Aviation Critical Safety Item Management Handbook

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CHAPTER 1

GENERAL INFORMATION

Aviation Critical Safety Items (CSIs) are defined by Public Law 108-136, Section 802, and Defense Federal Acquisition Regulation Supplement (DFARS) 209.270 as "*a part, an assembly, installation equipment, launch equipment, recovery equipment, or support equipment for an aircraft or aviation weapon system if the part, assembly, or equipment contains a characteristic any failure, malfunction, or absence of which could cause—*

1) a catastrophic or critical failure resulting in the loss of or serious damage to the aircraft or weapon system;

2) an unacceptable risk of personal injury or loss of life; or

3) an uncommanded engine shutdown that jeopardizes safety."

Several factors contributed to the establishment of CSI as a distinct category of supply items. The Department of Defense (DoD) has repeatedly received defective, suspect, improperly documented, unapproved, and fraudulent replenishment parts used in safety-critical applications. DoD and the defense industry recognized that unless processes were established and rigorously followed the potential for these parts to contribute to aviation mishaps and hazards was unacceptable.

In response, DoD acquisition organizations, program offices, functional specialties, supply centers, contract management offices, and contractors established and applied their own approaches for managing critical items. Although they all had the same intent (i.e., to ensure the quality of safety-critical parts), the proliferation of terms, policies, and procedures created unacceptable risks caused by gaps in policies and confusion about which policies applied in a given situation. Consequently, the term 'Aviation CSI', the Public Law, and implementing policies and processes described in this Handbook were established to standardize terminology, definitions, criteria, and management procedures across the military Services and defense agencies.

1.1. Policy Basis for CSI

The military Services' CSI policies, processes, and common terminology are founded in Public Law 108-136, Section 802, and DFARS 209.270. In addition to establishing the term 'Critical Safety Item' (defined above), they also define

'*Design Control Activity*' (DCA) with respect to an aviation critical safety item as "*the systems command of a military department that is specifically responsible for ensuring the airworthiness of an aviation system or equipment in which the item is to be used*." (In this Handbook the term '*Engineering Support Activity' (ESA)* is synonymous with the term DCA.) Most importantly, however, these policies establish that:

1) the head of the DCA is responsible for identifying CSIs and managing the procurement, modification, repair, and overhaul of aviation CSIs;
2) the head of contracting activities for aviation CSIs may enter into contract for procurement modification, repair, or overhaul only with sources approved by the DCA; and
3) CSIs delivered and services performed on CSIs meet all technical and quality requirements specified by the DCA.

Public Law 108-136, Section 802, directs Section 2319 of title 10, United States Code (USC) to be amended to reflect the aviation CSI requirements passed by the law. Approximately three years after the aviation CSI law passed, another law (Public Law 109-364) was passed to expand CSI coverage to include 'ship critical safety items'. These provisions also direct amendment of Section 2319 of title 10, USC to reflect ship CSI requirements. Upon revision, Section 2319 of title 10, USC will then address both aviation and ship CSI requirements. However, this Handbook will only address aviation CSI guidance.

To implement the aviation CSI Public Law, the military Services and defense agencies worked together to develop an instruction under the auspices of the former Joint Aeronautical Logistics Commanders (JALC). The JALC organization included the highest levels of leadership from each Service's aviation acquisition community and representatives from Defense Logistics Agency (DLA), Defense Contract Management Agency (DCMA), Federal Aviation Administration (FAA), National Aeronautics and Space Administration, and Department of Homeland Security. The CSI Instruction was issued by all Services and defense agencies under their respective regulation structures. Specifically, it was issued as SECNAVINST 4140.2, AFI 20-106, DA Pam 95-9, DLAI 3200.4, and DCMA INST CSI (AV) and is included in its entirety as Appendix I of this Handbook. The instruction is entitled "Management of Aviation Critical Safety Items", and is hereafter referred to as the Multi-Service/Defense Agency CSI Instruction or Appendix I. To supplement the instruction and provide implementing guidance, the JALC also sponsored the development of this Handbook.

On 11 March 2010, the JALC reorganized into the Joint Aeronautical Commanders Group (JACG). The JACG includes the same senior membership as the former JALC, and sponsorship of this Handbook continues.

Policies and guidance are continually under review and revision. The user is strongly advised to ensure the Multi-Service/Defense Agency CSI Instruction (Appendix I) and this Handbook are the most current versions issued. Contact the appropriate Service/Defense Agency CSI Point of Contact (POC) if there is any uncertainty. A list of CSI POCs is provided in Section 1.6.

This Handbook provides implementing guidance for the Multi-Service/Defense Agency CSI Instruction (included as Appendix I) to the degree that such guidance is common across the Services and defense agencies. Often, Service/defense agency-specific policies or guidance differ across agencies or may provide additional information to supplement the guidance provided here. The existence of such policies is noted in the text, where applicable. The user is again strongly advised to contact the appropriate Service/defense agency CSI POC to identify and access these policies.

1.2. Purpose

This Handbook is a guide for Government engineers, logisticians, contracting officers, quality assurance specialists, and other supply chain management personnel involved in the life cycle acquisition and management of aviation CSIs. It provides amplifying information and examples to help explain CSI policies and translate the Multi-Service/Defense Agency CSI Instruction into Government procedures and recommended contract requirements. This guide does not provide step-by-step implementing procedures. For detailed procedures, see Service/defense agency-specific guidance.

This guide applies to DoD aviation entities and is not intended as direction to prime/Original Equipment Manufacturer (OEM) Contractors or alternate suppliers. Prime/OEMs and alternate suppliers should refer to CSI provisions specified in their respective contracts and contact their Administrative Contracting Officer (ACO) or Procurement Contracting Officer (PCO) to resolve any ambiguities, conflicts, or concerns.

1.3. Scope

This document applies to aviation CSIs used in fixed and rotary wing aircraft, unmanned air vehicles, Aircraft Launch and Recovery Equipment (ALRE), aviation weapons and equipment, and associated aviation support equipment. CSIs are found on many different types of equipment in the aviation environment. These will be described and discussed in Chapter 2, Criticality Determinations and Identification. Also refer to Service-specific implementing policies and guidance

to specifically define the types of systems and equipment that should be addressed.

Additionally, this Handbook applies to Foreign Military Sales (FMS) aircraft when they are still in active use in the DoD inventory or if the U.S. military is providing engineering expertise via an FMS case.

However, this Handbook does not apply to aircraft, subsystems, or equipment certified, operated, or maintained in accordance with FAA regulation, unless required by the cognizant ESA. The Handbook does apply to those portions of commercial aircraft or subsystems which have been modified or maintained to meet unique military requirements. Additional guidance regarding CSI policies as they apply to commercial aircraft or subsystems is provided in Sections 2.6.3 and 2.6.4.

1.4. Organization of the Handbook

This document is structured to supplement the policies and procedures of the Multi-Service/Defense Agency CSI Instruction. It is organized into chapters that parallel the Instruction's Section E, *Procedures*.

Chapter 3 formerly addressed the topic of Sourcing for CSIs. However, the issues to be addressed became so expansive that separate JACG Source Approval and Management Handbooks were developed. A link to the current version of the JACG Source Approval and Management Handbook is included in Chapter 3.

Several appendices are included to maximize the utility of the Handbook. The Multi-Service/Agency Instruction is incorporated in its entirety as Appendix I, a list of acronyms is found in Appendix II, and Appendix III provides explanation of CSI Management key points and issues presented in the form of *Frequently Asked Questions (FAQ)*. Appendix III, *FAQ*, is strongly recommended as a resource for concise explanations of CSI policies and procedures.

Additionally, a set of Exhibits provide the user with job aids such as checklists, reference lists, forms, examples of recommended contract language, etc.

1.5. Terminology

Throughout the Handbook, the acronym CSI refers to *aviation* CSIs, exclusively.

Public Law 108-136 and DFARS 209.270 use the term 'Design Control Activity (DCA)', defined in Section 1.1, above. However, the Multi-Service/Defense Agency CSI Instruction and this Handbook use the term '*Engineering Support Activity' (ESA)* as synonymous with the term DCA.

> Note that paragraph E.1.b. of the Multi-Service/Defense Agency CSI Instruction provides a summary of the Public Law and DFARS definition of the term '*CSI'* and, alternatively, Enclosure (1), *Definitions*, of the Instruction amplifies the definition established in the Public Law to provide specific criteria. *The CSI definition issued by the Public Law takes precedence over all others*.

The term 'common use item' is used in this Handbook to refer to an item used in multiple platforms (e.g., the same part used in an F-15 and an F-18, the same item used in an H-53 and an H-60. etc.), across Services (e.g., Army; Navy; and Air Force H-60s: Air Force and Marine Corps C-130s, etc), or both.

Criticality determinations and other actions taken on aviation CSIs used by more than one Service must be coordinated with all using Services as contingencies arise. Procedures for this coordination process are outlined in Section 2.6.2 of this Handbook. A common use item may be a standard part or one that is unique to an aviation system or military Service.

The term '*standard part'* refers to a part manufactured and inspected in complete compliance with:

- an established U.S. Government specification or standard (e.g., a military or federal specification, Army-Navy Aeronautical Standard (AN), etc.);
- a U.S. ratified international standardization agreements [e.g. NATO STANAGS (Standardization Agreement), etc]; or
- a non-Government specification or standard published by a broadly-recognized professional society, industry association, or consensus standards development organization [e.g., SAE (Society of Automotive Engineers), ASME (American Society of Mechanical Engineers), ANSI (American National Standards Institute), AIA (Aerospace Industries Association), etc] which either includes design or manufacturing criteria, test and acceptance criteria, and uniform identification requirements; or establishes specific performance criteria, test and acceptance criteria, and uniform identification requirements.

Other acronyms and terms used in this Handbook are defined in the Multi-Service/Agency Instruction included as Appendix I.

1.6. Feedback

Users are encouraged to submit comments, questions, and lessons learned to their Service or defense agency point of contact responsible for updates to this Handbook.

SERVICE	ORGANIZATION	PHONE
Army	AMCOM	256-313-8981
Army	AMCOM	256-313-8966
Navy	NAVAIR	301-342-2219
Navy	NAVAIR	301-342-2241
Navy	NAVAIR	301-757-2505
USAF	AFMC	937-257-5448
DLA	DSCR	804-279-4628
DLA	DLA HQ	703-767-1519
DCMA	DCMA	816-468-5433 x12

CHAPTER 2

CSI DETERMINATION AND IDENTIFICATION

Identifying an item as 'CSI' helps ensure the item will receive appropriate management throughout its life cycle. DoD acquisition laws and regulations establish a preference for competitive procurements. The volume of spare and repair part procurements constrains DoD's ability to evaluate potential suppliers or their products prior to parts delivery. It is common for suppliers with limited knowledge of a critical item's function, application, design intent, failure modes and effects, or critical features to seek and obtain Government contracts. CSI designation helps DoD to prioritize products based on criticality to a system's safe operation and helps to establish prospective supplier and part assessment requirements based on that priority. The CSI designation helps prioritize Government quality assurance resources and determines the approval authority necessary for changes or deviations to specified requirements. (See Service-specific policies and guidance regarding delegation of approval authority for minor deviations and changes.) A CSI determination also triggers specific disposal procedures for items that are beyond their useful life or performance limits or are defective, suspect, or unapproved.

2.1. CSI Determination Responsibilities

The cognizant military Service ESA (or ESAs for common items) is responsible for criticality determinations. The ESA is the military Service organization assigned responsibility and authority to perform and approve engineering and quality assurance actions necessary to evolve detail design disclosures for systems, subsystems, equipment, and components exhibiting attributes essential for products to meet specific military requirements. For the purpose of this Handbook, the ESA is the Service's Aircraft Airworthiness Authority and Design Control Activity.

Prime contractors, OEMs, or other parties may provide recommendations regarding criticality determinations for individual items, but the cognizant ESA engineer is responsible for the official determination.

During initial provisioning, cataloging, or approval of an Engineering Change Proposal (ECP) or Design Change Notice (DCN), the cognizant Service logistics organization verifies that the criticality determination has been accomplished by the ESA cognizant engineer and verifies that the determination is recorded in appropriate databases.

To help prevent delays in procuring newly identified CSIs, at least one approved source of supply or repair/overhaul must be identified for each CSI at the time the criticality is determined or as soon afterwards as practical. (See paragraph E.1.b. of the Multi-Service/Defense Agency CSI Instruction, Appendix I.) The prime contractor or OEM may be the only approved source known at the time the determination is established. Additional information on sources of CSIs and the source approval process is provided in the JACG Source Approval and Management Handbook *[Future link to JACG Source Approval and Management Handbook].*

2.2. CSI Determination Timing and Triggers

For systems/subsystems under development or modification, the criticality of repairable and consumable parts (i.e., replenishment items) must be established by the cognizant Service ESA early enough to allow adequate support and manufacturing planning for CSIs.

For in-service items, criticality determinations should be initiated or validated when there are:

- changes to an item's configuration;
- changes to manufacturing or repair/overhaul processes;
- changes to sources of supply or repair/overhaul;
- requests for deviation
- significant changes in operating concepts or conditions
- product quality deficiency reports (PQDRs)
- engineering investigations.

See Service-specific policies requirements and processes regarding the performance of criticality determinations supporting PQDRs and engineering investigations.

2.3. CSI Applicability

2.3.1. Types of Items

Aviation CSI policy is intended to ensure required quality standards are consistently met by suppliers of CSI parts and services throughout a platform's life cycle. As such, *the CSI designation is generally applied to repairable and consumable parts (i.e., replenishment items).* In some cases, the ESA may wish to include critical airframe structures such as bulkheads, spars, and ribs that are produced and assembled once, even though there is no expectation that they

would be replaced or repaired, overhauled, or otherwise maintained on a recurring basis.

2.3.2. Level of Criticality Determinations

The focus on repairable and consumable parts also helps define the appropriate levels of work breakdown structure to which determinations should be applied. How "far down" do we go? Do we assess every piece-part of every assembly? Do we always stop at the assembly level?

The appropriate level of detail or decomposition for criticality determinations is primarily a function of the maintenance concept for the system or equipment, but may be influenced by other factors. Clear boundaries that would apply in every context cannot be defined.

Unless otherwise directed by the Service ESA, critical items should be identified at the *lowest level at which items will be procured or replenished by the Government*. For example, if nuts, bolts, bearings, blades, and other piece-parts of an assembly will be replaced at any DoD or DoD contracted maintenance level, then these items (and their next higher assembly) should be assessed as potential CSI candidates.

At the other extreme, if assemblies or subassemblies will be maintained solely by their removal and replacement (i.e., the item is considered a throwaway item (SM&R code PAOZZ), then CSI determinations should be completed only to the assembly or subassembly level. It is not required to go any lower level to perform determinations on individual components. For example, electronics subsystems, such as avionics or mission systems, are often remove/replace at the "box" level. The CSI determination would be made for the box part number, without delving into the individual electronic components inside the box.

Applying CSI designations only to the assembly or major subsystem level raises concerns that the actual safety-critical components that make up the assembly are being overlooked. In these cases, the focus of CSI practice would shift to emphasize the supplier's CSI management processes. Specifically, the Government would evaluate the supplier's methods for identifying the subsystem or assembly's critical parts and managing their manufacturing and supply sources. Prime contractor and OEM CSI management processes of interest are discussed in Section 4.7.

Questions are also asked regarding the level at which determinations should be rolled "upward." Generally, assemblies with CSI subcomponents should be designated CSI when DoD acquires both the complete assembly and the components to repair and overhaul it. *This does not imply that every*

subcomponent of a critical assembly is CSI. Only those subcomponents individually assessed to be relevant to the safety-critical nature of the assembly should be designated CSI.

The basis of CSI determinations on repairable and consumable parts and maintenance concepts underscores the importance of effective working relationships among logistics and engineering communities. Logisticians are responsible for life cycle support concepts that ultimately define spare parts and for providing these concepts to engineers who are then responsible for identifying CSIs and approving their sources. This relationship is particularly meaningful during the acquisition, development, and initial production stages of new platforms. There must be continual communication and exchange of information to meet the challenge of conducting criticality determinations while there are constant design and supportability updates in the late development/early production environment.

2.3.3. Types of Equipment Impacted by CSI Determinations

CSIs are not limited to aircraft components necessary to keep the aircraft flying. Refer to Service-specific direction and guidance to help define the types of equipment to which CSI policies apply. Examples of equipment that may contain CSIs include:

- propulsion, transmission, and power system items, such as high speed rotating components, bearings, propellers, etc.;
- landing and braking system components, such as nose wheel steering, wheels and hubs, brake pistons and assemblies, etc.;
- critical air vehicle subsystems, such as embedded, portable and engine fire suppression equipment, refueling equipment, armament/stores, etc.;
- flight control components, such as linkages, actuators, yokes, flight controls surfaces, etc.;
- support equipment, such as bomb loaders, engine hoists, external power units, etc.;
- aircraft launch and recovery systems, such as aircraft catapults, arresting gear, jet blast deflectors, holdback bars, etc.;
- escape systems and parts, such as ejection seats, parachutes, canopy release and fracturing systems, etc.;
- life support system equipment, such as oxygen delivery systems, acceleration protection systems, laser eye protection, etc.;
- survival and rescue gear, such as life vests and flotation devices, emergency radios and beacons, helmets, etc.

2.4. CSI Determination Criteria

Safety is the primary driver of CSI policies and processes. Failure consequence is the primary factor in determining an item's criticality. DoD's CSI strategy is intended to minimize the risk of death, injury, or illness to personnel resulting from preventable, improperly manufactured, assembled, repaired, inspected, or procured aviation components. While the focus is on personnel safety, defective CSIs can also cause significant damage to weapon systems and equipment. Consequently, factors relating to 'damage' are also considered in CSI principles. Both safety and damage factors are reflected in Public Law 108-136 which defines CSIs as parts that contain a characteristic any failure, malfunction, or absence of which could cause—

- a catastrophic or critical failure resulting in the loss of or serious damage to the aircraft or weapon system;
- an unacceptable risk of personal injury or loss of life; or
- an uncommanded engine shutdown that jeopardizes safety.

MIL-STD-882D, *Standard Practice for System Safety,* establishes guidance on mishap severity categories. As summarized in Table 2.1, below, MIL-STD-882D guidance has been adapted for CSIs. Consistent with CSI emphasis on personnel safety, both Catastrophic (Category I) and Critical (Category II) personnel safety related criteria apply to CSI determinations; however, only the Catastrophic (Category I) damage criterion (loss exceeding $1 million) is applied. MIL-STD-882D encourages programs to tailor damage criteria to correspond to system-specific levels of concern. Where a program has established 'catastrophic damage' criteria to be other than $1 million, CSI criticality determinations for that program should be consistent with the tailored damage criteria. See MIL-STD-882D for more information about mishap severity categories and establishing tailored criteria.

Table 2.1. CSI Selection Criteria

Description	Consequence Severity Category	CSI Failure Consequences
Catastrophic	I	Failure could result in • death, • permanent total disability, • loss exceeding $1M
Critical	II	Failure could result in • Permanent partial disability, • Injuries or occupational illness resulting in hospitalization of at least 3 personnel

2.5. CSI Determination Considerations

2.5.1. Failure Modes, Effects, and Criticality

A Failure Modes and Effects Analysis (FMEA) is a risk investigation technique for systematically identifying the ways (i.e., modes) in which a system, equipment, or item may fail and the consequences of those failures. FMEA results are used to prioritize failures with the most severe consequences. An extension of the FMEA is a Failure Modes, Effects, and Criticality Analysis (FMECA), which provides a severity assessment for a specific hazard or consequence. Both FMEAs and FMECAs are used to identify, prioritize, and reduce the likelihood of failures with high severity consequences. Results of these analyses:

- Facilitate decisions to reduce an item's failure probability or consequence severity through changes to design or design margins
- Introduce physical or functional redundancies
- Improve manufacturing process controls
- Mandate testing or inspections
- Incorporate failure detection systems or specified maintenance disciplines
- Establish operational limits
- Establish other similar safeguards.

FMEAs and FMECAs are invaluable design and support management tools, as are other risk assessment techniques (e.g., hazard risk assessments, fault tree analysis, etc). When a probability is added to a FMECA, that analysis becomes a Subsystem Hazard Analysis (SSHA) or a System Hazard Analysis (SHA), depending on the system level being considered. Failure probability estimates using these approaches, however, typically assume that an item will be manufactured, tested and inspected, installed, used, maintained, and repaired as specified. If there are deviations to any of these conditions, the failure probability estimates are invalid and safety can be compromised in a way that is difficult or impossible to predict. One of the primary objectives of CSI policies is to *ensure* … not simply assume … that prospective suppliers of products with catastrophic or severe failure consequences *have* the technical capability, discipline, and integrity to repeatedly produce conforming CSIs.

FMECAs are typically performed during a system's design and development phase, as part of reliability centered maintenance or maintainability analysis, or when the performance of fielded equipment needs to be improved. FMEA and FMECA results, ground rules, and assumptions need to be understood before the results are applied to CSI determinations. A FMECA may have been conducted only to the assembly level with a determination that failure could be catastrophic. Detailed analysis to identify which of the replaceable components in the

assembly had safety critical implications might not have been accomplished or the results not made available to the customer. Further informal or formal analysis would be required to identify the DoD replaceable CSIs in the assembly.

Similarly, FMECAs normally address multiple significant functions of equipment, including safety, operations, economics, environmental impacts, etc. The FMECA determination of a Catastrophic (or Category (CAT) I) failure might not relate to a safety concern but to the inability of the equipment to perform an essential mission-oriented function or other non-safety consequence. A review of the specific FMECA criteria and results would be appropriate to establish which CAT I failures should be classified as CSIs. Any contracts for development of new CSIs or analysis of current CSIs should include requirements for delivery of the data needed to support a criticality determination.

2.5.2. Failure Compensating Design Features

Criticality determinations should take into account whether certain features were designed into the system to compensate for system, subsystem, or component-level failures that could result in catastrophic or critical consequences. These compensating features could be included in the design at any indenture level that would 1) nullify the effects of a malfunction or failure, 2) control or deactivate items to halt generation or propagation of failure effects, or 3) activate backup or standby items or systems. Examples of failure compensating design provisions that might impact a CSI determination include:

- Non-identical or functional redundancy, where primary systems are backed-up by systems composed of different items or technologies (e.g., battery backup to a generator) that allow continued and safe operation. Items comprising functionally redundant systems may be considered for exclusion from CSI designation.

- Safety or relief devices such as monitoring or alarm provisions which permit effective operation (e.g., through human intervention) or limit damage. Items comprising systems with these types of features may be considered for exclusion from CSI designation.

