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# Critical Safety Item (CSI) Process Training for Suppliers



# General

- AAI maintains a Critical Safety Item (CSI) program designed to mitigate the risk of failure of items as specified on the Purchase Order (PO).
- As an AAI Supplier, it is your responsibility to review your PO to see if the program applies to you.
- AAI wishes to partner with Suppliers which have CSI applicable items to support continual improvement of your processes to ensure high quality of our combined products.



# What does this mean to me?

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- The CSI program is implemented through the CSI code identified on your PO
  - <http://suppliercodes.aaicorp.com/ProcCodes.html>
- The SQAR further defines CSI requirements
  - <http://www.aaicorp.com/docs/SQAR%20INSTR-SUPQ47.doc>
- Additionally, there is a CSI program activities guide QA-SP65 (available on supplier website)



# My PO does identify CSI , So?

- The CSI code currently requires data for at least one item per lot
- Suppliers need to have and follow a control plan for each item describing how critical characteristics are to be controlled
- Suppliers do not have authorization to make changes to CSI items including their production processes, acceptance tests, control plans, etc . . . . Without written AAI approval (ref. change request form also shown in SQAR, available on supplier website)
- Suppliers activities are subject to periodic audit and ongoing review



# Identification of CSI Items

- AAI ERP System Part description includes “(CSI x)”
  - e.g., 12345-67890 Widget 1 (CSI 4)
- AAI Product Life Management system (Matrix) part attributes indicates CSI level as “1, 2, 3, 4, or N”
- Drawing indicates **CRITICAL SAFETY ITEM** on first page
- Text within drawing identifies item as CSI
- Critical characteristics are identified with the symbol  
**\*CSI\***



# CSI Benefits

- Proactively identifies program and product risks
- Aligns controls with criticality of parts and risk of failure (including overall systems)
- Improves definition of AAI requirements (with Supplier input)
- Identifies impact of changes prior to implementation
- Improves part yields
- Reduces in mishap rate
- Ensures control of critical characteristics



# Definitions

Let's make sure we speak the same language (we love acronyms) . . .



# Critical Safety Item (CSI)

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A part, an assembly, installation equipment, launch equipment, recovery equipment, or support equipment for an aircraft system that contains a characteristic which failure, malfunction, or absence of could cause a catastrophic or critical failure resulting in the loss of or serious damage to the aircraft, an unacceptable risk of personal injury or loss of life, or an un-commanded engine shutdown that jeopardizes safety.





# Critical Characteristic (CC)

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Any feature throughout the life cycle of a CSI (e.g., dimension, finish, material or assembly, manufacturing or inspection process, installation, operation, field maintenance, or depot overhaul requirement) which if nonconforming, missing, or degraded could cause failure or malfunction of the CSI. Critical characteristics may be identified on drawings, in technical data packages, in contract quality assurance provisions, or through other contract requirements/clauses.

