

# Design Change Control for PMA Holders

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# Overview

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*Focus on T & C, Non-critical PMAs*

- ❑ **Requirements for Design Change Control**
- ❑ **Classification of Design Changes**
- ❑ **Determination and Submittal of Minor Design Changes**

# **Requirements for Design Change Control**

- **14 CFR 21.137 – Quality System**
- **14 CFR 21.319 - Design Changes**
- **Order 8110.42D, 2-15: Article Design Changes – Post PMA Approval**
- **Order 8110.4C, 4-2: Major and Minor Design Changes**

# Requirements for Design Change Control

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## 14 CFR 21.137 – Quality System

Each applicant for or holder of a production certificate must establish and describe in writing a quality system that ensures that each product and article conforms to its approved design and is in a condition for safe operation. This quality system must include:

- (a) Design data control. *Procedures* for controlling design data *and subsequent changes* to ensure that only current, correct, and approved data is used.

# Requirements for Design Change Control

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## 14 CFR 21.319 - Design changes

### (a) Classification of design changes.

(1) A "minor change" to the design of an article produced under a PMA is one that has no appreciable effect on the approval basis.

(2) A "major change" to the design of an article produced under a PMA is any change that is not minor.

### (b) Approval of design changes.

→ (1) *Minor changes to the basic design of a PMA may be approved using a method acceptable to the FAA.*

(2) The PMA holder must obtain FAA approval of any major change before including it in the design of an article produced under a PMA.]

# Requirements for Design Change Control

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## Order 8110.42D - Parts Manufacturer Approval Procedures

### 2-15: Article Design Changes – Post PMA Approval

- a. PMA holders control their designs and assess the magnitude and impact of later changes....
  
- b. The responsible ACO sets the manner for approving and the interval for the applicant submitting minor changes to the design of a PMA article.

## Order 8110.4C – Type Certification

### 4-2: Major and Minor Design Changes

...minor changes in type design may be approved under a method acceptable to the Administrator prior to the submittal to the Administrator of any substantiating or descriptive data. Minor changes to a type design are at a minimum recorded in the descriptive data, with the FAA and the applicant determining an acceptable process for approving the data supporting the type design changes.

# Classification of Design Changes

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## 14 CFR 21.93 - Classification of changes in type design

(a) .....changes in type design are classified as minor and major. A "minor change" is one that has no appreciable effect on the weight, balance, structural strength, reliability, operational characteristics, or other characteristics affecting the airworthiness of the product. All other changes are "major changes" (except as provided in paragraph (b) of this section).

## 14 CFR 21.319 - Design changes

(a) Classification of design changes.

(1) A "minor change" to the design of an article produced under a PMA is one that has no appreciable effect on the approval basis.

(2) A "major change" to the design of an article produced under a PMA is any change that is not minor.

# Classification of Design Changes

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**Appreciable** - capable of being perceived or measured  
(Merriam - Webster)

**Approval Basis -**

Approval Basis and Approved Design Data
Identity per 14 CFR 21.303 <u>DWG No:</u> SE 25206, <u>Rev:</u> None <u>Date:</u> 3/31/13 or later FAA-approved revisions
Test and Computations per 14 CFR 21.303, <u>DWG No:</u> SE 25207, <u>Rev:</u> None <u>Date:</u> 3/31/13 or later FAA-approved revisions



# Major/Minor Determination of Design Changes

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- **What constitutes design?**
- **Who is responsible for determining if a change is Major or Minor?**
- **How is that determination made?**
- **How/when is FAA notified of design changes**

# Major/Minor Determination of Design Changes

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## Design

14 CFR 21.303 – Application (for PMA)



(3) The design of the article, which consists of--

- (i) Drawings and **specifications** necessary to show the configuration of the article; and
- (ii) Information on dimensions, materials, and processes necessary to define the structural strength of the article.

# Major/Minor Determination of Design Changes

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## Specifications listed on drawing or MDL

### Industry and Military Specifications

- a) AMS, ASTM, NAS, MIL, AN, etc.