- Identical or physical redundancy, where primary systems are backed up by systems composed of the identical items. Items comprising physically redundant systems should be seriously considered for CSI designation. In this case, a failure that affects one item could also simultaneously affect multiple redundant items. An example would be a part with a critical non-conformance installed into an assembly, where the assembly has a physically identical redundant system. If multiple parts from the same manufacturing lot have the same non-

conformance, there would be a high probability of a part with the same critical non-conformance being installed in both redundant systems, leading to the failure of both systems. Items that are functionally redundant but non-identical would not be subject to this failure scenario.

2.5.3. Dependent Failures

A dependent failure is defined as a failure caused by the failure of an associated item. As applied to CSI determinations, if failure of one item causes failure of another item or items in an unstoppable chain of events (i.e., a domino effect) causing one of the consequences described in Section 2.3. above, then it should be designated as CSI. In contrast, if failure of an item does not cause one of the results in Section 2.3. unless another item fails or malfunctions and is not directly caused by the item in question (i.e. a secondary or dual independent failure), do *not* designate the item CSI. Exceptions to this rule involve survival equipment and safety systems used in emergency situations where the item is placed in operation only when the platform has experienced a catastrophic failure.

Examples of Dependent Failures:
Failure of a lubrication pump could lead to loss of lubrication in a main shaft engine bearing, leading to failure of the bearing. Bearing failure will then lead to engine component misalignment, vibration, or major engine rotors/disks may seize, etc. Therefore, the lubrication pump should be designated CSI.

An aircraft's rudder may have three or more hinges. If one of the hinges fails, the remaining hinges would be overloaded and result in the rudder departing the aircraft. Therefore, the hinges should be designated CSI.

2.5.4. Latent/Hidden Failures

A latent or hidden failure is defined as a failure that is inherently undetected when it occurs. If a latent and/or hidden failure of an item could cause a catastrophic or critical consequences (as discussed in Section 2.3.), then it should be designated as CSI. Latent/hidden failures may occur and remain undetected because 1) the effects of the failure on the system are masked by other components, or 2) the existence of one failure mode masks the existence of a second failure mode, or 3) the system is not normally operating. When analyzing the impact of latent/hidden failures, engineers should consider mitigating actions such as annunciation of the failure to the crew or inspections mandated by technical publications when completing the criticality analysis.

Examples of a Latent/Hidden Failure:
A tilt rotor aircraft has two engines and an interconnecting drive system to drive the rotors in the case of engine failure. While both engines are operating normally, the interconnecting drive system could fail without detection or safety-critical consequences. However, if one engine and/or drive system became inoperative with a failed interconnecting drive system, the consequences would be catastrophic. Therefore, components of the interconnecting drive system should be assessed for CSI designation.

In another example, an aircraft has a backup pneumatic landing gear extension system. When the normal hydraulic landing gear system is operating normally, the pneumatic system could fail without warning to the pilot and would be unavailable if the normal hydraulic system failed, thus resulting in serious damage to the aircraft and possible injury to the aircrew. In this example, components of the pneumatic landing gear extension system should be assessed for CSI designation.

2.5.5. Potential for Foreign Object Damage (FOD) and Things Falling Off Aircraft (TFOA)

Do not designate items as CSI if a FOD-induced failure is the sole basis for a CSI designation. An exception to this is the latent failure of FOD Prevention systems. Latent failure of a FOD Prevention system could lead to a situation where a pilot enters a FOD rich environment (such as a dust storm) expecting the system to work, leading to engine failure or failure of another CSI assembly.

An example of a FOD-induced failure is failure of the fasteners retaining an aircraft nose panel (or any fuselage structure forward of the engine(s)), causing the panel to release without safety-critical consequences, unless ingested by the engine (thereby causing engine failure). In this case of a FOD-induced failure, the fasteners would *not* be deemed CSI.

Similarly, if fasteners retaining external structures or devices (such as a pods, tanks, or doors) should fail (creating a TFOA scenario) without safety-critical consequences to the aircraft, aircrew, or passengers, then they generally should *not* be designated CSI. Consideration of catastrophic or critical consequences to personnel on the ground is often cited as a basis for possible CSI determinations in this scenario. However, in most cases, these factors were found to be beyond the scope of the meaning and intent of CSI determinations and management policies. Exceptions to this rule involve inadvertent release or detachment of ordnance or other devices that contain explosive material. In these cases, a CSI designation might be appropriate.

2.5.6. Prime Contractor/OEM CSI Determinations

Provisions should be included in appropriate acquisition program Statements of Work to ensure CSIs are identified, documented, and approved by ESA technical authorities in sufficient time to influence critical down-stream processes such as initial provisioning, supply support, and manufacturing planning. Specifically, provisions should be made for delivery of an initial list of criticality determinations to be reviewed at the Critical Design Review. The list should continue to evolve as the design and supportability analyses reach final stages of maturity, culminating at the Physical Configuration Audit (PCA). Based on the PCA, a final CSI list should be documented and approved by the ESA prior to the Full Rate Production Decision Review.

Requirements and milestones guiding CSI identification during System Development and Demonstration are discussed in the *Defense Acquisition Guidebook,* Section 4.4.21., and paragraph 3.3.10.3 of the *Air Vehicle Joint Service Specifications Guide* (JSSG) 2001B. Technical Data Packages (TDP) (drawings and associated documentation) for CSIs must be approved prior to provisioning and submitted to the appropriate technical data repositories.

CSIs identified by the prime contractor/OEM should be considered recommendations submitted for review and approval by the cognizant ESA engineer(s). Differences between contractor and Government criticality determinations are common due to divergent definitions, scope, and interpretations of criteria. A Government-contractor team approach to identifying CSIs is strongly encouraged to minimize discrepancies and possible down-stream cost and/or schedule impacts.

Differences often arise between the Government and the Prime/OEM CSI designations on in-service items. Those differences can result from systems fielded before the current CSI policies were established or through field experience. Items reviewed in these cases may be designated as CSIs by the Government without involvement from the Prime/OEM. Items designated as CSIs in this fashion will be managed as CSIs by the Government. Any contracts to sources other than the Prime/OEM must list all CSI requirements. Quality management of CSIs under these circumstances is discussed further in Section 4.1. Refer to Service-specific policy and guidance for resolution of CSI discrepancies between the Government and Primes/OEMs and for contracting to Primes/OEMs for items for which they are the sole or primary source of supply.

2.6. Criticality Determinations for Standard Parts, Common Use Items, FAA Certificated Systems, and COTS

2.6.1. Criticality Determinations for Standard Parts

The term '*standard part'* refers to a part manufactured and inspected in complete conformance with

- an established U.S. Government specification [e.g., a military or federal specification, Army-Navy Aeronautical Standard (AN), etc.];
- a U.S. ratified international standardization agreement (e.g., NATO STANAG, etc.); or
- a non-Government specification or standard published by a broadly-recognized professional society, industry association, or consensus standards development organization (e.g., SAE, ASME, ANSI, AIA, etc.) which either includes design or manufacturing criteria, test and acceptance criteria, and uniform identification requirements; or establishes specific performance criteria, test and acceptance criteria, and uniform identification requirements.

This definition is consistent with that used by the FAA for civil aircraft (Federal Aviation Administration Advisory Circular 21-21C, *Detecting and Reporting Suspected Unapproved Parts*).

Only if a standard part is to be used in a specific safety-critical application should it be classified as 'CSI.' Standard parts are typically manufactured by multiple suppliers, procured in large quantities, and subjected to established quality assurance processes. They are commonly used in a variety of applications across systems and equipment. For example, a bolt may be a standard part. One standard bolt can be used in hundreds of locations on an aircraft. The bolt should *not* be called CSI *solely* on the assumption that out of the hundreds of possible locations that bolt is used on that aircraft, there might be one location where the bolt is used in a safety-critical application. However, if it has been determined that the failure of the bolt in a specific location could have catastrophic results, the bolt must be deemed CSI. If a standard part is deemed to be a CSI, the ESA should consider assigning a new National Stock Number (NSN) to the part as outlined in Section 2.6.2.

In cases where the only critical characteristic of a standard part involves a feature of the part's installation, then the standard part should not be deemed a CSI. Instead, the installation feature of the standard part should be listed as a critical characteristic of the assembly or assemblies into which it is installed. For example, if the critical characteristic of a bolt is a torque value, then the assembly should be a CSI with a critical characteristic of "proper installation and torque of bolt part number xxx within torque range yy-zz in-lbs." The bolt itself would not be a CSI.

2.6.2. Common Use Item Coordination

The term 'common use item' refers to an item that is used in:

- multiple platforms (e.g., the same item used in an F-15 and an F-18; the same item used in an H-53 and an H-60);
- across Services (e.g., Army, Navy, and Air Force H-60s; Air Force and Marine Corps C-130s);
- or both.

A common use item may be a standard part or one that is unique to the aviation system or military Service.

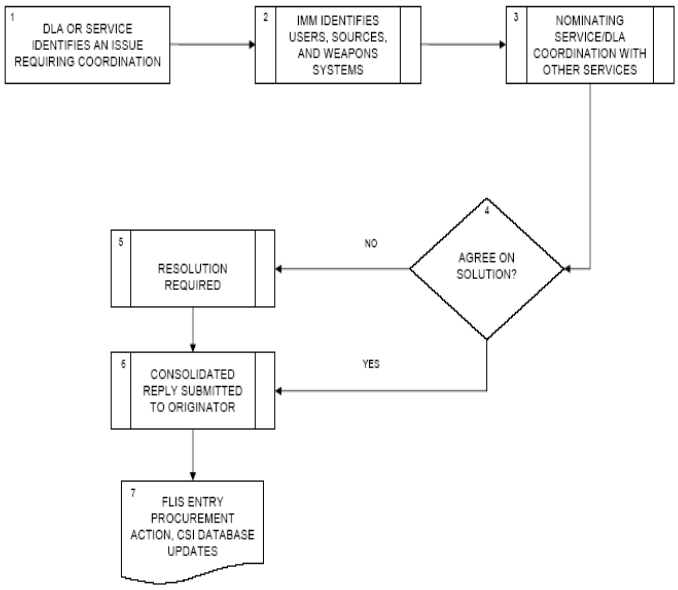
Engineers typically perform criticality determinations on a platform-specific basis. That is, they assess the consequence(s) of a part's failure within the context of the one (or many) location(s) the part functions on a given platform. However, if the part is used on multiple applications or by multiple military Services, problems occasionally arise that require the determination or other action to be coordinated across all or some of the affected communities. Procedures for this coordination process are outlined in Figure 2.1 below. Common Use Item Coordination is conducted on an 'as needed' basis. The Common Use Item Coordination process is initiated by the agency (e.g., DLA, Service Integrated Materiel Manager (IMM), Service ESA, DCMA, etc.) experiencing the issue. Coordination is recorded and managed using the 'Common Use Item Coordination Sheet' found in Exhibit A of this Handbook. An example of a completed Coordination Sheet is also provided in Exhibit A.

Like standard parts, a common use item that is determined to be CSI in one application, is not necessarily CSI for all applications. The same item may have safety implications when used in one or only a few applications but have absolutely no safety impacts when used in many or most other applications. From a design, manufacturing, assembly, installation, repair, or maintenance perspective, the item is CSI only in those applications where it has been determined to have safety critical implications. However, for DoD item acquisition and supply management purposes, the part is coded CSI for all users of the item because there is no predetermined way to know which items with the same stock number in the same stock bin will be distributed to which aviation communities over time. However, where it makes good business sense to differentiate identical items in the DoD supply system, separate NSNs may be created to distinguish the item when used in safety critical situations from all other applications.

> **Note**: A common use item or standard part which has been designated CSI and assigned a separate NSN will subsequently be sourced, manufactured, and generally managed as a CSI.

Figure 2.1

CSI COMMON USE ITEM COORDINATION PROCESS



Block 1: The IMM, DLA, DCMA, or an individual Service identifies an issue requiring coordination among users.

Block 2: The IMM identifies the using Services, the historical and current sources of supply, and the weapon system platforms on which the part is used, and all critical characteristics (if identified). (Typical expected time for completion is 5 days.)

Block 3: Service POCs coordinate review and concur/provide comment on the identified issue(s). Once each Service has provided comments/concurrence, the originator consolidates inputs and evaluates for consensus position. The originator acts as lead for all related coordination actions. (Typical expected time for completion is 30 days.)

Block 4: If all using Services agree on issue resolution, proceed to Block 6. If agreement is not reached, proceed to block 5 for issue resolution.

Block 5: Resolution of any disagreement should be performed at the lowest possible level. If resolution cannot be reached at the working engineering level, resolution should be elevated to the systems/chief engineer level. If the issue still cannot be resolved, contact your Service Help POC (listed on the Common Use Item Coordination Sheet) for action. In those rare instances where resolution cannot be obtained, the issue will be forwarded to the head of the engineering activity for each affected ESA for a final decision. When resolution is attained, proceed to block 6. (Typical expected time for completion is 10 days.)

Block 6: Once resolution is attained, the completed Common Use Item Coordination Sheet and any other related documentation (e.g., completed DLA Form 339 or other Request for Engineering Support) are returned to the originating IMM. When the common use item is

determined to be CSI in some applications but non-CSI in others, the IMM may establish separate National Stock Numbers when it is economically advantageous to do so.

Block 7: The IMM adds fully coordinated part information to the Federal Logistics Information System (FLIS). Newly designated or modified CSIs are entered in the Service specific CSI databases. (Typical expected time for completion is 5 days.) Examples of completed Common Use Item Coordination Sheets are shown in Exhibit A.

2.6.3. FAA Certificated Platforms/Subsystems/Equipment

2.6.3.1. Background

Federal Aviation Regulations and FAA procedures apply to all aircraft and aviation equipment designed, built, operated, altered, or maintained *by the civil sector*. To be certified for use in the civil airspace, all *civil* aircraft, engines, propellers, or appliances (i.e., any instrument, equipment, mechanism, part, etc used to operate or control an aircraft in flight or is attached to an aircraft) must demonstrate to FAA that all federal aviation requirements have been satisfied. This applies to both new aircraft and equipment as well as those not originally certified by FAA or not subsequently operated, maintained, altered, or documented in conformance with FAA requirements.

The DoD often acquires FAA certificated aircraft, systems, subsystems, and components. The military's use of commercial derivative aircraft and equipment can range from minor modifications, such as installation of military unique mission systems into an FAA certificated aircraft, to substantial variations, such as converting a passenger/cargo carrying aircraft to a refueling tanker or a weapons delivery aircraft. The decision to procure or modify civil aircraft and equipment for military applications is a programmatic issue that involves numerous factors, such as performance, operational usage, life cycle supportability, cost, schedule, and other considerations.

2.6.3.2. Types of FAA Certifications

FAA approves the design of an aircraft, engine, propeller, or appliance through a "Type Certificate" process. FAA Type Certificates, Amended Type Certificates, or Supplemental Type Certificates are FAA determinations that the design of an aircraft, engine, or propeller meets all civil aviation regulatory requirements for safe operations within a defined flight envelope, design limits, and maintenance approach. FAA Type Certification does not certify the effectiveness of the design in satisfying customer unique mission or functional requirements.

FAA Production Certification indicates an applicant successfully demonstrated to FAA the ability to consistently manufacture specific Type Certificated designs and has effective quality and manufacturing inspection systems for these products.

An FAA "Production Approval Holder" will have documented and auditable processes for manufacturing management, configuration management, quality assurance, and supplier management systems. FAA Order 8120.2F, *Production Approval and Certificate Management Procedures*, provides guidance to FAA Aircraft Certification Service Personnel executing certificate management responsibilities at manufacturing facilities.

FAA provides Airworthiness Certification when an aircraft, engine, or propeller was manufactured in conformance to the Type Certificated design; was operated and maintained in accordance with FAA approved limits; alterations were accomplished in accordance with FAA approved practices; all Airworthiness Directives were complied with; and supporting documentation meets FAA standards. Deviations to any of these conditions jeopardize an item's FAA airworthiness approval status, whether the deviation was caused by the military or an entity in the civil sector or whether the item was designated CSI or not.

2.6.3.3. Applicability of CSI Policies to FAA Certificated Aircraft and Equipment

The Multi-Service/Defense Agency CSI Instruction (Appendix I) states that it does not apply to aircraft or subsystems purchased, operated, and maintained in accordance with FAA regulation, unless required by the ESA. In other words, CSI policies are not intended to over-ride or duplicate FAA approaches when these are applicable and satisfy military CSI objectives. The acceptability of FAA-certificated products and processes in lieu of CSI processes is a decision made by the ESA. The ESA should assess FAA-certificated products and processes against military requirements to determine whether and the extent to which CSI policies should apply or whether existing or modified FAA processes provide satisfactory coverage for DoD.

Appendix D of FAA Order 8120.2F, *Production Approval and Certificate Management Procedures* discussed in Sec 2.6.3.2 above describes the FAA's "Category Parts List (CPL)" approach for determining item criticality for risk management purposes. Items and assemblies assigned a Category 1 rating are those whose failure could prevent continued safe flight and landing, and resulting consequences could reduce safety margins, degrade performance, or cause loss of capability to conduct certain flight operations. An unofficial sample listing of a CPL is posted at the following website: (http://www.faa.gov/aircraft/air_cert/production_approvals/mfg_best_practice/media/CPL-Rev%20F.%207-01-04.pdf). Prior versions of FAA Order 8120.2 used the term 'Priority Part' or 'Critical Part' with similar implications. The ESA should work with the FAA and the contractor to determine whether the CPL exists and is sufficient to establish a risk management oversight technique for DoD CSIs when

the DoD procures a Type Certificated aircraft or an aircraft based on a commercial design.

2.6.3.4. New Aircraft Procurement and Repair, Overhaul, Maintenance, and Modification (ROMM)

Commercial Aircraft. When DoD procures or otherwise uses an unmodified FAA certificated aircraft, the ESA may determine that FAA quality oversight meets all CSI requirements and no further oversight is required by the ESA. The aircraft must be operated and maintained in accordance with FAA requirements and using FAA approved repair stations. Alternatively, the ESA may determine that the FAA quality oversight meets all CSI requirements for acceptance of new aircraft and spare parts, but a DoD CSI program will be required for ROMM. This approach is required in cases where the commercial aircraft will not be operated and/or maintained in accordance with FAA requirements. The aircraft would be manufactured under FAA oversight, but would transition to DoD oversight upon acceptance.

If a military Service will maintain an aircraft's FAA certification throughout its life, the Service is considered an owner/operator of that aircraft under the FAA guidelines. The DoD is then responsible for the same types of quality oversight a commercial owner/operator (such as an airline) would provide. The ESA should evaluate the quality requirements necessary for their aircraft and the mission it will perform versus the quality oversight provided by the aircraft manufacturer and maintenance facilities. Any additional requirements should be added to contracts for the aircraft, spare parts, and maintenance services.

Commercial Derivative Aircraft. Commercial Derivative Aircraft (CDA) are aircraft that have in some way been modified from an existing commercial aircraft. An example would be a commercial aircraft modified with a weapon mount or with military unique electronics. The military Service may still maintain the aircraft's FAA Type Certificate for a CDA by negotiating with the FAA to maintain oversight. As with commercial aircraft used by the DoD, the aircraft must be operated and maintained in accordance with FAA requirements and using FAA approved repair stations.

When the DoD acquires a commercial derivative aircraft, compliance with Federal Aviation Regulations and FAA oversight cannot be assumed. Military aircraft and equipment, whether or not based on FAA certified designs, are considered "Public Aircraft" by statute and are exempt from Federal Aviation Regulations and FAA oversight. FAA's involvement with Public Aircraft is at FAA's discretion. To address this, the Military Departments, US Coast Guard, and FAA established a Memorandum of Agreement (MOA) (FAA Order 8110.101) to provide reimbursable FAA support for commercial derivative aircraft. The extent of FAA

support depends upon whether the military's design, manufacturing, operational usage, and maintenance requirements are comparable to that of the civil sector or whether the military requirements differ significantly from civil applications. Under the MOA, FAA "Baseline Support Services" are centrally funded and apply when DoD and Coast Guard requirements are fundamentally the same as those in the civil sector.

FAA 'Program Support Services' apply when DoD or Coast Guard requirements are substantially different from the civil aircraft application. FAA 'Program Support Services' are individually negotiated and funded by program offices and can vary widely between programs. Therefore, the ESA needs to understand the degree to which FAA support to a commercial derivative aircraft program effectively satisfies military CSI objectives, how to take best advantage of FAA approaches when they are provided, and how to address the situation when FAA approaches are not sufficient or available.

DoD Aircraft Based on a Commercial Design. The DoD may develop a military unique aircraft based on a commercial design. These aircraft are modified to perform a military mission, with operation and maintenance performed under the DoD's airworthiness authority. Examples include commercial aircraft modified for a mid-air refueling mission or a commercial helicopter modified to fly and fire weapons in a war zone.

Some or all of the qualification effort for the commercial aircraft's type certificate may be applied to the DoD airworthiness qualification. The ESA should evaluate the tests performed to certify the aircraft to civil requirements versus the testing required for the military mission and flight regime. The ESA may then determine that some or all of the testing meets the military requirement. The ESA may also accept the original testing and require limited additional testing specifically for the military unique requirement. The FAA cannot provide qualification data for an aircraft to the DoD. Therefore, any contracts for new aircraft based on a commercial design should include a requirement for the aircraft manufacturer to deliver the required qualification data.

Aircraft operated and maintained outside of FAA oversight will not retain their FAA Type Certificate, even if the aircraft delivered to the DoD is a Type Certificated aircraft. Therefore, the DoD CSI requirements outlined in this Handbook would apply. However, if the aircraft is delivered with an FAA Type Certificate, the ESA may determine that the quality procedures used to produce the aircraft and any spare parts would meet all CSI requirements, depending on how the mission profile of the aircraft would differ from the civil equivalent. The DoD CSI oversight would then apply only to ROMM for those aircraft.

2.6.3.5. Example of FAA-Certificated Engine/Non-Certificated Rotorcraft

A potential scenario might involve an FAA Type Certified engine installed on a non-certified rotorcraft with operations different from those defined for the similar commercial rotorcraft. The Service does not plan to follow an FAA approved maintenance program or use an FAA-approved repair facility. All spares (including engine parts) will be obtained from the prime contractor. However, FAA-certified design, production, and manufacturing processes remain the same and the ESA determined them to be acceptable.

From the prime contractor/OEM perspective, the production and other manufacturing systems used to fabricate the FAA type certified engine remain the same, regardless of whether the engine is ultimately installed on an FAA type certified rotorcraft, or not. FAA type certified design and FAA production approvals are acceptable to the Government and no additional coverage for CSIs in the manufacturing environment is necessary.

