues, and analyzing, assessing and controlling non-compliance risk.

Risk means the composite of predicted severity and likelihood of the potential effects of a potential or actual compliance issue.

Risk control means a means to reduce or eliminate the effects of potential or actual compliance issues.

B.2 Compliance Assurance Policy

(a) The CAS holder must have a compliance assurance policy that includes at least the following:

(1) The compliance assurance objectives of the CAS holder and a framework for setting CAS objectives that must include:

(i) What will be done.

(ii) What resources will be required.

(iv) When it will be measured.

(v) How the results will be evaluated.

(2) A commitment of the CAS holder to fulfill the organization's compliance assurance objectives.

(3) A clear statement about the provision of the necessary resources for the implementation of the CAS.

(4) A compliance assurance reporting policy that defines requirements for staff reporting of potential or actual compliance issues.

(5) A policy that defines unacceptable behavior and conditions for disciplinary action.

(6) Ensures that no conflicting non-CAS duties or other interference affects the performance of CAS activities by individuals supporting CAS.

(7) A description of the CAS Holder and CAS organizational structure and responsibilities.

(i) Sufficient management personnel as described in § XXX

(ii) A staff consisting of the engineering, flight test, inspection, or maintenance personnel as needed to establish the showing of compliance. Staff members must have the experience and expertise to show compliance, demonstrate conformity, or show airworthiness.

(8) Ensures the CAS must have the ability to trace requirements forwards and backwards throughout the product, article, and CAS lifecycles.

(b) The compliance assurance policy must be signed by the accountable executive described in § XXX.

(c) The compliance assurance policy must be documented and communicated throughout the CAS holder's organization.

(d) The compliance assurance policy must be regularly reviewed by the accountable executive to ensure it remains relevant and appropriate to the CAS holder.

B.3 Compliance Assurance Accountability and Authority

(a) The CAS holder must define accountability for compliance assurance within the organization's compliance assurance policy for the following individuals:

(1) Accountable executive, as described in § XXX.

(2) All members of management in regard to developing, implementing, and maintaining CAS processes within their area of responsibility, including, but not limited to:

(i) Potential or actual compliance issue identification and compliance risk assessment.

(ii) Assuring the effectiveness of compliance risk controls.

(iii) Promoting compliance assurance as required in XXX of this part.

(iv) Advising the accountable executive on the performance of the CAS and on any need for improvement.

(3) All staff relative to the CAS holder's compliance assurance performance.

(b) The CAS holder must identify the levels of management with the authority to make decisions regarding compliance risk acceptance.

(c) Consistent with a CAS Holder's qualifications, the Administrator may accept CAS Holder's showing compliance activity as determined appropriate.

(d) Under the general supervision of the Administrator, a CAS holder may perform the compliance showing activities, subject to the limitations where FAA involvement may be required listed in the CAS procedures manual.

B.4 Compliance Assurance Management Personnel

(a) *Designation of the accountable executive.* The CAS holder must identify an accountable executive who, irrespective of other functions, satisfies the following:

(1) Is the final authority over operations authorized to be conducted under the CAS holder's certificate(s).

(2) Controls the financial resources required for the operations to be conducted under the CAS holder's certificate(s).

(3) Controls the human resources required for the operations authorized to be conducted under the CAS holder's certificate(s).

(4) Retains ultimate responsibility for the compliance performance of the operations conducted under the CAS holder's certificate.

(b) *Responsibilities of the accountable executive.* The accountable executive must accomplish the following:

(1) Ensure that the CAS is properly implemented, integrated into the organization's business processes and performing in all areas of the CAS holder's organization in support of its compliance assurance objectives.

(2) Develop and sign the compliance assurance policy of the CAS holder.

(3) Communicate the compliance assurance policy throughout the CAS holder's organization.

(4) Regularly review the CAS holder's compliance assurance policy to ensure it remains relevant and appropriate to the CAS holder.

(5) Regularly review the compliance assurance performance and intended results of the CAS holder's organization and direct actions necessary to address substandard compliance assurance performance in accordance.

(c) *Designation of management personnel.* The accountable executive must designate sufficient management personnel who, on behalf of the accountable executive, must be responsible for the following:

(1) Coordinate implementation, maintenance, and integration of the CAS throughout the CAS holder's organization.

(2) Facilitate potential or actual compliance issue identification and compliance risk analysis.

(3) Monitor the effectiveness of compliance risk controls.

(4) Ensure compliance assurance promotion throughout your organization as required in XXX of this part.

(5) Regularly report to the accountable executive on the performance of the CAS and on any need for improvement.

(6) Ensure CAS performance maintains FAA's confidence in the organization's CAS.

B.5 Compliance Risk Management Applicability

A CAS holder must apply compliance risk management to the following:[6]

(a) Implementation of new systems.

(b) Revision of existing systems.

(c) Development of design approval procedures.

(d) Identification of potential or actual compliance issues or ineffective risk controls through the compliance assurance processes in XXX of this part.

B.6 System Analysis and Compliance Issue Identification

(a) When applying compliance risk management, the CAS holder must analyze the systems identified in § XXX. Those compliance assurance analyses must be used to identify potential or actual compliance issues under paragraph (c) of this section and developing and implementing risk controls related to the system under § XXX.

(b) In conducting the system analysis, the following information must be considered:

(1) Function and purpose of the system.

(2) The system's operating environment.

(3) An outline of the system's processes and procedures.

(4) The personnel, equipment, and facilities necessary for operation of the system.

(c) The CAS holder must develop and maintain processes to identify potential or actual compliance issues within the context of the system analysis.

[6] See Section 3.2 and Appendix C.2 for more information on how risk management is used in the GAP analysis as well as the FAA Oversight model to validate systems

B.7 Compliance Risk Assessment and Control

(a) The CAS holder must develop and maintain processes to analyze compliance risk associated with the potential or actual compliance issues identified in § XXX.

(b) The CAS holder must define a process for conducting risk assessment that allows for the determination of acceptable compliance risk.

(c) The CAS holder must develop and maintain processes to develop compliance risk controls that are necessary as a result of the compliance risk assessment process under paragraph (b) of this section.

(d) The CAS holder must evaluate whether the risk will be acceptable with the proposed compliance risk control applied, before the compliance risk control is implemented.

B.8 Compliance Performance Monitoring and Measurement

(a) The CAS holder must develop and maintain processes and systems to acquire data to monitor the compliance performance of the organization. These processes and systems must include, at a minimum, the following:

(1) Monitoring of design approval processes.

(2) Monitoring internal and external changes that may affect the CAS.

(3) Auditing of CAS and design approval processes and systems to provide information on whether they:

(i) conform to the requirements of this subpart.
(ii) are properly implemented and maintained.

(4) Evaluations of the CAS and design approval processes and systems to ensure effectiveness and identify areas for improvement.

(5) Investigations of service difficulties, incidents, accidents, and non-compliances.

(6) Investigations of reports regarding potential non-compliance with regulatory standards or other compliance risk controls established by the CAS holder through the compliance risk management process established in XXX of this part.

(7) A confidential reporting system in which staff can report potential or actual compliance issues, concerns, occurrences, incidents, as well as propose solutions and compliance assurance improvements.

(b) The CAS holder must develop and maintain processes that analyze the data acquired through the processes and systems identified under paragraph (a) of this section and any other relevant data with respect to its operations, products, and services.

B.9 Compliance Performance Assessment

(a) The CAS holder must conduct assessments of its compliance performance against its compliance assurance objectives, which include reviews by the accountable executive, to:

(1) Ensure compliance with the compliance risk controls established by the CAS holder.

(2) Evaluate the performance of the CAS.

(3) Evaluate the effectiveness of the compliance risk controls established under § XXX and identify any ineffective controls.

