

Safety Attribute Inspection (SAI) Data Collection Tool
1.3.9 Engineering / Major Repairs and Alterations (AW)

ELEMENT SUMMARY INFORMATION

Purpose of this Element (certificate holder's responsibility):

- To ensure that all major repairs and major alterations are accomplished in accordance with technical data approved by the administrator.

Objective (FAA oversight):

- To determine if the certificate holder's Engineering/Major Repairs and Alterations process meets all applicable requirements of Title 14 of the Code of the Federal Regulations (14 CFR) and FAA policies.
- To determine if the certificate holder's Engineering/Major Repairs and Alterations process incorporates the safety attributes.
- To identify any shortfalls in the certificate holder's Engineering/Major Repairs and Alterations process.

Specific Instructions:

- Intentionally left blank

SUPPLEMENTAL INFORMATION

Specific Regulatory Requirements (SRRs):

- SRRs:
 - 121.135(a)(1)
 - 121.135(b)(1)
 - 121.135(b)(2)
 - 121.135(b)(3)
 - 121.367
 - 121.379
 - 121.379(a)
 - 121.379(b)
 - 43.10(b)
 - 43.13(a)
 - 43.17(e)(1)
 - 43.3(d)

Related CFRs & FAA Policy/Guidance:

- Related CFRs:
 - Intentionally left blank
- FAA Policy/Guidance:
 - FAA Order 8900.1, Volume 6, Chapter 11, Section 19
 - AC 120-77

SAI Section 1 - Procedures Attribute

Objective: Procedures, instructions, and information are documented methods for accomplishing a process. The certificate holder's policies should establish their compliance posture. Policies may be stand-alone statements, or they may be imbedded within procedures, instructions, or information regarding a particular regulatory requirement. The questions in this section of the data collection tool (DCT) are designed to assist the inspector in determining if the certificate holder has documented or prescribed methods of accomplishing the process requirements that provide answers to the associated questions regarding who, what, when, where, and how. This section contains policy questions, procedural questions, and instructional or informational questions pertaining to various types of certificate holder requirements such as actions, prohibitions, or resources (i.e., personnel, facilities, equipment, technical data, etc.).

Tasks

	To meet this objective, the inspector must accomplish the following tasks:
1.	Review the information listed in the Supplemental Information section of this DCT.
2.	Review the duties and responsibilities for management and other personnel identified by the certificate holder who accomplish the Engineering/Major Repairs and Alterations process.
3.	Review the certificate holder's Engineering/Major Repairs and Alterations process to ensure it contains the policies, procedures, instructions and information necessary for personnel to perform their duties and responsibilities with a high degree of safety.

Questions

	To meet this objective, the inspector must answer the following questions:	
1.	Does the certificate holder's Engineering/Major Repairs and Alterations process meet the specific regulatory and FAA policy requirements:	
1.1.	<p>Does the certificate holder specify that for each major repair or alteration of an aircraft, airframe, aircraft engine, propeller, or appliance, the work must be done in accordance with technical data approved by the Administrator?</p> <p>SRRs: 121.379(b)</p> <p><i>Related Design JTIs:</i></p> <p>1. The Certificate Holders manual system contain instruction for approval for return to service. Which ensures, in the case of a major repair, the work was done in accordance with technical data approved by the Administrator.</p> <p><i>Sources:</i> 121.135(b)(26); 121.379(b)</p> <p><i>Interfaces:</i> 1.1.1(AW); 1.2.1(AW); 1.2.2(AW); 1.2.3(AW); 1.3.1(AW); 1.3.2(AW); 1.3.4(AW); 1.3.7(AW); 1.3.14(AW)</p> <p>2. The Certificate Holders manual system contain instruction for approval for return to service. Which ensures, in the case of a major alteration, the work was done in accordance with technical data approved by the Administrator.</p> <p><i>Sources:</i> 121.135(b)(26); 121.379(b)</p> <p><i>Interfaces:</i> 1.1.1(AW); 1.2.1(AW); 1.2.2(AW); 1.2.3(AW); 1.3.1(AW); 1.3.2(AW); 1.3.4(AW); 1.3.7(AW); 1.3.14(AW)</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain

1.2.	Does the certificate holder's continuous airworthiness maintenance program (CAMP) contain instructions and information necessary to allow personnel to approve each of the following for return to service after a major repair or alteration has been performed: SRRs: 121.135(a)(1); 121.379(a); 121.379(b)	
1.2.1	An aircraft? SRRs: 121.379(b)	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
1.2.2	An airframe? SRRs: 121.379(b)	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
1.2.3	An engine? SRRs: 121.379(b)	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
1.2.4	A propeller? SRRs: 121.379(b)	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain <input type="checkbox"/> Not Applicable
1.2.5	An appliance? SRRs: 121.379(b)	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
1.3.	When major repairs and alterations are performed on another certificate holder's aircraft or subcomponents, does the certificate holder's manual include instructions and information necessary for allowing personnel concerned to approve for return to service any of the following for that other certificate holder: SRRs: 121.135(a)(1); 121.379(a); 121.379(b)	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain <input type="checkbox"/> Not Applicable
1.3.1	An aircraft? SRRs: 121.379(a); 121.379(b)	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain <input type="checkbox"/> Not Applicable
1.3.2	An airframe? SRRs: 121.379(a); 121.379(b)	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain <input type="checkbox"/> Not Applicable
1.3.3	An engine? SRRs: 121.379(a); 121.379(b)	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain <input type="checkbox"/> Not Applicable
1.3.4	A propeller? SRRs: 121.379(a); 121.379(b)	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain <input type="checkbox"/> Not Applicable
1.3.5	An appliance? SRRs: 121.379(a); 121.379(b)	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain <input type="checkbox"/> Not Applicable
1.4.	Does the certificate holder's inspection program and the program covering Engineering Major Repairs and Alterations ensure that each person performing maintenance, preventive maintenance, or alterations on an aircraft, engine, propeller, or appliance, uses the methods, techniques, and practices contained in the certificate holder's CAMP and maintenance manual? SRRs: 43.13(a); 121.367; 121.379	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
1.5.	Does the certificate holder's Engineering/Major Repairs and Alterations process ensure that Canadian Aircraft Maintenance Engineers do not approve for return to service major repairs or alterations?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain <input type="checkbox"/> Not Applicable

	SRRs: 43.17(e)(1)	
1.6.	<p>Does the certificate holder's Engineering/Major Repairs and Alterations process comply with the guidance contained in FAA Order 8900.1?</p> <p><i>Related Design JTIs:</i></p> <p>1. Check that the Certificate Holders has procedures to determine safety related software changes to its Line Replaceable Units (LRU) are controlled and monitored as major alterations</p> <p><i>Sources:</i> FAA Order 8900.1, Volume 6, Chapter 11, Section 19 Paragraph 6-2618, D, 1.</p> <p><i>Interfaces:</i> 1.2.2(AW); 1.3.14(AW)</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
1.7.	<p>Does the certificate holder's Engineering/Major Repairs and Alterations process comply with the guidance contained in FAA Advisory Circular 120-77?</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
2.	<p>Does the certificate holder manual contain general policies for the Engineering/Major Repairs and Alterations process that comply with the SRRs?</p> <p>SRRs: 121.135(b)(1); 43.3(d); 43.10(b)</p> <p><i>Related Design JTIs:</i></p> <p>1. Check that the Certificate Holder's manual system contains a policy, which prohibits a Canadian Aircraft Maintenance Engineer from approval for return to service of a product after a major repair.</p> <p><i>Sources:</i> 121.135(b)(1); 43.17(e)(1)</p> <p><i>Interfaces:</i> 1.2.1(AW); 1.2.2(AW); 1.2.3(AW); 1.3.1(AW); 1.3.7(AW); 1.3.14(AW)</p> <p>2. Check that the Certificate Holder's manual system contains a policy, which prohibits a Canadian Aircraft Maintenance Engineer from approval for return to service of a product after a major alteration.</p> <p><i>Sources:</i> 121.135(b)(1); 43.17(e)(1)</p> <p><i>Interfaces:</i> 1.2.1(AW); 1.2.2(AW); 1.2.3(AW); 1.3.1(AW); 1.3.7(AW); 1.3.14(AW)</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
3.	<p>Does the certificate holder's manual reference the appropriate Federal Aviation Regulations listed in the Supplemental Information section of this safety attribute inspection (SAI)?</p> <p>SRRs: 121.135(b)(3)</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
4.	<p>Does the certificate holder s manual contain the duties and responsibilities for personnel who will accomplish the Engineering/Major Repairs process?</p> <p>SRRs: 121.135(b)(2)</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
5.	<p>Does the certificate holder s manual include instructions and information for personnel to meet the requirements of the Engineering/Major Repairs and Alterations process?</p> <p>SRRs: 121.135(a)(1)</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain

SAI Section 1 - Procedures Attribute Drop-Down Menu	
1.	No procedures, policy, instructions or information specified.
2.	Procedures or instructions and information do not identify (who, what, when, where, how).
3.	Procedures, policy or instructions and information do not comply with CFR.
4.	Procedures, policy or instructions and information do not comply with FAA policy and guidance.
5.	Procedures, policy or instructions and information do not comply with other documentation (e.g., manufacturer's data, Jeppesen's Charts, etc.).
6.	Procedures, policy or instructions and information unclear or incomplete.
7.	Documentation quality (e.g., unreadable or illegible).
8.	Procedures, policy or instructions and information inconsistent across Certificate Holder manuals (FOM - Flight Operations Manual to GMM - General Maintenance Manual, etc.).
9.	Procedures, policy or instructions and information inconsistent across media (e.g., paper, microfiche, electronic).
10.	Resource requirements incomplete (personnel, facilities, equipment, technical data).
11.	Other.