However, once the engines are put on the aircraft, they leave the FAA system. The Service is responsible for the life cycle maintenance and continued airworthiness programs of both the engines and airframe. The FAA will not allow a parts pooling arrangement between these military Service engines and commercially used engines.

2.6.4. Commercial Products

Commercial products may be Commercial off the Shelf (COTS) items, or they may be commercial derivative items. A COTS item is an item that can be purchased commercially and used as-is on a DoD aircraft. A commercial derivative item is an item that is bought on the commercial market and then modified in some way for use on a DoD aircraft.

Safety implications apply whether an item is uniquely developed for the military, already exists within the DoD inventory, or is available as COTS. Criteria used to establish the level of criticality determinations (See Section 2.3.2.) also apply to commercial products. For COTS products that are FAA certificated, see Section 2.6.3 for guidance on the applicability of CSI requirements.

2.7. DCMA Role in Criticality Determinations

Assigned DCMA technical specialists (Product Assurance Specialists, engineers, Government industrial specialists, etc.) review contracts, Quality Assurance Letters of Instruction (QALIs), and any other procuring activity direction involving

CSIs to identify technical requirements, inspections, and acceptance criteria; particularly those associated with critical and significant characteristics. Significant characteristics are criteria used by DCMA when critical characteristics are not otherwise defined in the technical data package, contract, or specific instructions provided by the procuring activity. If a technical specialist believes an item may be a CSI but it is not identified as such or an item may be inappropriately identified as a CSI, the specialist must notify the Procuring Activity. The procuring activity should contact the applicable ESA for clarification and guidance.

2.8. Documenting Criticality Determinations

2.8.1. Criticality Codes

When a criticality determination is recorded in a Service-specific CSI database, DLA updates the FLIS Data Record Number (DRN) 3843, Criticality Code, for the item in accordance with DoD 4100.39-M, Volume 10, *FLIS Procedures Manual*, Table 181. Codes "E" (the item is an Aviation Critical Safety Item/Flight Safety Critical Aircraft Part and is specially designed to be or selected as being nuclear hard) and "F" (the item is an Aviation Critical Safety Item/Flight Safety Critical Aircraft Part) are specifically established for aviation CSIs.

2.8.2. Acquisition Method Code (AMC)/Acquisition Method Suffix Code (AMSC)

DFARS, PGI 217.7506, Part 2, *Breakout Coding*, defines AMC/AMSCs. The ESA may delegate responsibility to the IMM for assignment of an AMC/AMSC to an item, when appropriate. However, ESA approval is required to:

- change the AMC/AMSC assignments of CSIs from a more restrictive code to a less restrictive code;
- approve the use of AMC/AMSC code of "1G" or "2G" (i.e., a part is a candidate for full and open competition).

"G" codes will preclude ESA source approval authority and generally should not be used for CSI. When sufficient data exists to allow for the competitive procurement of an item, it is recommended that the AMC/AMSC code of "1C" be used instead of "1G". The code of "1C" does not prevent competition, but rather requires that any prospective source follow the source approval process as noted in the JACG Source Approval and Management Handbook *[Future link to JACG Source Approval and Management Handbook]* and be considered an approved source by the ESA. By following this process and involving the ESA, this helps to ensure that the quality of the CSI is maintained. Application of a "G" code to a

CSI should be on an exception basis, only. For example, if an assembly is designated CSI based solely on installation critical characteristics, the ESA engineer might deem a "G" code to be appropriate after careful consideration.

An AMC/AMSC of '1B' should not be used if sources other than those listed on a source control drawing are approved. A code '1B' denotes that acquisition of the part is restricted to source(s) specified on 'source control', 'altered item', or 'selected item' drawings/documents. (See the JACG Source Approval and Management Handbook *[Future link to JACG Source Approval and Management Handbook]* for more information.)

2.8.3. Cross-Service and Service-Specific CSI Lists

2.8.3.1. Cross Service CSI List

The former JALC sponsored the development of a Joint Services CSI Management DataViewer that provides capabilities essential to cross-Service CSI coordination and management. It provides a reliable method for quickly identifying common use CSI parts and provides cross-Service visibility of CSIs. The DataViewer allows each Service to maintain their own CSI data, while providing a tool to ensure common use CSI determinations, critical characteristics, and approved source identification are available to and performed efficiently among all users. To access the CSI Management DataViewer (https://remote2.amrdec.army.mil/csiviewer) contact your CSI POC listed in Section 1.6 of this Handbook.

2.8.3.2. Service-Specific CSI Lists

The Joint Services CSI Management DataViewer does not provide visibility of all data elements that may have been captured by a Service for a given CSI. To view this additional information, Service-specific databases must be accessed.

The website maintained by the Defense Supply Center, Richmond, (http://www.dscr.dla.mil/ExternalWeb/UserWeb/AviationEngineering/EngineeringSupport/CSI.htm) provides access to separate CSI lists for DLA-managed Naval aviation CSIs, DLA-managed Army CSIs, and select Air Force CSIs.

The complete Army CSI list can be found at (https://arise.amrdec.army.mil/csiportal) See Exhibit B for additional information.

The Joint Deficiency Reporting System (JDRS) Critical Item Management (CIM) module (https://jdrs.mil/) contains a single, consolidated repository of Naval aviation CSIs, CAIs (Critical Application Items), and Not-critical items, item

characteristics and approved sources for which a criticality determination has been made. Critical Safety Items, Critical Application Items, and Not-Critical Items are identified here and are managed by the Navy with respective levels of management oversight and controls.

The Air Force CSI lists are on the CSI Management Community of Practice (CoP). The CSI Management CoP (https://afkm.wpafb.af.mil/ASPs/CoP/EntryCoP.asp?Filter=OO-EN-MC-07) is accessible via the Air Force portal (https://www.my.af.mil). (See Exhibit B for access instructions.)

Many DoD aviation platforms were in service when CSI policies were first established. If an item does not appear on a CSI list, this does not necessarily mean that the item is not critical. It may simply indicate that a criticality determination has yet not been performed for that item or that the information has not yet been added to the list.

2.9. CSI Identification

2.9.1. Distinguishing Markings

In the event an actual or potential operational hazard involving CSIs is identified, the supply system may need to be purged or the operational community may be directed to remove installed parts. Mishap, Safety, or other types of Engineering Investigations may also drive the need to review manufacturing and inspection records for specific items. In these cases, the ability to trace parts to specific manufacturers and processes/materials used in production is essential.

Traceability involves documented evidence that the item to be supplied was/will be:

- manufactured and/or maintained by the prime contractor, approved manufacturer, or FAA certificate/approval holder;
- identical to the product that was initially manufactured; and
- in full compliance with all specifications, drawings, storage, packaging, and handling requirements, and other associated requirements.

Documentation is required to demonstrate, to the Government's satisfaction, the Government's ability to obtain all information necessary to trace the items back through the manufacturing and inspection process in the event of the item failure. The required manufacturing process information includes date and place of actual manufacturing and additional information as appropriate, such as verification of all aspects of material, manufacture, special processes, personnel

certifications, assembly, inspection, installation, and repair. Traceability is enabled by effective serialization and/or marking.

A serial number is a combination of numbers and/or letters assigned to an item that separately identifies one individual item from all others. CSIs require individual serialization on the part as well as the packaging, unless it is not practical due to size, material property, excessive cost, or other requirements as specified by the cognizant Service ESA. Serial numbers should be marked in accordance with MIL-STD-130 or other contract requirements. All serialized and lot numbered CSIs should be documented and reported (including material scrapped during manufacturing) to the Contracting Officer or the Contracting Officer's designee (e.g., DCMA). Re-branding by suppliers which obscures the original marking (part number, serial number, CAGE code) of the CSI's OEM is prohibited. Refer to DFARS 252.211-7003, *Item Identification and Valuation*, and DFARS 211.274, *Item Identification and Valuation Requirements*, for additional information and guidance regarding specific criteria for unique item identification. Serialization requirements for CSIs are further addressed in Section 7.5.4 of this Handbook.

Marking schemes may include color coding, imprinting, or other distinguishable marks that do not affect form, fit, or function. The marking scheme should be reflected in all applicable technical documentation.

CSI serialization and marking requirements should be defined on the drawing or elsewhere in the Technical Data Package. Contact Service CSI POCs listed in Section 1.6 for general guidance about serialization and marking requirements.

> **Note**: The requirement for serialization does not categorically define the component as serially managed. 'Serially managed' refers to a tangible item that is designated by a DoD or Service Item Manager to be uniquely tracked, controlled or managed by its serial number in maintenance, repair and/or supply (e.g., via logbooks, aeronautical equipment service records, etc.).

2.9.2. Drawings and Technical Data

The Multi-Service/Defense Agency CSI Instruction (Appendix I) states that drawings and associated technical data for new repairable or consumable parts (i.e., replenishment items) must clearly identify items as CSI and identify critical and major characteristics, critical processes, and inspection and other quality assurance requirements. Additionally, technical data required in the design, manufacture, procurement, repair, or overhaul of CSIs must be verified and validated by the ESA's cognizant engineer. This requirement also applies to development programs, upgrades, and ECPs. Refer to Service-specific policies and guidance for detailed procedures.

Paragraph E.1.e of the Multi-Service/Defense Agency CSI Instruction (Appendix I) discusses identification of an item's criticality as well as critical and major characteristics on drawings and associated technical data packages. This direction is not intended to require contractors to revise existing data. The goal is to ensure that CSI requirements are properly described whenever legacy technical data are revisited for other purposes, e.g., when a part number is changed causing creation of new technical data or publications. *If the ESA believes there are sufficient protections in place to assure delivery of quality products, then legacy/existing drawings and associated technical data do not need to be revised solely to identify critical characteristics, etc.* New replenishment CSIs require a new part number and almost always involve development or revision of drawings and associated technical data. The new or revised drawings for new CSIs must reflect the item's criticality and critical characteristics.

2.9.3. Critical Characteristics

Critical Characteristics are defined as any feature throughout the life cycle of a Critical Item, such as dimension, tolerance, finish material or assembly, manufacturing or inspection process, operation, field maintenance, or depot overhaul requirement that if nonconforming, missing, or degraded may cause the failure or malfunction of the Critical Item.

Every CSI has characteristics, processes, or features that if missing, nonconforming, or defective, could cause catastrophic results or render the item ineffective. Similarly, the critical characteristics for an assembly will be the sum of the critical characteristics of the subcomponents and critical characteristics associated with the assembly process, if applicable.

Critical characteristics are important for several reasons. Alternate sources (i.e., Government or contractor offerors (other than the prime/OEM) providing items identical to the prime/OEM's items) may not know how and where the parts they manufacture are used and are usually reliant on the drawings, manufacturing data, and inspection requirements provided by DoD. Government quality assurance representatives may also be in the same situation. Because of this, the identification of critical characteristics and processes for alternate sources is particularly important.

In addition to characteristics that are critical from a manufacturing perspective, there are many instances where the only likely way an item could fail and have catastrophic affects is through improper installation or incorrect repair. In these instances, the terms "Installation Critical Characteristics" or "Depot Critical Characteristics" are applied. These characteristics may have little relevance in the production of CSIs at the piece part level because there is nothing the

manufacturer can do to affect compliance. The installation or depot critical characteristics, however, are extremely important in building higher level assemblies or performing maintenance, overhaul, or repair. Exhibit C provides additional guidance on identification of critical characteristics.

Types of critical characteristics are defined as follows:

- MANUFACTURING CRITICAL CHARACTERISTIC (M). Any characteristic resulting from or produced during the manufacture of an item, such as a dimension, finish, material or assembly, manufacturing or inspection process, special process (i.e. heat treat, brazing/welding, plasma, shot peening, non-destructive testing, chemical cleaning, grit blast, plating and paint), installation, or operation (acceptance test), which if nonconforming, missing or degraded, could cause the failure or malfunction of the CSI. Exhibit C lists examples of critical manufacturing processes and critical process elements.

- DEPOT CRITICAL CHARACTERISTIC (D). Any characteristic resulting from or present during the maintenance/overhaul/repair such as a dimension, finish, material, assembly, inspection process, special process (i.e. heat treat, brazing/welding, plasma, shot peening, non-destructive testing, chemical cleaning, grit blast, plating and paint), installation, operation (acceptance test), or depot overhaul/repair requirement which, if nonconforming, missing, or degraded during maintenance, overhaul, or repair could cause the failure or malfunction of the CSI.

- INSTALLATION CRITICAL CHARACTERISTIC (I). Any characteristic resulting from or present during the installation of an item such as the proper assembly/orientation, installation sequence or technique, use of special tools/fixtures, hardware, safety wire, or torque which, if nonconforming, missing or degraded, could cause the failure or malfunction of the CSI. 'Installation-critical' does not imply that the part simply must be installed. Sometimes, the only plausible way a part can fail is through improper installation. If proper installation is a part's only critical characteristic, the part should *not* be designated CSI but consideration should be given to designating the next higher assembly as CSI, with the appropriate critical installation characteristic(s) identified.

An item may be CSI, even though its critical characteristics may not have been documented. Many designers elect not to distinguish critical or major characteristics on their technical documentation. They expect all features identified on drawings, specifications, standards, manufacturing process sheets,

and inspection criteria to be satisfied and it is better not to imply that some characteristics are more important than others. Other designers also expect all characteristics in the technical data to be satisfied, but believe it important to identify the critical characteristics to make sure manufacturers and quality assurance personnel know the features that absolutely can not be compromised. *The consequence(s) of failure primarily determines an item's criticality, not whether the technical documentation highlights or does not highlight critical characteristics and critical processes.* Because of variations in industry practice, CSI procedures require CSI drawings to reflect the item's criticality determination and critical characteristics when the drawings are created or updated.

Therefore, a requirement for prime contractor/OEM's to identify critical characteristics for every new CSI should be included in the System Development and Demonstration Statement of Work for new systems and major platform modifications. Like criticality determinations, critical characteristics identified by the prime contractor/OEM must be considered recommendations submitted for review and approval by the cognizant ESA engineer(s). New repairable and consumable CSIs require a new part number and usually involve development or revision of drawings and associated technical data. The new or revised drawings for new CSIs must reflect the item's criticality and the critical characteristics.

Legacy CSI parts (i.e., parts with existing technical data) are often used on new platforms. If the ESA believes there are sufficient protections in place to assure delivery of quality products, the Statement of Work (or other direction to/agreement with the contractor) should clearly explain that drawings and associated technical data for legacy CSI parts do not need to be changed or updated to define critical characteristics. DCMA surveillance of significant product characteristics/features described in Appendix I, Enclosure (3) is an example of the types of protections the ESA should consider.

In other words, drawings and associated technical data do not necessarily need to be revised just to identify critical characteristics. However, the next time the drawings and data are revised for other reasons, the CSI identifier and critical characteristics must be included. For example, if the ESA determines that the hardness of an item is critical, and the drawing already requires a 100% hardness check, then it would be acceptable to wait until the next drawing update to identify hardness as a critical characteristic.

For in-service platforms, critical characteristics are normally identified by the ESA as part of the qualification process for an alternate source (i.e., Source Approval Request process) while performing an item criticality determination or during First Article Testing. Critical characteristics or inspections may be included in mandatory Quality Assurance Provisions (QAPs) that are incorporated in a contract.

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CHAPTER 3

SOURCING

The Competition in Contracting Act (Public Law 98-369 and 10 United States Code 2304), the Federal Acquisition Regulation (FAR) Part 6 (Competition Requirements), and DFARS Part 206 (Competition Requirements) establish "full and open" competition as the standard for federal contracting, with some exceptions. Public Law now requires CSIs to be purchased from or repaired/overhauled by sources approved by the Service ESA, only.

The topic of sourcing, covering CSIs and non-CSIs as well, has been developed as a separate, stand-alone Source Approval and Management Handbook which can be referenced at *[Future link to JACG Source Approval and Management Handbook]*. The processes described in the Sourcing Handbook focus on approval and quality oversight of suppliers and are intended to ensure that suppliers are capable of consistently producing or providing high quality, conforming items that meet design and manufacturing or repair/overhaul requirements.

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CHAPTER 4

QUALITY MANAGEMENT

In addition to CSI source oversight presented in the JACG Source Approval and Management Handbook *[Future link to JACG Source Approval and Management Handbook]*, other quality controls are essential to ensuring the integrity of CSIs throughout their life cycle. As discussed in this Chapter, significant CSI quality control responsibilities lie with Government engineers, logisticians, and contracts personnel, and also extend to acquisition organizations, DLA, and DCMA. Additional CSI management controls are discussed in Chapter 5 of this Handbook.

4.1. Quality Management in Solicitations and Contracts

To ensure appropriate quality processes are implemented, solicitations and contracts must clearly identify any applicable CSIs as such. Contracts for CSIs may be awarded only to sources approved by the ESA cognizant engineer and must reflect any technical and Quality Assurance (QA) requirements established by the ESA. CSI contract controls are discussed in general terms in Chapter 7 and examples of specific contract clauses are provided in Exhibit D. If the Service ESA has deemed it necessary to apply CSI requirements to commercial aircraft or subsystems, contracts for CSIs should include provisions to allow DCMA access to verify product and process conformance on a non-interference basis.

All CSIs must be managed in a fashion deemed acceptable by the ESA. The same level of control/management may not be required for all CSIs. An ESA may agree that alternative control/management approaches (including in some cases, FAA certificated processes) would provide sufficient protections for some CSIs. That is, based on failure analyses or other rationale, a source may be approved to implement a set of rigorous controls for some CSIs and one or more alternative (i.e., less rigorous) controls for other CSIs. The cognizant ESA may approve alternative methods when provided the details of 1) which of the source's internal quality and management systems are invoked, 2) the types or levels of control employed, and 3) the items to which each type/level is applied. These alternative approaches may or may not be distinguishable by a name (e.g., Primary Parts Program, Flight Essential Parts Program, etc.) established by the source. Prior to contract award for CSI parts, subsystems, equipment, platforms, or repair/overhaul services, the ESA, the DCMA Product Assurance Specialist (PAS), and the source should all have a clear understanding of the Government's CSI list and how each CSI will be managed. This approach should

be unambiguously defined in the contract. Alternate methods also may be submitted through the DCMA QAR (Quality Assurance Representative) and/or Engineer to the PCO for ESA approval at any time during the contract period of performance. The PCO should implement contract actions, as applicable.

4.2. Frozen Planning

The term frozen planning has many definitions, interpretations and implications throughout the aviation industry. In the context of the CSI program, the term frozen planning is defined as a methodology by which contractors will control manufacturing, repair, and/or overhaul processes to achieve consistent quality results in the production of CSI designated features/characteristics of parts and assemblies. Acceptable methods to achieve this result also include Process Control and Process Certification in addition to traditional frozen planning methods. Process Control ensures that features will always be within technical requirements and achieves the same affect as frozen planning. The cognizant ESA must determine which method will be used for a particular procurement, modification, repair, or overhaul of aviation critical safety items.

Effective management of frozen planning revision assures process traceability and validity. While it does not mean that each and every process step must be locked and never changed, there must be sufficient control of the revisions to the manufacturing, repair, or overhaul methods such that the source consistently achieves the desired acceptable results. Revision controls enabled by frozen planning allow the identification of manufacturing, repair, or overhaul methods in effect during a specific period of time. If the source is not the prime contractor or OEM, frozen planning is required for CSIs after First Article Test. Frozen planning will be required for the prime contractor or OEM when specific requirements for such have been negotiated between the cognizant ESA and the prime contractor/OEM and included in the contract.

Changes to frozen planning will be submitted to the cognizant ESA in accordance with negotiated procedures. For example, the ESA may choose to limit frozen planning changes that must be submitted for review to include only processes affecting critical characteristics. The ESA may also choose to delegate the review of other frozen planning changes to DCMA.

4.3. Configuration Management

In order to control changes to CSIs and their associated documentation, configuration management requirements should be included in contracts. These requirements are essential when procuring CSIs because they require contractors

to submit all ECPs and product deviation requests on CSIs to the Government for review and evaluation prior to implementation. It should be noted that for contractors having product design authority (i.e., OEMs and prime contractors), the cognizant ESA may delegate approval authority for Class II ECPs and minor non-conformances to DCMA via the procuring activity. An example of the configuration management clause is included in Exhibit D.

4.3.1. Engineering Change Proposals (ECP)

As defined by the Multi-Service/Defense Agency CSI Instruction (see Appendix I), a Class I ECP is a formally recommended change to an item's configuration that would affect form, fit, function, performance, reliability, maintainability, survivability, weight, balance, moment of inertia, interoperability, interchangeability, or interface characteristics, electromagnetic characteristics, other critical or major characteristics identified in technical documentation, or cost. All Class I ECPs and proposed permanent or temporary modifications of CSIs must be reviewed and approved by an ESA engineer. Refer to Service-specific policies for approval guidelines. (Some Services stipulate that only the most senior engineering authorities are empowered to approve these types of CSI modifications.) This authority may not be delegated.

ECPs that do not meet the requirements for Class I ECPs are categorized as Class II ECPs. In addition to minor design changes, Class II ECPs might also address drawing corrections of typographical errors, updating obsolete specification references, or changes to the number of significant digits used to specify a dimension. An ESA engineer must also approve all CSI Class II ECPs; however, this authority may be delegated. Typically, ESAs delegate approval authority to DCMA sites at prime contractor and OEM locations as specified on a CAGE code (i.e. site-specific) basis. Contact the CSI POCs (listed in Section 1.6) for a list of these Service-specific delegations. The decision to delegate Class II ECP approval authority considers:

- in-house availability of extensive design knowledge
- understanding of potential consequences resulting from CSI design changes
- contractor performance
  - minimal occurrences of Class I versus Class II misclassifications
  - the company's quality history, including validated Product Quality Discrepancy Report (PQDR) history and other discrepancy reports written against the site

    Note: PQDRs should be individually reviewed and assessed to ensure they are directly attributable to the source's product quality.
- open communication between the ESA/Service and DCMA site.

Requests for delegation of approval authority may come from procuring activities, DCMA, suppliers, or may be initiated by the cognizant ESA. The local DCMA QAR and/or Engineer should be contacted for recommendations and input on whether or not approval authority should be delegated.

If the ESA organization has delegated Class II ECP approval authority to a given DCMA site, that delegation may be withdrawn completely or may be withdrawn on a platform, subsystem, or item-specific basis so that only those relevant Class II ECPs must be submitted for ESA approval. Refer to Service-specific procedures and guidance regarding delegation of Class II ECP approval authority for additional information.