(4) Identify internal and external changes that are relevant to the CAS that introduce new potential or actual compliance issues.

(5) Identify new potential or actual compliance issues.

(b) Upon completion of the assessment, if ineffective controls or new potential or actual compliance issues are identified under paragraph (a)(2) through (a)(5) of this section, the CAS holder must use the compliance risk management process described in XXX of this part.
(c) Upon completion of the assessment, opportunities for improvement have been identified; the CAS holder must use the continuous improvement have been identified; the CAS holder must use the continuous improvement process described in XXX of this part.

B.10 Accountable Executive Review

(a) The CAS holder must include procedures for review of the compliance assurance system by the Accountable Executive, at planned intervals, to ensure its continuing suitability, adequacy, and effectiveness.

(b) The management review shall take into consideration:

(1) the status of actions from previous management reviews.

(2) changes in external and internal issues that are relevant to the compliance assurance system.

(3) information on the performance and effectiveness of the compliance assurance system, including trends in:

(i) the extent to which compliance assurance objectives have been met.

(ii) process performance and compliance of products and services.

(iii) non-compliances and corrective actions.

(iv) properly identifying airworthiness regulations and methods of compliance.

(v) monitoring and measurement results.

(vi) audit results.

(4) the adequacy of resources.

(5) the effectiveness of actions taken to address risks and opportunities.

(6) opportunities for improvement.

(c) The outputs of the management review shall include decisions and actions related to:

(1) opportunities for improvement.

(2) any need for changes to the compliances assurance system.

(3) resource needs.

(4) risks identified.

B.11 Continuous Improvement

(a) The CAS holder must develop procedures for determining and selecting opportunities for improvement and implementing any necessary actions including, but not limited to:

(1) correcting, preventing, or reducing regulatory or procedural non-compliances.

(2) correcting deficiencies discovered during assessments conducted under § XXX, and the outputs from management review.

(3) improving the performance and effectiveness of the compliance assurance system.

(b) The CAS holder must establish and implement processes to correct the compliance deficiencies identified in (a)(1) and (a)(2), and improvements in (a)(3).

(1) The inputs and output of these processes must be identified.

(2) The sequence and interaction of these processes must be determined

(3) The implementation status must be monitored

(4) The effectiveness of the results must be evaluated.

B.12 Non-compliances and Corrective Action

When a non-compliance occurs the CAS holder shall:

(a) react to the non-compliance and, as applicable:
  (1) take action to control and correct it
  (2) deal with the consequences

(b) evaluate the need for action to eliminate the cause(s) of the non-compliance, in order that it does not recur or occur elsewhere, by:
  (1) reviewing and analyzing the non-compliance
  (2) determining the causes of the non-compliance, including, as applicable, those related to human factors
  (3) determining if similar non-compliances exist, or could potentially occur

(c) implement any action needed

(d) review the effectiveness of any corrective action taken

(e) update risks and opportunities determined during planning, if necessary

(f) make changes to the compliance assurance system, if necessary

(g) flow down corrective action requirements to an external provider when it is determined that the external provider is responsible for the non-compliance

(h) take specific actions when timely and effective corrective actions are not achieved.

(i) Corrective actions shall be appropriate to the effects of the non-compliances encountered.

(j) The CAS holder shall maintain documentation and records that defines the non-compliance and corrective action management processes.

B.13 CAS Oversight

(a) The Administrator, at any time and for any reason, may inspect a CAS Holder's or applicant's facilities, products, components, parts, appliances, procedures, operations, and records associated with the CAS activities or functions.

(b) The CAS Holder will:

(1) Cooperate with the Administrator in his performance of oversight of the CAS.

(2) When required by the Administrator:

(i) Investigate any problem concerning the showing of compliance

(ii) Suspend issuance of similar compliance until the CAS Holder implements all corrective action required by the Administrator.

(iii) Compile and submit information required by the Administrator to exercise his supervision of the CAS Holder

(3) Notify the Administrator of:

(i) Any change that could affect the CAS Holder's ability to continue to meet the requirements of this part within 48 hours of the change occurring

(ii) A condition in a product, part or appliance that could result in a finding of unsafe condition by the Administrator; or

(iii) A product, part or appliance not meeting the applicable airworthiness requirements for which the CAS Holder has obtained a certificate or approval.

(iv) Any error that the CAS Holder finds it made in obtaining an authorization or certificate.

(v) The information necessary to implement corrective action needed for safe operation of the product, part, or appliance.

B.14 Competencies and Training

(a) The CAS holder must document the knowledge, experience and training requirements and provide training for each individual identified in § XXX to ensure the individuals attain and maintain the competencies necessary to perform their duties relevant to the operation and performance of the CAS.

(b) The procedures for selecting and documenting individuals supporting the CAS organization, as required under Sec XXX must be documented.

B.15 Compliance Assurance Communication

The CAS holder must develop and maintain means for communicating compliance assurance information that, at a minimum:

(a) Ensures that staff are aware of the CAS policies, processes, and tools that are relevant to their responsibilities.

(b) Conveys compliance assurance information relevant to the staff's responsibilities.

(c) Explains to staff why compliance assurance actions have been taken.

(d) Explains to staff why compliance assurance procedures are introduced or changed.

(e) Notifies the appropriate FAA offices regarding changes to the CAS processes.

B.16 CAS Documentation

The CAS holder must develop and maintain CAS documentation that describes the CAS holder's:

(a) Compliance assurance policy.

(b) CAS processes and procedures.

(c) Description of those changes to the CAS manual or procedures that may be made by the CAS Holder. All other changes to the manual or procedures must be approved by the Administrator before they are implemented.

B.17 CAS Records

(a) The CAS holder must maintain records of outputs of compliance risk management processes as described in XXX of this part. Such records must be retained for as long as the control remains relevant to the operation.

(b) The CAS holder must maintain records of outputs of compliance performance monitoring, measurement and assessment processes as described in XXX of this part. Such records must be retained for a minimum of 5 years.

(c) The CAS holder must maintain a record of all CAS responsibilities, qualifications and training provided under § XXX for each individual performing CAS activities. Such records must be retained for the duration of the CAS.

(d) The CAS holder must retain records of all communications provided under § XXX for a minimum of 24 consecutive calendar-months.

(e) CAS Holder must ensure the following are maintained for the duration of the CAS:

(1) Application and required certification or approval data, including:

(i) The data and records documenting the CAS showing of compliance.

(ii) A list of products, components, parts, or appliances for which CAS was employed.

(2) Copy of each CAS manual approved.

(3) Any other records specified in the CAS Holder's procedures manual.

(f) For all records required by this section to be maintained, each CAS Holder must:

(1) Ensure that the records and data are available to the Administrator for inspection at any time.

(2) Submit all records and data to the Administrator upon surrender or termination of the authorization.

B.18 Design Assurance

(a) *Requirements Definition*. The compliance assurance system shall include procedures for defining, reviewing, and controlling requirements for designs and design changes of products and/or articles. This procedure must include processes for:

(1) Determining Requirements.

(2) Validating Requirements.

(3) Changes to Requirements.

(b) *Design and Development*. The compliance assurance system shall include procedures for design and development. This procedure must include processes for:

(1) Design and Development Planning.

(2) Design and Development Inputs.

(3) Design and Development Controls.

(4) Design and Development Outputs.

(5) Design and Development Changes.

(c) *Configuration Management*. The compliance assurance system shall include procedures for configuration management to ensure the identification and control of physical and functional attributes throughout the product lifecycle. This process shall:

(1) control product identity and traceability to requirements, including the implementation of identified changes.

(2) ensure that the documentation and records (e.g., requirements, design, verification, validation, and acceptance documentation) is consistent with the actual attributes of the products and/or articles.

