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MARPA's Guidance Material for a PMA Continued Operational Safety (COS) System

Report No. MA-07-0316

Revision 3

September 22, 2014

Aviation companies use their Quality Systems to help them meet business goals like satisfying customer demands and promoting industry safety. A properly implemented continued operational safety system is a tool to be integrated into a business' Quality System in order to help that company achieve long-term safety goals through oversight of the life-cycle of their aircraft articles. This document was produced to aid PMA companies in establishing and managing a continued operational safety system. It represents one way, but not the only way, to implement such a system. A continued operational safety system should be tailored to the specific needs of the implementing company. Implementing a robust continued operational safety system should help encourage aviation safety, but it cannot eliminate all possible risk, and its effectiveness may depend on the specifics of implementation and oversight; MARPA makes no representations about the results of implementing continued operational safety system in accordance with this standard. This document is not meant to reflect a minimum standard for safety. Compliance with this document is voluntary and not mandatory.

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Section 1

1.0 MARPA's Definition of COS

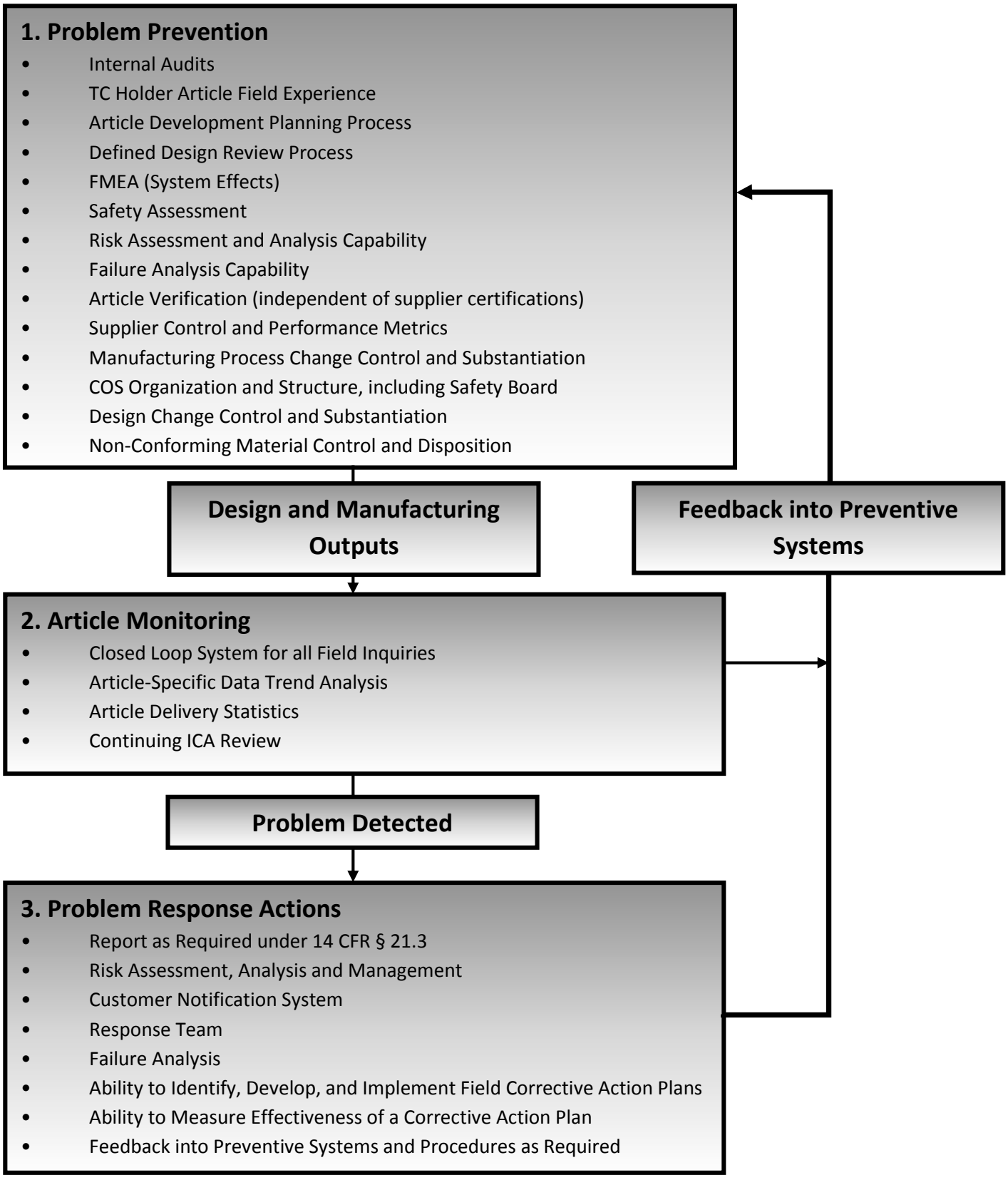
Continued Operational Safety is a closed-loop technical and logistical support system that ensures lifetime article safety and addresses applicable fleet requirements. This support system includes the following three fundamental elements addressed both before and after FAA article approval:

