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FEDERAL AVIATION ADMINISTRATION

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National Policy

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SUBJ: Repair Specification Approval Procedures

FOREWORD

This order describes the procedures for evaluating and issuing approval for repair specifications for aircraft and aircraft parts. These procedures apply to all Federal Aviation Administration (FAA) Aircraft Certification Service (AIR) and Flight Standards Service (AFS) personnel.

This order defines the responsibilities of FAA personnel and designees involved in approving repair specifications for major repairs of aircraft and aircraft parts. It also defines the procedures that inspectors must follow when reviewing repair specifications and states what to expect from applicants seeking approval.

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Chapter 1. General Information

1. Purpose of This Order. This order defines the responsibilities of Federal Aviation Administration (FAA) personnel and designees engaged in approving new repair specifications for major repairs of civil aviation articles (aircraft, airframe, aircraft engine, propeller, appliance, or component part). It also provides a uniform methodology to review, evaluate, and approve technical data supporting independently developed specifications and assess whether the certificate holder has the appropriate housing, facilities, equipment and knowledgeable personnel to accomplish the repair properly.

a. Previous Approvals. This order is not retroactive. We will not re-evaluate previous approvals to comply with this process unless we discover obvious regulatory noncompliance. However, we will expect all new repair specifications to comply with these requirements.

b. Other Methodologies. Certificate holding organizations may continue to use other existing methodologies to obtain repair specification approval, as long as those methodologies are acceptable to the FAA and do not conflict with current FAA policy.

2. Audience. The primary audience for this order is FAA Flight Standards Service (AFS) and Aircraft Certification Service (AIR) personnel, and FAA designees authorized to approve data as required by the following parts and sections of Title 14 of the Code of Federal Regulations (14 CFR):

- Part 21,
- Part 43,
- Part 121 § 121.379(b),
- Part 135, § 135.437(b), and
- Part 145, § 145.201(c)(2).

3. Where You Can Find This Order. FAA personnel can access this order through the Flight Standards Information Management System (FSIMS) at <http://fsims.avs.faa.gov>. Operators and the public can find this order at <http://fsims.faa.gov>.

4. Effective Date. This order is effective on XX/XX/XX.

5. How This Order is Organized.

a. Responsibilities. In general, we have organized this order by the responsibilities for repair specifications held by the certificate holder, cognizant Flight Standards District Office (FSDO)/certificate management office (CMO)/International Field Office (IFO), the Aircraft Certification Office (ACO), and/or Designated Engineering Representatives (DER) granted the specific authority to manage and approve the overall engineering aspects of repair specifications.

Note: In this order, we refer to DERs with this delegation as Repair Specification Designated Engineering Representatives (RS-DER). Note that RS-DER is not a new kind of DER, but rather a shortened name for a DER with the special delegation to approve major repairs and manage repair specification approvals.

b. Flow Charts. We have divided the overall flow for creating repair specifications into three areas:

- Assessing the need for a repair specification (see appendix A),
- Developing a repair specification (see appendix B), and
- Approving repair specification data (see appendix C).

6. Regulations. FAA regulations require persons performing maintenance, preventive maintenance or alterations to use methods, techniques and practices acceptable to the FAA. See part 43, § 43.13(a). Normally, these “how-to” instructions are found in the manufacturer’s documents, such as maintenance and/or overhaul manuals, aircraft maintenance and structural repair manuals, instructions for continued airworthiness (ICA), Service Bulletins (SB), and other documents developed under the certification process. See part 21 § 21.50(b) and its referenced sections and appendices.

a. Independently Developed Methods. The regulations also allow a person performing maintenance, preventive maintenance, or alterations to perform that work in accordance with independently developed methods, techniques, and practices. See § 43.13(a).

b. Acceptability of Methods. Section 43.13(b) establishes the criteria for ensuring that methods, techniques, and practices for performing maintenance, preventive maintenance, or alterations are acceptable to the FAA. The instructions must ensure that the work and the materials used return the article to at least its original or properly altered condition.

c. Major Repairs and Alterations. To determine whether a repair or alteration is minor, it must be shown that it is not major. See 14 CFR part 1, § 1.1 for definitions of major and minor repair and alteration. When the technical data supporting a method, technique, or practice needs approval because the result is a major repair or major alteration, the FAA ensures appropriate substantiation and approval through § 21.305(d).

7. Repair Specifications. Repair specifications provide an alternative to the methods, techniques, and/or practices contained in the current manufacturer’s maintenance manual, SBs, or ICA.

a. Contents. The specification describes:

- (1) What the specific repair accomplishes,
- (2) When the repair is appropriate,
- (3) How the repair will be accomplished,

- (4) How the repair is substantiated,
- (5) How the repair will be inspected,
- (6) How the repair must be maintained, and
- (7) How the repair specification will be kept up to date.

b. Acceptable Specifications. An acceptable specification:

- (1) Results in a repeatable end state that can be evaluated to show compliance to the applicable airworthiness standards.
- (2) Provides the substantiating data for use in approving the aircraft or product for return to service.
- (3) Is a procedure not listed in the current manufacturer's maintenance manual, ICA, or FAA-approved service documents.
- (4) Is intended to be used repeatedly.
- (5) Requires FAA data approval.
- (6) Is authorized for use by the FAA for a specific maintenance entity.

8. Repair Specification Data. Data contained in a repair specification processed in accordance with this order may be used as approved data when:

- a.** The certificate holder identified on the specification title page accomplishes the repair.
- b.** The specification title page contains all required signatures.
- c.** The certificate holder's operations specifications (OpSpecs), air carrier maintenance program, or current capabilities list (CL) acceptable to the FAA authorize the specification.

9. Repair Specification Users.

a. Authorized Users. The FAA only authorizes maintenance facilities holding a part 145 certificate or operators having a maintenance program authorized by OpSpecs under part 121 or 135 to use repair specifications processed in accordance with this order. The FAA does not authorize the use of these specifications by 14 CFR part 65 mechanics or holders of an inspection authorization.

b. Repetitive Major Repairs. A repair specification is not mandatory, but it is the only method a certificated maintenance organization may use to obtain FAA approval of field-developed repair data intended for continuous repetitive use applications. Since the repairer must perform each major repair in accordance with applicable FAA-approved technical data, a major repair performed repetitively may require the data to be evaluated and approved each time the repair is performed. An approved repair specification will eliminate the need for repetitive

approvals. Inspectors should advise maintenance facilities that perform or intend to perform recurring repairs that are not contained in the manufacturer's maintenance documents to consider developing a repair specification.

c. Advantages. The advantage of a repair specification is that it allows the maintenance provider to perform work without having to obtain FAA-approved data for every identical repair. It also helps the maintenance provider to plan for and operate under a consistent method authorized by the FAA. This helps to ensure the repair facility has consistent quality in its repairs, reduces demand on FAA resources, and improves efficiency.

d. FAA-Approved Technical Data. A repair specification is appropriate when the maintenance provider does not or can not use FAA-approved technical data for the major repair of an article because:

- (1) The instructions don't exist.
- (2) The instructions are not available.
- (3) The applicant wants to deviate from the established instructions.

(4) The existing instructions are not appropriate for the article. For example, the article was previously repaired or altered and the instructions assume the article was not previously repaired or altered.

10. The Difference Between a Repair Specification and a Process Specification. For the purposes of this order, the two terms are distinguished as follows.

a. Repair Specification. A repair specification:

(1) Describes how the repairer will manage a repair from the point the article is received by the facility authorized to use the repair specification to the point the article is approved for return to service.

(2) Is a method, technique, or practice for accomplishing a repair that is not included in the manufacturer's document (maintenance or overhaul manual, ICA, SB, etc.). It may vary from adding or substituting a particular manufacturer-recommended action to developing complete overhaul instructions for an article. One specification may contain information on accomplishing a complete repair action.

(3) Includes step-by-step "how to" instructions for performing the repair. This type of specification is referred to by many names, including "repair specifications," "repair procedures," and "maintenance specifications."

(4) May incorporate by reference one or more process specifications.

b. Process Specification. A process specification:

(1) Is a written methodology or standard for completing a specific requirement of the step-by-step (how to) instructions contained in a manufacturer's maintenance manual, ICA, an air carrier or commercial operator's Continuous Airworthiness Maintenance Program (CAMP), or an independently developed repair specification. These specifications typically include methods or standards for accomplishing welding, heat treating, plasma spraying, and other standard processes referenced in repair instructions.

(2) Is generally more detailed than a repair specification, but has broader application than a repair specification.