4.3.2. Common Use Items, including Standard Parts

When an item is used on two or more applications or by two or more Services, where it is only considered a CSI in one application or by one Service, consideration should be given to assigning the part a new part number and NSN for the CSI application. When a part is classified as a CSI, the additional quality requirements will often result in a higher procurement cost. Assigning a new part number and NSN to the part used in the CSI application prevents these additional costs from being applied to parts that are not used in CSI applications and do not need the additional quality oversight. Note that standard parts are used across many DoD applications. If a standard part is designated as a CSI in one aircraft application, it will increase costs for all other applications unless a new part number and NSN are assigned. See Section 2.6.1 for guidance on criticality determinations for standard parts.

4.4. Inspection of Critical Characteristics

All critical characteristics that can be non-destructively inspected/tested should be subjected to 100% inspection by the contractor or subcontractor, unless sampling or Statistical Process Control (SPC) approaches have been approved by the cognizant ESA. Once the contractor has demonstrated (statistically) that critical processes are under control and are stable to a level meeting or exceeding a Six Sigma process level (e.g., 3.4 ppm based on Six Sigma methodology) the ESA may consider approving SPC.

The DCMA QAR and/or Engineer should evaluate contractor's sampling and/or SPC approach concerning critical characteristics and, if the approach is acceptable, the QAR and/or Engineer should send a recommendation to the ESA via the ACO and PCO for ESA's approval of a deviation to allow the contractor to utilize sampling and/or SPC methods. At the Government's discretion, 100%

inspection may be reinstated if process controls prove to be ineffective or inadequate. The DCMA QAR and/or Engineer should withdraw the contractor's authorized deviation to utilize sampling and/or SPC and notify the procuring activity and ESA and request ESA's concurrence and approval.

Critical characteristics that require destructive testing should be tested on a lot or batch basis with no skip lots allowed unless a deviation is granted by the ESA. Consideration of whether to grant a request for deviation should include the need for the item, its product history, completed test results, and the supplier's quality history. All inspections of critical characteristics should be recorded by serial number (or lot number, if serialization is not required), part number, drawing number, characteristic inspected, actual reading or dimension observed, date of inspection, identity of inspector, and all required inspection certifications.

4.4.1. Conflicting Critical Characteristics

Conflicts or contradictions among the TDP list of critical characteristics, contractually furnished data, and drawings or specifications sometimes arise. These conflicts should not be resolved according to the order of precedence paragraph in the TDP. Instead, the ESA should be immediately notified and clarification should be requested. Contractors must immediately notify the ESA in writing through the PCO with a copy furnished to the DCMA ACO.

For common use items, conflicts often arise when critical characteristics have been identified for the part's application on one platform but there are no characteristics or different characteristics identified for the part's application on another platform. In these cases, the Common Use Item process described in Section 2.6.2, using the form provided in Exhibit A, should be employed to resolve the conflict or clarify the requirement.

4.4.2. Nonconforming Material

Items are considered 'nonconforming' when they fail to meet a defined characteristic or process requirement. A nonconformance is considered 'critical' if it is likely to result in hazardous or unsafe conditions for individuals using, maintaining, or depending on the supplies or services involved or is likely to prevent performance of vital agency mission. (Vital agency missions might include nuclear weapons delivery, transport of the President, or other similar missions where the user community has defined the tolerance for error or failure as significantly less than other military operational scenarios.) Alternatively, a 'minor' nonconformance is not likely to materially reduce the usability of the supplies or services for their intended purpose, or is a departure from established standards having little bearing on the effective use or operation of the supplies or services.

CSIs with nonconforming critical characteristics must not be dispositioned through Contractor 'use-as-is' or 'repair' actions, although rework to print is acceptable. Requests for deviation in critical characteristics must be classified as 'critical.' Requests for deviation in critical characteristics must be reviewed by the cognizant ESA. Action on such requests will result in a change to the technical data requirements, deletion of the critical characteristic in its entirety, or disapproval of the request. Nonconforming critical characteristics will not be accepted by Materiel Review Board (MRB) action.

An MRB is a formal contractor-Government board established for the purpose of reviewing, evaluating, and disposing of specific nonconforming supplies or services and for assuring the initiation and accomplishment of corrective action to preclude recurrence. MRBs are responsible for categorizing nonconformances as 'critical' or 'minor' and ensuring they are dispositioned accordingly. Technically, the Government approves or disapproves MRB decisions and is not a formal member of the MRB, unless specifically directed to be a member in the contract. The cognizant Contract Administration Office (CAO) makes the determination to accept or reject minor nonconformances, except with CSIs where that authority must be delegated. Typically, the Government is represented in MRB activities by DCMA personnel from the cognizant CAO.

However, all CSI critical nonconformances must be reviewed and approved by an ESA engineer. Refer to Service-specific policies for approval guidelines. This authority may not be delegated. An ESA engineer must also approve all minor nonconformances; however, this authority may be delegated. Like Class II ECPs, ESAs delegate authority to DCMA to participate on MRBs and disposition minor nonconformances on-site at prime contractor and OEM locations as specified on a CAGE code (i.e. site-specific) basis. Contact the CSI POCs (listed in Section 1.6) for a list of these Service-specific MRB disposition delegations. To delegate authority, the ESA will consider:

- in-house availability of extensive design knowledge,
- understanding of potential consequences resulting from CSI nonconformances
- any patterns of misclassification (i.e., critical versus minor)
- any patterns of inappropriate dispositions (i.e., repair or use-as-is instead of scrap)
- the company's quality history, including PQDR history and other discrepancy reports written against the site; and
- open communication between the ESA/Service and DCMA site.

Requests for disposition approval authority may come from procuring activities, DCMA, suppliers, or may be initiated by the cognizant ESA. The local DCMA QAR and/or Engineer should be contacted for recommendations and input to the decision process.

If the ESA organization has delegated approval authority for minor nonconformances to a given DCMA site, that delegation may be withdrawn completely or may be withdrawn on a platform, subsystem, or item-specific basis so that only those relevant minor nonconformances must be submitted for ESA approval. Refer to Service-specific procedures and guidance regarding delegation of minor nonconformance approval authority for additional information.

Clear and open communication between contractors and DoD is essential, particularly when non-conformances in safety-critical features of items already delivered to the Government are identified. DFARS 252.246–7003, *Notification of Potential Safety Issues*, requires contractors to promptly notify the Government of all non-conformances of designated CSIs acquired by the Government and of all non-conformances or deficiencies (i.e., not limited to critical characteristics) of *any* part that may result in a safety impact. When incorporated as contract requirements, contractors must notify the ACO and the PCO as soon as practicable, (but not later than 72 hours) after discovering or acquiring credible information concerning non-conformances and deficiencies. The Contractor must issue a written notification to the ACO and the PCO within five working days. Additionally, contractors are required to facilitate communication between the Government and any subcontractor, as necessary. It is important to note that such notification is considered neither an admission of responsibility nor a release of liability for the defect or its consequences.

4.5. CSIs from Unapproved Sources

On occasion, CSIs from an unapproved source are found in the supply system. In this case, the IMM will freeze stock and notify the cognizant ESA(s). The ESA(s) will define testing requirements to verify that the product conforms to technical requirements and will review and approve the results. If unapproved CSIs have been installed in the field, serious consideration should be given to any field performance history and continued use of installed CSIs.

4.6. Installation of CSIs

Modification of CSIs during installation or repair is prohibited unless the change was approved by the ESA or the CSI was specifically designed for modification

during installation or repair. Examples of CSIs that may be modified include: fuel lines, hydraulic lines, pneumatic lines, wiring, etc. Prior to installation of replacement CSIs not drawn from 'ready for issue' inventory, the cognizant engineer should ensure that all required maintenance actions and configuration changes conform to current fleet technical documentation and applicable acceptance test procedures have been satisfied.

4.7. Prime Contractor/OEM CSI Processes

Prime contractor/OEMs generally have detailed knowledge of an item's application, design intent, failure modes, failure effects, critical design characteristics, and critical manufacturing, repair, or installation processes. They are expected to have current and complete design, manufacturing, and QA documentation for the parts they produce and/or deliver to the Government. When addressing prime/OEM contractors' internal processes for CSI management and control, the following topics should be included. Refer to Service-specific standards and references for more detailed definition of requirements, guidance, and evaluation criteria.

CSI CLASSIFICATION SYSTEM

- What definition of CSI is being applied?
- What types of parts are being considered?
  - Replenishment items? How are "replenishment items" defined/identified?
  - Non-buy items? How are these defined and identified?
  - Items identified in PQDRs, Mishaps, Hazard Reports (HAZREPs), etc?
- What criteria are used to classify CSIs?
- How is the criticality determination process incorporated in existing review processes such as ECP, MRB, mods/upgrades, etc?
- When will acquisition program CSI lists be delivered?
- How will lists be maintained over time?
- What data will be recorded along with part number and criticality?

CSI IDENTIFICATION SYSTEM

- Describe whether, how, and when CSI drawings will be marked and critical characteristics/processes and QA requirements will be identified.
- Describe serialization methods and parts traceability.
- How will parts be marked if they cannot be identified with a serial number?

CHANGE MANAGEMENT SYSTEM

- Describe the treatment of CSIs in the ECP process.

MANUFACTURING MANAGEMENT SYSTEM

- Describe how CSI manufacturing is reviewed, controlled, and approved.
- Explain whether and how operations producing critical characteristics are defined and documented.
- Will a Frozen Planning List be prepared, maintained, and updated? If so, how?

QUALITY MANAGEMENT SYSTEM

- Describe how CSI critical characteristics will be inspected/tested or otherwise verified. Address sampling/SPC; destructive and non-destructive inspection/testing; applicability to lots/batches; and use of First Article Test (FAT), Product Verification Test (PVT), and Production Verification Audit (PVA).
- How long will CSI quality records be kept?
- Describe how records will enable verification of all aspects of material, manufacture, processing and inspection of critical characteristics.
- Describe the MRB process as applied to CSIs.
- What is the notification process if it is discovered that nonconforming CSIs have been delivered to the Government?
- Explain all the circumstances that might cause a CSI to be disposed of and describe the disposal process.

SUPPLIER MANAGEMENT SYSTEM

- Provide a detailed description of the process by which all new CSI suppliers to the prime/OEM are approved. Will source qualification data be maintained? Provide a description of the requirements flow-down process and describe how supplier planning/process are overseen and how supplier parts are accepted.
- How are non-compliant suppliers removed?
- Will surplus parts be used? If so, explain the process for qualifying surplus parts used as CSIs?
- Will a list of suppliers providing CSI items be established and maintained? What provisions will be made for changes to the list and Government notification?

4.8. Government Contract Quality Assurance

Government Contract Quality Assurance (GCQA) is performed by DCMA technical specialists to ensure CSIs meet contract technical requirements, particularly

those associated with critical and significant characteristics. GCQA at the source is required for all CSI procurements. Exceptions are made when GCQA is not feasible, such as procurements from distributors (See Section 4.8.3. below) and when GCQA would result in redundant Government oversight, such as in the purchase of FAA production-certificated products for use on FAA certificated aircraft. The need for GCQA for FAA certificated products is generally considered unnecessary, although exceptions may arise. See Section 2.6.3. for additional guidance.

Where the contract clearly identifies an item as CSI and identifies critical product characteristics/features of the item, DCMA technical specialists must establish a surveillance methodology to ensure that all critical characteristics associated with the CSI are evaluated in accordance with DCMA CSI Product Assurance Instructions. CSI GCQA is not limited to verification of identified critical characteristics (i.e., as identified by drawings, specifications, technical data packages, or otherwise identified within the contract). Exhibit C includes critical manufacturing processes that the ESA considers when identifying critical characteristics. Therefore, if they pertain to a specific CSI, they should be considered when performing risk based GCQA surveillance. Surveillance activities could also include destructive or non-destructive testing (see Exhibit C). DCMA technical specialists should contact the ESA where application of Quality Assurance Letters of Instruction (QALI) or inspection of critical/significant characteristics and processes will result in excessive DCMA resource expenditure and request or recommend an alternative GCQA approach.

4.8.1. GCQA for Prime Contractor/OEM Manufacturers

GCQA is performed for CSIs comprising systems that are manufactured by the system or subsystem prime contractor or an OEM with design authority delegated from either the prime contractor or ESA. If the CSI is the responsibility of the prime or OEM with design authority and surveillance of critical characteristics requires a significant investment of time, the ESA should be contacted with proposed alternative surveillance strategies for ESA approval.

4.8.1.1. GCQA for In-Service CSIs Manufactured by a Prime Contractor/OEM

For CSIs comprising in-service (or 'legacy') systems that are manufactured by the system prime/OEM, DCMA technical specialists must establish a GCQA strategy consistent with requirements provided in the contract, approved contractor program plans, QALIs, or procuring activity or ESA direction. If no specific guidance is provided, a risk-based GCQA strategy should be established to address critical characteristics and processes identified in technical documentation. If no critical characteristics or processes are identified in design,

manufacturing or inspection documentation, then a risk-based GCQA surveillance strategy should be established consisting of process review techniques focusing on selected important processes from the examples in Exhibit C. Exhibit C lists critical characteristics and processes for ESA use; however, DCMA can use the same list as guidance to determine important processes for surveillance given the particular CSI.

DCMA risk-based GCQA strategy/surveillance is based on Government quality assurance contract requirements and the criticality of the supplies being procured. A critical item, e.g., CSI, is considered high risk due to the consequence of failures due to improperly controlled manufacturing, repair, or overhaul processes. A high risk item means DCMA must employ higher-levels of effort in surveillance to mitigate risks to customer desired outcomes. Risk-based strategy includes appropriate surveillance methods and techniques, planned level of effort, and intervals for performance of surveillance. The methods and levels of surveillance are determined by:

- Contract requirements;
- Important characteristics or tests not identified as critical by the ESA;
- Important processes;
- Mapping important characteristics to the processes that produce or control them;
- Validated Product Quality Deficiency Reports;
- Contractor's performance and process control;
- Inputs from the field and customer complaints; and
- FMEA or FMECA results.

4.8.1.2. GCQA for New CSIs Manufactured by a Prime Contractor/OEM

There are two types of 'new' CSIs. One type includes items for which there has been a configuration or manufacturing change requiring updating of technical data and rolling/establishment of a new part number. A 'new' CSI may also refer to a newly designed item requiring development of original technical data and establishment of a new part number. For both types, technical documentation should identify the item as CSI and identify the critical characteristics and processes.

If the contractor does not or is unwilling to identify CSIs and their associated critical characteristics and processes in technical documentation, DCMA technical specialist must determine whether there is a contract requirement for such identification. Where a contract requirement does not exist for identifying CSIs and critical characteristics and processes in new technical data, the procuring

activity and the ESA should be advised of the contract deficiency and request guidance. The DCMA technical specialist may provide recommendations for ESA considerations.

4.8.2. GCQA for Alternate Sources

When the manufacturer is an alternate source and critical product characteristics/features are not identified in technical data or QALIs, DCMA technical specialists should apply the guidance associated with Significant Product Characteristics/Features (see Enclosure 3 of Appendix I) to structure GCQA surveillance activities. The ESA should be contacted and informed of the lack of critical characteristics and requested to provide GCQA guidance. The DCMA technical specialist and the ESA cognizant engineer should address requirements for QALIs needed for the current or future procurements of the specific CSI(s).

If the CSI is the responsibility of an alternate source and significant investments in time and effort are anticipated in reviewing the technical data package to identify applicable significant characteristics, the ESA should be contacted with proposed alternative surveillance strategies focused on surveillance of critical characteristics and critical manufacturing processes (see Exhibit C). Discussion with the ESA and ESA concurrence on the alternative surveillance strategy should be documented and kept as a part of the documented surveillance strategy.

4.8.3. GCQA for CSIs Obtained from Surplus Sources and Distributors

GCQA inspections are performed on surplus offers to ensure product conformance and that all critical characteristics are acceptable. Supplemental QA provisions may be provided where verification of critical characteristics cannot be performed without degrading the CSI. Contracts for surplus material should include instructions to DCMA regarding acceptance criteria.

DCMA should request the procuring activity either provide specific acceptance criteria or require acceptance at destination (vice source), when the contract for a CSI is awarded to a distributor and the applicable drawings, specifications, test or inspection equipment or facilities are not available to the DCMA specialist to verify product conformance.

4.9. CSI Testing

4.9.1. First Article Test

First Article Test (FAT) requirements are specified by the ESA and any resulting FAT non-conformances are evaluated and adjudicated by the ESA. FAT may be performed at the contractor's facility, witnessed by the ESA or the ESA's designated Government representative (e.g., DCMA QAR or Engineer, or procuring activity quality assurance representative) or FAT may be performed at Government or other testing facilities, thereby minimizing queuing for Government inspections. Several factors should be considered when determining where FAT should be performed, including cost, timeliness, facility backlog, whether the contractor has a history of problems, etc. In order to improve delivery schedules, FAT may be accomplished as part of the first production lot, thereby also satisfying any requirements for Production Lot Test, when successful. With this approach, the contractor assumes the risk of the entire lot being rejected should the FAT be rejected, since any non-conformances would typically be present throughout the entire lot. FAT should be completed within 90 days of asset availability, unless dynamic or fatigue testing is required. Material will not be accepted by the Government until a FAT (or a PVA in the case of repair and overhaul) is completed and approved, unless waived by the ESA. FAT is only intended to verify a contractor's ability to meet the specified technical requirements, not to re-qualify the item's original design. Unless specifically waived by the ESA cognizant engineer, FAT is required from manufacturers that:

- were not previously approved for the specific item; or
- have not delivered the specific CSI within the past three years to any Service managing the item as a CSI; or
- have unfavorable quality history; or
- have made any changes to the item, manufacturing processes, or sub-contractors used to manufacture the item successfully in the past.

Refer to Section 7.3. for a discussion of FAT contract requirements.

4.9.2. Production Lot Test

Production Lot Tests (PLT) may be performed at a Government or commercial test facility on samples from production lot(s) presented to the Government for acceptance. Strong consideration should be given to performing PLT at the contractor's facility when practical, in order to reduce Government costs and delivery lead-times. PLT should be overseen by the ESA or the ESAs' designated Government representative. PLT provides an added level of assurance that production items will comply with contract requirements, and indicates the effectiveness of the QA program. ESAs are responsible for reviewing test requirements to ensure that all critical characteristics will be inspected. Requirements for PLT must be incorporated in contracts (or Government repair

work orders) when specified in drawings, TDP, Source Approval Request (SAR) packages, or when specified by the Service ESA. See Section 7.3. for PLT contract requirements.

4.9.3 Product Verification Test

Product Verification Tests (PVT) may be performed at any time, but will be specifically performed when CSIs from an unapproved source are found in the supply system. In these cases, the IMM will freeze stock and notify the affected Service ESA(s). The ESA(s) will define testing requirements to verify that the product conforms to technical requirements and will review and approve the results. If unapproved CSIs have been installed in the field, strong consideration should be given to any field performance history and continued use of installed CSIs. A PVT should consist of a subset of the requirements of a FAT. Since most PVTs are performed on items that have been used in the field without any reported PQDRs, this typically precludes the need for form, fit and functional testing although other items of a typical FAT (dimensional, metallurgical, flow checks, etc.) will be considered. See Section 7.3. for PVT contract requirements.

4.10. Product Quality Deficiency Report

A 'product quality deficiency' is a defect or nonconforming condition which limits or prohibits the item from fulfilling its intended purpose. Included are deficiencies in design, specifications, materiel, manufacturing, operation, and workmanship.

The PQDR Program is the cross-Service process that provides quality deficiency data to activities responsible for design, development, purchasing, production, supply, maintenance, and contract administration so that action may be initiated to determine cause, take corrective action, and prevent recurring deficiencies. The PQDR is used to report deficiencies occurring in major weapon systems, consumable/repairable items, spare and repair parts, Government-owned products used during development and test, and items supplied as Government-furnished property, to include warranted, Contractor Logistics Support, and commercial off-the-shelf. Any individual may report a product quality deficiency.

4.10.1. When to Submit a CSI PQDR

The Multi-Service/Defense Agency CSI Instruction (see Appendix I) requires that a PQDR be submitted on a CSI when a defect or nonconforming condition is detected on new or newly reworked Government-owned products, premature equipment failures, or products in use that do not fulfill their expected purpose, operation, or service due to deficiencies in design, specification, material,

manufacturing, or workmanship. All cross-Service CSI PQDRs will be reported, investigated, tracked, processed, and resolved in accordance with DLAD 4155.24/AR 702-7/SECNAVINST 4855.5B/AFI 21-115, Product Quality Deficiency Report Program. A PQDR submitted specifically on deficiencies relating to critical characteristics of CSIs or those characteristics that potentially impact safety must be classified as a 'Category I' PQDR.

4.10.2. PQDRs for Common Use CSIs

If the PQDR item is common to multiple platforms, a copy of the PDQR, or other technical notification of the deficiency, will be sent to all item users. Initial mitigation of Category I CSI deficiencies will be formally addressed through technical directives (e.g., Technical Notices, Safety of Flight Messages, Airworthiness Directives, Bulletins, etc.) that are issued and managed in accordance with Service instructions. The appropriate Service ESA will approve resolution actions associated with Category I PQDR CSI investigations.

4.11. Quality Assurance Considerations for CSI Reverse Engineering

Prior to beginning a reverse engineering effort for a CSI, a detailed plan of action called a Reverse Engineering Management Plan (REMP) [refer to MIL-HDBK-115, *US Army Reverse Engineering Handbook (Guidelines and Procedures)*] should be developed involving all parties within the Government to ensure that responsibilities, timelines, and the resources required are well understood. Because of the nature of reverse engineering, significant testing may be required to validate the reverse engineered product. The ESA cognizant engineer is responsible for validating that all aspects of the proposed reverse engineered design, materials, critical characteristics, and critical manufacturing processes fully satisfy requirements. Additionally, the ESA engineer should approve the REMP and conduct (or otherwise oversee) all FAT of a reverse engineered CSI the first time an award is made using the reverse engineered design.

All documentation gathered for reverse-engineering purposes should be carefully screened to ensure that no restricted or proprietary data is included. Any additional data subsequently requested by reverse engineering personnel from sole-sources or prime contractors must be delivered via the Government to prevent inadvertent access to restricted or proprietary data. Technical data developed through reverse engineering that was contracted and paid for by the Government should be delivered to the Government with unlimited rights.

When a subassembly has been reverse engineered and one or more pieces within the subassembly remain sole source for economic or other reasons, it/they remain as limited rights piece(s).

Unauthorized disclosure or access to proprietary data disqualifies the company or activity as a candidate source for competitive procurement of reverse engineering efforts. The source may also be subject to legal action by the OEM. The Government may opt to select a different contractor who has not had access to the restricted data to perform the reverse engineering function for the candidate item.