1. Problem Prevention
2. Article Monitoring
3. Problem Response

Figure 1 shows the MARPA PMA COS system overview.

Note: Per Part 21.1 (b) Article means a material, part, component, process, or appliance
Product means an aircraft, aircraft engine, or propeller

Figure 1-Overview of a PMA COS System



Section 2

2.0 Fundamental Elements of a COS System

2.1 Preventive Systems/Procedures

The PMAH shall establish procedures within their Quality System that includes the following:

2.1.1 Internal Audits-The PMAH shall perform internal audits at least annually in order to monitor compliance with required airworthiness standards and adequacy of the procedures to ensure that such procedures produce airworthy articles. The internal audit element of the Quality System may be contracted to another organization or a person with appropriate technical knowledge and proven satisfactory audit experience. The audit shall include a detailed review of all ACSEP audit results and any reporting under 14 CFR §21.3. The procedures shall have a quality feedback reporting system to the accountable manager that ensures proper and timely corrective action is taken in response to reports resulting from the independent audits performed.

2.1.2 TC Holder Article Field Experience-Prior to developing the candidate PMA article the PMAH shall perform a comprehensive review of all available SDR/ASB/SB/AD and operator and maintenance provider inputs.

Service Difficulty Reports (http://av-info.faa.gov/sdrx/)and pertinent Airworthiness Bulletins shall be studied to understand the nature and extent of field issues connected to the PMA candidate article and any efforts toward corrective action on the part of the TC Holder. All available ICA (including Overhaul Instructions, Illustrated Parts Catalogs and Service Bulletins) shall also be reviewed. Operators and maintenance providers should be surveyed to assess their service experience with the candidate PMA article; the scope of the survey should, at a minimum, enable confirmation of the findings of the SDR/ASB/SB/AD review.

The PMAH should review all available documentation related to the article throughout the article life cycle at regular intervals.

2.1.3 Article Development Planning Process-Engineering should give consideration to structuring the design effort into significant elements to ensure article safety and reliability. The structure shall include:

- The design and development plan.
- The review, verification and validation that is appropriate to each design and development stage.
- The responsibilities and authorities for design and development, and project communication.

- Design and development inputs related to article requirements shall be determined and records maintained. These inputs shall include:

    - Functional and performance requirements.

    - Applicable statutory and regulatory requirements.

    - Information derived from previous similar designs.

Note: For simple projects, this process may be collapsed into the design review.

2.1.4 Defined Design Review -The PMAH shall have a Design Review process in place. The purpose is to systematically review the PMA candidate design at appropriate stages to establish appropriate requirements and then evaluate the ability of the results of the design activity to meet these requirements. The NHA, interface features and consequences of failure should be understood, thereby enabling identification of critical/major characteristics, feature and manufacturing controls, and inspection plans. Follow-on reviews are intended to identify any problems and propose necessary actions, and authorize progression to the next stage. Participants in such reviews shall include representatives of functions concerned with the design being reviewed. Records of review and any actions shall be maintained. Elements of the review shall also include:

- A review of the available ICA and service history.
- Failure Modes and Effects Analysis (FMEA)
- Safety Assessment

2.1.5 Failure Modes and Effects Analysis (FMEA)- A failure modes and effects analysis is a qualitative process, independent of failure rates and probabilities, by which each failure mode of an article in the product is analyzed. Each system and subsystem of the product is broken down into its basic functions using a functional block diagram consistent with the Air Transport Association policy for identification and definition of systems. (See AC 33.8 Appendix 1 for an example.)

The functional block diagram defines each system and subsystem, and all their functions, in the product. The experienced safety engineer performing the analysis determines the article-to-article and article-to-system influences in both directions (input and output).

System interactions are influences that an article, or a set of articles, can have on the engine, propulsion system, or aircraft through form, fit, or function. These influences may extend beyond the article being analyzed, may be direct or indirect, and may develop immediately or over time. Characteristics of these influences include:

(1) Direct influences, which are form and fit. These influences are based on physical contact or interface clearances between adjacent parts.