APPENDIX C: OVERSIGHT MEASURES

C.1 Gap Analysis

This table of measures should be evaluated to set up an initial system within a CAS and during subsequent audits

Measure	Element	Sub element
Confirm that the required elements are in the internal CAS policy	Compliance assurance policy	(a) The CAS holder must have a compliance assurance policy that includes at least the following: (1) The compliance assurance objectives of the CAS holder and a framework for setting CAS objectives that must include: (i) What will be done. (ii) What resources will be required. (iv) When it will be measured. (v) How the results will be evaluated. (2) A commitment of the CAS holder to fulfill the organization's compliance assurance objectives. (3) A clear statement about the provision of the necessary resources for the implementation of the CAS. (4) A compliance assurance reporting policy that defines requirements for staff reporting of potential or actual compliance issues. (5) A policy that defines unacceptable behavior and conditions for disciplinary action. (6) Ensures that no conflicting non-CAS duties or other interference affects the performance of CAS activities by individuals supporting CAS. (7) A description of the CAS Holder and CAS organizational structure and responsibilities. (i) Sufficient management personnel as described in § XXX (ii) A staff consisting of the engineering, flight test, inspection, or maintenance personnel as needed to establish the showing of compliance. Staff members must have the experience and expertise to show compliance, demonstrate conformity, or show airworthiness. (8) Ensures the CAS must have the ability to trace requirements forwards and backwards throughout the product, article, and CAS lifecycles.
Confirm signature with current roles within CAS.	Compliance assurance policy	(b) The compliance assurance policy must be signed by the accountable executive described in § XXX.

Measure	Element	Sub element
Confirm that communication plans are outlined in policy and evidence that it has been implemented.	Compliance assurance policy	(c) The compliance assurance policy must be documented and communicated throughout the CAS holder's organization.
Confirm that RAA and qualifications for participants is outlined in policy	Compliance assurance accountability and authority	(a) The CAS holder must define accountability for compliance assurance within the organization's compliance assurance policy for the following individuals: (1) Accountable executive, as described in § XXX. (2) All members of management in regard to developing, implementing, and maintaining CAS processes within their area of responsibility, including, but not limited to: (i) Potential or actual compliance issue identification and compliance risk assessment. (ii) Assuring the effectiveness of compliance risk controls. (iii) Promoting compliance assurance as required in XXX of this part. (iv) Advising the accountable executive on the performance of the CAS and on any need for improvement. (3) All staff relative to the CAS holder's compliance assurance performance.
	Compliance assurance accountability and authority	(b) The CAS holder must identify the levels of management with the authority to make decisions regarding compliance risk acceptance.
	Designation and responsibilities of required compliance assurance management personnel	(a) Designation of the accountable executive. The CAS holder must identify an accountable executive who, irrespective of other functions, satisfies the following: (1) Is the final authority over operations authorized to be conducted under the CAS holder's certificate(s). (2) Controls the financial resources required for the operations to be conducted under the CAS holder's certificate(s). (3) Controls the human resources required for the operations authorized to be conducted under the CAS holder's certificate(s). (4) Retains ultimate responsibility for the compliance performance of the operations conducted under the CAS holder's certificate.

Measure	Element	Sub element
	Designation and responsibilities of required compliance assurance management personnel	(b) Responsibilities of the accountable executive. The accountable executive must accomplish the following: (1) Ensure that the CAS is properly implemented, integrated into the organization's business processes and performing in all areas of the CAS holder's organization in support of its compliance assurance objectives. (2) Develop and sign the compliance assurance policy of the CAS holder. (3) Communicate the compliance assurance policy throughout the CAS holder's organization. (4) Regularly review the CAS holder's compliance assurance policy to ensure it remains relevant and appropriate to the CAS holder. (5) Regularly review the compliance assurance performance and intended results of the CAS holder's organization and direct actions necessary to address substandard compliance assurance performance in accordance.
	Designation and responsibilities of required compliance assurance management personnel	(c) Designation of management personnel. The accountable executive must designate sufficient management personnel who, on behalf of the accountable executive, must be responsible for the following: (1) Coordinate implementation, maintenance, and integration of the CAS throughout the CAS holder's organization. (2) Facilitate potential or actual compliance issue identification and compliance risk analysis. (3) Monitor the effectiveness of compliance risk controls. (4) Ensure compliance assurance promotion throughout your organization as required in XXX of this part. (5) Regularly report to the accountable executive on the performance of the CAS and on any need for improvement. (6) Ensure CAS performance maintains FAA's confidence in the organization's CAS.
Confirm that a risk management process exists and is applied appropriately throughout the design and cert process. Confirm that evidence exists that risks are being identified and managed appropriately.	Compliance risk management applicability	A CAS holder must apply compliance risk management to the following: (a) Implementation of new systems. (b) Revision of existing systems. (c) Development of design approval procedures. (d) Identification of potential or actual compliance issues or ineffective risk controls through the compliance assurance processes in XXX of this part.
	System analysis and compliance issue identification	(a) When applying compliance risk management, the CAS holder must analyze the systems identified in § XXX. Those compliance assurance analyses must be used to identify potential or actual compliance issues under paragraph (c) of this section and developing and implementing risk controls related to the system under § XXX.

Measure	Element	Sub element
	System analysis and compliance issue identification	(b) In conducting the system analysis, the following information must be considered: (1) Function and purpose of the system. (2) The system's operating environment. (3) An outline of the system's processes and procedures. (4) The personnel, equipment, and facilities necessary for operation of the system.
	System analysis and compliance issue identification	(c) The CAS holder must develop and maintain processes to identify potential or actual compliance issues within the context of the system analysis.
	Compliance risk assessment and control	(a) The CAS holder must develop and maintain processes to analyze compliance risk associated with the potential or actual compliance issues identified in § XXX. (b) The CAS holder must define a process for conducting risk assessment that allows for the determination of acceptable compliance risk. (c) The CAS holder must develop and maintain processes to develop compliance risk controls that are necessary as a result of the compliance risk assessment process under paragraph (b) of this section. (d) The CAS holder must evaluate whether the risk will be acceptable with the proposed compliance risk control applied, before the compliance risk control is implemented.
Confirm that a performance monitoring system exists, and it is working appropriately. Confirm that evidence exists that data is being collected for each of the required measures	Compliance performance monitoring and measurement	(a) The CAS holder must develop and maintain processes and systems to acquire data to monitor the compliance performance of the organization. These processes and systems must include, at a minimum, the following:
	Compliance performance monitoring and measurement	(4) Evaluations of the CAS and design approval processes and systems to ensure effectiveness and identify areas for improvement.
Confirm that a process exists to monitor the design approval environment for changes and that changes are being identified and managed.	Compliance performance monitoring and measurement	(2) Monitoring internal and external changes that may affect the CAS.

Measure	Element	Sub element
Confirm that a performance monitoring system is working appropriately and according to established requirements. Confirm that actions are carried out as appropriate based on performance information collected.	Compliance performance monitoring and measurement	(b) The CAS holder must develop and maintain processes that analyze the data acquired through the processes and systems identified under paragraph (a) of this section and any other relevant data with respect to its operations, products, and services.[7]
Confirm that risk management process is appropriately capturing new potential or actual compliance issues and managing them appropriately.	Compliance performance assessment	(b) Upon completion of the assessment, if ineffective controls or new potential or actual compliance issues are identified under paragraph (a)(2) through (a)(5) of this section, the CAS holder must use the compliance risk management process described in XXX of this part.

[7] Risk controls must be used in order to be effective. The CAS performance must be confirmed via audits. Changes to the design environment may introduce new non-compliances or negate effectiveness of compliance risk controls. The CAS system must find potential non-compliances before they occur.