(3) By itself is not adequate to meet the requirements of this order, because it is not evaluated and limited to a particular article. Repair specifications may reference or incorporate process specifications. Examples include:

- American Society for Testing and Materials (ASTM) B 0244, Eddy Current Inspection of Coatings;
- American Welding Society (AWS) D1.1, Structural Welding Code;
- Society of Automotive Engineers (SAE) AMSP81728, Plating, Tin-Lead (Electrodeposited);
- MIL-S-13165A, Shot Peening of Ferrous Metal Parts;
- AWS C2.23M/C2.23:2003, Specification for the Application of Thermal Spray Coatings (Metallizing) of Aluminum, Zinc, and Their Alloys and Composites for the Corrosion Protection of Steel; and
- Process specifications the applicant has developed for use in conjunction with and in support of a repair specification.

(4) Is typically not approved by the FAA as an independent specification because of its general applicability and recognition as an industry standard. Process specifications are evaluated and approved as an integral part of the repair when referenced within the repair specification.

11. How a Repair Specification is Approved.

a. Approval Authorities. The approval process normally includes a joint evaluation of the repair specification by the FSDO/CMO/IFO and the ACO or RS-DERs.

b. Approval and Authorization. Except as provided below, the ACO (or RS-DER) completes data approval and the FSDO/CMO/IFO grants the authorization for use. Repair specification approval is indicated when both groups have signed the repair specification title page and the specification is authorized. Specifications will be authorized in the certificate holder's OpSpecs, or in a current CL acceptable to the FAA. For an air carrier, the specification is authorized in the air carrier's maintenance program.

Note: See the current edition of FAA Order 8100.15, Organization Delegation Authorization Procedures, for information to allow those organizations and personnel properly authorized and qualified under the Organization Designation Authority (ODA) Program to use this order.

c. Simple Repairs. The FSDO/CMO/IFO can choose to accept the repair specification without engineering review for simple repairs (see chapter 2, paragraphs 6 and 7). For these repairs, the aviation safety inspector (ASI), with management concurrence, must determine that the scope and detail of the repair is well within his/her experience and expertise and follows the guidelines of Order 8900.1, Volume 4, Chapter 9, Section 1.

d. Required Signatures. In no case is the repair specification considered authorized when only the ACO or RS-DER has signed it. All repair specifications must also be signed by the responsible FSDO/CMO/IFO and then authorized in the certificate holder's OpSpecs, air carrier's maintenance program, or a current CL acceptable to the FAA.

e. Additional Information. See chapter 2, paragraphs 9 and 10; and chapter 3, paragraph 5 for more information on authorizing the repair specification.

12. Roles of the FAA and the Applicant. See the items below and Figure 1-1 that follows.

a. Applicant. The applicant is responsible for:

(1) Contacting the geographically responsible FSDO/CMO/IFO to plan the repair specification when the applicant desires or the FAA recommends.

(2) Developing the repair specification and ensuring that it addresses all elements identified in chapter 2, paragraph 4.

(3) Determining if the proposed repair affects compliance with any existing Airworthiness Directives (AD).

(4) Substantiating the validity and applicability of the repair specification.

(5) Submitting the repair specification for data approval.

(6) Correcting deficiencies in the repair specification prior to FAA authorization.

(7) Providing a list of any parts fabricated to complete the repair. This includes the method of identifying those parts.

(8) Ensuring the specification remains current and applicable for its intended purpose.

(9) Using the repair specification within the limitations of its authorization.

Note: Appendices A and B of this document contain applicant responsibility flowcharts. Appendix A provides guidance to assess the need for a repair specification. Appendix B will assist the applicant in developing a repair specification.

b. FAA. The FAA is responsible for:

- (1) Working with the applicant during the planning phase, when necessary.
- (2) Coordinating between offices within the FAA during planning and evaluation of the repair specification.
- (3) Evaluating the applicant's capability to use the repair specification.
- (4) Evaluating and approving the substantiating data supporting a certificate holder's repair specification. Appropriately authorized designees may accomplish this step unless the specification will result in a major repair or alteration to a critical/life-limited article. In this case, the ACO must review and approve the specification and substantiating data .

13. Proprietary Information. The applicant's repair specification may include proprietary information or trade secrets. In general, proprietary information is private property and is not readily available to the public. Release of proprietary information could result in competitive harm to the applicant. Do not share proprietary information with anyone outside the FAA without written consent of the owner.

Figure 1-1. Roles of FAA and Applicant in Repair Specifications

Applicants:	FSDO/CMO/IFOs:	ACOs:	DERs:
<ul style="list-style-type: none"> • Determine if a repair specification is appropriate. • Contact the FSDO/CMO/IFO for planning repair specifications. • Develop repair specification. Include all applicable elements identified in ch. 2, par. 4. • Develop data to substantiate repair specification. • Utilize DERs as needed to support repair specification substantiation. • Submit proposed repair specification to the geographically responsible FSDO/CMO/IFO. • Maintain capabilities in order to use authorized repair specification. • Perform periodic review of repair specification and revise as needed. • See app. A and B for more details. 	<ul style="list-style-type: none"> • Ensure compliance with regulations, programs, standards, and procedures on issuing authorization for repair specifications. • Help applicant in planning repair specification. • Evaluate applicant's capability to use repair specification. • Coordinate as needed with ACO for technical review and approval of data used to substantiate repair specification. • Issue or deny the repair specification authorization. • See ch. 2 and app. C flowchart for more details. 	<ul style="list-style-type: none"> • Evaluate and approve (or delegate) test plans and witness (or delegate) tests at their discretion. • When requested by FSDO/CMO/IFO, evaluate and approve data used to substantiate repair specifications. • Approve the engineering aspects of repair specifications, when adequate. • Evaluate and approve, when adequate, all repair specs affecting life-limited or critical parts. • Evaluate and approve qualified DERs as RS-DERs. • See ch. 3 for more details. 	<ul style="list-style-type: none"> • When appropriately authorized by ACO: <ul style="list-style-type: none"> ○ Evaluate and approve test plans and witness tests. ○ Evaluate and approve data used to substantiate repair specifications. • When authorized as RS-DERs, approve the engineering aspects of repair specifications, when adequate. • See ch 3 for more details.

14. Acronyms. See appendix D, List of Acronyms.

15. Definitions. See appendix E, Definitions and Terms.

16. Related Publications. See appendix G, Related Publications.

17. Suggestions for Improvement. If you find any deficiencies, need clarification, or want to suggest improvements to this order, send a copy of FAA Form 1320-19, Directive Feedback Information, (in writing or electronically) to the Flight Standards Service, Technical Information and Communications Programs Branch (AFS-140), Attention: Directives Management Officer. Form 1320-19 is on the last page of this order. You also may send a copy to the Aircraft Maintenance Division (AFS-300), Attention: Comments to Order 8300.14. Always use Form 1320-19 to follow up each conversation.

18. Records Management. See your office's Records Management Officer or Directives Management Officer for guidance on keeping or disposing of records, or refer to the current editions of the following FAA orders:

- Order 0000.1, FAA Standard Subject Classification System;
- Order 1350.14, Records Management; and
- Order 1350.15, Records, Organization, Transfer, and Destruction Standards.

19. Distribution. Distribute this order to the branch level in Washington headquarters, branch levels of AFS and AIR; the branch levels of the regional Aircraft Certification Directorates; the Brussels Aircraft Certification Staff; all ACOs and all FSDOs/CMOs/IFOs.

Chapter 2. Flight Standards Certificate-Holding District Office (FSDO/CMO/IFO) Responsibilities

1. General Responsibilities. The Flight Standards District Office (FSDO)/certificate management office (CMO)/International Field Office (IFO) has several responsibilities for repair specifications. In general the responsible aviation safety inspector (ASI) at the FSDO/CMO/IFO:

- Coordinates all activity concerning the repair specification authorization within the Federal Aviation Administration (FAA),
- Provides guidance to the applicant during planning,
- Reviews the applicant's proposed repair specification,
- Coordinates with the Aircraft Certification Office (ACO) as needed,
- Evaluates the applicant's capabilities, and
- Authorizes or disapproves the repair specification.

2. Coordinate All Activity within the FAA. The responsible ASI should plan and coordinate all aspects for the evaluation of the proposed repair specification within the FAA. Instruct the applicant to direct all project correspondence to the ASI at the FSDO/CMO/IFO where the application was submitted. Likewise, the assigned ASI should be the only person within the FAA communicating directly with the applicant, unless the assigned ASI determines otherwise. By only communicating with one point of contact, the applicant avoids getting conflicting guidance from multiple FAA representatives.