Reverse engineering candidates with existing patents, with patents pending, or patents applied for require formal Government authorization [in accordance with MIL-HDBK-115, *US Army Reverse Engineering Handbook (Guidelines and Procedures)*], for the contractor to reverse engineer such items (including piece-parts or components). Prior to initiating reverse engineering efforts in these cases, appropriate legal counsel should be obtained.

CHAPTER 5

DISPOSAL

Special care is required in the disposal of CSI to ensure that items which are defective, nonconforming, suspect, or have reached the end of their useful life are not reintroduced into the supply system. In the past, there have been numerous occurrences where defective items had been sent for disposal, bought by a commercial entity as surplus and sold back to the military Services. This situation created serious safety concerns and unnecessary additional work for Government acquisition, quality, and engineering personnel; and on occasion has allowed defective or suspect CSIs to be installed in military aviation systems.

5.1. Mutilation of CSIs

To prevent inadvertent use, CSIs that are defective, suspect, or beyond their specified life limits must be mutilated prior to disposal. Likewise, CSIs for which there is no reliable documentation regarding manufacture, acquisition, use, modification, repair, or overhaul must be mutilated. CSIs delivered to the Defense Reutilization and Marketing Service (DRMS) for disposal receive special attention to ensure the items are mutilated and rendered unusable.

DLAM 4130.3 VOL II, PART 12, APPENDIX A-97 lists demil codes and addresses mutilation (e.g., code C= MLI - Demilitarize by mutilation (make unfit for intended purpose) by melting, cutting, tearing, scratching, crushing, breaking, punching, neutralizing, etc.). (As an alternate, burial and deep-water dumping may be used when authorized.)

5.2. Contract Disposal Clause

Procuring Activities must ensure contracts for CSI manufacturing, repair, overhaul, or modification include requirements for proper disposal practices. Unless specific language requiring proper disposal of nonconforming CSIs is included in applicable contracts, there will be no safeguards to prevent reintroduction of these parts into the DoD supply system. Therefore, it is important to include contract provisions for CSI disposal, particularly for items not previously purchased by or delivered to the Government. Section 7 of Exhibit D contains a sample clause for CSI disposal.

5.3. One Time Manufacturing Authority

ESAs must ensure facilities have established appropriate disposal procedures and capabilities prior to granting One Time Manufacturing Authority. Any CSIs produced under a One Time Manufacturing Authority that do not meet original manufacturer requirements or have not been fully qualified must be disposed of according to the Multi-Service/Defense Agency CSI Instruction (see Appendix I), when no longer required or beyond useful life limit.

CHAPTER 6

MANAGEMENT AND OVERSIGHT

Management controls are essential to ensuring the quality of CSIs throughout their life cycle. In addition to those discussed in previous chapters, there are other management and oversight activities required to ensure consistent and effective CSI management. Significant responsibilities for CSI management controls lie with the ESA engineers, logisticians, and contracts personnel, and extend to the commanders of acquisition organizations, Program Executive Officers, Program Managers, DLA, and DCMA. Standardized contractual controls for CSIs are discussed in Chapter 7 and presented in Exhibit D of this Handbook.

Each Service and DoD activity has developed its own internal processes to implement CSI policies. Any actions that adversely impact cost, supply posture or system readiness, should be coordinated among all stakeholders (e.g., the item's IMM, system Program Manager, operational users, etc.) in accordance with Service-specific procedures.

To pro-actively identify issues, implement solutions, and institute process improvements, the Services, DLA and DCMA must jointly conduct periodic assessments of CSI management controls and their implementation to confirm that this Handbook and the Multi-Service/Defense Agency CSI Instruction (see Appendix I) are properly executed.

6.1. Source Reciprocity and Coordinated MRB Delegation

The military Services should strive to maintain common terminology and processes in training, engineering support, documentation and technical data to enable coordination of common use items and a more uniform approach to working with DLA and DCMA personnel. The Multi-Service/Defense Agency CSI Instruction (see Appendix I) and this Handbook represent significant achievements toward this goal. Further, in some cases, the Services have developed mutually acceptable source approval and minor deviation approval (MRB) delegation processes. Refer to Service-specific guidance for additional information on these processes.

6.2. CSI List Accessibility

The Joint Services CSI Management DataViewer provides capabilities essential to cross-Service CSI coordination and management. It provides a reliable method

for quickly identifying common use CSI parts and provides cross-Service visibility of CSIs. The Joint Services DataViewer allows each Service to maintain its own CSI data, while providing a tool to ensure common use CSI determinations, critical characteristics, and approved sources are available to all users, thus enabling efficient common use coordination. To access the Joint Services CSI DataViewer, contact your CSI POC listed in Section 1.6 of this Handbook.

The website maintained by the Defense Supply Center, Richmond (DSCR), http://www.dscr.dla.mil/ExternalWeb/UserWeb/AviationEngineering/TechnicalOversight/CSI.htm provides access to separate CSI lists for all Naval aviation CSIs, DLA-managed Army CSIs, and select Air Force CSIs. The complete Army CSI list can be found at https://arise.amrdec.army.mil/csiportal/.

The Joint Deficiency Reporting System (JDRS) Critical Item Management (CIM) module provides access to the full range of Naval aviation item criticality determinations, as well as source and critical characteristics data. Critical Safety Items, Critical Application Items, and Not-Critical Items are identified here and are managed by the Navy with respective levels of management oversight and controls. The JDRS CIM module is accessible at https://jdrs.mil.

The Air Force CSI lists are on the CSI Management Community of Practice (CoP). The CSI Management CoP is accessible via the Air Force portal https://afkm.wpafb.af.mil/ASPs/CoP/EntryCoP.asp?Filter=OO-EN-MC-07

Many DoD aviation platforms were in service when CSI policies were first established. If an item does not appear on a CSI list, this does not necessarily mean that the item is not critical. It may simply indicate that a criticality determination has yet not been performed for that item or that the information has not yet been added to the list.

6.3. Requests for Engineering Support

Requests for engineering support are routinely initiated by activities external to ESAs. These requests may be generated by the ESA's own Service IMM or by DCMA or DLA. Refer to Service-specific policies and guidance for the processing of requests generated by Service IMMs. DCMA refers deviations and other requests to the cognizant ESA via the procuring activity, unless otherwise delegated. A Multi-Service/Defense Agency Instruction, *Engineering Support Instruction for Items Supplied by Defense Logistics Agency,* provides instructions for engineering support provided by the Services to DLA. (This instruction was issued jointly as DLAI 3200.1, PAM 715.13, NAVSUPINST 4120.30A, AFI 21-408, and MCO 4000.18.)

Every effort must be made to ensure responses to requests for engineering support are accurate and timely. The requestor should be notified if a response cannot be made within the requested timeframe and an estimated completion date should be provided. When issues arise that cannot be resolved at the working level in a timely manner, they must be elevated within the respective Service and defense agency organization for resolution.

6.4. Acquisition Program Technical Reviews and Assessments

The DoD Acquisition Guide (available at https://akss.dau.mil/dag/) provides discretionary guidance for acquisition program managers regarding the identification of CSIs during the System Design and Development phase of new equipment and platforms. Refer to Service-specific guidance for CSI provisions to be included in production contracts. (Provisions may include requirements for ESA-approval of prime/OEM CSI Programs prior to production approval, etc.) Also refer to Service-specific guidance for CSI coverage in acquisition program technical review and assessment processes. Such supporting information may include CSI coverage in Critical Design Reviews, Physical Configuration Audits, Full Rate Production Decision Reviews, and Milestone decision reviews or assessments.

6.5. CSI Training

Each Service/Defense Agency offers training opportunities to ensure that personnel involved in CSI processes are informed of current procedures and issues. Effective training is essential to maintaining common processes throughout DoD and will ensure that personnel involved in CSI management can learn from the experiences of others performing similar tasks. Service/Defense Agency CSI focal points listed in Section 1.6 should be contacted for specific training events and schedules.

Training can also contribute to the continuous improvement of this Handbook. Issues, questions, and exceptions raised during CSI training should be forwarded to the appropriate Service/Defense Agency CSI focal point for consideration in future updates to this Handbook.

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CHAPTER 7

CSI CONTRACT PROVISIONS

This chapter outlines contract provisions that may be applied in the procurement of CSIs. Typically, quality assurance controls included in solicitations or contracts will vary based on the type of procurement sought (e.g., repair, new spares, surplus, etc.) and based on the source receiving the award. Sole source procurements for CSIs to contractors having product design authority (i.e., OEM and prime contractors) may not need many of these provisions, if their in-house critical item management plans and practices already cover the requirement. However, for competitive procurements, including sources approved under the Alternate Source Qualification (ASQ) program, it is essential to include all appropriate CSI requirements.

The following sections outline the various areas of coverage that may be required in Government contracts for CSIs. Exhibit D provides examples of contract requirements and clauses that may be used or tailored to implement these requirements.

7.1. CSI Procurement Restrictions

CSIs and services for CSIs (such as repair, overhaul, etc.) must be procured only from approved sources. An approved source is a source that has been approved by an ESA to deliver aviation CSIs and/or services for CSIs to the military. Contracting methods such as 'full and open competition' (AMC/AMSC code of '1G' or '2G' as described in DFARS, PGI 217.7506 Parts 2-201.1, *Acquisition Method Codes* and 2-201.2, *Acquisition Method Suffix Codes*) are not authorized for CSIs, unless approved by the cognizant ESA.

7.2. Contract Criticality Identifier

Marking the front page of a solicitation or contract with the words "Critical Safety Item," simply and effectively communicates the critical nature of the procurement. Within the aerospace industry, this raises alertness levels and informs everyone involved with the manufacturing, inspection, and packaging; or repair, overhaul, and maintenance of the item of the critical nature of the item. Within DoD, this designation similarly alerts personnel associated with contract oversight and administrative functions. As a result of this designation and to mitigate risk, DCMA Product Assurance Specialists may perform additional

contract oversight during various product manufacturing/repair stages (in-process) or during the final inspection and acceptance phase.

7.3. Testing Requirements

These requirements are normally imposed by ESAs and are used as a demonstration of the contractor's ability to produce the subject item or are used during production to determine whether a production lot meets established technical requirements.

- FIRST ARTICLE TESTING (FAT). A FAT is conducted when a contract includes either FAR clause 52.209-3, *First Article Approval – Contractor Testing* or FAR clause 52.209-4, *First Article Approval – Government Testing*. These clauses require the testing and evaluation of first articles for conformance with specified contract requirements before production. Testing of a first article may take place at a Government or a commercial laboratory or at the contractor's facility. Waiver of FAT can only be authorized by the cognizant ESA, via the PCO. Refer to Section 4.9.1. for additional discussion of FAT.
- PRODUCTION LOT TESTING (PLT). PLT is a means of testing samples randomly selected from a contractor's production lot. PLT may take place at a Government or commercial laboratory or at the contractor's facility. The waiving of PLT can only be authorized by the cognizant ESA, via the PCO. See Section 4.9.2. for more information on PLT.
- PRODUCT VERIFICATION TEST (PVT). A PVT is performed on a subject item so that a full determination of its conformance to the contract's technical specifications can be verified. PVT involves the physical examination, functional testing, disassembly, inspection, re-assembly, and/or re-setting of an item. These audits also include the correcting of defect(s) noted during the performance of the audit. PVTs are used on dynamic assemblies where the performance of built-up components is of concern. They are predominately used in conjunction with maintenance and overhaul efforts in lieu of FAT. See Section 4.9.3. and Service-specific policies and guidance governing PVT requirements.
- STATEMENT OF WORK (SOW). Additional testing requirements such as form, fit, function, interchangeability, endurance, or performance should be addressed in the contractual statement of work (SOW) narrative, or in the SOW's technical data such as Depot Maintenance Work Requirements (DMWRs) or TDPs.

- MATERIAL TESTING AT GOVERNMENT LABORATORY. Some special commodities, i.e., life support systems, weapon launchers, aircraft launching and arresting equipment, critical application bearings, etc., may require additional testing or inspection at a designated Government testing facility or laboratory. This requirement is generated by the cognizant ESA and should be included in the solicitation.

7.4. Quality Management Requirements

These requirements cause the contractor to establish and maintain an in-house system or program for controlling product quality. It is DoD policy to use commercial specifications and standards that satisfy quality and metrology management requirements whenever possible.

7.4.1. Quality System

When procuring CSIs, procuring activities should invoke the FAR clause 52.246-11, *Higher-Level Contract Quality Requirement*, in conjunction with one of the standard inspection FAR clauses, 52.246-2, *Inspection of Supplies – Fixed Price.*; 52.246-3, *Inspection of Supplies—Cost-Reimbursement*; 52.246-4, *Inspection of Services—Fixed Price*; or 52.246-5, *Inspection of Services—Cost-Reimbursement*) When the higher-level quality requirement clause is invoked, the contract will also indicate in that clause which higher-level quality standard will satisfy the Government's requirement. Examples of higher-level quality standards are ISO-9001:2000 and SAE AS9100. These managerial specifications require contractors to establish and maintain a written quality program subject to Government review and approval that provides for the control of quality during the manufacturing or repair/overhaul process as well as quality of the end-item. Some of the elements covered under a managerial quality program are: contract review, drawings and document control, purchasing, product identification and traceability, special process control, inspection and testing, control of nonconforming product and corrective action, personnel training, records, inspection and testing status, control of measuring and test equipment, and statistical techniques.

7.4.2. Quality Assurance Provisions (QAPs)

The procuring Services and/or Agencies may have specific CSI-unique quality assurance requirements, such as the Army Quality Engineering Standards or DLA QAPs. These must be applied as appropriate on a case-by-case basis.

7.4.3. Calibration

Measurement and test equipment used in a facility to inspect and test a product should be properly maintained and calibrated according to National Institute of Standards & Technology (NIST) standards or other ESA approved standards. Examples of calibration standards are the most current versions of ISO-10012 and ANSI/NCSL Z540. These documents outline requirements for calibration frequency and status, records, environmental controls, adequacy of measurement standards, calibration procedures and out-of-tolerance conditions.

7.4.4. Audits

Audits should be utilized to assure proper implementation of CSI requirements, not only at a contractor's facility but also at any of their subcontractors and suppliers. Contracts should include a requirement for the contractor to perform self-audits of their compliance to CSI requirements. Additionally, FAR 52.246-2, -3, -4, or -5, *Inspection of Supplies / Services*, and specific SOW language may be added as applicable to different types of contracts to establish the Government's right to audit the contractor.

7.4.5. Warranty

When appropriate and cost effective, CSI procurements should include a warranty clause. DoD policy and guidance for warranties can be found in FAR 46.7, DFARS 246.7 and in Service/Agency specific instructions. When warranties are appropriate, the solicitation must cite either FAR 52.246-17, *Warranty of Supplies of a Noncomplex Nature*, or FAR 52.246-18, *Warranty of Supplies of a Complex Nature*; these clauses allow material to be returned to the contractor for a period of six to twelve months following final shipment. Extended warranty clauses used in major acquisitions, repair and overhaul, Performance Based Logistics (PBLs) and commercial contracts should be individually tailored for a specific program and negotiated accordingly.

7.5. Engineering/Technical Requirements

The following topics describe specific hardware-related requirements and actions which the contractor must perform to demonstrate product conformance to the contract's technical requirements.

7.5.1. Configuration Management

In order to control changes to CSIs and their associated documentation, configuration management requirements should be included in contracts. These

requirements are essential when procuring CSIs since they require contractors to submit all ECPs and product deviation requests to the Government for review and evaluation prior to implementation. It should be noted that for contractors having product design authority (i.e., OEMs and prime contractors), the cognizant ESA may delegate approval authority for Class II ECPs and minor non-conformances to DCMA via the procuring activity. An example of the configuration management clause is included in Exhibit D. CSI configuration management is further discussed in Section 4.3.

7.5.2. Technical Data Requirements

During the performance of a modification or development type contract, the technical data that is created or modified must properly reflect the criticality of items and processes. It is therefore important that contract requirements and clauses include language that addresses compliance with this requirement whenever this type of procurement is being contemplated.

Conflicts or contradictions among the TDP list of critical characteristics, contractually furnished data, and drawings or specifications sometimes arise. These conflicts should not be resolved according to the order of precedence paragraph in the TDP. A contract provision should be included to ensure the ESA is immediately notified and clarification is requested. Contractors must immediately notify the ESA in writing through the PCO with a copy furnished to the DCMA ACO.

7.5.3. Frozen Planning Requirements

The term 'frozen planning' has many definitions, interpretations and implications throughout the aviation industry. In the context of the CSI program, the term frozen planning is defined as a methodology by which contractors will control manufacturing, repair, and/or overhaul processes to achieve consistent quality results in the production of CSI designated features/characteristics of parts and assemblies. Acceptable methods to achieve this result also include Process Control and Process Certification in addition to traditional frozen planning methods. Process Control ensures that features will always be within technical requirements and achieves the same affect as frozen planning. The cognizant ESA must determine which method will be used for a particular procurement, modification, repair, or overhaul of aviation critical safety items.

Effective management of frozen planning revision assures process traceability and validity. While it does not mean that each and every process step must be locked and never changed, there must be sufficient control of the revisions to the manufacturing, repair, or overhaul methods such that the source consistently achieves the desired acceptable results. Revision controls enabled by frozen

planning allow the identification of manufacturing, repair, or overhaul methods in effect during a specific period of time. If the source is not the prime contractor or OEM, frozen planning is required for CSIs after First Article Test. Frozen planning will be required for the prime contractor or OEM when specific requirements for such have been negotiated between the cognizant ESA and the prime contractor/OEM and included in the contract.

Changes to frozen planning will be submitted to the cognizant ESA in accordance with negotiated procedures. For example, the ESA may choose to limit frozen planning changes that must be submitted for review to include only processes affecting critical characteristics. The ESA may also choose to delegate the review of other frozen planning changes to DCMA.

7.5.4. Serialization and Marking

In the event an actual or potential operational hazard involving CSIs is identified, the supply system may need to be purged or the operational community may be directed to remove field-installed parts. Mishap, safety, or other types of Engineering Investigations may also drive the need to review manufacturing and inspection records for specific items. In these cases, the ability to trace parts to specific manufacturers and processes/materials used in production is essential.

Traceability involves documented evidence that the item to be supplied was/will be manufactured and/or maintained by the prime contractor, approved manufacturer, or FAA certificate/approval holder is identical to the product that was initially manufactured, and is in full compliance with all specifications, drawings, storage, packaging, and handling requirements, and other associated requirements. Documentation is required to demonstrate, to the Government's satisfaction, the Government's ability to obtain all information necessary to trace the items back through the manufacturing and inspection process in the event of the item failure. The manufacturing process information includes, date and place of actual manufacturing and additional information as appropriate, such as verification of all aspects of material, manufacture, special processes, personnel certifications, assembly, inspection, installation, and repair. Traceability is enabled by effective serialization and/or marking.

A serial number is a combination of numbers and/or letters assigned to an item that separately identifies one individual item from all others. All CSIs require individual serialization on the part as well as the packaging, unless it is not practical due to size, material property, excessive cost, or other requirements as specified by the cognizant Service ESA. When impractical to establish serial numbers on the item itself, CSIs should have distinguishable marking schemes approved by the Service ESA. Marking schemes may include color coding, imprinting, or other distinguishing marks that do not affect form, fit, or function.

The marking scheme should be reflected in all applicable technical documentation. Serial numbers should be marked in accordance with MIL-STD-130 or other contract requirements. All serialized and lot numbered CSIs should be documented and reported (including material scrapped during manufacturing) to the Contracting Officer or the Contracting Officer's designee (e.g., DCMA). Re-branding by suppliers which obscures the original marking (part number, serial number, CAGE code) of the CSI's OEM is prohibited.

> **Note**: The requirement for serialization does not categorically define the component as serially managed. 'Serially managed' refers to a tangible item that is designated by a DoD or Service Item Manager to be uniquely tracked, controlled or managed by its serial number in maintenance, repair and/or supply (e.g., via logbooks, aeronautical equipment service records, etc.).

> **Note:** Refer to DFARS 252.211-7003, *Item Identification and Valuation*, and DFARS 211.274, *Item Identification and Valuation Requirements*, for additional information and guidance regarding UID.

7.5.5. Level of Inspection

The contract, technical specifications, or approved quality plans and programs direct the nature of quality assurance for aviation CSIs. Because of the catastrophic or serious consequences of CSI failures, 100% inspection may be required, but sampling or SPC may also be authorized. Several factors influence decisions regarding contract quality assurance, such as production volume, quality history, stability of the production process, confidence in effectiveness of SPC practices, etc. When critical characteristics are identified on the drawings or by the cognizant ESA, the contract should clearly state that all critical characteristics will be 100% inspected, unless approval to use sampling or SPC has been authorized by the cognizant ESA. See Section 4.4 for further discussion of CSI inspection.

For serialized parts requiring traceability from the raw material to the finished product, contracts should also state that "actual test readings" must be recorded. For parts not individually serialized or assigned serialization upon lot/batch completion, a pass/fail inspection standard is acceptable provided the number of accepted/rejected units is recorded.

7.5.6. Control of Nonconforming Material

All CSI critical nonconformances must be reviewed and approved by an ESA engineer. (Refer to Service-specific policies for approval guidelines.) This authority may not be delegated. An ESA engineer must also approve all CSI minor nonconformances; however, this authority may be delegated. The contract should clearly state the appropriate approval authorities and routing of

nonconformance disposition requests. Refer to Section 4.4.2. for further discussion of nonconforming material.

7.5.7. Disposal of Nonconforming Material

To prevent the inadvertent release of defective material, it is important that the contract clearly state the method by which nonconforming material must be controlled. The contract should require nonconforming CSIs to be mutilated. Chapter 5 provides additional information on CSI disposal and Service-specific disposal guidance.

7.5.8. Notification of Delivered Nonconforming CSIs

Contracts should provide for clear and open communication between contractors and the Government when it is discovered that safety-critical non-conformances exist in items that were delivered to the Government. DFARS 252.246–7003, *Notification of Potential Safety Issues*, requires contractors to promptly notify the Government of all non-conformances of designated CSIs acquired by the Government and of all non-conformances or deficiencies of *any* part that may result in a safety impact. Contract requirements must provide for contractor notification of the ACO and the PCO as soon as practicable (but not later than 72 hours) after discovering or acquiring credible information concerning non-conformances and deficiencies. Contractors must be required to issue a written notification to the ACO and the PCO within five working days. Additionally, contractors must be required to facilitate communication between the Government and any subcontractor, as necessary. It is important to note that such notification is considered neither an admission of responsibility nor a release of liability for the defect or its consequences.