Measure	Element	Sub element
Confirm that a process exists and is working effectively to react to non-compliances identified, control and correct them, evaluate and address root cause, and implement actions required to prevent similar non-compliances from occurring in the future.	Non-compliances and Corrective Action	When a non-compliance occurs the CAS holder shall:[8] (a) react to the non-compliance and, as applicable: (1) take action to control and correct it (2) deal with the consequences (b) evaluate the need for action to eliminate the cause(s) of the non-compliance, in order that it does not recur or occur elsewhere, by: (1) reviewing and analyzing the non-compliance (2) determining the causes of the non-compliance, including, as applicable, those related to human factors (3) determining if similar non-compliances exist, or could potentially occur (c) implement any action needed (d) review the effectiveness of any corrective action taken (e) update risks and opportunities determined during planning, if necessary (f) make changes to the compliance assurance system, if necessary (g) flow down corrective action requirements to an external provider when it is determined that the external provider is responsible for the non-compliance (h) take specific actions when timely and effective corrective actions are not achieved. (i) Corrective actions shall be appropriate to the effects of the non-compliances encountered. (j) The CAS holder shall maintain documentation and records that defines the non-compliance and corrective action management processes.
Confirm that records/database exist of required resources and people that fill those spots. Check that those are maintained and accurate.	Competencies and training	(a) The CAS holder must document the knowledge, experience and training requirements and provide training for each individual identified in § XXX to ensure the individuals attain and maintain the competencies necessary to perform their duties relevant to the operation and performance of the CAS.

[8] This measure looks to ensure that the process is adequately responding to non-compliances. We propose that a check be made during a Gap Analysis and periodic audits, but the continuous monitoring measures regarding non-compliances and corrective actions also support this requirement.

Measure	Element	Sub element
Confirm evidence of communication plans in policy and that communication has happened as outlined.	Compliance assurance communication	The CAS holder must develop and maintain means for communicating compliance assurance information that, at a minimum: (a) Ensures that staff are aware of the CAS policies, processes, and tools that are relevant to their responsibilities. (b) Conveys compliance assurance information relevant to the staff's responsibilities. (c) Explains to staff why compliance assurance actions have been taken. (d) Explains to staff why compliance assurance procedures are introduced or changed. (e) Notifies the appropriate FAA offices regarding changes to the CAS processes.
Confirm that organization has and is following a configuration or conformity management plan.	Design Assurance	(c) Configuration Management. The compliance assurance system shall include procedures for configuration management to ensure the identification and control of physical and functional attributes throughout the product lifecycle. This process shall: (1) control product identity and traceability to requirements, including the implementation of identified changes. (2) ensure that the documentation and records (e.g., requirements, design, verification, validation, and acceptance documentation) is consistent with the actual attributes of the products and/or articles.

C.2 Periodic CAS Audits

In addition to the above listing of elements, the following list of measures should also be considered when performing the periodic CAS Audits.

Measure	Element	Sub element
Confirm that audit records are maintained and that audits are being executed as planned.	Compliance assurance policy	(d) The compliance assurance policy must be regularly reviewed by the accountable executive to ensure it remains relevant and appropriate to the CAS holder.
Confirm that audits are happening on schedule and per plan.	Compliance performance monitoring and measurement	(3) Auditing of CAS and design approval processes and systems to provide information on whether they: (i) conform to the requirements of this subpart. (ii) are properly implemented and maintained.

Measure	Element	Sub element
Confirm that CAS Holder Accountable Executive has conducted timely periodic reviews of CAS performance in accordance with required processes.	Accountable Executive Review	(a) The CAS holder must include procedures for review of the compliance assurance system by the Accountable Executive, at planned intervals, to ensure its continuing suitability, adequacy, and effectiveness.[9] (b) The management review shall take into consideration: (1) the status of actions from previous management reviews. (2) changes in external and internal issues that are relevant to the compliance assurance system. (3) information on the performance and effectiveness of the compliance assurance system, including trends in: (i) the extent to which compliance assurance objectives have been met. (ii) process performance and compliance of products and services. (iii) non-compliances and corrective actions. (iv) properly identifying airworthiness regulations and methods of compliance. (v) monitoring and measurement results. (vi) audit results. (4) the adequacy of resources. (5) the effectiveness of actions taken to address risks and opportunities. (6) opportunities for improvement. (c) The outputs of the management review shall include decisions and actions related to: (1) opportunities for improvement. (2) any need for changes to the compliances assurance system. (3) resource needs. (4) risks identified.
	Compliance performance assessment	(c) Upon completion of the assessment, opportunities for improvement have been identified; the CAS holder must use the continuous improvement process described in XXX of this part.

[9] This requirement ensures that the CAS Holder's Accountable executive is participating in the audits and reviews of CAS performance.

Measure	Element	Sub element
Confirm that periodic goals and thresholds exist for identified performance measures, and that a process is in place to ensure that performance deficiencies are corrected based on performance assessments.	Continuous improvement.	(a) The CAS holder must develop procedures for determining and selecting opportunities for improvement and implementing any necessary actions including, but not limited to: (1) correcting, preventing, or reducing regulatory or procedural non-compliances. (2) correcting deficiencies discovered during assessments conducted under § XXX, and the outputs from management review. (3) improving the performance and effectiveness of the compliance assurance system. (b) The CAS holder must establish and implement processes to correct the compliance deficiencies identified in (a)(1) and (a)(2), and improvements in (a)(3). (1) The inputs and output of these processes must be identified. (2) The sequence and interaction of these processes must be determined (3) The implementation status must be monitored (4) The effectiveness of the results must be evaluated.
Confirm that documentation exists as outlined in policy.	CAS documentation	The CAS holder must develop and maintain CAS documentation that describes the CAS holder's: (a) Compliance assurance policy. (b) CAS processes and procedures. (c) Description of those changes to the CAS manual or procedures that may be made by the CAS Holder. All other changes to the manual or procedures must be approved by the Administrator before they are implemented.

Measure	Element	Sub element
Confirm that required records are kept in an auditable location.	CAS records	(a) The CAS holder must maintain records of outputs of compliance risk management processes as described in XXX of this part. Such records must be retained for as long as the control remains relevant to the operation. (b) The CAS holder must maintain records of outputs of compliance performance monitoring, measurement and assessment processes as described in XXX of this part. Such records must be retained for a minimum of 5 years. (c) The CAS holder must maintain a record of all CAS responsibilities, qualifications and training provided under § XXX for each individual performing CAS activities. Such records must be retained for the duration of the CAS. (d) The CAS holder must retain records of all communications provided under § XXX for a minimum of 24 consecutive calendar-months. (e) CAS Holder must ensure the following are maintained for the duration of the CAS: (1) Application and required certification or approval data, including: (i) The data and records documenting the CAS showing of compliance. (ii) A list of products, components, parts, or appliances for which CAS was employed. (2) Copy of each CAS manual approved. (3) Any other records specified in the CAS Holder's procedures manual. (f) For all records required by this section to be maintained, each CAS Holder must: (1) Ensure that the records and data are available to the Administrator for inspection at any time. (2) Submit all records and data to the Administrator upon surrender or termination of the authorization.
Confirm that the qualifications of personnel performing design reviews is aligned with requirements outlined in policy.	Competencies and training	The CAS holder must document the knowledge, experience and training requirements and provide training for each individual identified in § XXX to ensure the individuals attain and maintain the competencies necessary to perform their duties relevant to the operation and performance of the CAS. The procedures for selecting and documenting individuals supporting the CAS organization, as required under Sec XXX must also be documented.[10]
Confirm that the training/qualification requirements are outlined in policy, and that records are kept to be able to ensure that workforce meets these requirements.	Competencies and training	(b) The procedures for selecting and documenting individuals supporting the CAS organization, as required under Sec XXX must be documented.