3. Provide Guidance to Applicant When Applicant Requests to Use a Repair Specification.

a. Formal Planning Phase. We recommend a formal planning phase to coordinate and evaluate the applicant's proposal with the FAA. This process can be beneficial in obtaining FAA data approval and authorization to use the specification in an efficient and timely manner. We particularly recommend a planning phase when:

- (1) It is the first time the applicant is applying for approval of a proposed repair specification,
- (2) The applicant expects to submit repair specifications frequently,
- (3) The proposed repair specification will involve a complex repair,
- (4) The proposed repair specification will involve a critical part, or
- (5) The applicant will use complex techniques or equipment for the first time.

b. Areas for Discussion. The planning phase can be done in a manner that works best for the FAA and the applicant, but we recommend that they meet to ensure all issues are adequately

addressed and understood. When planning the development and approval of a repair specification with the applicant, you should typically address the following:

- (1) Verify that a repair specification is appropriate for the proposed repair.
- (2) Establish primary points of contact (POC) for the applicant and FSDO/CMO/IFO.
- (3) Briefly explain the approval process and what the applicant can expect.
- (4) Discuss the proposed repair specification (use paragraph 4 for topics).
- (5) Discuss applicant's capability to use the proposed repair specification. This is an informal discussion to ensure the applicant has considered any unique qualifications or capabilities that may be required to accomplish the proposed repair.
- (6) Assess the need for ACO involvement versus using a Repair Specification Designated Engineering Representative (RS-DER). The applicant should understand that each Designated Engineering Representative's (DER) authority may be different and is identified on the DER's letter of authorization. The FSDO/CMO/IFO may want to get support from the ACO for the meeting.
- (7) Determine if testing will be necessary to substantiate the repair specification. If formal testing is required, ask:
 - Who will approve test plan(s)?
 - Who will conform test article(s)?
 - Who will witness test(s)?
 - What are the pass/fail criteria?
- (8) Ensure the certificate holder establishes a coordinated schedule for all activities necessary to ensure the repair specification provides the step-by-step instructions in a consistent and repeatable manner.
- (9) Schedule a follow-up planning meeting if necessary. Request the applicant to develop a summary of the meeting and submit it to the FSDO/CMO/IFO for review, comment, and concurrence. This is not required, but can help eliminate any misunderstandings of expectations, roles, and responsibilities.

4. Review the Applicant's Proposed Repair Specification. The ASI must review the applicant's submittal to make sure it meets the definition of a repair specification as outlined in chapter 1. The ASI will also determine if a repair specification is warranted and the applicant is eligible in accordance with this order. The specification should include and appropriately address the following areas:

a. Applicant Information. The repair specification must list the applicant's name, address, and relevant operating certificates and ratings for maintenance activities. We recommended that the applicant place this information prominently on the title (cover) page. This information should be on the same page as the required signatures. See the sample title page in appendix F for an example.

b. Purpose. The applicant should provide a general description of the repair. The description can include the anticipated condition of the part or aircraft before it's repaired, a simple explanation of the procedure to be followed, and the expected outcome of the part or aircraft when the procedure is followed. We recommend that the applicant briefly explain general limitations or applicability.

c. Scope. Expect applicants to describe in detail how, when, and where the repair described in the "Purpose" is appropriate and applicable to the product or article. Define the specific application, product eligibility, and limitations of the repair specification. For example, list:

(1) All Original Equipment Manufacturer (OEM) part numbers covered by the repair specification.

(2) The part numbers of the higher assembly when the repair specification covers the repair of articles that will be integrated into a higher assembly.

(3) The eligibility of the repair by article make and model or part number as applicable.

(4) Any limitations resulting from the article being repaired in accordance with the repair specification. As an example, a repair specification developed for the repair of safety belts might stipulate that the repaired belts are for use only on 9g static seats and that the repair specification is not adequate for repairing belts to be used on 16g dynamic seats.

(5) The applicable sections of Title 14 of the Code of Federal Regulations (14 CFR) (e.g., specific airworthiness regulations) that will be met when the repair specification is followed. DERs, when involved, are required to make a compliance finding to certification rules.

(6) Critical parts, as determined by the design approval holder. Typically, such components include parts for which a replacement time, inspection interval, or related procedure is specified in the Airworthiness Limitation Section (ALS) of the manufacturer's maintenance manual or instructions for continued airworthiness (ICA).

(7) A list of any existing applicable Airworthiness Directives (AD) and notice of proposed rule-making (NPRM) proposed ADs that the repair may affect.

(8) A list of any parts that will be fabricated to complete the repair. Persons who want to fabricate parts under a repair specification need to establish a quality control system for making those parts. Parts fabricated under a repair specification are to be consumed within the repair and can not be sold independent of the repair. Parts sold independent of the repair must be approved and manufactured in accordance with 14 CFR part 21, § 21.303. See the current edition of Advisory Circular (AC) 43-18, Fabrication of Aircraft Parts by Maintenance Personnel, for additional information.

d. Capabilities. Applicants should describe their ability to perform the necessary components of the repair specification successfully. This should typically include the expertise, skills, personnel, tools, facility requirements, material handling, storage requirements, and other factors necessary to follow the proposed repair specification. Applicants should not describe their current capabilities, but rather what is necessary to implement the repair specification successfully.

e. Procedure. The applicant must list the detailed step-by-step instructions that it will follow to perform the repair. The instructions should include all necessary steps, from receiving and inspecting the article or product to final test and/or inspection before return to service.

(1) The instructions should be sufficient in detail and clarity to get the expected result when qualified personnel follow them. For example, when it is necessary to eliminate sharp edges from a part, an instruction like “break all edges” is subjective and may not be adequate. An instruction like “all exposed edges must have a minimum 0.2 in radius” provides a standard, measurable result.

(2) The repair specification can reference documents not included in the instructions, but those documents must be available to the person(s) performing the repair per the repair specification. The applicant must submit the referenced documents with the application for repair specification for review by the FAA, unless the FAA determines they are not needed. These documents are typically industry process specifications, standards, or documents previously accepted or approved by the FAA (e.g., quality control procedures for material receiving, inspection, and storage).

(3) The procedures should include all metrics testing and inspection done in the course of each repair. The repair specification must also provide instructions for the proper disposition of repairs that fail any test or inspection and how to manage failed articles to ensure they are not installed in a product or next higher assembly for return to service.

(4) Include in the repair specification procedures for marking the article so that the repair can be identified. Refer applicants to AC 43-18 for guidance on marking articles fabricated for use within the repair.

f. Metrics. The repair specification should include instructions for inspecting and/or measuring the repair on the article to ensure the repairer achieves the expected result when following the repair specification. Metrics can include physical measurements, visual inspection, nondestructive testing, functional tests, procedural controls, and other methods to ensure the repairer achieves the desired result.

g. Substantiation.

(1) Data. Include in the repair specification a list of data used to substantiate the repair specification. The data may consist of drawings, test plans, test reports, analysis, and other documents that validate the methodology of the repair specification. The applicant is not required to include the actual data in the repair specification, although the applicant must submit it as part of the repair specification application. If the applicant chooses to include the actual substantiating data in the repair specification, the applicant should attach it as an appendix.

(2) Inspections. In some cases, the RS-DER or ACO may not be able to find compliance with the regulations by a review of drawings, tests, and/or analysis alone. The RS-DER or ACO may request the ASI to inspect the repaired article for fit, form, or function to validate that the repair specification meets the requirements of a specific airworthiness regulation. For example, a repair specification that repaired safety belts might require a physical test and inspection to ensure the repaired belt, including the shackle and retention clip, can be easily attached to the seat's safety belt anchor point to minimize inadvertent false attachments (i.e., shackle hooks anchor point but retention clip fails to properly close).

h. ICA. The developer of the repair specification must determine if the repair affects the ICA or existing maintenance requirements of the affected article. Major repairs may require a change in existing maintenance requirements or inspection intervals. For example, a major structural repair such as a repair to a static engine component could influence the life limits on critical rotating parts and need more frequent inspection. It is rare that a repair that restores an article to its original or properly altered condition has an affect on the ICA. However, this determination should be performed with special consideration of the repair falling into an alteration category, which is beyond the scope of this order.

(1) The repair specification must address whether or not the existing ICA are adequate and clearly state that finding.

(2) If the existing ICA are inadequate because of the proposed repair, the repair specification must contain the appropriately revised ICA. These revised ICA become part of the repair specification. Process subsequent revisions to the ICA in accordance with the repair specification revision process.

i. Periodic Review of Repair Specification. Expect the applicant to include a requirement for periodic review of the specification. The review process can either be defined in the repair specification or defined in a separate document. When a separate document is used, reference the document in the repair specification. The periodic review should include the following:

(1) Review any new applicable FAA guidance material, revise the repair specification, and submit it for approval if changes are necessary.

(2) Seek service experience of the repairs to ensure the original repair specification is adequate for meeting all applicable sections of 14 CFR. If service experience shows that the repair specification needs revision, the revision must be authorized before implementing those changes.

(3) Monitor future ADs to ensure AD compliance requirements do not supersede or conflict with the approved repair specification. The review process can either be defined in the repair specification or defined in a separate document. When using a separate document, reference the document in the repair specification.