7.5.9. Sourcing and Procurement

When contractors responsible for design and/or delivery of aviation systems/platforms/equipment (i.e., aircraft, engines, electronics systems, test equipment, etc.) require a new CSI source of supply, the contractor responsible for design will perform the same approval process for the potential new source that was required during the original qualification of the approved source(s). Reductions in such testing will be submitted to the procuring activity for the Government's review and approval.

7.5.10. Records Retention

Presently, the FAR requires contractors to retain copies of all records generated for a period of three years after final payment (FAR 4.703). However, contracts for CSI manufacturing or CSI repair/overhaul should require records to be

retained at least ten years after final payment. Records may be maintained in any suitable format, but the medium must be appropriate to ensure durability and readability over the required storage period. Furthermore, at the end of this period, or in the event of relocation or shutdown, all records should be offered to the procuring activity prior to disposal.

7.6. Supplier Notifications

CSI contracts must stipulate that if the source changes manufacturing processes, methods, controls; manufacturing locations or facilities; or any manufacturing aspect that was used to demonstrate the supplier's capability, the Government must be notified and the changes must be reviewed and approved by the Service ESA prior to accepting delivery of CSIs. Refer to Service-specific guidance to determine whether Government notification and/or approval is also required if the source develops a new supplier; removes a supplier for quality reasons; or undergoes a business status change (loss of a licensing agreement, bankruptcy, etc.).

7.6.1. Relocation of Manufacturing/Repair Facilities

As a result of company mergers or acquisitions, many companies reevaluate their organizations and determine that it is advantageous for them to close or consolidate facilities. Past experience indicates that significant changes in manufacturing/repair location may impact the quality of a product. Relocations may necessitate that some contractors be re-approved if they are to continue supplying or repairing CSIs. Contracts must include provisions for Government notification of manufacturing/repair re-location. By obtaining this information, the Government can determine the best approach to take based on the facts presented. A sample checklist of types of information to be collected from companies that are relocating manufacturing facilities is included in Exhibit E.

7.6.2. Subcontractor Removal

Historically, contractors have not notified their customers when a subcontractor is removed for quality reasons. However, past experience with CSIs has shown that having this type of information, as it becomes available, is extremely important. It provides an opportunity for the Government to determine what actions, if any, need to be taken in regard to the affected material. At a minimum, contract provisions should be considered for Government notification of removal of sub-contractors performing special processes, such as non-destructive testing (NDT), plating, heat treat, welding, etc., or manufacture finished products.

7.6.3. Business Status Change

Like facility relocations, changes in business status can impact product quality and deliveries. Changes such as company bankruptcy, licensing agreement expirations, mergers, and acquisitions all need to be evaluated for impact on operations. Contracts should include provisions for Government notification of business status changes.

7.7. Government Contract Quality Assurance

It is DoD policy that GCQA must be required for all CSI procurements. Section 4.8 of this Handbook addresses DCMA actions and responsibilities supporting aviation CSI management.

7.7.1. Government Inspection at Source

It is essential for contracts to include one of the standard inspection clauses (FAR 52.246-2, *Inspection of Supplies—Fixed Price*; 52.246-3, *Inspection of Supplies—Cost-Reimbursement*; 52.246-4, *Inspection of Services—Fixed Price*; or 52.246-5, *Inspection of Services—Cost-Reimbursement*), when GCQA is to be performed at the source. This clause authorizes the Government to have access to the contractor's facility. In addition to accepting product in behalf of the Government, DCMA QARs and Engineers perform many other activities that affect the quality of a product. The following are some of the key activities that are performed by DCMA QARs or Engineers as part of a GCQA:

- Assure that supplies tendered for acceptance by the contractor comply with technical and quality contractual requirements.
- Review contracts for inappropriate or insufficient technical or quality requirements or data.
- Perform in-process and final product examinations.
- Perform in-plant process reviews.
- Delegate Government Source Inspection (GSI) on sub-contracts.
- Perform periodic reviews of the quality and inspection systems.
- Accept material on the Government's behalf by signing a material inspection and receiving report.
- Review ECPs for classification (Class I (major, critical) or Class II (minors), and accept/reject Class II (minors) when delegated by the cognizant ESA.
- Provide comments or recommendations on Class I (major, critical) or Class II (minor) ECPs.

- Review contractors' requests for a deviation or a waiver to ensure that the requests are properly classified as either a major or minor request.
- Approve minor deviation requests, when so delegated by the cognizant ESA.
- Provide comments and recommendations on major deviation requests.
- Issue Corrective Action Requests (CARs) and, when required, escalate corrective action issues to the procuring activity and the cognizant ESA.
- Monitor and evaluate contractor responses to CARs.
- Provide PQDR investigative support.
- Issue PQDRs on defective Government-Furnished Material (GFM).
- Monitor and control the condition of Government-Furnished Equipment (GFE).
- Provide oversight for receiving inspections and control of Government Owned Material.
- Perform or witness FATs at contractors' facilities.
- Represent the Government during contractual disputes.
- Provide technical and quality assurance support to the procuring activity.

7.7.2. Product Assurance Specialist (PAS) Guidance

When the procuring activity wants a DCMA QAR or Engineer to perform specific actions, a QALI must be prepared and sent by separate correspondence to the DCMA office responsible for contract administration. Exhibit F contains an example of a QALI and QALI requirements.

7.8. Other Contracting Methods

7.8.1. Procurement of Surplus Materials

When offers for surplus material are received, technical personnel should evaluate the offer according to Service/Agency-specific direction and guidance to determine if the material is acceptable for use by the Government. See Exhibit G for a clause and checklist for surplus material procurements. At a minimum, the following factors should be considered:

- Manufacturer of the original material
- Traceability, including manufacturing records
- Condition and configuration of the item, i.e., revision level of the item

- Shelf-life of the item, if applicable
- Cost of test & evaluation (T&E) required to determine acceptability
- Availability of technical data and testing facilities
- Instructions to DCMA regarding acceptance criteria.

7.8.2. Performance Based Logistics (PBL)

PBL typically involves long-term contracts for commercial support of military products, such as systems, bench stock, or entire platforms. Refer to http://akss.dau.mil/dag/Guidebook/IG_c5.3.asp for additional information. Prior to contracting for PBL support, all CSIs must be identified, along with the technical requirements to be used for their manufacturing, repair, and/or overhaul. Additional technical consideration areas, over and above those normally considered for non-PBL support contracts, include:

- Parts obsolescence management
- Escape and/or exit clauses
- Tailoring of Government oversight
- Contractor technical support, i.e., field representatives
- CSI management plan.

7.8.3. Licensing Agreements

Licensing agreements are used by OEMs and prime contractors to authorize another entity to support a system or program. When these agreements impact or involve CSIs, it is important to determine the scope of the agreement and the relationship between the licensee and the OEM or prime contractor. Government technical and contracting personnel should not assume that a licensee is an approved source until an evaluation has been performed by the cognizant ESA to determine the impact of the licensing agreement on a subject item. Each licensing arrangement must be individually reviewed for acceptability by the cognizant ESA. If a copy cannot be provided to the Government, the contractor must allow access to the licensing agreement. The financial arrangements of the agreement need not be disclosed; however, it is essential for the Government to know provisions of the agreement relating to technical aspects (data rights, data accessibility, technical oversight, process approval, warranties, mishap support, etc.) (not just simply that an agreement exists).

7.8.4. Commercial Acquisition

CSIs procured under a commercial contract requirement (FAR 52.212-4) will need addenda to give the government the authority to perform the necessary in-

process product examinations and/or process reviews to verify conformity. Without addenda, this clause limits government surveillance to point of tender and to be compatible with common industry practice. Where CSIs are procured with a commercial contract clause and no addenda, DCMA QAR and/or Engineering personnel should determine if the necessary product examination and/or process review could be accomplished to determine critical characteristic conformity. If the QAR or Engineer is unable to perform product examination, the procuring/delegating activity must be immediately notified and an addendum requested.

It should be noted that including FAR 52.246-2 (or -3, -4, -5) Inspection of Supplies / Services is not permissible within a contract when FAR 52.212-4, Contract Terms and Conditions - Commercial Items is used. Therefore, an addendum must be added to modify conditions and include the Government access. FAR 52.246-2 allows Government access and inspection at all places and times; whereas FAR 52.212-4 only allows Government access and inspection at the time the product is tendered for acceptance, unless the addendum is used. Although FAR 52.246-2 Inspection of Supplies - Fixed Price is the most frequently applied (and therefore most frequently misused in commercial procurements), the same limitations apply to FAR 52.246-3, Inspection of Supplies-Cost-Reimbursement; 52.246-4, Inspection of Services-Fixed-Price; and 52.246-5, Inspection of Services Cost-Reimbursement."

7.8.5. Distributors

For certain items, manufacturers will not start up production lines for small quantities; therefore, they will produce a large quantity of the items and make them available through their authorized distributors. Procurement of CSIs from authorized distributors is allowed in accordance with the Multi-Service/Defense Agency CSI Instruction (Appendix I), but traceability to an ESA-approved source of manufacture is mandatory. Contracts for CSIs to be procured from distributors should include acceptance criteria and define critical characteristics.

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16 March 2011

Appendix I

Multi-Service/Defense Agency CSI Instruction

DEPARTMENT OF THE NAVY
OFFICE OF THE SECRETARY
1000 NAVY PENTAGON
WASHINGTON, DC 20350-1000

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DCMA INST CSI (AV)
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MANAGEMENT OF AVIATION CRITICAL SAFETY ITEMS

A. REFERENCES

1. Public Law No 108-136 "National Defense Authorization Act for Fiscal Year 2004", Section 802, Quality Control In Procurement Of Aviation Critical Safety Items And Related Services.

2. DoD 4140.1-R, DoD Supply Chain Material Management Regulation, Section C8.5, DoD Aviation Critical Safety Item (CSI)/Flight Safety Critical Aircraft Part (FSCAP) Program

3. ASME Y14.100, 2000 Engineering Drawing Practices

4. ASME Y14.24, 1999 Types and Applications of Engineering Drawings

5. ASME Y14.35M, 1997 Revision of Engineering Drawings and Associated Documents

6. ASME Y14.34M, 1996 Associated Lists

7. DoD-STD-2101, Classification of Characteristics

8. DFARS-Appendix E, DoD Spare Parts Breakout Program

9. FAA Order 8110.42A, Parts Manufacturer Approval Procedures

10. FAA AC 00-56A, "Voluntary Industry Distributor Accreditation Program"

11. Aviation Supplier Association, ASA-100, "Quality System Standard"

12. SAE Aerospace Standard AS7104, NADCAP Requirements for Accreditation of Full Distributors

13. FAA AC 20-142, Eligibility and Evaluation of U.S. Military Surplus Flight Safety Critical Aircraft Parts, Engines, and Propellers

14. DFARS 208.70, Coordinated Acquisition

15. FAR 46, Quality Assurance

16. DFARS 246, Quality Assurance

17. DFARS 217.7503, Acquisition of Parts When Data Is Not Available

18. DLAR 4155.24/AR702-7/SECNAVINST 4855.5A/AFR 74-6, Product Quality Deficiency Report Program

19. DOD 4160.21-M, Defense Material Disposition Manual

20. DOD 4160.21-M-1, Defense Demilitarization Manual

21. DLAI 3200.1/PAM 715-13/NAVSUPINST 4120.30A/AFI 21-405/MCO 4000.46, Engineering Support For Items Supplied By Defense Logistics Agency and General Services Administration

Encl: (1) Definitions
(2) Example Format for One-Time Manufacturing Approval
(3) Significant Product Characteristics/Features for CSIs

B. PURPOSE. This instruction:

1. Establishes policy, procedures, and assigns responsibilities for the life-cycle management of replenishment items critical to aviation safety as required by and implements the Department of Defense (DoD) Critical Safety Item/Flight Safety Critical Aircraft Part (FSCAP) program as required by "National Defense Authorization Act for Fiscal Year 2004", Section 802, Quality Control In Procurement Of Aviation Critical Safety Items And Related Services (reference 1) and reference 2.

2. Addresses requirements governing the initial determination of item criticality and subsequent changes to this determination; coding and tracking of aviation Critical Safety Items (CSIs); the process for ensuring the adequacy of technical data and proposed changes; the process for approving sources of supply and repair/overhaul; the surveillance process assuring that approved sources retain required capabilities; authorities for one-time organic manufacture of CSIs under exigent circumstances; and requirements for disposing of CSIs when no longer needed by military aviation.

C. APPLICABILITY AND SCOPE. This instruction:

1. Applies to Program Executive Officers (PEOs), commanders of system acquisition and logistics organizations, program managers, and other agencies or commercial entities providing procurement, repair, or overhaul services to aviation materiel.

2. Covers aviation CSIs used in fixed and rotary wing aircraft, unmanned air vehicles, Aircraft Launch and Recovery Equipment (ALRE), aviation weapons and equipment, and associated aviation support equipment

3. Does not apply to commercial aircraft or subsystems purchased and maintained in accordance with Federal Aviation Administration (FAA) regulation, unless required by the Service ESA. This instruction applies to those portions of the commercial aircraft or subsystems modified or maintained to meet unique military requirements.

4. Does not apply to items provided through the foreign military sales program for foreign owned and operated aircraft, systems, or equipment when (a) the aircraft or item being acquired or modified is not in the active DoD inventory and the U.S. military no longer has engineering expertise on the aircraft or item, or (b)) the foreign customer directed the use of suppliers or configurations not approved by the US military Services.

D. DEFINITIONS. See enclosure 1.

E. PROCEDURES.

1. Criticality Determinations and Identification:

a. Criticality determinations for each new replenishment item shall be established by the cognizant Service Engineering Support Activity (ESA) prior to initial supportability analysis to allow adequate support planning for CSIs. During initial provisioning/cataloging or approval of a design change notice, the cognizant Service logistics organization shall validate that the criticality determination has been accomplished and is accurately documented. The criticality determination shall be recorded in all appropriate databases.

b. An item shall be identified as CSI when failure of that item could result in loss or substantial damage to the air vehicle or weapons system, or death or serious injury to personnel. Damage sufficient to create a Class A accident or a mishap of severity category I constitutes "substantial damage". Items determined by the system prime contractor to be a "flight safety part," "flight critical part," or similar terminology shall be designated as CSIs unless determined otherwise by the Service ESA. Items determined as "structurally significant," "fracture critical or "safety of flight structure" shall be identified as CSI.

c. All CSIs shall be considered to be FSCAP in accordance with reference 2. The Service organization responsible for assuring airworthiness (i.e., operational safety, suitability, and effectiveness) will be the "Aircraft Airworthiness Authority" for these items. The CSIs shall be identified as FSCAP with the applicable criticality code in the Federal Logistics Information System (FLIS) by the Integrated Material Manager (IMM) having management responsibility for the item. CSIs not currently identified as FSCAP in the FLIS system shall additionally be recorded as such.

d. For a common use new replenishment item or when an existing common use replenishment item is assessed for criticality, the IMM shall coordinate the criticality determination with affected Service ESAs and shall reflect the most stringent determination in the logistics files. When the common-use item is determined to be CSI in some applications but non-CSI in others, the IMM may establish separate National Stock Numbers when it is economically advantageous to do so.

e. Drawings and associated technical data for new replenishment items shall clearly identify that the item is CSI. Drawings and technical data shall identify the critical and major

characteristics, critical processes, and inspection and other quality assurance requirements. Drawing practices for CSIs shall be in accordance with references 3 through 6. Critical and major characteristics for CSIs shall be established in accordance with reference 7 and shall clearly be identified on the drawings and associated documentation.

f. Where legacy drawings for CSIs do not clearly identify the item as a CSI, or do not identify the critical characteristics/ processes, the cognizant Service ESA shall determine whether there are sufficient other protections in place (e.g., application of enclosure (3)) to assure successful procurement or repair/overhaul of the CSI. If not, the ESA shall update the drawings to identify the critical characteristics and/or processes.

g. Items determined to be CSIs shall be identified as such to the designated logistics manager for inclusion in the supportability analysis candidate listing to ensure adequate support planning. Additions to the initial list of CSIs shall also be provided to the logistics manager as changes occur throughout the life cycle of the equipment.

h. All CSIs shall be documented, by National Stock Number (NSN) and/or Part Number (P/N), in the maintenance plan. CSIs shall be identified using a Special Maintenance Item Code (SMIC) of "H" or "J," and a Criticality Code of "F" or "E." in accordance with MIL-PRF-49506

i. Approved sources of supply or repair/overhaul shall be identified for each CSI at the time the criticality determination is established or as soon afterwards as practical.

j. The cognizant Service organization for each CSI shall assign the appropriate Acquisition Method Codes (AMC)/Acquisition Method Suffix Codes (AMSC) based on the cognizant Service ESA criticality determination. AMCs and AMSCs are used to instruct the contracting officer on the suitability of an item for competitive procurement in accordance with reference 8.

k. AMC/AMSC codes of 1G or 2G (i.e., a part is a candidate for full and open competition) shall not be used for CSIs unless reviewed and approved by the ESA.

l. The cognizant Service ESA shall approve any proposed change to AMC/AMSC assignments from a restrictive code to a less restrictive code for CSIs.

m. Criticality determinations for existing items shall be revalidated by the Service ESA whenever there are changes to the item’s configuration, manufacturing or repair/overhaul processes, or sources of supply or repair/overhaul, or when there is a request for waiver or deviation.

n. CSIs shall have serial numbers on the item and on the packaging in accordance with reference 2, unless impractical or determined otherwise by the Service ESA. When impractical to establish serial numbers on the item itself, CSIs shall have distinguishable marking schemes approved by the Service ESA. The technical documentation shall reflect the appropriate marking scheme.

2. Sourcing:

a. CSIs shall be purchased or repaired/overhauled only from sources approved by the Service ESA in accordance with United States Code Title 10, Section 2319. The objective is to achieve competition among approved CSI suppliers and their products and to ensure that potentially new CSI suppliers and their products are effectively evaluated prior to delivery of CSIs to the Services. The source approval requirements established by this instruction are comparable to the Parts Manufacturer Approval (PMA) procedures established by FAA in reference 9. Unless otherwise established by the cognizant Service ESA, only sources in the following categories shall be considered for approval:

(1) the system or subsystem prime contractor;

(2) the actual manufacturer (i.e., Original Equipment Manufacturer (OEM)) that supplies the CSI(s) to the prime contractor where the Service ESA determines the prime contractor provides no "value added" to the item that couldn't be performed by the Government. The Service and DLA logistics organizations and the Defense Contract Management Agency (DCMA) shall provide assistance to the Service ESA in assessing "value added" for CSIs;

(3) fully-licensed manufacturers of the prime contractor or of the OEM that provide substantiation of their licensing arrangement, as validated by and acceptable to the Service ESA;

4) fully-licensed repair/overhaul facilities of the prime contractor or of the OEM that provide substantiation of their repair/overhaul arrangement with the prime contractor, as validated by and acceptable to the Service ESA;

(5) dealers or distributors approved by the Service ESA who provide traceability (as defined in enclosure (1)) that the items they are supplying were produced by the system prime contractor, OEM, or ESA approved alternative source and are unchanged in any way. FAA Advisory Circular 00-56A (reference 10) describes a voluntary system for the accreditation of civil aircraft parts distributors for parts and products installed on type-certificated products. The FAA concluded that ASA-100 (reference 11) and AS7104 (reference 12) meet and/or exceed the accreditation criteria;

(6) sources identified on a Qualified Product List (QPL) or Critical Item Procurement Requirements Document (CIPRD) where the ESA coordinated on the approval. Sources identified on source controlled drawings shall be considered approved, unless determined by the ESA to be otherwise. Any additional quality assurance provisions established by the ESA for the aforementioned sources or situations shall be incorporated in contracts; and

(7) alternate sources approved by the cognizant Service ESA (which may include FAA certificate/approval holders). Service depots and other organic government facilities may be considered alternate sources for production of CSIs provided they are approved by the Service ESA to satisfy the requirements of this instruction.

b. When dual use CSIs are purchased from other than FAA certificate/approval holders (Production Approval Holders, PMA Holders, Technical Standard Order Authorization Holders, Certificated Repair Stations) or their approved suppliers, or the documentation supporting procurement or repair from one of these sources does not exist or is unavailable, the CSIs are not to be considered FAA approved (references 2 and 13).

c. Alternate sources shall be revalidated by the Service ESA to ensure they remain capable of delivering satisfactory items if they have not delivered or repaired/overhauled the specific CSI to the DoD within 3 years of an anticipated solicitation. Similarly, alternate sources shall be reevaluated if there are concerns regarding product quality, manufacturing process changes, the source moves its manufacturing location, or the source has transferred its manufacturing facilities since the last manufacture. Companies that are having severe financial difficulties should also be reevaluated to ensure they can and will continue to provide acceptable CSIs. Only the Service ESA can determine whether reevaluation should be waived or the extent to which reevaluation should be relaxed.

d. System prime contractors and OEMs (1) with design responsibility from the system prime contractor for the preparation and technical currency of engineering drawings, (2) who supply the CSIs to the prime contractor, and (3) have current quality systems acceptable to the Government normally will not need reevaluation even if they have not delivered or repaired/overhauled the specific CSI within 3 years. However, reevaluation may be considered if there are concerns regarding product quality, manufacturing process changes, the source moves its manufacturing location, or the source has transferred its manufacturing facilities since the last manufacture, or if a new source is being qualified by the prime contractor, there are financial concerns with the system prime contractor or OEM, or if a new source is being qualified by the prime contractor.

e. Proposed changes to approved sources' manufacturing processes, methods, controls, manufacturing locations, or manufacturing facilities that were used to demonstrate the approved sources' capabilities shall be reviewed and approved by the Service ESA prior to accepting delivery of the CSI. Solicitations and contracts for CSIs shall require the contractor to formally notify the procuring activity of any proposed change to any prior approval factor evaluated by the Service ESA. Dual use parts or products subjected to this paragraph are no longer FAA-approved in accordance with reference 13.

f. Sources for CSIs approved by one Service that have common usage with other Services shall be recognized across all Services provided:

(1) the defined item requirements meet the most stringent requirements required of the item by an individual Service (as determined by the each Service ESA for assigned items);

(2) the source qualification requirements of the original approving Service were comparable to or greater than those required by each Service;

(3) each Service ESA had the opportunity to review all information that supported the request for approval and the determination that the source was acceptable and the other Services' ESA concurred in the conclusions; and

(4) there is compliance with the procedural requirements of this instruction; .

g. Unless otherwise authorized by the Service ESA, offers of surplus material (as defined in enclosure (1)) of CSIs shall only be considered for procurement provided the Service ESA has approved documentation substantiating the below criteria. Government contract quality assurance inspections will be performed on the surplus offers to ensure the criteria are met and all critical characteristics identified on the component drawings, in the solicitation or contract, in the Quality Assurance Letter of Instruction, or as established by enclosure (3) are acceptable. Supplementary quality assurance provisions may be provided where verification of critical safety characteristics cannot be performed without degradation of the CSI.