(2) Indirect influences, which are functional in nature. These influences are not based on physical contact, but may be aerodynamic, electrical, hydraulic, thermal, or vibratory.

The interactions where the consequence of failure is the furthest from the cause are the most difficult to identify.

2.1.6 Safety Assessment-The FMEA will drive the safety/risk assessment of the candidate PMA article. AC 23.1309-1, AC 25.1309-1, or AC 33.75-1 can be used as guidance for safety assessments.

The article criticality classification should be determined during this review to establish the extent of quality and manufacturing controls required. (See Section 5)

2.1.7 Risk Assessment and Analysis Capability-The PMAH shall be capable of providing a detailed risk assessment and risk analysis, if required. The FMEA and Safety Assessment are the building blocks of a (qualitative) Risk Assessment. Risk Analyses (quantitative) may be required, if the Risk Assessment identifies a potential unsafe condition.

2.1.8 Failure Analysis Capability-The PMAH shall be capable of providing a detailed failure analysis of any in service or manufacturing difficulty. Failure analysis capability demonstrates that the PMAH has developed an understanding of the article, its manufacturing processes, its interaction with mating articles, the NHA, other systems, and the product.

2.1.9 Article Verification (Independent of Supplier Certifications)-The PMAH shall have a system in place to determine the conformity of incoming articles independent of supplier certifications. The extent of the evaluation shall include geometric, material and special process characteristics. The PMAH may contract the required services from appropriately qualified agencies, preferably those that hold ISO9001 or similar approvals.

2.1.10 Supplier Control and Performance Metrics-The PMAH shall evaluate and select suppliers based on supplier capabilities, performance and article criticality. Criteria for selection, evaluation, and re-evaluation of suppliers shall be established. Records of the results of evaluations and any necessary actions arising from the evaluation shall be maintained.

The type and extent of control imposed onto the supplier for the purchased article or service is dependent upon the criticality of the article and the effect of the purchased article or service on downstream article realization. The control systems put in place shall meet the intent of AC 21-43 Chapter 3 (Supplier Control Program). When appropriate, the article shall be controlled through Engineering oversight of the manufacturing process, source inspection, and/or receiving inspection (see next Paragraph).

Suppliers shall be formally advised that their facilities, personnel and articles being supplied are subject to evaluation and inspection by the PMAH and the FAA, as they constitute an extension of the facilities of the PMAH. Supplier performance metrics should also comply with the intent of AC 21-43 Chapter 3.

2.1.11 Manufacturing Process Change Control and Substantiation-To ensure article safety and reliability, a system to control manufacturing processes and services should be considered. Such a system requires that each process be performed by qualified personnel and in accordance with approved specifications containing definitive standards of quality. Certain article categories may dictate the needs for Engineering Source Approval (fixed or frozen manufacturing processes) to qualify and manage changes to the manufacturing process and/or inspection system. Substantiation for a proposed process change may include functional and/or destructive testing.

2.1.12 COS Organization and Structure, including Safety Board-The PMAH shall have a defined COS Program Manager who is responsible for ensuring that the elements of the PMA Holder's COS systems and procedures are consistent with all regulatory and guidance material. In addition, the COS Program Manager shall be responsible for the creation and maintenance of PMA Holder's Safety Board. This Safety Board shall address any safety issues that may arise with the PMA Holder's articles. The Safety Board shall be responsible for communication with the FAA on any safety or airworthiness issues that may arise.

2.1.13 Design Change Control and Substantiation-The design change control process shall consist of a Review Board responsible for the evaluation and disposition of engineering change requests as well as the approval of initial releases of design data. Proposed changes will be reviewed with substantiating data. The evaluation of the change will include the effect of the changes on the articles, the Next Higher Assemblies (NHAs), any affected systems, and the product. The change will be approved, verified and validated, as appropriate, prior to implementation. The PMA Holder's Safety Board shall review design changes as required by the approved COS system.

2.1.14 Non-Conforming Material Control and Disposition-The non-conforming material control and disposition process shall consist of a Review Board responsible for the evaluation and disposition of non-conforming material in accordance with the PMAH Quality System. The PMA Holder's Safety Board shall review material dispositions as required by the approved COS system.