Note: The operators manual or maintenance program typically addresses continuous operational safety requirements. In any case, the repair specification should clearly identify the method of compliance.

j. Incomplete Application. Notify the applicant when information or data is incomplete or inadequate for the ASI (or other FAA representatives evaluating the application) to make a determination. Ask the applicant to supply the missing information or supplement the inadequate information. When the applicant does not comply with the request in a reasonable amount of time (we suggest 30 days), return the repair specification unsigned with all data supplied by the applicant, unless you have agreed upon other arrangements. This will help maintain currency of previously evaluated information as well as provide the applicant with the project status. The applicant can resubmit the proposed repair specification to the FAA when the deficiencies are corrected.

k. Alteration and Not a Repair. If you determine that the proposal is actually an alteration, you must not approve the repair specification. Inform the applicant that the proposal is beyond the scope of a repair specification, provide the rationale, and return the application package.

Note: Some repairs may result in an alteration. For example, a replacement part necessary to complete the proposed repair may be unavailable; however, the OEM supplies a new improved replacement part with instructions to change the repaired article's part number. If the proposed specification is clearly intended to repair the article, yet a minor alteration occurs as a result of the repair, the specification may be processed in accordance with this order. The specification must contain or reference the methods techniques and practices acceptable to the FAA which will be used to accomplish the minor alteration.

5. Service History Considerations. Review of the service history is essential when developing a repair for an aircraft article. The ASI should:

a. Subject to AD or Accident Causal Factor. Verify that any article addressed in the proposed repair specification is neither subject to an AD or a causal factor in an accident. Consult the Certificate Management Aircraft Certification Office (CMACO) with regulatory responsibility for the article involved when the ASI cannot make this determination.

b. Continued Airworthiness Problems. Verify the article is free of continued airworthiness problems.

c. Potential Unsafe Condition. Follow the guidelines below if an article has a potential unsafe condition and the proposed repaired article has a similar design (coordinate with the ACO as needed):

(1) Reject the repair specification application if an existing AD removes the associated type certificate (TC) holder's article from service immediately or in the future.

Note: You must process repair specifications submitted in support of an alternative method of compliance (AMOC) in accordance with the AD AMOC instructions and 14 CFR part 39, § 39.19.

(2) Consider a delay in processing or rejecting the repair specification application if an AD is being discussed or developed that would remove the TC holder's article from service.

Direct repair specifications submitted in support of a solution to an AD to the party developing the AD for their consideration.

(3) If the TC holder's article is under investigation for an incident or accident, delay processing the repair specification application until the article is cleared.

(4) Reject the repair specification application if an AD calls for repetitive inspections without setting a terminating corrective action (for example, modification or replacement of the article). Also, reject the repair specification application if the intent of repetitive inspections is to detect potential failures before reaching a published service life.

(5) If the article is having service difficulties and the FAA is actively pursuing corrective action (that is, a design change per § 21.99) with the TC holder, reject the application for the repair specification. If a service history review reveals problems, consult the CMACO for a status of corrective action, if any, of the article.

(6) Consult the FAA Service Difficulty Reporting Subsystem (SDR) database (<http://av-info.faa.gov/sdrx/>) and the TC holder's product support as necessary for service difficulties of the article.

6. Coordinate with the ACO for Engineering Support.

a. No RS-DER Signature. When the FSDO/CMO/IFO receives a proposed repair specification that an RS-DER has not signed, the FSDO/CMO/IFO should ask the ACO to evaluate the repair specification. Before sending it to the ACO:

(1) Verify that the proposed repair specification adequately addresses each of the areas identified in paragraph 4.

(2) Verify that the article or aircraft repair area has no known service history issues.

b. RS-DER Signature. When the FSDO/CMO/IFO receives a proposed repair specification that an RS-DER has signed, the ACO evaluation is not required. The FSDO/CMO/IFO will continue the authorization process and assess the applicant's capabilities per paragraph 8. If questions arise concerning the RS-DER's authority, the FSDO/CMO/IFO may contact the ACO or verify the designee's authority in the Designee Information Network (DIN).

c. Simple Repair Specifications. The FSDO/CMO/IFO may choose to authorize simple repair specifications without obtaining an engineering review and approval from a RS-DER or ACO. In this situation, the ASI is accepting responsibility for the data and all engineering review normally done by the RS-DER or the ACO. Authorizations for simple repair specifications require concurrence of the ASI's supervisor. See paragraph 7 for more details on FSDO/CMO/IFO data approvals.

d. Comprehensive Engineering Evaluation. The FSDO/CMO/IFO can expect the RS-DER or the ACO to make a comprehensive engineering evaluation of the repair specification to ensure compliance with all applicable portions of the Code of Federal Regulations (CFR). This includes evaluating any interaction between different engineering disciplines that the

applicant may have overlooked. For example, if the applicant relied on DERs with individual categorized authorizations only, there may not have been an evaluation of the integration of the repair as a whole. See chapter 3, paragraphs 3 and 4 for more information on engineering reviews.

e. Critical Parts. FSDO/CMO/IFOs must forward all repair specifications affecting critical parts to the ACO for evaluation.

Note: Both the ACO/RS-DER and the FSDO/CMO/IFO normally accomplish review of the technical data used in a repair specification. Repair specification approval is indicated when the specification title page contains all required signatures, and the specification is authorized in the certificate holder's operations specifications (OpSpecs), air carrier maintenance program, or current capabilities list (CL) acceptable to the FAA.

7. FSDO/CMO/IFO Data Approvals. A primary objective of this order is to ensure that proper engineering evaluation occurs for all repair designs. We expect that RS-DERs or an ACO will complete most data approvals supporting compliance with airworthiness standards. In cases where the applicant is requesting repair specification approval for a repair otherwise eligible for field approval, the ASI may, with their supervisor's concurrence, approve data within his/her authority and expertise to expedite the processing of the repair specification. See Order 8900.1, Volume 4, Aircraft Equipment & Authorization, for further information on determining this authority. The ASI:

- Approves data by signing the repair specification FSDO/CMO/IFO acceptance statement.

Note: ASIs should be aware that by approving the repair specification without an ACO or RS-DER signature, they are accepting responsibility for its content. The ASI should enter "N/A" (i.e., Not Applicable) on the ACO/RS-DER signature line.

- Must review chapter 3, paragraph 3 for guidance on evaluating the data for approval.
- Must ensure that the applicant has met all applicable CFRs and the data used to substantiate compliance to those CFRs is applicable and adequate.
- Should be aware that by signing the repair specification and approving the engineering data in the repair specification, the inspector assumes the responsibility that an RS-DER or the ACO would otherwise have for the repair design.
- Should not approve data if uncertain of applicable CFRs or has questions about the adequacy or applicability of the substantiating data.
- Approves the repair specification, provided he/she has completed FAA Academy Course 21811, Aircraft Alterations and Repairs.
- Must only approve data within the ASI's authority provided in Order 8900.1.

- Must have supervisor's concurrence.

8. Evaluate the Capabilities of the Applicant to Make the Repair. After the FSDO/CMO/IFO, the ACO, or the RS-DER has determined that the proposed repair specification has adequate substantiation and will result in a proper repair, the ASI must evaluate the applicant to determine if they have the capability to make repairs in accordance with the repair specification. This evaluation includes assessing the applicant's housing and facilities, equipment, personnel, and parts and material control used to make repairs in accordance with the repair specification. The ASI's confirmation of the applicant's capabilities is a critical step in the repair specification approval process. It must be completed before the ASI signs the repair specification. Applicants may be either a 14 CFR part 145 certificated repair station or an operator with a maintenance program authorized by OpSpecs under 14 CFR part 121 or 135 (see chapter 1, paragraph 9).

Note: The ASI can perform this evaluation up front or concurrent with the process; however, the ASI should evaluate the final acceptance criteria before the specification is signed and authorized.

a. Certificated Repair Station. When evaluating a repair specification submitted by a part 145 certificated repair station, the ASI should prepare to inspect the applicant by reviewing:

- (1) The proposed repair specification.
- (2) Title 14 CFR parts 43 and 145.
- (3) Repair station manual (RSM)/Quality Control Manual (QCM).
- (4) Safety Performance Analysis System (SPAS).
- (5) FSDO/CMO/IFO file.

b. Operators. When evaluating a repair specification submitted by an operator with an authorized maintenance program under part 121 or 135, the ASI should prepare to inspect the applicant by reviewing:

- (1) The proposed repair specification.
- (2) Title 14 CFR part 43 and the CFR part the operator holds a certificate under (e.g., part 121, 135).
- (3) Applicant's operations or quality manual.
- (4) SPAS.
- (5) FSDO/CMO/IFO file.

c. Ability to Perform the Repair. When evaluating the applicant's ability to perform the repair, the ASI should consider the following:

(1) The applicant must be properly rated or authorized to perform the repair. Repair stations may need to apply for an additional rating or authorization, and/or require a change to their existing OpSpecs before performing the repair.