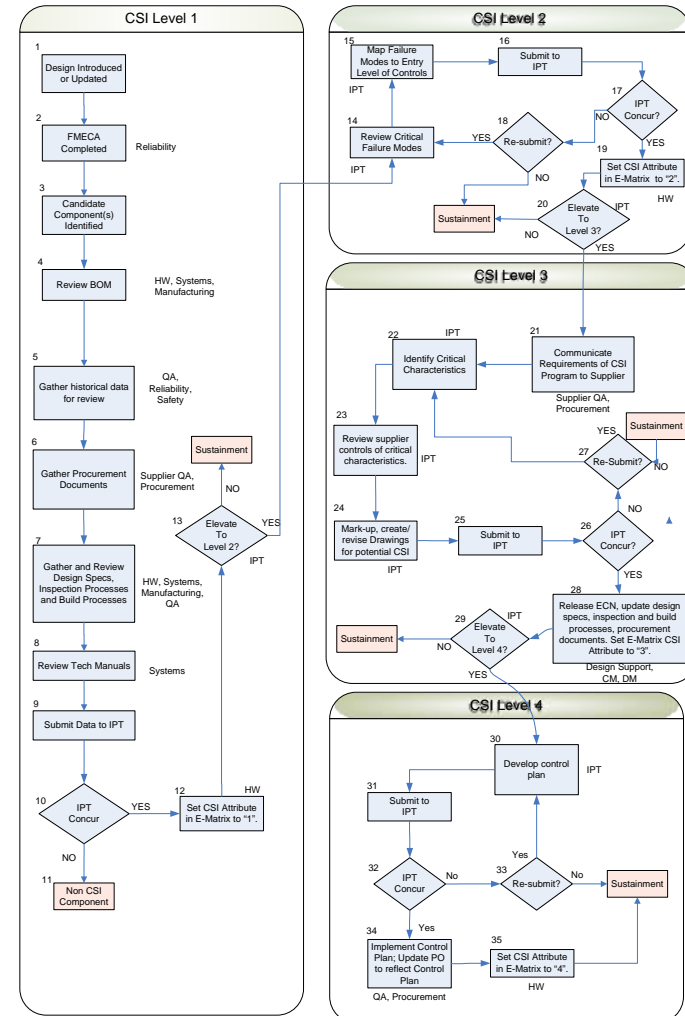


# CSI Process Flow and Life Cycle

- 4 Levels to CSI

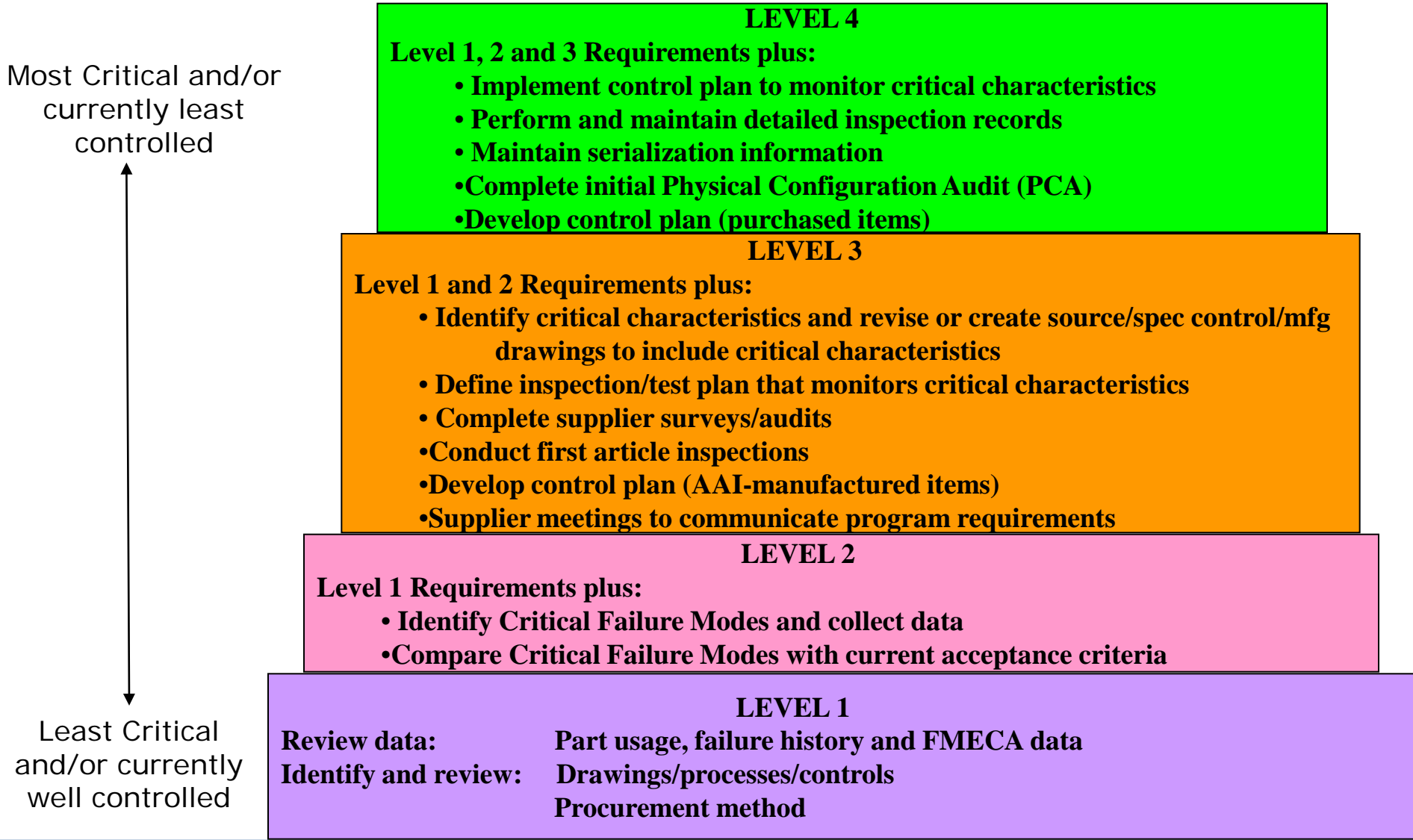
- Level 1 (least critical and/or currently well controlled)
- Level 2 (no longer used for new design)
- Level 3 (no longer used for new design)
- Level 4 (most critical and/or least currently controlled)

TUAS CSI PARTS LIFECYCLE  
For Purchased Parts





# General Description of Levels





# Level 1 Review

- Historical data gathering is the focus in order to understand the part's likelihood to contribute or cause a severity 1 or 2 failure
  - Complete FMECA
  - Review Near Mishap/Mishap Database
  - Review Quality Data for positive/negative trends
  - Review BOM and drawing package for accuracy and proper integration within the system
  - Review procurement documentation to identify supplied parts
  - Review Tech / Field manuals
- Following Review: CM/Data Management updates Matrix attribute to 1



