
**Application for Parts Manufacturer Approval Via Tests and Computations or Identicality**

Comments on FAA Draft AC 21.303-PMA
published online for public comment at http://www.faa.gov/aircraft/draft_docs/media/AC%2021_303-PMA.pdf

Submitted to John Milewski via email to john.milewski@faa.gov

**Submitted by the**
**Modification and Replacement Parts Association**
**2233 Wisconsin Ave, NW, Suite 503**
**Washington, DC 20007**

**For more information, please contact:**
**Ryan Aggergaard**
**MARPA Associate Counsel**
**(202) 628-8947**

MODIFICATION AND REPLACEMENT PARTS ASSOCIATION
2233 Wisconsin Avenue, NW, Suite 503
Washington, DC 20007

Tel: (202) 628-6777
Fax: (202) 628-8948
http://www.pmaparts.org

**Application for Parts Manufacturer Approval Via Tests and Computations or Identicality**

Comments on FAA Draft AC 21.303-PMA
published online for public comment at http://www.faa.gov/aircraft/draft_docs/media/AC%2021_303-PMA.pdf

Submitted to John Milewski via email to john.milewski@faa.gov

September 3, 2013

John Milewski
Federal Aviation Administration
Aircraft Engineering Division
Engineering Procedures Office, AIR-110
950 L'Enfant Plaza, SW, 5th Floor
Washington, DC 20024

Dear Mr. Milewski:

Please accept these comments in response to FAA Draft AC 21.303-PMA, Application for Parts Manufacturer Approval Via Tests and Computations or Identicality, which was published for public comment at http://www.faa.gov/aircraft/draft_docs/media/AC%2021_303-PMA.pdf.

# Contents



# Who is MARPA?

The Modification and Replacement Parts Association was founded to support PMA manufacturers and their customers. Aircraft parts are a vital sector of the aviation industry, and MARPA acts to represent the interests of the manufacturers of this vital resource before the FAA and other government agencies.

MARPA is a Washington, D.C.-based, non-profit association that supports its members' business efforts by promoting excellence in production standards for PMA parts. The Association represents its members before aviation policy makers, giving them a voice in Washington D.C. to prevent unnecessary or unfair regulatory burden while at the same time working with aviation authorities to help improve the aviation industry's already-impressive safety record.

MARPA represents a diverse group of manufacturing interests – from the smallest companies to the largest - all dedicated to excellence in producing FAA-PMA aircraft parts.

MARPA members are committed to supporting the aviation industry with safe aircraft components. MARPA members manufacture and sell aircraft components that provide equal or better levels of reliability when compared to their original equipment manufacturer competitors.

MARPA members have a tremendous interest in working with the FAA to help develop and improve the guidance that directly addresses the parts they manufacture. MARPA supports efforts to produce guidance that increases the aviation industry's already excellent safety record.

## Comments

MARPA thanks the FAA for the opportunity to offer comments on this Advisory Circular. MARPA applauds the FAA's efforts to enhance aviation safety. We offer these preliminary comments on the draft AC 21.303-PMA and reserve the right to submit additional comments should the need arise. MARPA respectfully requests an in-person meeting with the FAA to discuss these comments and the draft Advisory Circular.

## The Draft AC Should Contain a Reference to the Streamlined PMA Process

### Issue

FAA Order 8110.119 "Streamlined Process for Parts Manufacturer Approval (PMA)" was issued on November 30, 2012. It should be referenced in the guidance for PMA approvals.

### Discussion

The Streamlined PMA process was developed and issued by the FAA, in cooperation with the PMA industry, to establish a streamlined process by which a PMA applicant with an established safety record could take advantage of expedited process of PMA applications for non-safety-significant parts. The process uses test and computation to show compliance with applicable airworthiness requirements, but removes substantial burden from the FAA to allow FAA personnel to better direct resources to applications for parts with a greater effect on safety.

The Streamlined PMA process is still in its infancy. However, those companies that have implemented an MOU with their ACOs and have taken advantage of the streamlined process have reported positive

results. In other cases, certain ACOs have taken a negative view of the streamlined process and been hesitant or have outright refused to implement it.

The Streamlined PMA process is one procedure by which a manufacturer may seek PMA approval. The guidance for PMA applicants should include a reference to the streamlined process.

### Recommendation

Include a paragraph addressing Order 8110.119 Streamlined Process for PMA to bring this approval procedure to the attention of PMA applicants.

## Paragraph 21 "Airworthiness Directives" Contains Vague Instructions

### Issue

Subparagraph 21(b) requires an applicant addressing an AD to "provide a sound technical rationale for [the] design and show how it results in an acceptable level of safety."[1] This language should be clarified.

### Discussion

A PMA applicant seeking approval of an article subject to an AD must provide a sound rationale for its design as well as show how the design results in an acceptable level of safety. The AC does not go on to offer any guidance or suggestion as to how an applicant should make such a showing.

Although a sound technical rationale would likely be shown objectively through the design drawings, the same is not necessarily true of an "acceptable level of safety." Such a showing might be made through a narrative description, through data analysis, through physical testing, or through any number of combinations. Making such a showing without guidance could become prohibitively expensive for the applicant.

Because the language instructing the applicant to show an acceptable level of safety is vague, it may dissuade potential applicants from developing an alternative to a part that is subject to an AD. It may also result in substantial delay as the ACO and applicant coordinate in attempting to determine whether the applicant has made such a showing. The potential for conflicting subjective assessments as to what degree of showing satisfies the AC's requirements should be avoided if possible.

### Recommendation

Include clarifying metrics or instructions to better allow an applicant and the ACO determine what constitutes demonstrating an "acceptable level of safety" for a part subject to an AD.