[10] This can measure the quantity of people resources and qualifications thereof within the CAS to determine that the holder is meeting the requirements it defined.

Measure	Element	Sub element
Evaluate FAA agreement with company-performed audit findings and corrective actions that were identified.	Compliance performance assessment	(a) The CAS holder must conduct assessments of its compliance performance against its compliance assurance objectives, which include reviews by the accountable executive, to: (1) Ensure compliance with the compliance risk controls established by the CAS holder. (2) Evaluate the performance of the CAS. (3) Evaluate the effectiveness of the compliance risk controls established under § XXX and identify any ineffective controls. (4) Identify internal and external changes that are relevant to the CAS that introduce new potential or actual compliance issues. (5) Identify new potential or actual compliance issues.[11]
Confirm that organization has and is following a Design and Development Plan	Design Assurance	(b) Design and Development. The compliance assurance system shall include procedures for design and development. This procedure must include processes for: (1) Design and Development Planning. (2) Design and Development Inputs. (3) Design and Development Controls. (4) Design and Development Outputs. (5) Design and Development Changes.
Confirm that activities performed are in accordance with privileges outlined in CAS approval and procedures manual	Compliance assurance accountability and authority	(c) Consistent with a CAS Holder's qualifications, the Administrator may accept CAS Holder's showing compliance activity as determined appropriate.
Confirm that activities performed are in accordance with privileges outlined in CAS approval and procedures manual	Compliance assurance accountability and authority	(d) Under the general supervision of the Administrator, a CAS holder may perform the compliance showing activities, subject to the limitations where FAA involvement may be required listed in the CAS procedures manual.

[11] This measure illustrates the effectiveness of company audits and the appropriateness of internally developed corrective actions.

C.3 Continuous CAS Monitoring

The following list of measures should be monitored continuously during CAS operation.

Measure	Element	Sub element	Examples or Further Explanation
Track actual non-compliances reported	Compliance performance monitoring and measurement	(5) Investigations of service difficulties, incidents, accidents, and non-compliances.	Non-compliances discovered in service may indicate weaknesses in the ability of CAS to meet requirements or identify non-compliances before type certification. In-Service measures can be complex because raw data may include both CAS-approved design and designs approved by other means (traditional compliance), and in order to measure CAS performance a means to provide a distinction needs to be developed.

Measure	Element	Sub element	Examples or Further Explanation
	Non-compliances and Corrective Action	When a non-compliance occurs the CAS holder shall: (a) react to the non-compliance and, as applicable: (1) take action to control and correct it (2) deal with the consequences (b) evaluate the need for action to eliminate the cause(s) of the non-compliance, in order that it does not recur or occur elsewhere, by: (1) reviewing and analyzing the non-compliance (2) determining the causes of the non-compliance, including, as applicable, those related to human factors (3) determining if similar non-compliances exist, or could potentially occur (c) implement any action needed (d) review the effectiveness of any corrective action taken (e) update risks and opportunities determined during planning, if necessary (f) make changes to the compliance assurance system, if necessary (g) flow down corrective action requirements to an external provider when it is determined that the external provider is responsible for the non-compliance (h) take specific actions when timely and effective corrective actions are not achieved. (i) Corrective actions shall be appropriate to the effects of the non-compliances encountered. (j) The CAS holder shall maintain documentation and records that defines the non-compliance and corrective action management processes.	Non-compliance findings can be a sign of weaknesses in initial assessment.
	Design Assurance	(a) Requirements Definition. The compliance assurance system shall include procedures for defining, reviewing, and controlling requirements for designs and design changes of products and/or articles. This procedure must include processes for: (1) Determining Requirements. (2) Validating Requirements. (3) Changes to Requirements.	This measure is to specify the reason for a potential or actual non-compliance to identify misses because of a miss-identified airworthiness requirement. CAS holder must have a means to identify the applicable airworthiness requirements CAS holder must have a process to validate the list of applicable requirements CAS holder must have a process to evaluate compliance data to ensure compliance was acceptably shown

Measure	Element	Sub element	Examples or Further Explanation
	Compliance performance monitoring and measurement	(5) Investigations of service difficulties, incidents, accidents, and non-compliances.	Non-compliances discovered in service may indicate weaknesses in the ability of CAS to meet requirements or identify non-compliances before type certification. In-Service measures can be complex because raw data may include both CAS-approved design and designs approved by other means (traditional compliance), and in order to measure CAS performance a means to provide a distinction needs to be developed.
Track potential non-compliances reported	Design Assurance	(a) Requirements Definition. The compliance assurance system shall include procedures for defining, reviewing, and controlling requirements for designs and design changes of products and/or articles. This procedure must include processes for: (1) Determining Requirements. (2) Validating Requirements. (3) Changes to Requirements.	Non-compliance findings can be a sign of weaknesses in initial assessment. CAS holder must have a process to evaluate compliance data to ensure compliance was acceptably shown
	Design Assurance	(a) Requirements Definition. The compliance assurance system shall include procedures for defining, reviewing, and controlling requirements for designs and design changes of products and/or articles. This procedure must include processes for: (1) Determining Requirements. (2) Validating Requirements. (3) Changes to Requirements.	This measure is to specify the reason for a potential or actual non-compliance to identify misses because of a miss-identified airworthiness requirement. CAS holder must have a process to validate the list of applicable requirements CAS holder must have a process to evaluate compliance data to ensure compliance was acceptably shown

Measure	Element	Sub element	Examples or Further Explanation
	Non-compliances and Corrective Action	When a non-compliance occurs the CAS holder shall: (a) react to the non-compliance and, as applicable: (1) take action to control and correct it (2) deal with the consequences (b) evaluate the need for action to eliminate the cause(s) of the non-compliance, in order that it does not recur or occur elsewhere, by: (1) reviewing and analyzing the non-compliance (2) determining the causes of the non-compliance, including, as applicable, those related to human factors (3) determining if similar non-compliances exist, or could potentially occur (c) implement any action needed (d) review the effectiveness of any corrective action taken (e) update risks and opportunities determined during planning, if necessary (f) make changes to the compliance assurance system, if necessary (g) flow down corrective action requirements to an external provider when it is determined that the external provider is responsible for the non-compliance (h) take specific actions when timely and effective corrective actions are not achieved. (i) Corrective actions shall be appropriate to the effects of the non-compliances encountered. (j) The CAS holder shall maintain documentation and records that defines the non-compliance and corrective action management processes.	None provided in this report

Measure	Element	Sub element	Examples or Further Explanation
Airworthiness directives	Compliance performance monitoring and measurement	(5) Investigations of service difficulties, incidents, accidents, and non-compliances.	Airworthiness Directives are assumed to be a measure of non-compliances in a product that are critical to be rectified from a Safety perspective. They may be less critical if related to improvement areas identified in service that met original compliance. In-Service measures can be complex because raw data may include both CAS-approved design and designs approved by other means (traditional compliance), and in order to measure CAS performance a means to provide a distinction needs to be developed.
Airworthiness directives involving a non-compliance	Compliance performance monitoring and measurement	(5) Investigations of service difficulties, incidents, accidents, and non-compliances.	Non-compliances discovered in service may indicate weaknesses in the ability of CAS to meet requirements or identify non-compliances before type certification. In-Service measures can be complex because raw data may include both CAS-approved design and designs approved by other means (traditional compliance), and in order to measure CAS performance a means to provide a distinction needs to be developed.