SAI Section 2 - Controls Attribute

Objective: Controls are checks and restraints designed into a process to ensure a desired result. The questions in this section of the DCT are designed to assist the inspector in determining if checks and restraints are designed into the process to ensure the desired result is achieved. Controls should be written into the system to ensure that the most important policies, procedures, or instructions and information will be followed.

Controls may be in the form of administrative controls, which are secondary or supplemental written procedures. Like written procedures, administrative controls also need to provide answers to questions regarding who, what, when, where, and how. Controls may also be in the form of engineered controls, such as automated features or mechanical actions or devices (i.e., safety devices, warning devices, etc.).

Tasks

To meet this objective, the inspector must accomplish the following tasks:

1. Review the control questions below.
2. Review the certificate holder's policies, procedures, instructions, and information to gain an understanding of the controls that it has documented.

Questions

	To meet this objective, the inspector must answer the following questions:	
1.	Are the following controls built into the Engineering/Major Repairs and Alterations process:	
1.1.	Is there a control or controls in place to ensure that the certificate holder uses only FAA approved technical data for major repairs and alterations?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
1.2.	Is there a control or controls in place to ensure that the certificate holder provides a comprehensive engineering technical data package appropriate for the major repair or alteration?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
1.3.	Is there a control or controls in place to ensure that the certificate holder properly classifies repairs and alterations as minor or major?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
1.4.	Is there a control or controls in place to ensure that the the certificate holder uses the proper tools and test equipment when performing major repairs and alterations?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
2.	Does the certificate holder have a documented method for assessing the impact of any changes made to the controls in the Engineering/Major Repairs and Alterations process?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain

SAI Section 2 - Controls Attribute Drop-Down Menu	
1.	No controls specified.
2.	Documentation for the controls do not identify (who, what, when, where, how).
3.	Controls incomplete.
4.	Controls could be circumvented.
5.	Controls could be unenforceable.
6.	Resource requirements incomplete (personnel, facilities, equipment, technical data).
7.	Other.

SAI Section 3 - Process Measurement Attribute

Objective: Process measurements are used by the certificate holder to measure and assess its processes, to identify and correct problems or potential problems, and to make improvements to the processes. The questions in this section of the DCT are designed to assist the inspector in determining if the certificate holder measures or assesses information to identify, analyze, and document potential problems with the process. Process measurements are a certificate holder's internal evaluation or auditing of the most important policies, procedures, or instructions and information associated with an element.

To prevent the duplication of work, process measurements are most commonly addressed through a combination of auditing features contained in both the certificate holder's safety program/internal evaluation program (for operations and cabin safety related issues) and the auditing function of the Continuous Analysis and Surveillance System (for airworthiness or maintenance/inspection related issues). The director of safety and the quality assurance department often work together to accomplish this function for the certificate holder. This approach requires amendment of the safety program/internal evaluation program audit forms or checklists and the Continuous Analysis and Surveillance System audit forms or checklists to include the specific process measurements for each element.

Tasks

	To meet this objective, the inspector must accomplish the following tasks:
1.	Review the process measurement questions below.
2.	Review the certificate holder's policies, procedures, instructions, and information to gain an understanding of the process measurements that it has documented.

Questions

	To meet this objective, the inspector must answer the following questions:	
1.	Does the certificate holder's Engineering/Major Repairs and Alterations process include the following process measurements:	
1.1.	Is there a process measurement or process measurements that would identify if the certificate holder failed to ensure that only FAA approved technical data was used for major repairs and alterations?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
1.2.	Is there a process measurement or process measurements that would identify if the certificate holder failed to provide a comprehensive engineering technical data package appropriate for the major repair or alteration?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
1.3.	Is there a process measurement or process measurements that would identify if the certificate holder failed to ensure that repairs and alterations were properly classified as minor or major?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
1.4.	Is there a process measurement or process measurements that would identify if the certificate holder failed to ensure the use of proper tools and test equipment when performing major repairs and alterations?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
2.	Is there a process measurement or process measurements that would reveal if the certificate holder's policy, procedures, instructions, and information were not followed?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain

3.	Does the certificate holder document its process measurement results?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
4.	Does the certificate holder use its process measurement results to improve its programs?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
5.	Does the organization that conducts the process measurements have direct access to the person with responsibility for the Engineering/Major Repairs and Alterations process?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain

SAI Section 3 - Process Measurement Attribute Drop-Down Menu	
1.	No process measurements specified.
2.	Documentation for the process measurements does not identify (who, what, when, where, how).
3.	Inability to identify negative findings.
4.	No provisions for implementing corrective actions.
5.	Ineffective follow-up to determine effectiveness of corrective actions.
6.	Resources requirements (personnel, facilities, equipment, technical data).
7.	Other.

SAI Section 4 - Interfaces Attribute

Objective: Interfaces are used by the certificate holder to identify and manage the interactions between processes. The questions in this section of the DCT are designed to assist the inspector in determining whether or not interactions between the policies, procedures, or instructions and information associated with other independent processes within the certificate holder's organization are documented. Written policies, procedures, or instructions and information that are interrelated and located in different areas within the certificate holder's system must be consistent and complement each other. For the interfaces to be effectively managed, the certificate holder's system should identify and document the interfaces.

Tasks

	To meet this objective, the inspector must accomplish the following tasks:	
1.	Review the interfaces associated with the Engineering/Major Repairs and Alterations process that have been identified along with the individual questions in section 1, Procedures, of this DCT.	
2.	Review the certificate holder's policies, procedures, instructions, and information to gain an understanding of the interfaces that it has documented.	

Questions

	To meet this objective, the inspector must answer the following questions:	
	Note: The design job task items (JTIs) displayed with the questions in section 1, Procedures, of this DCT identify potential interfaces (by element number) for this element.	
1.	Does the certificate holder's system properly address the interfaces that are identified along with the questions in section 1, Procedures, of this DCT?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
2.	Does the certificate document a method for assessing the impact of any changes to the associated interfaces within the Engineering/Major Repairs and Alterations process?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain

SAI Section 4 - Interfaces Attribute Drop-Down Menu	
1.	No interfaces specified.
2.	The following interfaces not identified within the Certificate Holder's manual system:
3.	Interfaces listed are inaccurate.
4.	Specific location of interfaces not identified within the manual system.
5.	Other

SAI Section 5 - Management Responsibility & Authority Attributes

Objective: The questions in this section of the DCT address the responsibility and authority of the process. They are designed to assist the inspector in determining if there is a clearly identifiable, qualified, and knowledgeable person who is responsible for the process, is answerable for the quality of the process, and has the authority to establish and modify the process. (The person with the authority may or may not be the person with the responsibility.)

Tasks

	To meet this objective, the inspector must accomplish the following tasks:
1.	Identify the person who has overall responsibility for the Engineering/Major Repairs and Alterations process.
2.	Identify the person who has overall authority for the Engineering/Major Repairs and Alterations process.
3.	Review the duties and responsibilities of the person(s) documented in the certificate holder's manual.
4.	Review the appropriate organizational chart.

Questions

	To meet this objective, the inspector must answer the following questions:	
1.	Does the certificate holder clearly identify who is responsible for the quality of the Engineering/Major Repairs and Alterations process?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain Name/Title:
2.	Does the certificate holder clearly identify who has authority to establish and modify the policies, procedures, instructions, and information for the Engineering/Major Repairs and Alterations process?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain Name/Title:
3.	Does the certificate holder's manual include the duties and responsibilities of those who manage the work required by the Engineering/Major Repairs and Alterations process? SRRs: 121.135(b)(2)	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
4.	Does the certificate holder's manual include instructions and information for those who manage the work required by the Engineering/Major Repairs and Alterations process? SRRs: 121.135(a)(1)	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
5.	Does the certificate holder clearly and completely document the responsibility for this position?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
6.	Does the certificate holder clearly and completely document the authority for this position?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
7.	Does the certificate holder clearly and completely document their qualification standards for the person having responsibility for the Engineering/Major Repairs and Alterations process?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
8.	Does the certificate holder clearly and completely document their qualification standards for the person having authority to establish and modify the certificate holder's policies, procedures, instructions, and information for the Engineering/Major Repairs and Alterations process?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain

9.	Does the certificate holder clearly and completely document the procedures for delegation of authority for the Engineering/Major Repairs and Alterations process?	<input type="checkbox"/> Yes <input type="checkbox"/> No, Explain
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SAI Section 5 - Management Responsibility & Authority Attributes Drop-Down Menu	
1.	Not documented.
2.	Documentation unclear.
3.	Documentation incomplete.
4.	Other.