## Paragraph 22 "Continued Operational Safety Responsibilities" omits a principle of COS

### Issue

Paragraph 22 states that the three principles of COS are "monitoring an article's performance in service, investigating its problems and then providing remedies." This is not precisely accurate.

[1] Draft AC 21.303-PMA at 9.

### Discussion

Paragraph 22 is accurate in describing monitoring of articles (monitoring an article's performance in service) and responding to identified issues (investigating its problems and then providing remedies), however the paragraph fails to include the third element of an effective COS program: problem prevention.

The identification of potential problem before they arise is a key element of a COS program.[2] Problem prevention occurs at all points throughout the design and production process, including article development, supplier control, manufacturing process control, and internal audits. Such elements (among others) are an important aspect of an effective COS system.

Problem prevention is also consistent with Safety Management System (SMS) principles. As the FAA shifts toward the implementation of SMS, it will be important for applicants to be in a position to implement effective safety systems. A comprehensive understanding of COS principles will help applicants in adoption and implementation of SMS.

### Recommendation

Include Problem Prevention as a principle of Continued Operation Safety.

## Paragraph 25(a) "Sample Size" contains certain requirements that are either vague or unworkable.

### Issue 1: "Enough" samples

Subparagraph 25(a) states that an applicant should use "enough samples to ascertain the essential characteristics of a design."[3] No metric is given to define "enough."

### Discussion

The requirement that an applicant use "enough samples" is a subjective standard. It also lacks any metrics or guidance to determine how many samples is "enough."

The number of samples used by an applicant may vary depending on the nature of the article. For very simple and non-safety significant parts, such as a curtain ring, a single sample may be adequate to ascertain the essential characteristics of the design. For highly complex parts, or parts that must be destroyed in conducting an analysis, the applicant may use a large sample of parts.

A sample size of two parts may be sufficient in many cases to perform a min-max analysis. This will provide the applicant a range of tolerances within which to design and produce the part. That the applicant may end up producing parts with tighter tolerances than that of the production approval holder whose parts were sampled is a business decision best left to the applicant.

### Recommendation

Make clear that the applicant, not the ACO, should determine what constitutes an appropriate sample size.

[2] See, e.g., MARPA Guidance Material for A PMA COS System, available at http://pmamarpa.com/gvt/COSGuidance.pdf.
[3] Draft AC 21.303-PMA at 10.

## Issue 2: Samples from different lots or billets

The draft AC states that the applicant should obtain samples from "separate lots, billets, production runs, or other sources" to determine variability. This is unnecessary and often impractical.

## Discussion

As discussed above, for many parts, a very small sample size is required to determine the characteristics of the design. If the applicant selects samples from only a single lot or production run, the only person "penalized" is the applicant, because the applicant may ultimately design and produce a part to tighter tolerances than the original design requires.

It may also be impractical or impossible to determine if parts are from different lots. Many parts do not have such tracking information available. The AC suggests in response to this reality that samples should be obtained from different sources. This, again, may not be possible, particularly in the case of extremely rare parts for legacy aircraft. Often, PMA manufacturers are asked to produce parts by customers because those parts are no longer reasonably available. Requiring the manufacturer to seek out multiple sources of scarce parts could be highly cost prohibitive both in terms of time and resources.

Although it would be ideal to obtain large numbers of samples from various production runs, the reality is that such sampling would be very expensive and in most cases unnecessary. A small sample size is nearly always sufficient to perform a min-max analysis. Under a min-max analysis, as stated above, the only person penalized is the applicant designing to tighter tolerances. This reality addresses the concern that "potential sources of variability" and "inaccuracies inherent in the sampling method" are accounted for.[4]

Because the parts that comprise the sample are those parts produced under an approved quality system, each part should conform to the approved design. An applicant using a small sample size can therefore be confident that the analysis performed will accurately reflect acceptable tolerances for a given part. Although a small sample may not capture the entire range of variability acceptable, the applicant will establish a narrower range of variability that falls within the original PAH's acceptable tolerances. The applicant is thereby able to capture the essential characteristics of the design.

## Recommendation

Include language making clear that, although samples from varying lots or productions runs are preferred, it is not required.

## Issue 3: Minimum of 3 articles in a sample

The draft AC implies that a minimum sample size of three articles is required. This is not always necessary and should be left to the discretion of the applicant.

## Discussion

The AC states that a minimum of three articles should be used to establish the maximum, minimum, and nominal dimensions of an article's geometry.[5] As discussed previously, in the case of many parts,

[4] See Draft AC 21.303-PMA at 11.
[5] Id.

particularly non-safety sensitive parts, a single sample may be sufficient to establish the required dimensions of an article.

Although the applicant would naturally benefit from establishing a wider acceptable range of dimensions for a particular part, if an applicant deemed it expedient to manufacture only to the precise dimensions of a single sample part that is the prerogative of the applicant. Moreover, a sample size of two parts is sufficient in many cases to perform a min-max analysis to determine a part's characteristics.

The draft AC explains that "less than three samples will constrain [the applicant's] replacement's design to narrow or impractical limits."[6] One significant benefit of PMA parts is that in many cases, due to a min-max analysis of a small sample of parts, the PMA part is reliably produced to tighter tolerances than the OEM part. Although a small sample may result in narrow limits, designing and producing to narrower tolerances than the original part is a business decision best left to the applicant.

### Recommendation

Make clear that a sample size of three articles is recommended, but not required.

## Conclusion

We thank you in advance for your consideration of these preliminary comments. MARPA looks forward to working with the FAA to better improve aviation safety and we look forward to meeting with you to further discuss this Advisory Circular. Your consideration of these comments is greatly appreciated.

[6] Id.

Respectfully Submitted,

Ryan Aggergaard
Associate Counsel
Modification and Replacement Parts Association

Jason Dickstein
President
Modification and Replacement Parts Association