Measure	Element	Sub element	Examples or Further Explanation
Monitor corrective actions created, including how many are created, what types of things are they for, and whether there are repeats.	Non-compliances and Corrective Action	When a non-compliance occurs the CAS holder shall: (a) react to the non-compliance and, as applicable: (1) take action to control and correct it (2) deal with the consequences (b) evaluate the need for action to eliminate the cause(s) of the non-compliance, in order that it does not recur or occur elsewhere, by: (1) reviewing and analyzing the non-compliance (2) determining the causes of the non-compliance, including, as applicable, those related to human factors (3) determining if similar non-compliances exist, or could potentially occur (c) implement any action needed (d) review the effectiveness of any corrective action taken (e) update risks and opportunities determined during planning, if necessary (f) make changes to the compliance assurance system, if necessary (g) flow down corrective action requirements to an external provider when it is determined that the external provider is responsible for the non-compliance (h) take specific actions when timely and effective corrective actions are not achieved. (i) Corrective actions shall be appropriate to the effects of the non-compliances encountered. (j) The CAS holder shall maintain documentation and records that defines the non-compliance and corrective action management processes.	None provided in this report
	Compliance performance assessment	(a) The CAS holder must conduct assessments of its compliance performance against its compliance assurance objectives, which include reviews by the accountable executive, to: (1) Ensure compliance with the compliance risk controls established by the CAS holder. (2) Evaluate the performance of the CAS. (3) Evaluate the effectiveness of the compliance risk controls established under § XXX and identify any ineffective controls. (4) Identify internal and external changes that are relevant to the CAS that introduce new potential or actual compliance issues. (5) Identify new potential or actual compliance issues.	If corrective actions are not effective, then future non-compliances will occur. Too many corrective actions illustrate weakness in processes or that processes aren't being followed.

Measure	Element	Sub element	Examples or Further Explanation
Monitor corrective action closures and implementation	Non-compliances and Corrective Action	When a non-compliance occurs the CAS holder shall: (a) react to the non-compliance and, as applicable: (1) take action to control and correct it (2) deal with the consequences (b) evaluate the need for action to eliminate the cause(s) of the non-compliance, in order that it does not recur or occur elsewhere, by: (1) reviewing and analyzing the non-compliance (2) determining the causes of the non-compliance, including, as applicable, those related to human factors (3) determining if similar non-compliances exist, or could potentially occur (c) implement any action needed (d) review the effectiveness of any corrective action taken (e) update risks and opportunities determined during planning, if necessary (f) make changes to the compliance assurance system, if necessary (g) flow down corrective action requirements to an external provider when it is determined that the external provider is responsible for the non-compliance (h) take specific actions when timely and effective corrective actions are not achieved. (i) Corrective actions shall be appropriate to the effects of the non-compliances encountered. (j) The CAS holder shall maintain documentation and records that defines the non-compliance and corrective action management processes.	A system that does not effectively implement corrective actions and confirm that they are working is likely to reproduce non-compliances.
	Compliance performance assessment	(a) The CAS holder must conduct assessments of its compliance performance against its compliance assurance objectives, which include reviews by the accountable executive, to: (1) Ensure compliance with the compliance risk controls established by the CAS holder. (2) Evaluate the performance of the CAS. (3) Evaluate the effectiveness of the compliance risk controls established under § XXX and identify any ineffective controls. (4) Identify internal and external changes that are relevant to the CAS that introduce new potential or actual compliance issues. (5) Identify new potential or actual compliance issues.	A system that does not effectively implement corrective actions and confirm that they are working is likely to reproduce non-compliances.

Measure	Element	Sub element	Examples or Further Explanation
Number of times a MOC was updated after initial application	Design Assurance	(a) Requirements Definition. The compliance assurance system shall include procedures for defining, reviewing, and controlling requirements for designs and design changes of products and/or articles. This procedure must include processes for: (1) Determining Requirements. (2) Validating Requirements. (3) Changes to Requirements.	CAS holder must have a process to identify suitable MOC for each requirement This is intended to measure how often some of the requirements or assumptions in your system are changing throughout the project. It may indicate the robustness of the process, or knowledge and experience of those performing the determination which is critical to assurance
Monitor employee reports in the confidential reporting system, and number that result in non-compliances or corrective actions.	Compliance performance monitoring and measurement	(7) A confidential reporting system in which staff can report potential or actual compliance issues, concerns, occurrences, incidents, as well as propose solutions and compliance assurance improvements.	Similar to other non-compliance measures identified, but it is important to note whether it came from an employee report. It is important to monitor which data sources are providing items that need to be corrected. It is valuable to measure statistically, what percentage of reports are anonymous, which can be used to understand culture and make improvements. Additionally, measuring what percentage of the workforce participates in reporting can help understand more about the nature of reports and organizational culture. Additionally, monitoring how many of the corrective actions implemented come from employee reports, as opposed to other sources, can help determine the quality of employee reports.
Monitor internal audit findings, including: number of findings, what types of findings, whether there are repeat findings.	Compliance performance assessment	(a) The CAS holder must conduct assessments of its compliance performance against its compliance assurance objectives, which include reviews by the accountable executive, to: (1) Ensure compliance with the compliance risk controls established by the CAS holder. (2) Evaluate the performance of the CAS. (3) Evaluate the effectiveness of the compliance risk controls established under § XXX and identify any ineffective controls. (4) Identify internal and external changes that are relevant to the CAS that introduce new potential or actual compliance issues. (5) Identify new potential or actual compliance issues.	Audit findings are an opportunity to determine whether ongoing risk controls are being used and are effective to minimize the risk for future non-compliance. The CAS performance must be confirmed via audits. Changes to the design environment may introduce new non-compliances or negate effectiveness of compliance risk controls The CAS system must find potential non-compliances before they occur.

Measure	Element	Sub element	Examples or Further Explanation
Number of design changes due to COS reports	Compliance performance monitoring and measurement	(5) Investigations of service difficulties, incidents, accidents, and non-compliances.	This is a measure of how many problems are found in service on a product (e.g., Service Difficulty Reports (SDRs), 14 Code of Federal Regulations (CFR) Part 21.3 reports, repetitive field returns, and warranty performance related to design) that drive changes to the airplane design, which indicates robustness of the original design process. This may be less critical if related to improvement areas identified in service that met original compliance. Measure can be complex because raw data may include both CAS-approved design and designs approved by other means (traditional compliance), and in order to measure CAS performance a means to provide a distinction needs to be developed. Solution to COS report could be a design change to a system that wasn't originally the cause of the report/non-compliance. Need to have some latitude in how things are measured for this one.
Time needed to make design changes after an issue identifies that one is needed	Compliance performance assessment	(a) The CAS holder must conduct assessments of its compliance performance against its compliance assurance objectives, which include reviews by the accountable executive, to: (1) Ensure compliance with the compliance risk controls established by the CAS holder. (2) Evaluate the performance of the CAS. (3) Evaluate the effectiveness of the compliance risk controls established under § XXX and identify any ineffective controls. (4) Identify internal and external changes that are relevant to the CAS that introduce new potential or actual compliance issues. (5) Identify new potential or actual compliance issues.	Whether or not an organization is implementing required design changes is an indication of the system's capability to correct problems. However, this measure should be relative to the timeframe identified for corrective action depending on safety criticality.