(1) the proposed item was originally manufactured by an approved source at the time of manufacture and the manufacturer's approval for that item has not subsequently been revoked;

(2) the item is unused in any way;

(3) the item is not repaired, recycled, remanufactured, reconditioned, or has not been previously dispositioned as nonconforming by the system or subsystem prime contractor, OEM, other suppler or the Government;

(4) the surplus item fully conforms to all critical characteristics as identified in item technical data requirements, contract, or other ESA instruction (i.e., the item's critical characteristics are not discrepant in any way); and

(5) the remaining shelf life or other time critical aspects of the item are acceptable to the Service ESA.

h. Purchase of CSIs at the unit/local level must have prior approval by the Service ESA and be justified by unusual and compelling urgency. When CSIs are procured locally, the buying activity shall notify the cognizant IMM (reference 14).

i. Prior to installation of replacement CSIs not drawn from "ready for issue" inventory (e.g., obtained from aircraft recovery sites or other salvage/cannibalization activities), the ESA shall ensure that all required maintenance actions and configuration changes are in conformance with current fleet technical documentation and that applicable acceptance test procedures have been satisfied.

j. Service depots and other Government organic facilities are authorized to manufacture CSIs in accordance with the following:

(1) Alternate Source for Recurring Production: Depots and other government organic facilities are candidates to be alternate sources for routine, repetitive, production lot manufacturing of CSIs provided the Service ESA confirms they meet all the requirements established for alternate source qualification.

(2) One Time Manufacture: Depots and other Government facilities are authorized to manufacture CSIs in limited quantities (one or a few) on a "one-time basis" without

undergoing the full alternate source qualification process only when the Service ESA confirms the below conditions are satisfied. Execution of all phases of one-time manufacture processing shall be done on an emergency basis and will be given high priority. Quantities in excess of the immediate need may be manufactured where additional items are necessary for testing (e.g., first article, fatigue strength, other destructive tests, etc.) or the economics of production, part usage and production processes indicate this is clearly advantageous to the government. This authority for "one-time manufacture" shall not be used to circumvent alternate source qualification requirements for repeat or routine production. This one-time manufacture requirement does not apply to items produced to support research, development, test, or evaluation. The parts produced in accordance with this process shall be coded, tracked, and disposed of as military unique CSIs. Criteria for authorization of "one-time" manufacture of CSIs:

(a) there is an urgent need for a limited quantity of items to fill an immediate requirement for depot production or fleet operational requirements and no previously approved source (contractor or organic) exists, or approved sources cannot deliver the parts within the required time;

(b) the Service ESA has established the technical requirements (i.e., design requirements, manufacturing processes, testing requirements, inspection requirements, etc.) necessary to assure acceptability of the manufactured item, and that the time and expense required to produce and conduct the necessary tests/evaluations supports the decision to manufacture and test the item on a one-time basis;

(c) the items are produced with equivalent or better manufacturing processes, controls, quality, and traceability as parts manufactured by the formally approved equipment manufacturer; and

(d) the quality and manufacturing attributes of CSIs produced under this "one-time manufacturing" authority are traceable through formal contemporaneous documentation from point of origin of raw materials to finished goods;

(e) cognizant engineering, quality, and production personnel reviewed the CSI technical data, complete depot (or other cognizant facility as applicable) controls, serial number tracking process, and required tests and inspections to ensure they are current, complete, accurate, and capable of meeting the original manufacturer and/or Service ESA's requirements;

(f) first article testing is satisfactorily accomplished;

(g) assessments and testing of static and fatigue strength and limitations as well as other tests are conducted, when required by the Service ESA; and

(h) the Service ESA (including cognizant design engineering, quality, and production personnel) have signed their approval that the parts manufactured under this one-time manufacturing authority meet or exceed original manufacturer requirements, that traceability on the item is satisfactory, and that the item is safe for flight and ground operations and does not present a safety hazard to personnel. Enclosure (2) provides example forms for one-time manufacturing approval documents. When a CSI produced under the one-

time manufacturing authority does not meet original manufacturer requirements or has not been fully qualified, the ESA shall establish and ensure publication of applicable operating procedures, restrictions, and limitations as well as applicable maintenance, inspection, tracking, and disposal requirements.

3. Quality:

a. All Class I Engineering Change Proposals (ECPs) or proposed Permanent or Temporary Modifications (as defined in enclosure (1)) on CSIs shall be reviewed and approved by the cognizant Service ESA. All Class II ECPs for CSIs shall be approved by the cognizant Service ESA unless delegated by Service ESA.

b. As a rule, only CSIs that fully conform to all characteristics shall be accepted. Exceptions can be made in cases of public exigency, but only when the nonconformances have been reviewed, approved, and justified in writing by the cognizant Service ESA. All CSI nonconformances (critical, major, and minor) and all Requests for Deviations or Waivers associated with CSIs shall be approved by the cognizant Service ESA using quality assurance practices in accordance with references 15 and 16. The ESA may delegate to DCMA approval of Class II Engineering Change Proposals (ECPs). Procuring activities shall withhold waiver authority for minor nonconformances on CSIs unless otherwise advised by the ESA. The approval authority for critical or major nonconformances shall not be delegated. Additionally, exceptions to critical characteristics must be approved by the head of the Service ESA or their designated representative. Where the CSI is used by more than one Service (i.e., the item is a common-use CSI), nonconformances shall be coordinated across the using Services ESAs. Nonconformances to critical characteristics of common-use CSIs must be approved by the head of each affected Service ESA or their designated representative.

c. Rebranding (i.e., remarking or relabeling) which obscures the marking of the OEM of CSIs by suppliers is prohibited.

d. Government contract quality assurance (GCQA) at source shall be required for all CSI procurements. The GCQA approach shall be sufficient to ensure conformance of all critical characteristics and critical processes identified on the drawing, specification, technical data package, otherwise established in the contract, or enclosure (3). Critical characteristics and processes may be indicated on the drawing by a black star, flight critical marking, or similar identification. GCQA is not limited to verification of the CSI characteristics identified as critical. The cognizant Contract Administration Office shall perform quality assurance activities in accordance with references 15 and 16. Certificates of Conformance (CoCs) for CSIs in lieu of government product verifications are not authorized without Service ESA approval.

e. When specific CSI quality requirements are identified by the Service ESA, quality assurance letters of instruction (QALIs), quality assurance provisions (QAPs), criteria for the special inspections, process verifications, or similar requirements shall be developed and provided to the procuring activity.

f. When DCMA anticipates delegating to a Host Nation the GCQA functions for aviation CSIs maintained, repaired, or overhauled at supplier facilities outside the United

States, DCMA will obtain concurrence from the affected ESAs. As much as practical, the GCQA delegations should show the functions to be performed by the Host Nation for each aviation program. DCMA and the ESAs will review the effectiveness of the delegation at least every 3 years.

g. First Article Testing (FAT), Production Lot Testing (PLT), and Product Verification Audits (PVA) shall be incorporated into the contract or organic repair work order (e.g., program notice, task order, etc.) when specified in drawings, technical data packages, in response to Source Approval Request (SAR) packages or when otherwise specified by the Service ESA. As a rule, waiver of FAT or PVA should be considered, provided the manufacturer:

(1) was previously approved for that item;

(2) has successfully manufactured and delivered the specific CSI within the past 3 years;

(3) has no unfavorable quality history; and

(4) has not made any changes to the item, processes, manufacturing location or sub-contractors used to manufacture the item successfully in the past.

h. Reverse engineering shall be considered only after all other methods for obtaining the part or the necessary technical data have been unsuccessful and significant cost savings can be demonstrated or where mission readiness is severely impacted. Reverse engineering decisions shall be authorized by both the head of the contracting activity and the Service ESA, in accordance with reference 17. Source approval and quality assurance policies established by this instruction shall apply to all reverse engineered CSIs. Coordination among Service ESAs is required for common use CSIs.

(1) The Service ESA shall validate that all aspects of the proposed reverse engineered design, materials, critical characteristics, and critical manufacturing processes fully satisfy requirements.

(2) The Service ESA shall approve and/or conduct the FAT of a reverse engineered CSI the first time an award is made using the reverse engineered design.

i. CSIs are candidates for competition or breakout from the prime contractor only when the screening requirements outlined in reference 8 have been considered.

j. Modifications of CSIs during installation or repair in order to make the item fit or function are prohibited unless approved by the Service ESA. CSIs that need to be modified to make them fit or function properly shall not be installed until the problem has been reported to the cognizant Service ESA and dispositioned in accordance with established discrepant material review processes.

k. In the repair/overhaul of aviation systems and equipment, only conforming CSIs purchased from sources approved by the Service ESA shall be used. This is regardless of whether the repair/overhaul is performed by the Government or a contracted entity.

l. Product Quality Deficiency Reports (PQDRs) shall be submitted, investigated, tracked, processed, and recorded in accordance with reference 18, where deficiencies are identified or suspected on CSIs. PQDRs shall be submitted on CSIs where there is a defect or nonconforming condition detected on new or newly reworked government-owned products, premature equipment failures, or products in use that do not fulfill their expected purpose, operation, or service due to deficiencies in design, specification, material, manufacturing, and workmanship. Deficiencies relating to critical characteristics or those that potentially impact safety shall be classified as Category 1 PQDRs.

m. Technical directives (e.g., Technical Notices, Safety of Flight Messages, Airworthiness Directives, Bulletins, etc.) shall be issued and managed in accordance with service instructions where an engineering investigation or Quality Deficiency Report (QDR) investigation indicates that action is required to address a deficiency associated with a CSIs.

n. CSIs that were originally purchased with an FAA certification/approval (i.e., dual-use FSCAP) or were received as an installed item on an FAA-certificated aircraft will not retain their dual-use status if any subsequent modifications, repairs, engineering changes, waivers or deviations were made without FAA approval or if the items were manufactured in a facility that does not have FAA production approval. In such cases, the item is to be considered "military-unique FSCAP" upon disposal. Such parts should be marked or renumbered prior to disposal to prevent potential commingling with civil part.

4. Disposal

a. When CSIs are no longer required by each service's aviation activity the CSIs and associated documentation shall be provided to the Defense Reutilization and Marketing Service (DRMS) for disposal as required by reference 2 and in accordance with reference 19. When it is not economically practical to send consumable CSIs to DRMS, military Services may dispose of the CSIs in accordance with paragraph E.4.b.

b. Prior to disposal, CSIs that are defective, nonconforming, have exceeded their life or time/use critical limits, or for which there is either no documentation or no reliable documentation regarding the manufacture, acquisition, use, modification, repair, or overhaul shall be mutilated. CSIs that contain military offensive or defensive capabilities shall be demilitarized in accordance with reference 20.

c. Only CSIs purchased from FAA certificate/approval holders or removed from FAA certificated aircraft with full documentation supporting FAA approval (design and production) through maintenance/repair and use shall be considered dual use FSCAP and disposed of with documentation in accordance with references 2 and 13.

d. Contracts for the repair, overhaul or modification of aviation systems, subsystems, or equipment shall ensure proper disposal of CSIs.

5. Management and Oversight

a. Technical data necessary for the design, manufacture, procurement, repair, or overhaul of CSIs shall be verified and validated by the Service ESA. The ESA shall ensure

that copies of new Technical Data Packages (drawings and associated documentation) are approved prior to provisioning and are submitted to the appropriate technical data repositories in accordance with internal procedures.

b. The Service ESAs shall develop, maintain, and distribute or provide access to a current listing of CSIs, which includes identification of all approved sources of manufacture, supply, or repair/overhaul for each CSI.

c. All Services and DLA shall comply with reference 21.

d. All Services responses to requests for engineering support shall be accurate and every effort shall be made to respond in the time requested. Requestors shall be notified if the requested timeframe cannot be met and will be supplied with an estimated completion date.

e. In the event of concerns regarding specific requests for engineering support that cannot be resolved at the working level in a timely manner, the issue shall be elevated within the respective Service and DLA organizations for resolution.

f. The Services, DLA, and DCMA shall establish and conduct training programs to ensure personnel involved with CSIs are fully aware of management responsibilities and requirements.

g. The Services, DLA, and DCMA shall jointly conduct an annual assessment of CSI management to confirm that this instruction is properly implemented, to identify and correct nonconforming situations before they become problems to the fleet, and to identify and institute process improvements.

F. RESPONSIBILITIES

1. The Joint Aeronautical Logistics Commanders' (JALC) are responsible for developing, coordinating, and managing the policies, processes, training and reviews associated with CSIs.

2. The Service ESAs are responsible for the design integrity and operational safety, suitability, and effectiveness of aviation systems and equipment and have authority to delegate this responsibility. For the purpose of complying with references 1 and 2, the Service ESAs are the "Design Control Activity" and the "Aircraft Airworthiness Authority" for their cognizant aircraft. The Service ESAs are responsible for:

a. Obtaining the support, priority, and timely and accurate responses towards implementing this instruction from the chief engineers of the various programs.

b. Properly identifying or confirming the criticality and the associated critical characteristics, manufacturing processes, and quality assurance requirements of each CSI when an item is newly introduced into the inventory or whenever there is a proposed change to a CSI, its manufacture, or its supply or repair/overhaul source.

c. Developing, maintaining, and distributing or providing access to a current listing of CSIs, which includes identification of prime contractors, OEMs, and alternate sources of manufacture, supply, or repair/overhaul for each CSI.

d. Coordinating with the other using Service ESAs on all procurement and quality actions that affect common use items designated as CSI by any Service ESA.

3. The Logistics Organizations (Services and DLA) are responsible for ensuring that:

a. Logistics personnel are effectively trained on CSI responsibilities;

b. CSIs and the associated documentation are effectively coded, acquired, maintained, and managed for applicable equipment;

c. Technical documentation acquired to support or maintain an aviation system subsystem, equipment, or component adequately identifies CSIs and/or associated critical characteristics or processes. Service logistics organizations shall ensure that technical documentation is maintained and provided to or made accessible to the organizations responsible for acquiring, maintaining, repairing, or overhauling the systems or equipment;

d. Engineering support is requested when evaluating alternate sources for CSIs and on all issues involving potential design manufacturing and configuration changes on CSIs (e.g., Class I ECPs, waivers or deviations, reverse engineering proposals);

e. ESA determinations are requested on the criticality of items not previously determined;

f. Solicitations and contracts for CSIs properly identify the items as critical safety, that contract awards are made only to sources approved by the ESA, and that the contracts reflect the technical requirements established by the Design Control Activity;

g. Cataloging data and Federal Logistics Information System (FLIS) data for CSIs they manage accurately reflect items as critical safety by listing the Criticality Code (in accordance with MIL-PRF-49506 in current data systems; and

h. Advice, assistance, and recommendations concerning criticality determinations and related issues are provided to the ESA.

4. The Service depots and other organic industrial facilities are responsible for ensuring the implementation of this instruction by responsible maintenance activities and commercial contractors supporting repair and overhaul.

5. Service Acquisition Commanders, Aviation Program Executive Officers (PEOs) and/or Program Managers that provide procurement or repair/overhauling services for aviation products shall:

a. Support the ESAs in identification of current CSIs for their programs;

b. Assign engineers to respond to requests for engineering support on CSIs in a timely manner;

c. Provide sufficient funding to ensure that all CSIs are identified sufficiently early enough during the acquisition cycle, or when developing Design Change Notices (DCNs), to provide the required information to impact support planning. When such information was not previously provided, PEOs/Program Managers shall fund for developing such information when subsequently needed;

d. Include contractual provisions that require prime contractors to conduct analyses and identify CSIs using Criticality Code (in accordance with Mil-Prf-49506) and their associated critical/major characteristics and processes prior to provisioning/cataloging. Contractual provisions shall ensure this information is either distributed to or accessible by the Government;

e. Ensure that contracts for acquisition or logistics support include provisions that require the contractor to adhere to the policies of this instruction and that CSIs are only provided by sources approved by the Service ESA;

f. Ensure that contracts for the acquisition or logistics support of aviation systems, subsystems, or equipment require the prompt notification to potentially affected procuring activities and DCMA of subcontractors or suppliers who are removed from the contractor's approved supplier system as a result of improper manufacturing, testing, processing or certifying parts and equipment;

g. Ensure that technical documentation delivered to the Government for use in reprocurements clearly identifies CSIs and their associated critical characteristics and processes; and

h. Ensure that repair and rework specifications (e.g., Standard Depot Level Maintenance, Phased Depot Level Maintenance, and Integrated Maintenance Concept specifications) comply with this instruction.

6. DCMA shall:

a. Review contracts involving CSIs to identify technical requirements, inspections, and acceptance criteria, particularly those associated with critical and major characteristics. Where a DCMA technical specialist believes an item may be a CSI but is not identified as such or an item may be inappropriately identified as a CSI, the technical specialist will initiate contact with the procuring activity to request guidance. Where the contract clearly identifies an item as CSI but the technical requirements or customer direction (e.g. QALI or MOA) do not identify critical characteristics, the technical specialist shall apply the criteria in enclosure (3) to determine the characteristics/features that should be treated as significant during Government Contract Quality Assurance (GCQA) surveillance activities.

b. Perform GCQA in accordance with references 14 and 15, including the necessary product inspection, test, or verification to ensure CSIs presented for acceptance meet technical requirements of the contract. GCQA shall include requirements established by QALIs. GCQA shall include critical characteristics identified on the drawings,

specifications, technical data packages, or as otherwise established by the contract. Where critical characteristics are not otherwise defined GCQA shall include significant product characteristics/features as defined through application of the criteria in enclosure (3).

(1). GCQA is not limited to verification of the CSI characteristics identified as critical. The following key processes have been identified by the ESAs as important in so far as they pertain to the specific CSI. The following processes should be considered when identifying "key processes". GQA surveillance of these processes should be risk based. These processes include: destructive and nondestructive tests (e.g. proof load, pressure, leakage, tensile, shot peen, operational/functional, etc); special processes (e.g. welding, soldering, bonding and curing for composite and honeycomb assemblies, surface coatings and plating, etc.); heat treat; stress relieve; part markings, fabrication and assembly; and special packaging or handling (e.g. control of electrostatic discharge).

c. Advise the procuring activity of corrective action requests issued by DCMA to the supplier relating to nonconforming CSIs, CSI critical characteristics, or deficient manufacturing, configuration management, quality management, or supplier management processes. Advise procuring activities of contractor responses and status of corrective actions relating to defective CSIs or CSI processes.

d. Notify affected procuring activities when DCMA becomes aware that a contractor removes a source from the contractor's listing of approved subcontractors or suppliers because of improper or suspect manufacturing, quality management, or configuration management processes and there may be an impact on critical safety items.

e. Advise the procuring activity of recommendations for use of a Certificate of Conformance (CoC) in lieu of GCQA. DCMA shall assure that the contract has been appropriately modified prior to implementing an ESA approved CoC.

f. Perform disposition of minor non-conformances of CSIs when authority for disposition has been delegated by the ESA. Delegations are issued on a Supplier/CAGE basis. Any use-as-is or repair dispositions being applied to contractually defined critical characteristics must be forwarded to the procuring activity and subsequently to the ESA for approval. Where the critical characteristic is not identified on the drawing, specification, technical data package, or otherwise specified in the contract, but identified through a QALI or other customer direction, any use-as-is or repair disposition to nonconformance of such characteristics must be prior coordinated with the procuring activity. Where DCMA has minor non-conformance decision authority for CSIs, the specialist shall advise the ESA of any evidence or trends indicating potential problems with the specific CSI or other related critical products produced by the manufacturer.

g. Review ECPs and requests for major and minor waivers or deviations for completeness and accuracy. Provide comments and recommendations to the procuring activity.

h. Request that the procuring activity either provide specific acceptance criteria or require acceptance at destination vice source when the CSI contract is awarded to a dealer or distributor and the applicable drawings, specifications, test or inspection equipment or facilities are not available to the DCMA specialist to verify product conformance.

By Order of the Secretaries of the Navy, the Army, and the Air Force:

DELORES M. ETTER
Assistant Secretary of the Navy
(Research, Development and Acquisition)

PETER J. SCHOOMAKER
General, United States Army
Chief of Staff

DONALD J. WETEKAM
Lt General, USAF
Deputy Chief of Staff,
Installations and Logistics

By Order of the Directors of the Defense Logistics Agency and Defense Contract Management Agency:

CHRISTINE L. GALLO
Director, DLA Enterprise Support Director

DARRYL A. SCOTT
Maj General, USAF
Director
Defense Contract Management Agency

ENCLOSURES
1. Definitions
2. Samples of One-Time Manufacturing Approval
3. Significant Product Characteristics/Features for CSIs

DISTRIBUTION:
Electronic only, via Navy Directives Website
http://neds.daps.dla.mil

DEFINITIONS

Accident, Class A. A mishap where the resulting total cost of damages to Government and other property is of an amount $1 million or more; a DoD aircraft is destroyed; or an injury and/or occupational illness results in a fatality or permanent total disability

Acquisition Method Code (AMC). A single digit numeric code, assigned by a DoD activity, to describe to the contracting officer and other government personnel the results of a technical review of a part and its suitability for breakout.

Acquisition Method Suffix Code (AMSC). A single digit alpha code, assigned by a DoD activity, that provides the contracting officer and other government personnel with engineering, manufacturing, and technical information further describing suitability/non-suitability for breakout.

Actual Manufacturer. An individual, activity, or organization that performs the physical fabrication processes that produce the deliverable part or other items of supply for the government. The actual manufacturer must produce the part in-house. The actual manufacturer may or may not be the prime contractor or Original Equipment Manufacturer (OEM).

Aircraft Airworthiness Authority. A term used in reference 1 (DoD Regulation 4140.1-R) section C8.5 to describe the military organization responsible for determining the safety, suitability and effectiveness of parts that go into aviation systems. For the purpose of this instruction, the Aircraft Airworthiness Authority for each respective service are the Naval Air Systems Command, Assistant Commander for Research and Engineering (AIR-4.0) for the Navy; US Army Aviation and Missile Command (AMSAM-RD-AE) for the Army; and Designated Air Force Single Manager for a Weapon System for the Air Force. The term Aircraft Airworthiness Authority is synonymous with Design Control Activity and Engineering Support Activity.