2.2 PMA Article Monitoring

The PMAH shall establish procedures within their Quality System that includes the following:

2.2.1 Closed Loop System for All Field Inquiries-The PMAH shall have a system and procedures in place to review, evaluate and respond to any inquiries or notifications of potential service problems from aircraft operators, maintenance service providers or the FAA. This procedure shall include a list of individuals or organizations within the company with defined responsibilities for responding to all inquiries/notifications. The procedure should require the PMAH to have appropriate methods and resources available to them to be able to identify the cause of any service difficulties, develop corrective actions and implement those actions in a timely manner. It should also define how the resolution and corrective action (if necessary) would be transmitted to the notifying entity, other entities potentially impacted (if necessary) and the FAA (per 14 CFR §21.3).

2.2.2 Article-Specific Performance Data Trend Analysis-An article-specific performance tracking system should be implemented for a PMA article that was determined during the design phase to have potential adverse effects on the operational safety of the NHA and/or product/article if it does not perform as intended. This system should include at a minimum, inspection and qualitative feedback from the article user after removal for any reason (including routine maintenance). The return of used article to the PMAH for evaluation is preferred. When possible, the PMAH should develop an in-service plan with the article End User to assess article performance relative to the design assumptions.

2.2.3 Article Delivery Statistics-For all PMA articles delivered, the PMAH shall maintain records of the quantity shipped, ship date and customer. The records shall contain sufficient information to allow the PMAH to positively link each article shipped to the lot number or manufacturing order under which the articles were produced.

2.2.4 Continuing ICA Review-Each PMAH shall have a system and procedure in place to review all available new and revised TCH maintenance instructions, Service Bulletins, etc. as well as Airworthiness Directives that pertain to the TCH article replaced by each of their PMAs. This system may utilize periodic searches of new or revised TCH ICAs for referencing the TCH PN replaced by the PMA PN.

This procedure shall include a list of individuals or organizations within the company with defined responsibilities for determining if any new or updated ICAs potentially affect the performance of their PMA article and procedures for resolving any such issues. The procedure should define steps to be taken when it is determined that the PMA article is affected by new or revised ICA.

2.3. Problem Response Actions

The PMAH shall establish procedures within their Quality System that includes the following:

(See Appendix 6.5 for a flow chart depicting the COS Problem Response process flow.)

2.3.1 Report as Required under 14 CFR § 21.3- The FAA requires a means for reporting failures, malfunctions, defects and service difficulties that have or could have created an unsafe condition, within 24 hrs of identification. PMA Holders already have this requirement within the PMAH Quality System. In addition to the PMAH PMA approval letter requirements, AC 21-9 provides requirements for reporting under 14 CFR § 21.3.

2.3.2 Risk Assessment, Analysis and Management- Risk assessments (qualitative) are performed immediately upon identification of a potential unsafe condition. Any design or hardware issue discovered by the PMAH that could result in a reduction in operational safety must be evaluated to determine the level risk. If a risk assessment cannot make a definite determination that the condition is not unsafe, then a risk analysis (quantitative) is required.

> Each FAA directorate has Risk Analysis and Management requirements. Contact your ACO COS Program Manager for assistance in performing a risk analysis. (Reference MSAD FAA Order 8110.107 Monitor Safety / Analyze Data)

Once the Risk Analysis has been completed, the results must be compared to the directorate's Risk Management requirements to determine if the level of risk is acceptable.

2.3.3 Customer Notification System-This system shall include a procedure for the release and control of technical information that is issued to ensure all necessary parties are aware of the field problem. The notification system may include FAA review. The notification system should include detailed technical instructions, which the End User can utilize to complete the necessary corrective action.

2.3.4 Response Team-A Response Team shall be developed to utilize expertise in resolving manufacturing, technical or in-service issues. The required expertise may vary depending on the issue at hand and the particular article or system involved. Response teams shall be able to provide expertise and evaluate field issues, such that they not only facilitate the investigation but also provide resolution to the customer and the FAA.

2.3.5 Failure Analysis –Once a failure (in service or manufacturing difficulty) has occurred, the PMAH should perform a detailed failure analysis. A policy should be in place that makes clear where the responsibility lies in completing the failure analysis and how that information is disseminated and presented to the FAA, if required. Although laboratory equipment does not have to be located at the PMAH facility, the PMAH must have the means to accomplish the analysis.

2.3.6 Ability to Identify, Develop, and Implement Field Corrective Action Plans- The PMAH's Safety Board directs the development and implementation of the field corrective action plan, if required, based on input from the Response Team. The PMAH should have a means of communicating with the supply chain and customers such that issues can be tracked and corrective actions implemented. The PMAH Quality System should already include a corrective action procedure; however this procedure should be extended to include field corrective action plans.