Measure	Element	Sub element	Examples or Further Explanation
Timeliness of audits and corrective action identification and implementation.	Non-compliances and Corrective Action	When a non-compliance occurs the CAS holder shall: (a) react to the non-compliance and, as applicable: (1) take action to control and correct it (2) deal with the consequences (b) evaluate the need for action to eliminate the cause(s) of the non-compliance, in order that it does not recur or occur elsewhere, by: (1) reviewing and analyzing the non-compliance (2) determining the causes of the non-compliance, including, as applicable, those related to human factors (3) determining if similar non-compliances exist, or could potentially occur (c) implement any action needed (d) review the effectiveness of any corrective action taken (e) update risks and opportunities determined during planning, if necessary (f) make changes to the compliance assurance system, if necessary (g) flow down corrective action requirements to an external provider when it is determined that the external provider is responsible for the non-compliance (h) take specific actions when timely and effective corrective actions are not achieved. (i) Corrective actions shall be appropriate to the effects of the non-compliances encountered. (j) The CAS holder shall maintain documentation and records that defines the non-compliance and corrective action management processes.	If audits are not being performed, then compliance assurance is in doubt. Similarly, if corrective actions aren't implemented, the likelihood of repeat non-compliance is increased.
	Compliance performance assessment	(a) The CAS holder must conduct assessments of its compliance performance against its compliance assurance objectives, which include reviews by the accountable executive, to: (1) Ensure compliance with the compliance risk controls established by the CAS holder. (2) Evaluate the performance of the CAS. (3) Evaluate the effectiveness of the compliance risk controls established under § XXX and identify any ineffective controls. (4) Identify internal and external changes that are relevant to the CAS that introduce new potential or actual compliance issues. (5) Identify new potential or actual compliance issues.	If audits are not being performed, then compliance assurance is in doubt. Similarly, if corrective actions aren't implemented, the likelihood of repeat non-compliance is increased.

Measure	Element	Sub element	Examples or Further Explanation
Track design changes as the design progresses: how many, what are they, underlying reason for a change.	Compliance risk assessment and control	(a) The CAS holder must develop and maintain processes to analyze compliance risk associated with the potential or actual compliance issues identified in § XXX. (b) The CAS holder must define a process for conducting risk assessment that allows for the determination of acceptable compliance risk. (c) The CAS holder must develop and maintain processes to develop compliance risk controls that are necessary as a result of the compliance risk assessment process under paragraph (b) of this section. (d) The CAS holder must evaluate whether the risk will be acceptable with the proposed compliance risk control applied, before the compliance risk control is implemented.	Late design changes tend to be a signal that something was missed earlier in the process. It is important to identify a reason behind a design change - in this case especially if the system is not identifying the correct requirements or dependencies between requirements. Design changes due to non-compliance with regulatory requirements are critical to monitor. If there are a high number of changes during the process, some non-compliances are likely to get through to the final product.
	Compliance performance monitoring and measurement	(1) Monitoring of design approval processes.	Late design changes tend to be a signal that something was missed earlier in the process. It is important to identify a reason behind a design change. Design changes due to non-compliance with regulatory requirements are critical to monitor. If there are a high number of changes during the process, some non-compliances are likely to get through to the final product. Types of Engineering design change requests could be driven by design reviews, flight test, manufacturing, and service issues, and how/when these identified changes can provide insight into where there may be weaknesses in the system.
Track number of Vendor design and manufacturing issues discovered at incoming inspection and later	Compliance performance monitoring and measurement	(1) Monitoring of design approval processes.	Finding issues as products arrive from Vendor may be a sign of lack of adequate vendor coordination and oversight

Measure	Element	Sub element	Examples or Further Explanation
FAA agreement with applicant's CAS use assessment/proposal for compliance showing	Design Assurance	(b) Design and Development. The compliance assurance system shall include procedures for design and development. This procedure must include processes for: (1) Design and Development Planning. (2) Design and Development Inputs. (3) Design and Development Controls. (4) Design and Development Outputs. (5) Design and Development Changes.	CAS should assure accurate proposals and assessments, so this monitors that a company can accurately make an assessment of whether a project or application should use the CAS system or some other means. If the FAA always approves when things can be completed using a CAS, this measure may not be required. CAS holder must have a process to determine FAA LOI

APPENDIX D: PROPOSED REGULATIONS

§ 21.251 - Applicability.

This subpart prescribes -

(a) Procedural requirements for issuing Compliance Assurance System certificates; and

(b) Rules governing holders of those certificates.

§ 21.252 - Eligibility.

Any interested person may apply for a Compliance Assurance System certificate.

§ 21.253 - Application.

Each applicant for a Compliance Assurance System certificate must apply in a form and manner prescribed by the FAA.

§ 21.254 - Definitions.

For the purposes of this subpart:

(a) *Applicable Requirements* means standards prescribed under or pursuant to this subchapter for which compliance may be found by the FAA and includes airworthiness standards prescribed in 14 CFR parts 23 through 39 and Technical Standard Order requirements.

(b) A *Compliance Assurance System* is a system that is intended to ensure that, for each statement of compliance issued by the Compliance Assurance System certificate holder, the corresponding design has been shown to comply with the Applicable Requirements. The Compliance Assurance System ensures this by implementing the elements described under this subpart.

(c) A *Compliance Assurance System Person* means a Person (defined in 14 CFR §1.1) having a specified role in the Compliance Assurance System.

(d) *Method of Compliance Library* means a collection of practices or procedures accepted by the FAA and utilized by a Compliance Assurance System certificate holder for establishing that a design meets the Applicable Requirements.

(e) *Process* means a series of related tasks or methods that accomplish an objective within the Compliance Assurance System. Processes must be recorded in a permanent form, such as in written procedures.

(f) *Project* means any activity that is intended to generate compliance data under a Compliance Assurance System.

§ 21.255 - Organization.

(a) Each applicant for or holder of a Compliance Assurance System certificate must provide the FAA with a document -

(1) Describing how its organization will ensure compliance with the provisions of this subpart;

(2) Describing for each Compliance Assurance System Person,

(a) assigned responsibilities; and

(b) the functional relationship of the Person to management and other organizational components; and

(3) Identifying an accountable manager.

(b) The accountable manager specified in paragraph (a) of this section must be responsible within the applicant's or Compliance Assurance system certificate holder's organization for, and have authority over, all Compliance Assurance System operations conducted under this subpart. The accountable manager must confirm that the procedures described in the compliance assurance documentation required by § 21.258 are in place and that the Compliance Assurance System certificate holder satisfies the requirements of the applicable regulations of this subchapter. The accountable manager must serve as the primary contact with the FAA.

§ 21.257 – General Requirements

Each applicant for or holder of a Compliance Assurance System certificate must establish and describe in writing a Compliance Assurance System. This Compliance Assurance System must:

(a) identify by title or corporate name each Compliance Assurance System Person.

(b) describe a process for assessing and identifying Compliance Assurance System Persons, and a process for internal management of these Compliance Assurance System Persons.

(c) describe a process for identifying the FAA level of involvement in each project.

(d) describe a method of notification to the FAA about new projects

(e) describe a process for identifying each Applicable Requirement that applies to the design for each project

(f) describe a process for independently validating the list of Applicable Requirements that apply to the design to ensure it is both complete and correct.

(g) describe a process for identifying methods of compliance for all Applicable Requirements that apply to the design.

(h) for each Applicable Requirement identified to be relevant to a design, describe a process for assessing the data that purports to show compliance, to verify that compliance is shown.

(i) describe one or more processes for ensuring appropriate skills are represented within the Compliance Assurance System:

(1) A process for identifying the technical skills necessary for each Person who has compliance assurance responsibilities in the Compliance Assurance System, and updating that identification to reflect changing circumstances (such as a process change that makes a skill no longer necessary);

(2) A process for ensuring that each Person who has compliance assurance responsibilities within a Compliance Assurance System meets the technical skills identified for that role in this subsection;

(3) A process for ensuring that each Person who has compliance assurance responsibilities within a Compliance Assurance System continues to meet the technical skills identified for that role in this subsection, e.g. through testing, recurrent training to maintain an appropriate technical skill level, on-the-job training, etc.

(j) describe a change control system to identify all design changes that arise between the time that design compliance parameters are first identified, and the time that final design compliance is determined. This system shall:

(1) assess each design change's impact on the list of Applicable Requirements; and

(2) assess compliance of the changed design to the Applicable Requirements.

