

MIL-STD-11991A Overview

For Parts Standardization Management Committee

April 2016

AMRDEC

MIL-STD-11991A Summary

- General Standard for Parts, Materials, and Processes (PM&P)
 - Reinstated 28 Aug 2015
 - Electronic and “Non-Electronic” PM&P
 - Addresses Commercial Off-The-Shelf assemblies
- Incorporates General Requirements and Detailed Requirements
 - General Requirements modeled after EIA-4899B and EIA-933B
 - Leveraged Missile Defense Agency PM&P Assurance Plan, and other industry and Defense standards
 - Structured so just General Requirements can be invoked and executed by detailed Plan
 - Detailed Requirements can be invoked at option of Procuring Activity, or as reference to develop detailed Plan
- Data Item DI-STDZ-81993 for PM&P Plan and PM&P List
 - Recommended to require customer approval of Plan
 - PM&P List supports design review and proactive program management
- Actively working Revision B requirements: **Seeking inputs**
 - Emerging and evolving technology concerns
 - Revision A comments
 - Inadvertently left out MIL-STD-3018, so will be added

Provides Knowledge Base for PM&P Disciplines

MIL-STD-11991A

Outline Summary

4. General Requirements

- 4.1 General
- 4.2 PM&P (Application)
- 4.3 PM&P Selection
- 4.4 Life Cycle Management
- 4.5 Commercial Off-The-Shelf Management
- 4.6 Subcontractor Management

5. Detailed Requirements for PM&P

- 5.1 General
- 5.2 Parts Requirements
- 5.3 Materials Requirements
- 5.4 Processes Requirements
- 5.5 Prohibited PM&P

Appendix A, Derating

Appendix B, COTS Management

Appendix C, Prohibited PM&P

Appendix D, Radiation Hardness Assurance

Appendix E, Outgassing

Appendix F, Counterfeit Parts and Materials

Appendix G, Obsolescence

Appendix H, Incoming Inspection

MIL-STD-11991A Requirements

- Selection
 - PM&P must meet reliability requirements over the life cycle environmental and operating stress profile
- Life Cycle Management
 - Address obsolescence, counterfeit prevention, change control
- Subcontractor Management
 - Assure flow-down throughout the supply chain
 - Can leverage similar commercial aviation Parts requirements with mostly common supply chain
- Prohibited PM&P
 - Items require customer approval for use
 - Provides rationale for assessment in application and possible mitigations
- Derating
 - Leverages industry standards, such as GEIA-STD-0008 for commonality
 - GEIA-STD-0008 under revision currently
- COTS: must meet system requirements proven with data
 - Identify PM&P and/or mitigate risk of knowledge gaps
- Counterfeit Prevention: comply with industry best practices

AMRDEC Actively Applying MIL-STD-11991 to Multi-Missile Launcher Technology Development Program and EMD: Lessons Learned for Rev B

MIL-STD-11991 SOW Example

X.X Parts, Materials, and Processes (PM&P) Plan

The contractor shall develop, implement, and maintain, or comply with and maintain, a program that defines the criteria, procedures, and processes for the management and control of PM&P, and document it IAW DI-STDZ-81993, with government approval. The PM&P Plan shall address the requirements of MIL-STD-11991, and describe the parts and materials selection process, including responsibilities for the evaluation, documentation and notification of part changes, manufacturing processes, and material changes. This process shall address allocation of system performance requirements to parts and materials requirements, including consideration for performance tolerances, and define parts and materials qualification requirements that assure meeting system performance and reliability requirements. In addition, the Plan shall include flow-down requirements for parts and materials, including off-the-shelf and non-developmental items, to suppliers for assemblies procured. The use of any of the problem PM&Ps listed in MIL-STD-11991, Appendix C, shall require government approval. The PM&P program shall ensure that:

- a. Parts performance, reliability, quality, and safety will meet system performance requirements for the worst case system non-operating and operating environments over the system life cycle. Parts shall not be used outside vendor specifications without prior Government approval.
- b. Materials utilized will produce equipment that meets system performance requirements. The PM&P program shall include the necessary design effort, selection of materials, delineation of applicable finishes, techniques for deterioration prevention, and appropriate test programs to verify deterioration control. Finishes and coatings shall be applied as necessary to provide corrosion/deterioration protection. The paint system shall provide Chemical Agent Resistant Coating (CARC) characteristics.
- c. Processes utilized for the manufacture of electronic hardware will produce assemblies and equipment that meet system performance requirements. The PM&P program shall describe the materials, methods, and verification criteria for producing quality electrical interconnections and assemblies and shall utilize process control methodologies for the planning, implementation, and evaluation of the manufacturing processes. Soldering shall comply with J-STD-001, class 3, and IPC-A-610, class 3.
- d. Lead-free Control Plan. The Contractor shall prepare, or update existing, Lead Free Control Plan (LFCP) for submittal and approval as a portion of the PM&P Plan. The requirement for a Lead Free Control Plan shall be flowed down to suppliers of equipment that may include lead-free materials. The LFCP shall follow the guidelines set forth in GEIA-STD-0005-1, "Performance Standard for Aerospace and High Performance Electronic Systems Containing Lead-Free Solder" or its equivalent. In addition, the LFCP shall also include tin whisker mitigation plans in accordance with GEIA-STD-0005-2, "Standard for Mitigating the Effects of Tin Whiskers in Aerospace and High Performance Electronic Systems" or its equivalent, at control level 2C or equivalent. The Contractor should include in the LFCP any special design considerations, manufacturing process controls, test and qualification requirements, quality inspection and screening, marking and identification, maintenance and repair processes, and other steps taken to mitigate risks.
- e. Counterfeit Risk Management. The Contractor shall prepare, or update existing, Counterfeit Risk Management Plan for submittal and approval as a portion of the PM&P Plan. The Plan shall meet the requirements of SAE AS5553 for electronic items and SAE AS6174 for non-electronic items. The Contractor shall procure parts from original manufacturers or the original manufacturers' franchised distributors.
- f. Commercial Off-the-Shelf (COTS) Management. The Contractor shall prepare, or update existing, COTS Management Plan for submittal and approval as a portion of the PM&P Plan. The Plan shall meet the requirements of EIA-933.