The PMAH Safety Board should conduct risk analysis of its PMA article's field reports that might involve the article's reliability and/or a safety issue for the product. A good reference for creating a rational plan is AC 39-8: Continued Airworthiness Assessments of Powerplant and Auxiliary Power Unit Installations of Transport Category Airplanes. While there is not a parallel document at this time for other products, the process as outlined in AC 39-8 can be applied to assess the hazard severity and likelihood. (See also FAA Order 8110.107)

Once the Risk Analysis has been completed, the results must be compared to the directorate's Risk Management requirements to determine if the level of risk is acceptable. If the level of risk is unacceptable, the PMAH Safety Board should coordinate with the ACO COS Program Manager to identify and develop a Field Corrective Action Plan. The Risk Analysis should be reevaluated with the Corrective Action Plan to determine if the risk level has been sufficiently reduced. Continue to refine the Corrective Action Plans until the level of risk is acceptable.

The risk analysis and PMAH proposed recommendations (Service Bulletin, Alert Service Bulletin, or AD) shall be reviewed and coordinated with the FAA Corrective Action Review Board (CARB) as early in the process as feasible.

The PMAH shall have the ability to source and manufacture replacement articles to address reliability and safety issues, as required, to satisfactorily manage the FAA and customer expectations.

2.3.7 Ability to Measure Effectiveness of a Corrective Action Plan- When corrective action is implemented its effectiveness should be monitored and compared analytically to the original data. Proper communication between the PMAH and customers and/or suppliers allows for measurement of the effectiveness of the corrective action plan. Through the implementation phase, the Risk Analysis should be periodically reevaluated as additional data is collected to ensure that the original risk analysis assumptions remain valid.

2.3.8 Feedback into Preventative Systems and Procedures as Required-The final closure to resolving service difficulties is providing feedback into the existing engineering, quality, manufacturing and safety systems. The aim is to prevent recurrence of these and similar problems and, at the very least, minimize them before safety-critical action is required. Feedback can occur through various means such as a Lessons Learned library, training activities, and continuous monitoring. The PMAH's Management, Engineering, Manufacturing and Quality should be in the loop for service information leading to necessary changes regardless of the

level of safety impacted. The key rationale is to develop and implement solutions for problem root cause so that they do not become field issues in the future.

Section 3

3.0 Application of a COS System

3.1 General and Article-Specific COS Plans

The PMA COS System uses two levels, depending on the results of the safety analysis that is performed during the design phase.

3.1.1 General COS Plan-The General COS plan requirements would be the default requirements for all articles that do not require an article-specific COS plan. A reference to the PMAH's General COS requirements shall be included in the applicant's PMA data package.

3.1.2 Article-Specific COS Plan-An article should have an article-specific COS plan defined if it was determined during the design phase to have potential adverse effects on the operational safety of the NHA and/or product if the PMA candidate article does not perform as intended. This article-specific COS plan could add additional items that goes beyond the PMA Applicant's General COS plan, such as article reliability reporting, a life management system, or destructive testing of used articles. The article-specific COS plan would be defined or referenced in the PMA Applicant's data package and approved by the ACO prior to PMA approval.

Section 4

4.0 Implementation and Verification of the COS System

Implementation

The PMAH or Applicant shall have a Quality System that is in compliance with the recommendations of this document.

Verification

Each PMAH shall develop an audit procedure to demonstrate initial and continued compliance of their Quality System to the general COS system requirements.

The PMAH may use the checklist in the Appendix A6.3 to assess compliance of their Quality System to this guidance material.

Section 5

5.0 Article Classification Guidance

FAA Order 8110.42 requires a safety assessment to determine if an article is “critical” or “non-critical”. AC 23.1309-1, AC 25.1309-1, or AC 33.75-1 and AC 33-8 provide guidance for performing the safety assessment. The PMAH’s safety assessment is used to determine the criticality classification of the article.

The criticality classification should be used throughout the design and manufacturing processes and addressing article-specific COS needs stated in Section 3.1.2.