(2) The applicant must have sufficient housing and facilities to accommodate the work associated with the repair specification.

(3) The applicant must have the tools, equipment, and materials identified in the repair specification when performing the repair. Tools and equipment requiring calibration should be calibrated in accordance with the repair station's or operator's calibration procedures.

(4) The applicant must have the documents and data required to complete the repair. This includes any documents or data referenced in the repair specification. Documents such as travelers or inspection records created by the applicant to track and record the repair should clearly identify the article and any required inspections.

(5) Evaluate the applicant to ensure it has a sufficient number of employees with the training or knowledge and experience necessary to supervise, inspect, and perform the repair.

d. Demonstration. The ASI may ask the applicant to demonstrate the repair process, particularly for complex repairs, repairs affecting life-limited or critical parts, or first time repair specification authorizations.

9. Authorize or Reject the Repair Specification.

a. Authorize the Repair Specification. After the ASI has determined that the repair specification is acceptable and the applicant can make repairs as prescribed in the specification, the ASI should indicate acceptance by signing the repair specification. See paragraph 10 for details. The repair specification will also need to be listed in the certificate holder's OpSpecs or current CL acceptable to the FAA before the certificate holder uses the specification as the basis to approve an article for return to service. For an air carrier, the specification must be authorized in the air carrier's maintenance program.

b. Reject the Repair Specification. If the repair specification does not meet all applicable requirements, notify the applicant and return the applicant's data package. This notification must include the reason(s) for denial. Give the applicant the opportunity to make corrections as necessary. Do not authorize use of the repair specification until the applicant corrects the deficiencies.

10. Signatures Required in the Repair Specification. The repair specification must include the information listed below. This information should be on the title page (see appendix F).

a. Certificate Holder's Authorized Representative. Name, title, and signature of the certificate holder's authorized representative, and the date the document is signed. This signature signifies the applicant:

(1) Verified the repair will return the article to an airworthy condition.

(2) Will not deviate from the repair specification without seeking authorization from the FAA, unless the deviation is minor.

b. RS-DER or ACO Representative. Name, title, and signature of the RS-DER or the ACO representative and the date the document is signed. This signature signifies the RS-DER or ACO has approved the engineering aspects of the repair specification. RS-DERs should include their DER's identification number.

c. FSDO/CMO/IFO Representative. Name, title, and signature of the FSDO/CMO/IFO representative and the date the document is signed. This signature signifies the repair described meets applicable maintenance CFRs and authorizes the certificate holder identified on the title page to use the specification upon being listed in the certificate holder's OpSpecs, air carrier maintenance program, or current CL acceptable to the FAA.

d. Signature Locations. All signatures should be on the same page (see appendix F). When changes occur to an existing repair specification, all parties authorizing the change must sign a new title page indicating the revision level. The applicant retains the original title page for authentication of the previous data acceptance.

Note: Appendix F contains a sample title page showing all required statements and signatures.

11. Statements Required in the Repair Specification. Include the statements below prominently in the repair specification.

a. Changes to the Repair Specification. Include the following statement on the title page: "Changes to the Repair Specification. The FAA must authorize any change to the repair specification before the applicant implements the change. The repair specification holder must submit all substantiating data to support the proposed change. Minor changes that do not differ from the previously approved engineering data and having no bearing on safety are permitted, provided the FSDO/CMO/IFO is notified of the change."

b. Fabricating Parts. Include the following statement in the body of repair specification: "Persons desiring to fabricate parts under a repair specification must establish a quality control system for making those parts. Parts fabricated under a repair specification are to be consumed within the repair and can not be sold independent of the repair. Parts sold independent of the repair must be approved and manufactured in accordance with § 21.303."

Note: See AC 43-18 for more information on fabricating parts for use in a repair.

Chapter 3. Aircraft Certification Office and Designated Engineering Representative Responsibilities

1. Purpose of This Chapter. This chapter defines the FAA's engineering responsibilities. The Aircraft Certification Office (ACO) can accomplish these responsibilities or can delegate them to Repair Specification Designated Engineering Representatives (RS-DER) (see chapter 1, paragraph 5).

2. Support the Flight Standards District Office (FSDO)/Certificate Management Office (CMO)/International Field Office (IFO)/Applicant.

a. Review Data. At the request of the FSDO/CMO/IFO, an ACO reviews the applicant's proposed repair specification and substantiating data to determine if the repaired article will meet the applicable airworthiness standards after the repair is accomplished. Likewise, an applicant may employ one or more DERs to perform the repair specification review and engineering data approval function. During this review, the ACO or RS-DER(s) should:

(1) Evaluate the service history of the original article and any corrective actions involving design change.

(2) Verify the eligibility for installation on type certificated (TC) products.

(3) Verify the repair specification meets airworthiness requirements applicable to the TC product subject to repair.

(4) Verify the repair data is adequate to fabricate any part(s) consumed in the repair, if needed.

(5) Review all differences between the original part and the repaired part. Assess the technical justification for these differences and associated impacts on the next higher assembly and product.

(6) Review and approve test plans and reports at your discretion. RS-DERs may perform these functions if specifically delegated.

(7) Ensure the applicant's substantiating data shows compliance with applicable airworthiness standards.

b. Critical Parts.

(1) Determine whether or not the repair specification affects critical parts. If the applicant did not identify the repair specification as affecting critical parts, inform the FSDO/CMO/IFO. If an RS-DER is managing the project, he or she must notify the ACO in accordance with the appropriate guidance. The FSDO/CMO/IFO must then notify the applicant and arrange for further discussion, if necessary, between the applicant and the Federal Aviation Administration (FAA) to resolve the issue.

(2) The ACO must evaluate all repairs to critical parts. RS-DERs may support the substantiation of the repair specification; however, the ACO must evaluate any repair to critical parts (see appendix E).

(3) Coordinate proposed repair specifications for critical parts with the Certificate Management Aircraft Certification Office (CMACO) to verify that repair data is complete before approving the engineering aspects of the repair specification.

3. Evaluate the Data Package. Review chapter 2, paragraph 4 to see what should be in an applicant's repair specification and data package. Ensure all applications include detailed repair design data adequate to show compliance with the applicable portions of the Code of Federal Regulations (CFR). The data package can include, but is not limited to, the following:

a. Drawings and Specifications. Applicants should provide copies of their drawings and specifications that show the configuration of the repaired part or product. These drawings and specifications should address dimensions and tolerances, materials, and processes that define the structural strength and design characteristics of the repaired article. The required information for some repaired articles may include:

- Routing sheets,
- Tooling requirements,
- Process sheets,
- Material handling and storage, and
- Inspection requirements the FAA deems necessary.

(1) When the applicant will fabricate parts for use in the repair, carefully review source control drawings to determine if the applicant has proper control over a fabricated article's configuration and fabrication. Ensure the applicant submitted all applicable detail drawings and specifications. These drawings and specifications are needed when evaluating the sources listed on source control drawings.

(2) Establish that the applicant has submitted sufficient data to fabricate conforming articles before issuing approval of the engineering aspects.

b. Test Plans and Test Results. The applicant may need to perform tests to demonstrate that a repair done in accordance with the repair specification will result in the repaired article complying with the applicable airworthiness standards. Testing ranges from functional to component to flight. Simple, noncritical parts may need little or no testing. When testing is required that the FAA chooses to witness, the applicant must develop a test plan approved by the FAA or an RS-DER.

(1) The test plan:

- (a) Describes the purpose of the test.

(b) Lists the specific airworthiness standards and a description of how the applicant expects to show compliance.

(c) Is used to ensure orderly and complete testing is accomplished, and typically includes sections on:

- Test safety control,
- Control of test procedures, and
- Test conditions and duration.

(d) Describes the items to be tested and lists all equipment necessary to conduct the test, and typically includes sections on:

- Physical and functional description of the test article and setup,
- Number of test units, and
- Test unit identification.

(e) Describes how to calibrate the equipment (when calibration is required) and approve it before the test.

(f) Describes the instrumentation and equipment necessary to measure and record the results of the test.

(g) Lists required conformities of the test article and test setup.

(h) Includes a test procedure written in a step-by-step format.

(i) Defines the pass/fail criteria.

(j) Describes who will witness the test.

(2) The test results report describes:

(a) Any deviations from the test plan for the test setup and their effect on the test.

(b) How and when the test equipment was last calibrated.

(c) Any nonconformities found with the test article(s) and their effect on the test.