# Level 2 Review

- Map failure modes in FMECA to existing controls
  - Example 1: Voltage output of electronic part is deemed severity 1. Current control is an in-process voltage test.
  - Example 2: Interface/Fit of part A with B is deemed severity 2. Current control is an in-process dimensional measurement of parts A and B prior to assembly.
- For failure modes which do not have existing controls in place the AAI must make a determination if elevation of the part is needed or if additional/modified process checks can be put in place without elevation.
- Following Review: CM/Data Management updates the Matrix attribute to 2



# Level 3 Review

- For Supplied Parts: Supplier QA, with Procurement concurrence, shall make a supplier visit to present the CSI program and define the responsibilities of the supplier should *further* elevation (to level 4) of their part occur.
- Once requirements are agreed to by the supplier and AAI, the CSI Program Activities Plan, QA-SP65, will be incorporated into the purchasing documentation for the CSI part via PO quality code.
- Critical Characteristics (CCs) identified
  - Contact your Assigned AAI Supplier Quality Engineer for support as required.



# Level 3 Review (continued)

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- Mark-up current or new drawings with CCs identified.
  - Inspection/Test/Receiving or In-Process Procedures
  - Procurement Documentation
  - Drawings
  
- Following Review: AAI CM/Data Management updates Matrix attribute to 3 as part of ECN/ECP process. QA Codes added to POs:
  - CSI Supplier Activities
  - First Article Inspection
  - Source Inspection
  - Government Source Inspection (potentially)





# Level 4 Review

## ★ For Supplied Parts Only – Control Plan Implemented

- Additional Options
  - First Article Inspections / First Article Tests (FAI/FAT) performed
  - Physical Configuration Audit (PCA) executed
  - Serialization
  - Supplier Survey / Audit
  - Source Control Drawing (SCD) to purchase parts
  
- Following Review: AAI CM/Data Management updates Matrix attribute to 4. QA Codes added to POs:
  - CSI Supplier Activities
  - First Article Inspection
  - Source Inspection
  - Government Source Inspection (potentially)



# Sustainment

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- Once completed (ie through ECN/ECP phase of a development/change program), identified CSI parts and their controls enter Sustainment.
- Responsibility for sustainment transfers to QA.
- During sustainment an audit and review cycle is established for CSI parts.



# Sustainment Activities

- AAI QA Process Guide “Critical Safety Item Program Control Implementation and Sustainment” describes:
  - Product inspection planning
  - First article inspection (or delta FAI)
  - Inspection Procedures (IPs), Manufacturing Process Directives (MPDs), Test plans (if applicable)
  - CSI control plans
  - Detailed process documentation
  - Supporting Configuration Management PCA (or delta PCA)
  - Data reviews (CSI levels 1 - 4)
  - Supplier audits (CSI levels 3 and 4)
  - Change control process



# Changes to CSI Items

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- Changes formally requested using form AAI QAPG-QE63-FM1 AAI Item Change Request
  - Applies to purchased and AAI manufactured parts
  - Available on website (hyperlink)
- Suppliers submit to buyer
- All requests then forwarded to AAI Engineering and QA for review/approval
- Formal ECN/ECP required to implement drawing or control plan changes
- Buyer communicates revisions to supplier through PO changes



# Example Control Plan

Part Number: 12345-67890-1 (One P/N per control plan)		<b>CSI CONTROL PLAN</b> <b>Any changes to control plans must be approved prior to implementation</b>				Control Plan Number: CP12345-67890			
Part Object Rev (e.g., 001, 002, ...): 001						Control Plan Revision/Date: A 7/28/2011			
Part Description: Widget 1						Supplier Approval / Date:			
Supplier: Widgets, Inc.						AAI Engineering Approval / Date:			
Supplier Contact: John Brown						AAI QA Approval / Date:			
					Customer Approval / Date:				
Characteristics		Mfg Tools/Machines	Characteristic Classification	Product/Process Specification/Tolerance	Evaluation/Measurement Technique/Accuracy	Methods		Control Method	Reaction Plan
Product	Process					Sample Size	Frequency		
Material (balsa wood)		Purchased	Critical	Widgets, Inc. to prepare a written process and assign a number to the current spec	Visual upon receiving inspection	Every lot	100%	One supplier	Contain with lot number and Widget 1 serial number
	Milling right angle	Milling machine 4	Critical	To drawing 12345-67890	Dial indicator, .0005" accuracy	Every lot	100%	Measurement	Contain/segregate



# Questions?

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- **If you have any questions, contact your assigned Supplier Quality Engineer.**