Section A6 Appendices

A6.1 List of Abbreviations and Acronyms

AB	Airworthiness Bulletin
AC	Advisory Circular
ACO	Aircraft Certification Office
ACSEP	Aircraft Certification Systems Evaluation Program
AD	Advisory Directive or Airworthiness Directive
AIA	Aerospace Industries Association
AN	Army-Navy Aeronautical Standard ANSI American National Standards Institute
APIS	Approved Production Inspection System
ASB	Alert Service Bulletin
CAA	Civil Aviation Authority or Civil Aeronautics Authority
CARB	Corrective Action Review Board
CFR	Code of Federal Regulations
COS	Continued Operational Safety
DER	Designated Engineering Representative
EASA	European Aviation Safety Agency
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FMEA	Failure Modes and Effects Analysis
ICA	Instructions for Continued Airworthiness
IPC	Illustrated Parts Catalog
MARPA	Modification and Replacement Parts Association
MIDO	Manufacturing Inspection District Office

MISO	Manufacturing Inspection Satellite Office
MSAD	Monitor Safety / Analyze Data
NAS	National Aerospace Standards
NHA	Next Higher Assembly
Part 21	Certification Procedures for Products, Articles and Parts
Part 25	Airworthiness Standards: Transport Category Airplanes
Part 33	Airworthiness Standards: Aircraft Engines
Part 43	Maintenance, Preventive Maintenance, Rebuilding and Alteration
Part 45	Identification and Registration Marking
PC	Production Certificate
PI	Principal Inspector
PMA	Parts Manufacturer Approval
PMAH	Parts Manufacturer Approval Holder
PN	Part Number
SAIB	Special Airworthiness Information Bulletin
SAE	Society of Automotive Engineers
SB	Service Bulletin
SDR	Service Difficulty Report
STC	Supplemental Type Certificate
TC	Type Certificate
TCH	Type Certificate Holder
TSO	Technical Standard Order
TSOA	Technical Standard Order Authorization

A6.2 List of References

1) Title 14 CFR Part 21, Certification Procedures for Products, Articles and Parts.

2) Title 14 CFR Part 45, Identification and Registration Marking.

3) AC 21-9B, Manufacturers Reporting Failures, Malfunctions, or Defects, 12 August 2010.

4) AC 21-43, Production Under 14 CFR Part 21, Subparts F, G, K, and O, 16 October 2009.

5) AC 21.303-4, Application for Parts Manufacturer Approval Via Tests and Computations or Identicality, 21 March 2014.

6) AC 25.1309-1A, System Design and Analysis, 21 June 1988.

7) AC 33-75-1A, Guidance Material for 14 CFR § 33.75, Safety Analysis, 26 September 2007.

8) AC 33-8, Guidance for Parts Manufacturer Approval of Turbine Engine and Auxiliary Power Unit Parts under Test and Computation, 19 August 2009.

9) AC 39-8, Continued Airworthiness Assessments of Powerplant and Auxiliary Power Unit Installations of Transport Category Airplanes, 08 September 2003.

10) FAA Order 8100.7D, Aircraft Certification Systems Evaluation Program, 16 April 2010.

11) FAA Order 8110.42D, Parts Manufacturer Approval Procedures, 21 March 2014

12) FAA Order 8120.2G, Production Approval and Certificate Management Procedures, 31 August 2010.

13) FAA Policy Memo ANE-2004-33.4-4, Design Approval Procedures for Parts Manufacturer Approval of Critical Engine and Propeller Parts, 23 September 2005.

14) FAA Order 8110.107, Monitor Safety / Analyze Data, 10 March 2010.

A6.3 PMA COS System Compliance Checklist

PMA COS System Element	Yes	No
2.1 Preventive Systems/Procedures		
2.1.1 Internal Audits Scheduled and Performed?		
2.1.2 TC Holder Article Field Experience Reviewed?		
2.1.3 Article Development Planning Process Exists?		
2.1.4 Defined Design Review Process?		
2.1.5 Failure Modes and Effects Analysis Performed?		
2.1.6 Safety Assessment Performed?		
2.1.7 Risk Assessment and Analysis Capability Exists?		
2.1.8 Failure Analysis Capability Exists?		
2.1.9 Independent Article Verification Performed?		
2.1.10 Supplier Control and Performance Metrics Exist?		
2.1.11 Manufacturing Process Change Control Exists as Required?		
2.1.12 COS Organization and Structure, Including Safety Board Exists?		
2.1.13 Design Change Control and Substantiation Process Exists?		
2.1.14 Non-Conforming Material Control and Disposition Process Exists?		
2.2 Article Monitoring		
2.2.1 Closed Loops System Exists for All Field Inquiries?		
2.2.2 Article-Specific Performance Data Trend Analysis Exists as Required?		
2.2.3 Article Delivery Statistics are Available for Review?		
2.2.4 Continuing ICA Review System in Place and Being Performed?		
2.3 Problem Response Actions		
2.3.1 Reporting as Required under 14 CFR § 21.3 Procedure Exists?		
2.3.2 Risk Assessment, Analysis and Management Capability Exists?		
2.3.3 A Customer Notification System Exists?		
2.3.4 A Response Team has been Developed?		
2.3.5 Failure Analysis Capability Exists?		
2.3.6 The Ability to Identify, Develop, and Implement Field Corrective Action Plans Exists?		
2.3.7 The Ability to Measure the Effectiveness of a Corrective Action Plan Exists?		
2.3.8 A System Exists to Provide Feedback into Preventive Systems and Procedures?		