(d) Any deviations from the test plan for the step-by-step test procedure and their effect on the test.

(e) The performance of the test article using observation, post-test inspection, physical measurement, electronically recorded data, photos, video, etc.

(f) Whether or not the test article(s) passed or failed each criterion defined in the test plan.

(g) Any anomalies that might have an effect on the outcome of the test.

(h) Who witnessed the test and made the pass/fail evaluation.

4. Considerations for Reverse Engineering. If a repair specification includes substantiating data based on reverse engineering, the applicant should determine the performance and durability of an acceptable repaired, overhauled, or undamaged original article. The applicant can do this using comparative test and analysis.

a. Comparative Test and Analysis. This method involves comparing (through analysis and testing) the original undamaged article with the article repaired according to the proposed repair specification.

(1) Expect the applicant to demonstrate that the functional design of the proposed repair returns the article to its airworthy condition.

(2) The criticality of the article and the complexity of its design will dictate the rigor of the comparative analysis and the extent of testing.

(3) Side-by-side testing of proposed repaired article and the original article with zero service time under the same procedures and conditions provides the standard to evaluate the adequacy of the repaired article.

(4) The results of the analyses and tests will note any differences and provide sound technical justifications for these differences.

(5) Simple, noncritical parts might not require the same level of evaluation by test and analysis to determine performance and durability as other articles.

b. Reverse Engineering for Fabricated Parts. Some repairs may rely on fabricating replacement parts for the original parts using reverse engineering. The reverse engineering process uses techniques that vary widely and produce diverse results. The process alone is inadequate to characterize and compare a new original article to a proposed fabricated repair article. The applicant must select the processes and techniques that are appropriate to the article's complexity. Reverse engineering alone may be enough to duplicate simple parts. However, complex articles may need other substantiating information to show equivalency between original and fabricated repair parts or articles. The applicant should consider the following when using reverse engineering:

(1) Typically, these samples are new, unused articles from approved and traceable sources (e.g., purchase orders, FAA airworthiness tag, etc.). The sample size varies with design complexity and key attributes that define the article. Use a sufficiently large sample to correctly represent the essential characteristics of a design. These essential characteristics include nominal dimensions, tolerances, material properties, fabrication processes, etc. Sampling used parts may provide some characteristics that don't deteriorate during use, such as material composition,

grain size, grain flow, and depth of case hardening. Ensure applicants substantiate the validity of this approach and get concurrence from the appropriate ACO or RS-DER. Testing may include more samples to show equivalency between a new original and the fabricated repair article.

(2) Variations in the sample measurements and accepted engineering practices determine the tolerances in part dimensions. The resulting tolerances for the fabricated part should not exceed the minimum and maximum dimensions measured on the sampled approved parts. Exceeding these limits requires additional substantiation.

(3) Various tests and documentation from the Production Approval Holder (PAH) or supplier define the material composition of a part. The fabricated repair part materials must be equivalent to the materials for the original part including the base part, any subparts, added welds, and coatings. A qualified laboratory can provide thorough destructive testing for at least the following information:

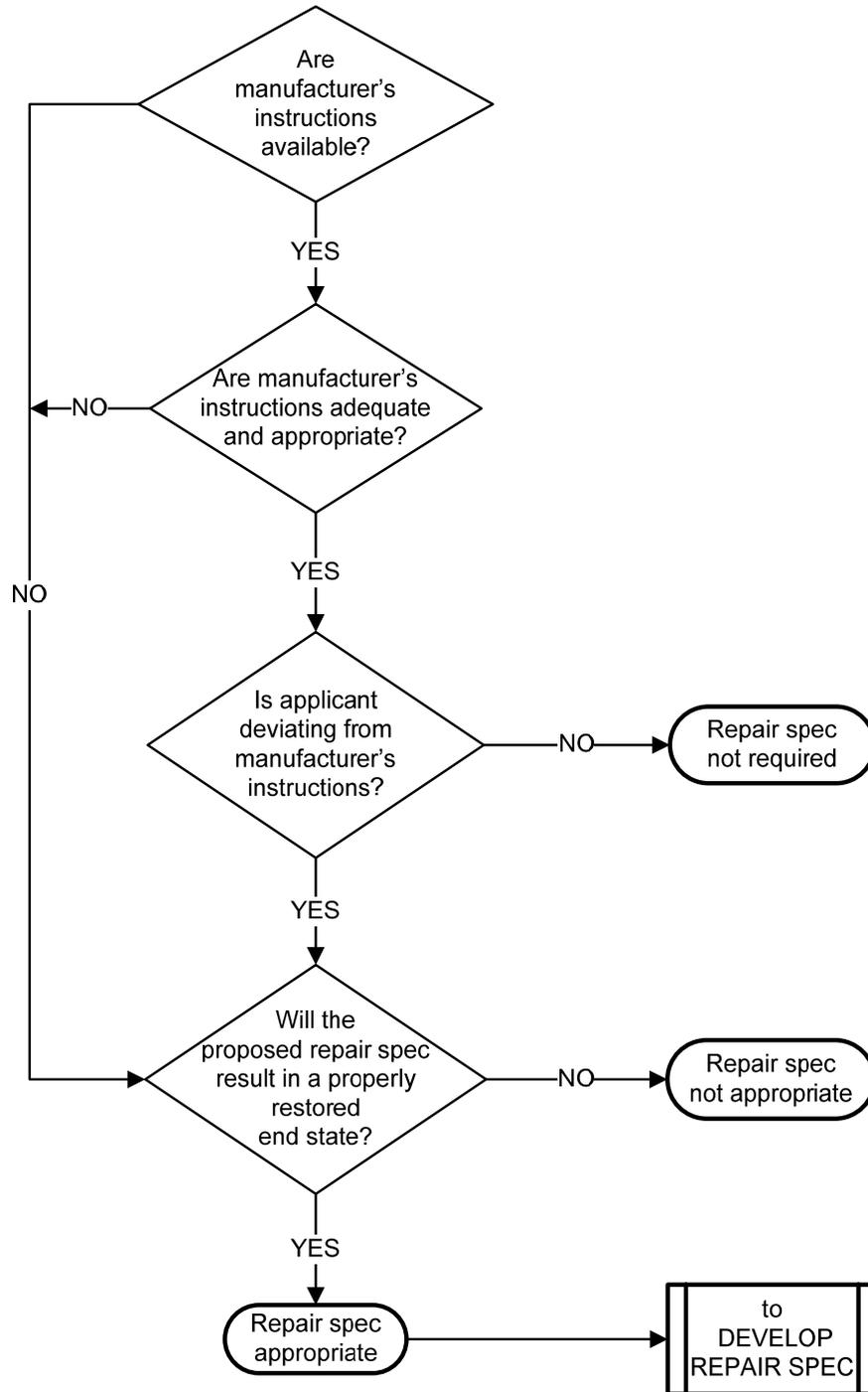
- Composition of each material in the part,
- Material properties (e.g., strength and fatigue characteristics, hardness, grain structure),
- Form of material (e.g., casting, forging, bar stock, sheet), and
- Use of special processes (e.g., nitriding, heat treat, shot peening) and resulting effect on material properties.

(4) The mass properties of a part are often significant to its function and impact on the associated product. To assess the effects on the next higher assembly and product, the reverse engineering process compares these properties. This assessment accounts for weight differences between the proposed fabricated repair part and the original part to ensure the absence of detrimental effects. For example, a small weight increase in compressor blades can affect disc life.

5. Approve the Engineering Aspects of the Repair Specification and Notify the FSDO/CMO/IFO or Applicant. After finding that the data is adequate to substantiate the repair specification and the repair complies with applicable airworthiness CFRs, notify the FSDO/CMO/IFO or applicant (as applicable) and return the data package to them. Indicate approval of the engineering aspects of the data by signing the repair specification title page (see chapter 2, paragraph 10). If the data is not adequate, do not sign the repair specification. The ACO or RS-DER should work with the FSDO/CMO/IFO or applicant (as applicable) to resolve any inadequacies in the engineering aspects of the repair specification before signing the repair specification.