(k) if a method of compliance library will be used, then describe a process for managing the method of compliance library, including amending the library, maintaining the library, and reflecting new and changed FAA policies in the methods of compliance found in the library.

(l) describe a process for identifying records that are required to be made and retained. The process should identify:

(1) What records need to be kept by the Holder;

(2) What records need to be transmitted by the Holder to the FAA;

(3) Who is responsible for creating the record;

(4) Who is responsible for keeping the record;

(5) What are the record retention requirements; and,

(6) How the Holder will ensure that records are made and kept in compliance with applicable regulatory requirements.

(m) describe a process for internal auditing of the Compliance Assurance System to ensure it is functioning according to the system's expectations.

(n) describe a process for collecting data and analyzing processes and systems to monitor and measure the performance and efficiency of the Compliance Assurance System.

§ 21.258 – Compliance Assurance Documentation

Each applicant for or holder of a Compliance Assurance System certificate must provide documentation describing its Compliance Assurance System to the FAA for approval. The documentation must be in the English language and retrievable in a form acceptable to the FAA.

§ 21.259 - Compliance Assurance Facilities Outside the United States

Neither an applicant for nor holder of a Compliance Assurance System certificate may identify a CAS Person located outside of the United States unless the FAA finds no undue burden in administering the applicable requirements of Title 49 U.S.C. and this subchapter.

§ 21.260 - Inspections and Tests

Each applicant for or holder of a Compliance Assurance System certificate must allow the FAA to inspect its Compliance Assurance System, facilities, and technical data, and witness any tests, including any inspections or tests at a compliance assurance facility, necessary to determine compliance with this subchapter.

§ 21. 261 - Issuance.

Upon finding that the applicant complies with the requirements of this subpart, the FAA shall issue a Compliance Assurance System certificate with appropriate ratings.

§ 21. 262 - Ratings.

(a) The following ratings are issued under this subpart:

1. product rating;
2. modification rating;
3. article rating;
4. Any other rating approved by Administrator

(b) An applicant may apply for, and be granted, more than one rating.

(c) Ratings may be limited to only certain activities under the rating. An applicant shall be entitled to be rated for any activity for which it demonstrates that its Compliance Assurance System is adequate to ensure that, for the applicant statement of compliance, the corresponding design has been shown to comply with the Applicable Requirements.

(d) The Compliance Assurance System Certificate Holder's privileges shall be limited to the scope of the rating, and the activities under that scope.

§ 21. 263 – Duration

A Compliance Assurance System certificate is effective until surrendered, suspended, revoked, or the FAA otherwise establishes a termination date.

§ 21. 264 – Transferability

The holder of a Compliance Assurance System certificate may not transfer the Compliance Assurance System certificate.

§ 21. 265 – Privileges and Administrator's Reliance

(a) The holder of a Compliance Assurance System certificate may certify to the FAA that a products or article complies with Applicable Requirements. Such products or articles must be described within the scope of the holder's ratings. The certification is subject to the limits of the holder's Compliance Assurance System Certification.

(b) The Administrator may rely on a certification of compliance by a Compliance Assurance System certificate holder when making a finding under this subchapter.

§ 21. 266 - Responsibility of Holder.

The holder of a Compliance Assurance System certificate must -

(a) Amend the document required by § 21.255 as necessary to reflect changes in the organization and provide these amendments to the FAA.

(b) Maintain the Compliance Assurance System in compliance with the data and procedures approved for the Compliance Assurance System certificate;

(c) Ensure that each completed design for which the Compliance Assurance System certificate holder certifies compliance meets the Applicable Requirements;

(d) Perform its Compliance Assurance System functions in accordance with the documentation described in § 21.258, and

(e) Retain its Compliance Assurance System certificate and make it available to the FAA upon request.

§ 21. 267 - Amendment of Compliance Assurance System Certificates

To add a rating, a holder of a Compliance Assurance System certificate must

(1) apply for an amendment to a Compliance Assurance System certificate in a form and manner prescribed by the FAA, and

(2) comply with §§ 21.257, 21.258, and 21.260

§ 21.270 - Changes in Compliance Assurance System.

After the issuance of a Compliance Assurance System certificate -

(a) The holder of a Compliance Assurance System certificate shall notify the Administrator within 48 hours of any change that could affect the FAA's ability to oversee the Compliance Assurance System, or affect the certificate holder's ability to continue to meet the requirements of this subpart

(b) The holder of a Compliance Assurance System certificate shall submit in a form and manner acceptable to the Administrator each change to the Compliance Assurance System

APPENDIX E: CAS WORKING GROUP TASKING

The following tasking was provided to the CAS working group and formed the foundation for the team's work resulting in the above recommendations and supporting information.

Compliance Assurance System

Bringing cutting-edge innovation and products meeting the latest airworthiness requirements to market is crucial to the continued safety of our airspace system. However, the pace of technology and the capacity to implement safety enhancements is significantly challenging the FAAs ability to certify those products efficiently. On the other hand, the FAA has long recognized the benefits of a systems approach to handling the challenges of ensuring compliance to the millions of products and articles manufactured under an FAA production approval each year. To address the challenges facing certification, the FAA must have a similar path to recognize the maturity, risk management, and capability of an applicant's system to demonstrate and find compliance in a similar manner.

In acknowledging the work already concluded by the SOC ARC, the FAA recognizes the next steps to a successful definition and implementation of a compliance assurance system is dependent upon collaboration and contributions by industry and the FAA.

Objectives and Outcomes

OBJECTIVE A: CAS implementation. The FAA would like to recognize the SOC ARC for their work in defining the elements and attributes of a CAS. Additionally, the FAA is seeking input on how to develop a program than enables the FAA to recognize a CAS that utilizes a performance based approach and consensus standards.

- **Task 1**: Propose attributes required to establish a CAS, consider the system attributes defined for a production compliance assurance system approval under § 21.137, and the organization attributes in § 21.605
- **Task 2**: Identify elements that are typically already present in a high functioning applicant's system that are mature, stable, and already defined and controlled that can be utilized and recognized by the FAA
- **Task 3**: Identify critical performance objectives and provide paths to leverage consensus standards.
- **Task 4**: Recommend how an applicant would structure their CAS if the applicant's capability does not support the ability to make 100% of the compliance determinations
    - For example, if a company has robust flammability capabilities and procedures, but is still developing software validation processes. Would they request CAS for Flammability only? We believe this is part of the scalability discussion and would need further consideration by the ARC
- **Task 5:** Recommend a phased implementation for applicant-showing only to transition to CAS. The process should consider the means to retain currency and revision control of the approved CAS as its processes are continually improved in response to advancement or lessons learned in design, development, certification or fleet operational experience.
- **Task 6:** Propose follow-on regulatory structure if substantial improvements can be realized

OBJECTIVE B: Oversight of the CAS: Once a CAS is defined to include an implementation strategy the FAA will need to do continuous monitoring for industry to realize the benefits of a CAS. In order to accomplish oversight, the FAA will need to understand how the CAS is performing so that we can perform oversight based on risk to the overall National Airspace System. The current oversight system does not have the ability to measure and monitor design systems outside of ODA.

- **Task 1**: Recommend a CAS oversight framework that builds off existing level of program involvement, and production system risk models. This framework should be consistent with the FAA Oversight Philosophy, specifically the AIR Integrated Oversight (AIO) activities, and use a systems approach to certification
- **Task 2**: Define the methods in which a company can measure their CAS performance. Identify required performance parameters and acceptable performance thresholds
- **Task 3**: Identify information and methods to be used to tailor FAA oversight; this could include information available from third party oversight providers.