A6.4 PMA COS Responsibility/Accountability Matrix Guidelines

PMA COS System Element	ENG	PUR	QA	Safety Board	ODA
2.1 Preventive Systems/Procedures				R	
2.1.1 Internal Audits			R	A	
2.1.2 TC Holder Article Field Experience	R			A	
2.1.3 Article Development Planning	R	I		A	
2.1.4 Design Review	R	I	I	A	C
2.1.5 Failure Modes and Effects Analysis	R			A	
2.1.6 Safety Assessment	R		I	A	C
2.1.7 Risk Assessment and Analysis Capability	R			A	
2.1.8 Failure Analysis Capability	R			A	
2.1.9 Independent Article Verification	C	I	R	A	
2.1.10 Supplier Control and Performance	I	R	C	A	
2.1.11 Manufacturing Process Change Control	C	R	I	A	
2.1.12 COS Organization and Structure, Including Safety Board	C	C	C	R	
2.1.13 Design Change Control and Substantiation	R	I	I	A	C
2.1.14 Non-Conforming Material Control and Disposition	R	I	R	A	
2.2 Article Monitoring				R	
2.2.1 Closed Loops System for All Field Inquiries	C	I	R	A	
2.2.2 Article-Specific Performance Data Trend Analysis	R			A	
2.2.3 Article Delivery Statistics	I		R	A	
2.2.4 Continuing ICA Review	R			A	
2.3 Problem Response Actions				R	
2.3.1 Reporting as Required under 14 CFR § 21.3	C		C	R	R
2.3.2 Risk Assessment, Analysis and Management	R		C	A	C
2.3.3 A Customer Notification	C		C	R	I
2.3.4 A Response Team	C		I	R	I
2.3.5 Failure Analysis	R		I	A	I
2.3.6 Identify, Develop, and Implement Field Corrective Actions	R	I	C	A	C
2.3.7 Measure the Effectiveness of a Corrective Action	C		I	R	I
2.3.8 Feedback into Preventive Systems and Procedures	R	I	C	A	C

Groups/Functions:

ENG – Engineering

PUR – Purchasing / Supply Chain

QA – Quality Assurance/Control

Safety Board – COS Safety Board

ODA – Organization Delegation Authorization (ODA), if applicapable

Action/Information codes:

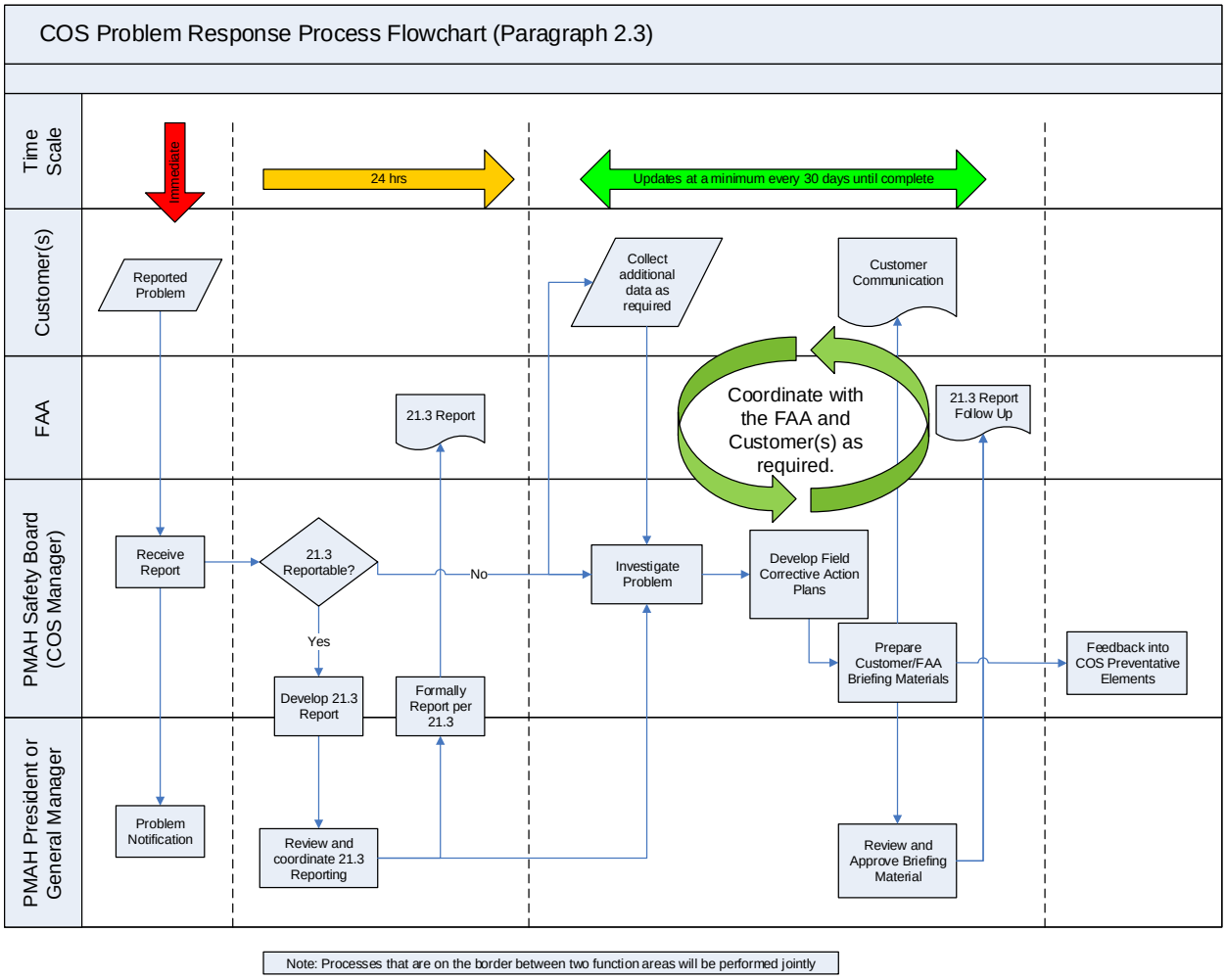
R-Primary Group Responsible for Action,

A-Accountable to ensure action takes place (if not primary),

C-Consultation with this group is recommended,

I-Inform this group to ensure proper communication.

A6.5 COS Problem Response Process Flow Chart



A6.6 Revision History

March 16, 2007 – Original Issue

September 16, 2007 (Revision 1) – Legal disclaimer added; address updated on page one to reflect MARPA's new office location.

August 31, 2012 (Revision 2) – Updated the MARPA logo. Updated to current FAA AC and Orders. Updated "part" to "article" and other minor editorial changes.

Note: Per Part 21.1 (b) Article means a material, part, component, process, or appliance
Product means an aircraft, aircraft engine, or propeller

Significant specific changes:

Paragraph 2.1	Re-ordered Problem Prevention section.
Paragraph 2.1.3	Changed focus from just complex parts to address all parts.
Paragraph 2.1.4	Broke Design Review paragraph into three related paragraphs (2.1.4-2.1.6)
Paragraph 2.1.5	Added FMEA paragraph.
Paragraph 2.1.11	Clarified Change Control process flow.
Paragraph 2.3.1	Added requirements for "or could have created an unsafe condition, within 24 hrs of identification."
Paragraph 2.3.2	Added Risk Analysis and Management Capability paragraph.
Paragraph 2.3.3	Dropped "Company-Wide".
Paragraph 2.3.5	Clarified requirements to include system effects up to the product level.
Paragraph 2.3.7	Reworded paragraph.
Paragraph 5.0	Reworded paragraph, changed AC references.
Appendix A6.4	Added new appendix for responsibility/accountability guidelines.

September 22, 2014 (Revision 3) – Enhanced Problem Prevention and Problem Response sections

Significant Specific Changes:

Paragraph 2.1	Moved Risk and Failure Analysis capability from 2.3 to 2.1.7 and 2.1.8.
Paragraph 2.3	Expanded Risk Assessment, Analysis and Management 2.3.2.
Paragraph 2.3.6	Added specific language on determining risk, risk levels and acceptable levels of risk. Linking these risk findings with appropriate field corrective actions.
Appendix A6.5	Added new appendix: COS Problem Response Process Flow Chart.