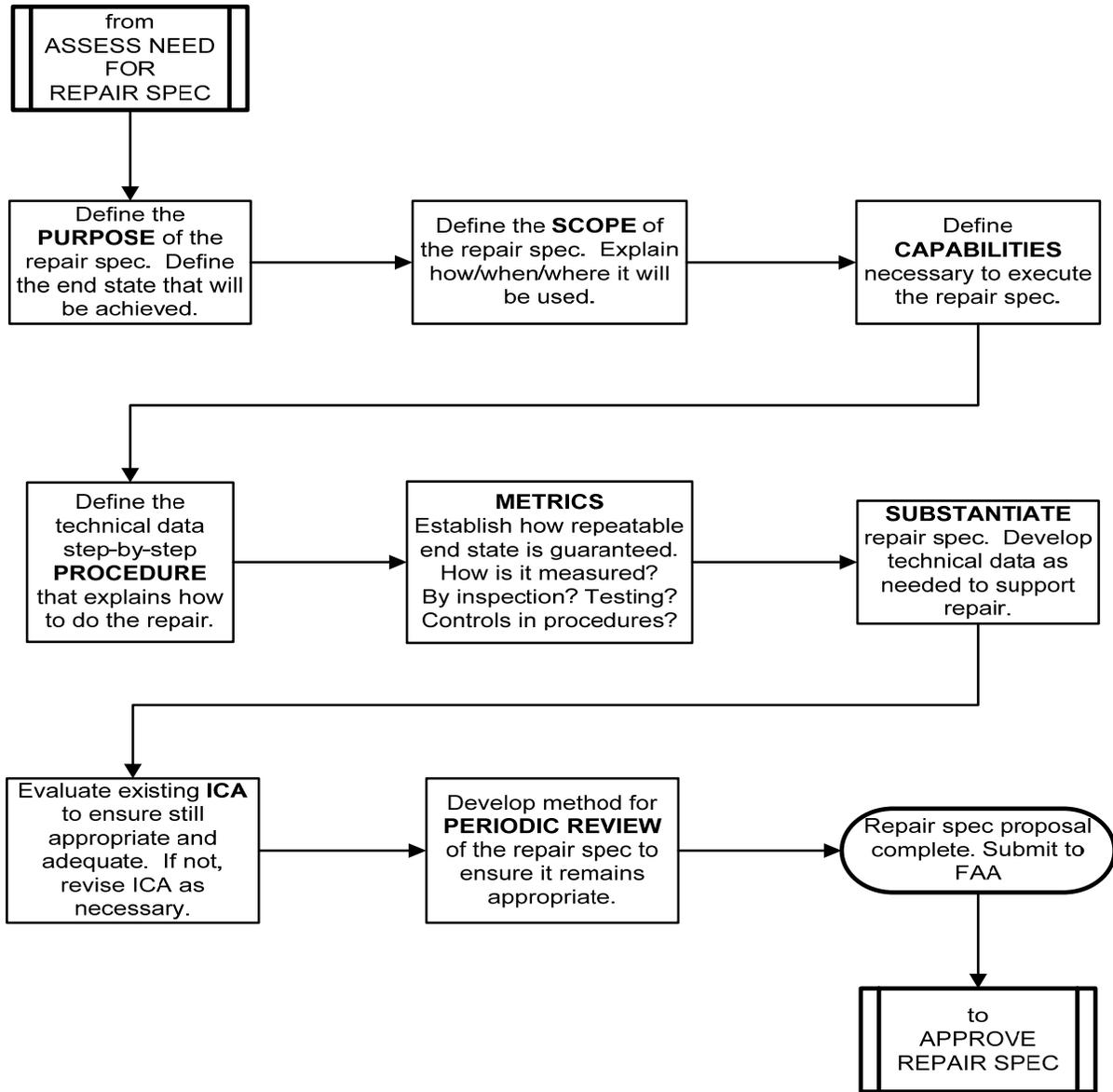
Appendix A. Flowchart: Assess the Need for a Repair Specification

Applicant Responsibility

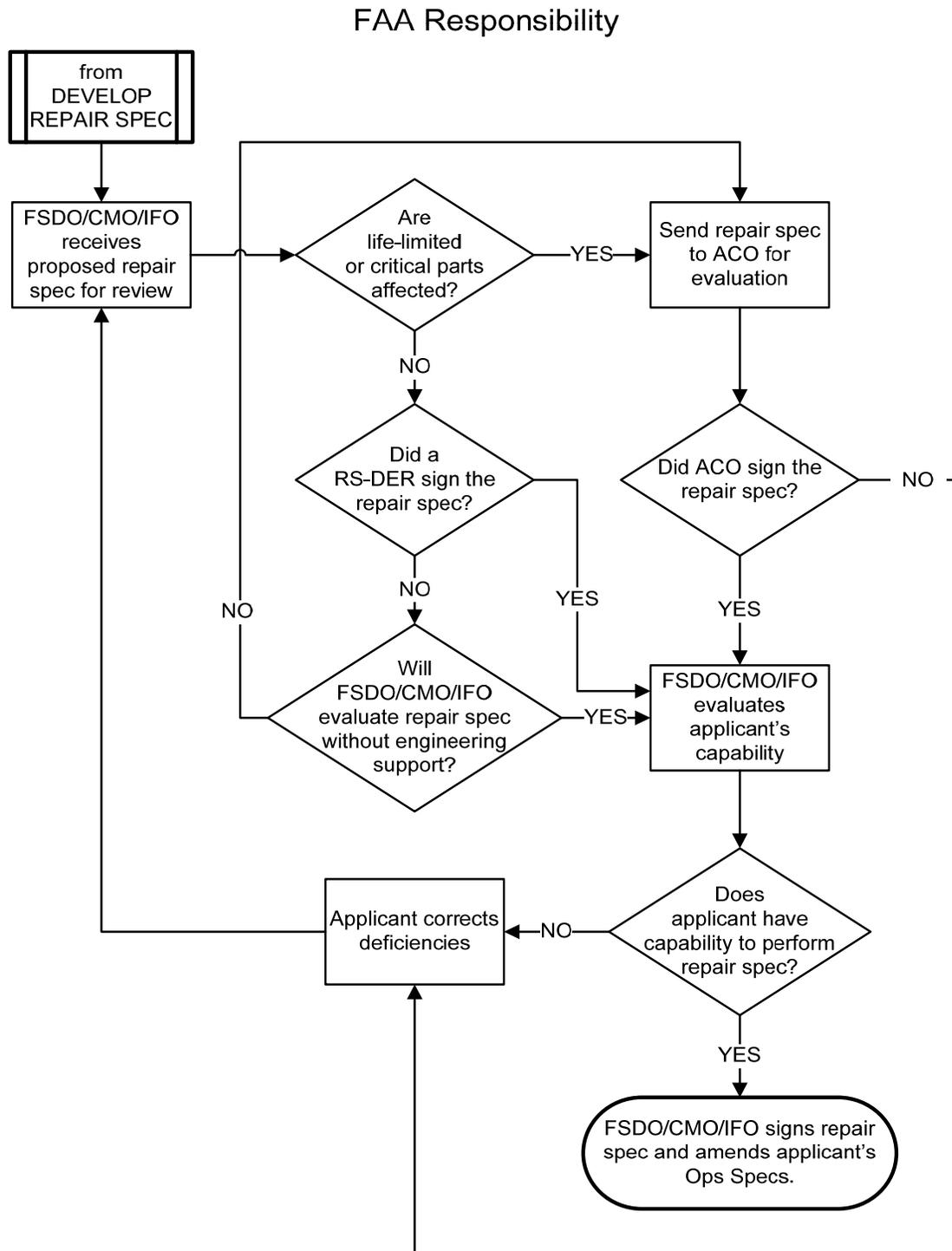


Appendix B. Flowchart: Develop a Repair Specification

Applicant Responsibility



Appendix C. Flowchart: Approve a Repair Specification



Appendix D. Acronyms

14 CFR	Title 14 of the Code of Federal Regulations
AC	Advisory Circular
ACO	Aircraft Certification Office
AD	Airworthiness Directive
AFS	Flight Standards Service
AIR	Aircraft Certification Service
ALS	Airworthiness Limitation Section
AMOC	alternative method of compliance
ASI	aviation safety inspector
ASTM	American Society for Testing and Materials
AWS	American Welding Society
CAMP	Continuous Airworthiness Maintenance Program
CFR	Code of Federal Regulations
CL	capabilities list
CMACO	Certificate Management Aircraft Certification Office
CMO	certificate management office
DER	Designated Engineering Representative
DIN	Designee Information Network
FAA	Federal Aviation Administration
FSDO	Flight Standards District Office
FSIMS	Flight Standards Information Management System
ICA	instructions for continued airworthiness
IFO	International Field Office
NPRM	notice of proposed rule-making

ODA	Organization Designation Authority
OEM	Original Equipment Manufacturer
OpSpecs	operations specifications
PAH	Production Approval Holder
PMA	Parts Manufacturer Approval
QCM	Quality Control Manual
RS-DER	Repair Specification Designated Engineering Representative
RSM	repair station manual
SAE	Society of Automotive Engineers
SB	Service Bulletin
SDR	Service Difficulty Reporting Subsystem
SPAS	Safety Performance Analysis System
TC	type certificate
TSO	Technical Standard Order

Appendix E. Definitions and Terms

When following procedures in this order, the following definitions and terms apply:

- 1. Article.** An aircraft, airframe, aircraft engine, propeller, appliance, or component part. See Title 14 of the Code of Federal Regulations (14 CFR) part 145, § 145.3.
- 2. Approved Data.** Technical and/or substantiating data that the Federal Aviation Administration (FAA) has approved. For examples of approved data, see the current edition of:
 - Advisory Circular (AC) 120-77, Maintenance and Alteration Data, or
 - AC 43-210, Standard Procedures for Requesting Field Approval of Data, Major Alterations, and Repairs.
- 3. Critical.** A class of parts, appliances, characteristics, processes, maintenance procedures, or inspections where a failure, omission, or nonconformance may cause significant degradation of the airworthiness of a product during all phases of operation.
- 4. Critical Part.** For the purpose of this order, a part identified as life limited or critical by the design approval holder. Typically, such components include parts for which a replacement time, inspection interval, or related procedure is specified in the Airworthiness Limitations Section (ALS) of the manufacturer's maintenance manual or instructions for continued airworthiness (ICA).
- 5. Design Data.** All drawings and specifications that show the part's configuration and all information on dimensions, tolerances, materials, processes, and procedures necessary to define all part characteristics. A master drawing list is the summary of these drawing and specifications. The design can also include the ALS of the ICA.
- 6. Life-Limited Part.** A part with an established replacement time, inspection interval, or related procedure in the ALS as required by the following parts and sections of 14 CFR:
 - Part 21, § 21.50,
 - Part 23,
 - Part 25,
 - Part 27,
 - Part 29, § 29.1529,
 - Part 31, § 31.82,
 - Part 33, § 33.4, and
 - Part 35, § 35.4.

7. Metrics. A system of parameters or ways of quantitative and periodic assessment of a process that is to be measured, along with the procedures to carry out such measurement and the procedures for interpretation of the assessment. Metrics are usually specialized by the subject area, in which case they are valid only within a certain domain and cannot be directly interpreted outside it.

8. Need Assessment. For the purpose of this order, the evaluation by the applicant to determine the value in developing a more efficient method of obtaining multiple authorizations.

9. Person. An individual, firm, partnership, corporation, company, association, joint-stock association, or governmental entity. It includes a trustee, receiver, assignee, or similar representative of any of them. See 14 CFR part 1, § 1.1.

10. Product. An aircraft, aircraft engine, or propeller. See § 21.1(b).

11. Production Approval Holder (PAH). The holder of a production certificate, approved production inspection system, Parts Manufacturer Approval (PMA), or Technical Standard Order (TSO) authorization. This person controls the design and quality of a product or part during the manufacturing process.

12. Quality System. An organizational structure with responsibilities, procedures, processes, and resources that implements a management function to determine and enforce quality principles. A quality system encompasses quality assurance and quality control.

13. Source Control Drawing. A drawing used to purchase controlled standard parts and/or materials. The purchase of materials from manufacturers other than those listed on the drawing is prohibited.

14. Safety Performance Analysis System (SPAS). The FAA's primary source of comprehensive, integrated safety information used by inspectors, analysts, and managers in developing and adjusting field surveillance, investigation, and other oversight programs.

15. Simple Repair. For the purpose of this order, a repair that the aviation safety inspector (ASI), with supervisor concurrence, has determined to be within their expertise and experience and follows the guidelines for data approval provided in Order 8900.1, Volume 4, Chapter 9, Selected Field Approvals.

16. Substantiating Data. Technical data used to show that an article complies with the applicable airworthiness standards (e.g., part 23, 25, 27, 29, 33, or 35).

17. Supplier. Any person or organization contracted to provide aviation products, parts, appliances, materials, or services to the manufacturer of a product or associated components.

18. Technical Data. Drawings and specifications needed to define the configuration and design features of a particular article, repair, or alteration. Typically, this includes information on materials, dimensions, and processes necessary to define structural strength, any required airworthiness limitations, and any data necessary to determine the airworthiness, noise characteristics, fuel venting, and exhaust emissions (as applicable) of the altered or repaired

aircraft. Technical data includes test data and engineering analyses and other engineering information, such as engineering handbooks or approved military or industry specifications. It also includes the step-by-step procedures or work instructions associated with the repair and may include operational and service experience, maintenance and alteration experience, reliability data, and other documented factual information that can be shown to be directly applicable to the airworthiness of the article.

Appendix F. Sample Title/Signature Page

[Specification Name and/or Control Number (Assigned by Applicant)]
[Revision Number and Revision Date]

Data contained in this specification may be used as approved data when: The repair is accomplished by the certificate holder identified below, the specification title page contains all required signatures, and the specification is authorized by the certificate holder's operations specifications (OpSpecs), air carrier maintenance program or current capabilities list (CL) acceptable to the Federal Aviation Administration (FAA).

[Company Name]

[Address]

[FAA Certificate Number and Ratings]

I certify that the repair described in this document will restore the aircraft or aircraft component, as applicable, to an airworthy condition.

_____ Date: _____

Signature—Certificate Holder's Authorized Representative

Printed Name and Title—Certificate Holder's Authorized Representative

I find the data are adequate to substantiate the repair design and the repair is compliant with applicable airworthiness Code of Federal Regulations (CFR).

_____ Date: _____

ACO/RS-DER Signature

Office ID/RS-DER ID Number: _____

The repair described in this document was found to comply with the applicable airworthiness requirements and is acceptable for use by the organization identified above.

_____ Date: _____

FSDO/CMO/IFO ASI Signature

Office ID: _____

Changes to the Repair Specification. The FAA must authorize any change to the repair specification before the applicant implements the change. The repair specification holder must submit all substantiating data to support the proposed change. Minor changes that do not differ appreciably from the previously authorized data and having no bearing on safety are permitted provided the Flight Standards District Office (FSDO)/certificate management office (CMO)/International Field Office (IFO) is notified of the change.

Appendix G. Related Publications

1. Code of Federal Regulations (CFR). You can get copies of Title 14 of the Code of Federal Regulations (14 CFR) sections online at <http://www.gpoaccess.gov/cfr/>. You can also get printed copies by contacting:

The Superintendent of Documents
Government Printing Office
P.O. Box 37154
Pittsburgh, PA 15250-7954
Telephone: (202) 512-1800 Fax: (202) 512-2250

1. Federal Aviation Administration (FAA) Orders. You can get copies of the current editions of the following orders from the FAA's Flight Standards Information Management System (FSIMS) at <http://fsims.faa.gov>, and/or from the Regulatory and Guidance Library (RGL) at <http://rgl.faa.gov>.

- Order 8100.5, Aircraft Certification Service Mission, Responsibilities, Relationships, and Programs.
- Order 8100.8, Designee Management Handbook.
- Order 8110.4, Type Certification.
- Order 8110.37, Designated Engineering Representative (DER) handbook.
- Order 8120.2, Production Approval and Certificate Management Procedures.

2. FAA Advisory Circulars (AC). You can get copies of the current editions of the following ACs from the RGL at <http://rgl.faa.gov>.

- AC 43-18, Fabricating Aircraft Parts by Maintenance Personnel.
- AC 43-210, Standardized Procedures for Requesting Field Approval of Data, Major Alterations, and Repairs.
- AC 120-77, Maintenance and Alteration Data.

3. U.S. Military Documents. Order copies of MIL-STD-1916, DOD Preferred Methods for Acceptance of Product, dated April 1, 1996, online at <http://dodssp.daps.dla.mil/>. You can also order printed copies by contacting:

The Department of Defense Single Stock Point
Subscription Services Desk
Building 4D
700 Robbins Avenue
Philadelphia, PA 19111-5098
Telephone: (215) 697-2179 Fax: (215) 697-1462

4. American National Standards Institute (ANSI) and American Society for Quality (ASQ). Order copies of ANSI/ASQC Z1.9-2009, Sampling Procedures and Tables for Inspection by Variables for Percent Nonconforming, dated March, 2008, online at <http://www.asq.org>. You can also order printed copies by contacting:

The American Society for Quality
P.O. Box 3005
Milwaukee, WI 53203
Telephone (800) 248-1946 Fax (414) 272-1734



U.S. Department of
Transportation
**Federal Aviation
Administration**

Directive Feedback Information

Please submit any written comments or recommendations for improving this directive, or suggest new items or subjects to be added to it. Also, if you find an error, please tell us about it.

Subject: Order 8300.14A

To: Directive Management Officer, AFS-140

(Please check all appropriate line items)

An error (procedural or typographical) has been noted in paragraph _____ on page _____.

Recommend paragraph _____ on page _____ be changed as follows: *(attach separate sheet if necessary)*.

In a future change to this directive, please include coverage on the following subject *(briefly describe what you want added)*:

Other comments:

I would like to discuss the above. Please contact me.

Submitted by: _____ Date: _____

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