### Company Specifications

- Specifications listed on MDL – usually list revision level/date
- Specifications listed on drawing
  - Usually don't list revision level

FABRICATE PER XXX-1001
XXX-1018
Material: 3.4
Heat Treatment: 4.4
Testing: 5.2
Coating: 6.4

# Major/Minor Determination of Design Changes

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## Company (PMA Holder) Specifications

- If revision level not listed on drawing/MDL
  - a) Revision level current when approved drawing was released is applicable/approved
  - b) Revision of specifications *can* constitute a design change
  - c) Revisions to specifications which do not necessitate a drawing revision should still be reviewed to determine if they create a design change. If so, is that change minor or major (per 21.93 and 21.319(a)).

# Major/Minor Determination of Design Changes

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## **14 CFR 21.319(b)**

*Approval of design changes. (1) Minor changes to the basic design of a PMA may be approved using a method acceptable to the FAA.*

This is usually covered by a section in the quality manual or a procedure referenced in the QM (14 CFR 21.137(a) – Design Data Control).

- DAH definition of “appreciable” as it applies to their approved articles is helpful
- Procedure defines a method for determining changes as minor or major
- Detailed procedure or flow chart
  - Yes/no, if/then, and/or type gates are useful to guide one through the process
  - Multiple minor changes may cumulatively create a major change
  - Review of company specification revisions should be included in procedure

# Major/Minor Determination of Design Changes

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## Example Procedure:

Design changes and modifications to approved designs are reviewed, implemented, and documented by authorized Engineering Department personnel.

1. Before implementation, all proposed design changes affecting FAA approved designs will be reviewed and classified as Major or Minor in accordance with 14 CFR § 21.93, 14 CFR § 21.319(b) and this procedure. Design change classification will be documented on *Company* form ENG0XX.
2. Final approvals are required by the Engineering Manager before release and implementation.
3. All Major changes require FAA approval prior to release or implementation.

### NOTE

In general, a **Major change** is one that has an appreciable effect on the weight, balance, structural strength, reliability, operational characteristics, or other characteristics affecting the airworthiness of the product.

Minor changes are sent as a group to the ACO in 12 month intervals, with an 8110-3 form signed by an appropriately delegated DER. Concurrence with the changes must be received from the FAA and maintained to show evidence of FAA approval.

### NOTE

Minor changes are those having no appreciable effect on the approval basis or original design intent. In general, a Minor change is one that has no appreciable effect on the weight, balance, structural strength, reliability, operational characteristics, or other characteristics affecting the airworthiness of the product.

All design changes of FAA approved designs will be reviewed by the Engineering department to verify that the change will not impact the airworthiness of the next higher assembly/system in which the part will be installed. A review of the existing Instructions for Continued Airworthiness (ICA) is also required to verify the ICA will not be impacted.

# Submittal of Minor Design Changes

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## Sample FAA PMA Supplement from Order 8110.42D

-----END OF DATA-----

GENERAL NOTES:

Provide minor design changes in a manner as determined by the ACO. Process major design changes to drawings and specifications in the same manner as that for an original FAA-PMA.

The FAA accepted the ICA approach for the above articles with their designs. These ICA may refer to those of the respective articles from the holders of type certificates. Otherwise, provide supplemental ICA for differences in the replacement articles. Make referral statements or supplemental ICA readily available per 14 CFR 21.50.

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Manager, (*ACO name*) Aircraft  
Certification Office

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Manager, (*MIDO name*) Manufacturing  
Inspection District Office

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# Submittal of Minor Design Changes

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## Sample Notification Letter of Design Approval from Order 8110.42D

The *(MIDO name)* will grant production approval after validating your Quality System. The FAA-PMA letter and PMA supplement from the *(MIDO name)* documents that approval.

Minor Design changes must be submitted to the *(ACO name)* at regular intervals not to exceed *(agreed to time frame)*.

-----*Choose the best scenario*-----

*Note – Not all ACO's include this statement in their design approval letter*



# Submittal of Minor Design Changes

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If interval for submitting minor changes not listed on design approval letter, include in Quality Manual or procedure referenced in QM.

- Once QM approved/accepted, interval and method of minor/major determination is a “method acceptable to the FAA”

# Thank You

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## Questions?

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