Airworthiness. For the purpose of this instruction, airworthiness is the demonstrated capability of an aircraft or aircraft subsystem or component to function satisfactorily when used within prescribed limits.

Alternate Item. An item other than the approved part number cited in the Acquisition Identification Description (AID). To be approved, the alternate item must be identical to, or be physically, mechanically, electrically, and functionally interchangeable with the product cited in the AID.

Alternate Source. An offeror (Government or contractor) other than the Prime contractor or OEM to provide the identical part numbered item.

Alternate Source Qualification (ASQ). The formal process for requesting, evaluating, and approving the capability of alternate sources to repeatedly and acceptably manufacture or repair/overhaul CSIs.

Approved Dealer/Distributor. A dealer or distributor (as defined in this instruction) that has been approved by the ESAs to deliver specific aviation CSIs to the military. Typically, approved dealers and distributors are formally sanctioned by the prime contractor or Original Equipment Manufacturer (OEM) to buy, sell, and distribute the prime contractor or OEM's products. Such dealers/distributors typically are reviewed, audited, approved, and monitored by the prime contractor or OEM to assure the parts supplied are identical to those originally supplied to them. Parts provided by such dealers/distributors typically carry the same warranty and protections as if the items were purchased directly from the prime contractor or OEM.

Bulletin. A Technical Directive that directs a one-time inspection of equipment, contains related instructions, and disseminates administrative or management information as related to maintenance of weapon systems.

Catastrophic Mishap. See Mishap Severity Category I, Catastrophic.

Class A Accident. See Accident, Class A

Common Use Item. For the purpose of this instruction, a common use item is a part, assembly, subsystem, or store used in different military aviation systems (e.g., "types") or a part, assembly, subsystem, or store that is unique to a specific aviation system used by multiple Military Services.

Consumable Item. Any item or substance that, upon installation, loses its identity and is normally consumed in use or cannot be economically repaired.

Critical Application Item (CAI). An item that is essential to weapon system performance or operation, or the preservation of life or safety of operating personnel, as determined by the military services. The subset of CAIs whose failure could have catastrophic or critical safety consequences (Category I or II as defined by MIL-STD-882) is called CSIs.

Critical Characteristic. Any feature throughout the life cycle of a Critical Item, such as dimension, tolerance, finish, material or assembly, manufacturing or inspection process, operation, field maintenance, or depot overhaul requirement that if non conforming, missing, or degraded may cause the failure or malfunction of the Critical Item.

Critical Item Code (CIC). A code that identifies items determined to have critical application in accordance with DLAR 3200.3. This code identifies items essential to the preservation of life in emergencies or essential to end item or system performance, the failure of which would adversely affect the successful accomplishment of a military operation.

Critical Item Procurement Requirements Document (CIPRD). A document managed by DLA for standard parts which are sometimes used in critical applications and described by military or nongovernmental specifications where a QPL does not exist. CIPRDs identify the top-tier procurement document for the specific National Stock Numbered and/or Part Numbered items covered, product technical requirements; reference documents; special quality assurance, packaging, traceability, or certification requirements; qualification procedures, sources approved by the Service ESAs, and approving Service ESAs.

Criticality Code. A code that indicates that an item has been assessed and documented in the TDP as being technically critical by reason of tolerance, fit restrictions, application, nuclear hardness properties or characteristics which affects identification of the item. The codes are defined by MIL-PRF-49506

Critical Deviation. See Deviation, Critical.

Critical Mishap. See Mishap Severity Category II, Critical.

Critical Safety Characteristic. Any feature, such as tolerance, finish, material composition, manufacturing, assembly or inspection process or product, which if nonconforming or missing could cause the failure or malfunction of the critical safety item.

Critical Safety Item (CSI). A part, assembly, installation equipment, launch equipment, recovery equipment, or support equipment for an aircraft or aviation weapons system that contains a characteristic any failure, malfunction, or absence of which could cause a catastrophic or critical failure resulting in the loss or serious damage to the aircraft or weapons system, an unacceptable risk of personal injury or loss of life, or an uncommanded engine shutdown that jeopardizes safety. Damage is considered serious or substantial when it would be sufficient to cause a “Class A” accident or a mishap of severity category I. The determining factor in CSIs is the consequence of failure, not the probability that the failure or consequence would occur. For the purpose of this instruction “Critical Safety Item”, “Flight Safety Critical Aircraft Part”, “Flight Safety Part”, “Safety of Flight Item”, and similar terms are synonymous. The term Critical Safety Item shall be the encompassing term used throughout this instruction.

Critical Waiver: See Waiver, Critical.

Dealer. Any business organization that sells, conveys, or otherwise transfers a product (not his own) to another party. The dealer performs no manufacturing or testing and may sell a manufacturer's product without the manufacturer's control or knowledge.

Defect. Any nonconformance of a unit or product with specified requirements. Defects shall normally be grouped into one or more of the following classes but may be grouped into other classes or subclasses within these classes.

Defect, Critical. A defect that constitutes a hazardous or unsafe condition, or as determined by experience and judgment could conceivably become so, thus making the aircraft, system, or equipment unsafe for flight or endangering operating personnel.

Defect, Major. A defect, other than critical, that could result in failure or materially reduce the usability of the unit or part for its intended purpose.

Defect, Minor. A defect that does not materially reduce the usability of the unit or part for its intended purpose or is a departure from standards but which has no significant bearing on the effective use or operation of the unit or part.

Demilitarization. The act of destroying the military offensive or defensive advantages inherent in certain types of equipment or material. The term includes mutilation, dumping at

sea, scrapping, melting, burning, or alteration designed to prevent the further use of this equipment and material for its originally intended military or lethal purpose and applies equally to material in unserviceable or serviceable condition that has been screened through an Inventory Control Point and declared excess or foreign excess.

Design Control Activity. The systems command of a military department that is specifically responsible for ensuring the airworthiness of an aviation system or equipment in which an aviation Critical Safety Item will be used. For common use CSIs, there will be multiple Design Control Activities. Design Control Activity is synonymous with Aircraft Airworthiness Authority and Engineering Support Activity.

Deviation. A written authorization, granted after contract award and prior to the manufacture of the item, to depart from a particular performance or design requirement of a contract, specification, or referenced document, for a specific number of units or a specified period of time. Deviations are intended only as one-time departures from an established configuration for specified items or lots and are not intended to be repeatedly used in place of formal engineering changes.

Deviation, Critical. A deviation is designated as critical when the deviation consists of a departure involving safety or when the configuration documentation defining the requirements for the item classifies defects in requirements and the deviations consist of a departure from a requirement classified as critical.

Deviation, Major. A deviation is designated as major when the deviation consists of a departure involving health, performance, interchangeability, reliability, survivability, maintainability, or durability of the item or its repair parts; effective use or operation; weight; or appearance (when a factor) or when the configuration documentation defining the requirements for the item classifies defects in requirements and deviations consist of a departure from a requirement classified as major.

Deviation, Minor. A deviation is designated as minor when it consists of a departure that does not qualify as Critical or Major or when the configuration documentation defining the requirements for the item classifies defects in requirements and the deviations consist of a departure from a requirement classified as minor.

Direct Purchase. The acquisition of a part from the OEM, including a prime contractor who is an actual manufacturer of the part.

Disposal. The process of reutilizing, transferring, donating, selling, destroying, or other ultimate disposition of personal property.

Dual Use Product/Part. Any product or part manufactured for civil application by an FAA Production Approval Holder (PAH) which is also procured under U. S. military contract. The product or part has the identical part number and configuration as its civil counterpart; it was manufactured using the same FAA-approved design and manufactured under the FAA production approval. These could also include any product (or part thereof) originally produced for the military which currently holds a normal, utility, acrobatic, or transport type certificate (TC) issued under section 14 Code of Federal Regulations 21.27

Engineering Change. A change to the current approved configuration documentation of an item at any point in the life cycle of the item.

Engineering Change Proposal (ECP). The documentation by which a proposed engineering change is described, justified, and submitted to a) the cognizant design control authority for approval or disapproval of the design change in the documentation and b) to the procuring activity for approval or disapproval of implementing the design change in units to be delivered or retrofit into assets already delivered.

Engineering Change Proposal, Class I. For the purpose of this instruction, a Class I Engineering Change Proposal is a formally recommended change to an item's configuration that would affect form, fit, function, performance, reliability, maintainability, survivability, weight, balance, moment of inertia, interoperability, interchangeability, or interface characteristics, electromagnetic characteristics, other critical or major characteristics identified in technical documentation, or cost.

Engineering Change Proposal, Class II. For the purpose of this instruction, a Class II Engineering Change Proposal is an ECP that does not meet the requirements for a Class I ECP.

Engineering Critical. A term used to describe a part so crucial that independent malfunction or failure could be catastrophic and result in personal injury or loss of life, jeopardize a military mission, or loss of military weapons system or equipment. Engineering critical parts require special documentation, controls, and testing beyond normal requirements.

Engineering Support. Engineering and technical assistance, including developing, validating and approving technical data, Technical Data Packages (TDPs) and engineering criteria, engineering representation, or providing technical guidance and decisions required in the management of an item or approving sources of manufacture, repair, or overhaul.

Engineering Support Activity (ESA). The Military Service organization assigned responsibility and authority to perform and approve engineering and quality assurance actions necessary to evolve detail design disclosures for systems, subsystems, equipment, and components exhibiting attributes essential for products to meet specific military requirements. During the operational phase, it includes any engineering activity, the results of which would add to or alter the design of equipment in such a manner, or to such an extent, as to change its operational capabilities or its design attributes of performance, reliability, maintainability and parts interchangeability, or to render it capable of alternative or additional use. For the purpose of this instruction, the ESA is the Service's Aircraft Airworthiness Authority and Design Control Activity.

Engineering Support Activity Focal Point. Entry and exit point for DLA Form 339, Request for Engineering Support, activity within each Service. The ESA Focal Point interfaces directly with DLA and ensures DLA Form 339 requests are forwarded to the correct and proper ESA. The ESA Focal Point also provides records and tracks associated timeliness and quality metric data. The ESA Focal Point is identified in DoD 4100.39-M, Vol. 10, Chapter 4, Table 104. Unless delegated by the ESA, the ESA Focal Point has no authority on CSIs for determining item criticality, approving engineering changes, approving nonconformances, or approving sources of supply.

Extended Engineering Effort. A DLA request for engineering support that, upon review by the ESA, requires the use of dedicated resources to work a defined requirement, has an end product clearly specified by DLA, and incurs a one-time negotiated charge.

Failure. The event, or inoperable state, in which any item or part of an item does not, or would not, perform as previously specified.

First Article. Pre-production models, initial product samples, test samples, first lot samples or pilot lots used to evaluate full conformance to the specified contract requirements.

First Article Test (FAT). Contractually required testing and inspection of a supplier's pre-production, production, or "production-representative" specimens to evaluate whether the supplier can manufacture fully conforming products prior to the Government's commitment to receive subsequent production items. First Article Testing does not necessarily assess manufacturing processes and controls nor does it assure the effectiveness of a supplier's quality system. First Article Testing is not synonymous with qualification testing.

Flight Safety Critical Aircraft Part (FSCAP). Any aircraft part, assembly, or installation containing a critical characteristic whose failure, malfunction, or absence may cause a catastrophic failure resulting in loss or serious damage to the aircraft or an uncommanded engine shutdown resulting in an unsafe condition. For the purpose of this instruction "Critical Safety Item", "Flight Safety Critical Aircraft Part", "Flight Safety Part", and "Flight Safety Critical Part" are synonymous. The term Critical Safety Item shall be the encompassing term used throughout this instruction.

Fully Licensed Manufacturer. An actual manufacturer with current, formal authorization by the prime contractor to produce critical items on behalf of the prime contractor. To be fully licensed, the prime contractor must have reviewed and approved the suppliers' manufacturing processes, manufacturing controls, technical documentation, quality and inspection capabilities, and item support practices. Licensing must assure that the prime contractor shall provide technical assistance to the customer, when requested, for parts manufactured by the supplier under the license agreement.

Fully Licensed Repair/Overhaul Facility. A repair/overhaul facility with current, formal authorization by the prime contractor or OEM to repair/overhaul CSIs on behalf of the prime contractor. To be a fully licensed repair/overhaul facility, the prime contractor must have reviewed and approved the facility's repair/overhaul processes and controls, technical documentation, quality and inspection capabilities, and item support practices. Licensing must assure that the prime contractor shall provide technical assistance to the customer, when requested, for items, equipment, or systems repaired/overhauled by the facility under the license agreement.

Government Contract Quality Assurance (GCQA). Government Contract Quality Assurance means the various functions, including inspection, performed by the Government to determine whether a contractor has fulfilled the contract obligations pertaining to quality and quantity. GCQA is the process by which Government develops and applies efficient plans for performing the various quality assurance actions necessary, including inspection and

written direction from the contracting office, to verify whether the supplies or services conform to contract quality requirements

Hazard. Any real or potential condition that can cause injury, illness, or death to personnel; damage to or loss of a system, equipment, or property; or damage to the environment.

Inspection. Evaluation by observation and judgment accompanied as appropriate by measurement, testing or gauging to assess the conformance of supplies and services to contract requirements.

Integrated Material Manager (IMM). Any DoD activity or agency that has been assigned wholesale integrated material management responsibility for the Department of Defense and participating Federal agencies. IMM responsibilities include cataloging, requirements determination, procurement, distribution, overhaul, repair and disposal of materiel.

Life Support Item. All man-mounted or aircraft installed equipment and components designed to protect, sustain, or save human lives are categorized as life support. This includes, but is not limited to, ejection systems, crew seats, passenger seats, emergency escape slides, parachutes, life rafts and preservers, survival kits, emergency radios and beacons, aircrew helmets, oxygen masks, goggles, visors, chemical defense equipment, and selected clothing and uniform items.

Local Purchase. The direct purchase of an item covered by the DoD Coordinated Acquisition Program (DFARS 208.70) by other than the organization assigned Coordinated Acquisition Program contracting responsibility or Integrated Material Management responsibility (as established in DoD 4140.26-M).

Major Characteristic. A characteristic that analysis indicates is not critical but is likely, if defective, to result in failure of the end item to perform a required mission.

Material Review Board (MRB). The formal contractor-government board established for the purpose of reviewing, evaluating, and disposing of specific nonconforming supplies or services, and for assuring the initiation and accomplishment of corrective action to preclude reoccurrence.

Military Unique FSCAP. Any FSCAP specifically and uniquely designed and manufactured for the U.S. military, for which there is no corresponding FAA-approved type design or PAH engine, propeller or part produced for civil application. "Breakout" products or parts, produced specifically for military use by a manufacturer other than an FAA PAH using military-provided designs/drawings and specifications, are also considered military unique.

Mishap. An unplanned event or series of events resulting in death, injury, occupational illness, damage to or loss of equipment or property, or damage to the environment.

Mishap Risk. An expression of the impact and possibility of a mishap in terms of potential mishap severity and probability of occurrence.

Mishap Severity. An assessment of the consequences of the most reasonable credible mishap that could be caused by a specific hazard.

Mishap Severity Category I, Catastrophic. A mishap that could result in death, permanent total disability, loss exceeding $1 million, or irreversible severe environmental damage that violates law or regulation.

Mishap Severity Category II, Critical. A mishap that could result in permanent partial disability, injuries, or occupational illness that may result in hospitalization of at least three personnel, loss exceeding $200 thousand but less than $1 million, or reversible environmental damage causing a violation of law or regulation.

Modification. For the purpose of this instruction, any alteration, addition, or removal of aircraft or aircraft engine structure, components, equipment, computer software, or primary instrumentation. Routine maintenance is exempt from this definition.

Modification, Permanent. A term used by the Air Force and described in Air Force Instruction 63-1101 to describe a proposed permanent change to the form, fit, function or interface of a configured item to either correct material deficiencies, improve reliability and maintainability, improve performance, add or remove capability, or correct a deficiency which could endanger the safety or health of personnel or cause loss or extensive damage to systems or equipment.

Modification, Temporary. A term used by the Air Force and described in Air Force Instruction 63-1101 to describe a proposed temporary change an item for flight or ground test purposes or to support accomplishment of a specific mission. Temporary modifications are often used to add or remove equipment in order to temporarily change the configuration of a configured item for a special mission or to support research, development, test, and evaluation (such as to evaluate the effectiveness of the change on selected equipment prior to authorizing a permanent modification).

Mutilation**.** The act of making material unfit for its originally intended purposes by cutting, tearing, scratching, crushing, breaking, punching, shearing, burning, neutralizing, etc.

Nonconformance. The failure of an item to meet a defined characteristic or process.

Nonconformance, Critical. A nonconformance that is likely to result in hazardous or unsafe conditions for individuals using, maintaining, or depending upon the supplies or services or one that is likely to prevent performance of a vital agency mission. Critical nonconformance includes departures from specified requirements in any critical characteristic or process or departures from unspecified requirements where the consequences would be catastrophic or critical.

Nonconformance, Major. A nonconformance other than critical that is likely to result in failure or to materially reduce the usability of the supplies or services for their intended purpose. Major nonconformances involve items which depart from contract requirements and typically affect one or more of the following major areas: performance, durability, interchangeability, effective use or operations, weight or appearance (where a factor), health or safety.

Nonconformance, Minor. A nonconformance that is not likely to materially reduce the usability of the supplies or services for their intended purpose, or is a departure from established standards having little bearing on the effective use or operation of the supplies or services. Minor nonconformances are departures from contract requirements and do not affect any of the criteria specified as major nonconformance.

One-Time Manufacture. A limited quantity of material which is used to fill an immediate requirement to support depot production demands and/or fleet operating forces, to be manufactured locally only after concerted efforts to expedite requirements from other sources have failed.

Original Equipment Manufacturer (OEM). For the purpose of this instruction, an OEM is the individual, activity, or organization that performs the physical fabrication processes that produce the deliverable part or other items of supply for the prime contractor. The OEM must produce the part in-house. The OEM may or may not be granted design responsibility by the prime contractor for preparation and technical currency of drawings and technical data.

Overhaul. The process of disassembly sufficient to inspect all the operating components and the basic end article. It includes the repair, replacement, or servicing as necessary, followed by the reassembly and bench check or flight test. Upon completion of the overhaul process, the component or end article will be capable of performing its intended service life or service tour.

Permanent Modification. See Modification, Permanent

Prescribed Limits. For the purpose of this instruction, the full authorized range or envelope of operating, environmental, and sustaining criteria or characteristics for the safe and reliable use of the aircraft system, subsystem, or associated equipment as determined by analysis, tests, and operating experiences.

Prime Contractor. A contractor having responsibility for design and/or delivery of a system, subsystem, or equipment such as aircraft, engines, ships, tanks, vehicles, guns and missiles, ground communications and electronics systems, and test equipment.

Production Lot Testing (PLT). Tests and examinations performed on items randomly selected from a contract, production line, or inventory to verify the items fully conform to all applicable requirements and are suitable for use. Product Lot Testing may be performed by the Government, at a Government designated testing laboratory, or by the contractor as established in the contract.

Product Verification. See Inspection.

Product Verification Audit. The physical examination, functional testing, disassembly, inspection, re-assembly and re-setting of an item so that full determination of conformance to specifications can be verified.

Provisioning. The process of doing the technical planning necessary to establish the item support plan, piece by piece and assembly by assembly; establishing the minimum levels or

echelons responsible for repair/overhaul; identifying the kind and type of support equipment requirements, handbooks, manuals, and other maintenance publications; determining the basic factory and field training requirements; and providing for the establishment of inventory management records.

Qualified Product List (QPL). A list of products that have met the qualification requirements stated in the applicable military, federal or non-government specification, including appropriate product identification and test or qualification reference with the name and plant address of the manufacturer and distributor, as applicable.

Rebranding. The remarking, relabeling, or repackaging of an item with a distributor's own product identification as opposed to that of the actual manufacturer.

Repair. Necessary preparation, fault correction, disassembly, inspection, replacement of parts, adjustment, reassembly, calibration, or tests accomplished in restoring items to serviceable status.

Repairable Item. A durable item which, when unserviceable, can be economically restored to a serviceable condition through regular repair procedures.

Replenishment Part. A repairable or consumable part purchased after provisioning for replacement; replenishment of stock; or use in the maintenance, overhaul, and repair of equipment such as aircraft, engines, ships, tanks, vehicles, guns and missiles, ground communications and electronic systems, ground support, and test equipment. As used in this instruction "part" includes subassemblies, components, and subsystems.

Reverse Engineering. The process by which serviceable parts are examined, analyzed, and tested to determine precisely from what materials they are made and how they were manufactured in order to enable manufacture of parts that exactly duplicate the examined parts. The expected result of reverse engineering is a complete Technical Data Package, including design and manufacturing data, verification requirements, and the associated qualification and proofing requirements suitable for reprocurement of the item by new sources.

Safety. Freedom from those conditions that can cause death, injury, occupational illness, damage to or loss of equipment or property, or damage to the environment.

Shelf-Life Item. An item of supply possessing deteriorative or unstable characteristics to the degree that a storage time period or condition(s) must be assigned to assure that it shall perform satisfactorily in service.

Source Approval Request (SAR). A vendor proposal that includes all of the technical data required for a competent manufacturer to manufacture a critical safety item to a level of quality that is equal or better than the OEM part.

Source Control Drawing. A drawing that provides an engineering description and acceptance criteria for purchased items that also establishes design activity imposed qualification testing and provides performance, installation and interchangeability specific characteristics required for critical applications. It includes a list of approved manufacturers, the manufacturers' item

identifications, and acceptance criteria for items, which are interchangeable in specific applications. The source control drawing establishes item identification for the controlled item(s). The approved items and sources listed on a source control drawing are the only acceptable items and sources.

Special Maintenance Item Code (SMIC). Codes which indicate any special maintenance category applicable to the item. The codes are defined by MIL-PRF-49506.

Stores. For the purpose of this instruction, any device intended for internal or external carriage, mounted on aircraft suspension and release equipment, and which may or may not be intended to be separated in flight from the aircraft. Stores include missiles, rockets, bombs, nuclear weapons, mines, fuel and spray tanks, torpedoes, detachable fuel and spray tanks, dispensers, pods, targets, chaff and flares including external dispensing equipment, and suspension equipment (racks, pylons).

Surplus Material. Material that was originally purchased and accepted by the U.S. Government and subsequently sold or disposed of by the Defense Reutilization and Marketing Service (DRMS).

System or Subsystem Prime Contractor. See Prime Contractor.

Technical Data. Data required for the accomplishment of logistics and engineering processes in support of the contract end item. It includes drawings, operating and maintenance instructions, provisioning information, specifications, inspection and test procedures, instruction cards and equipment placards, engineering and support analysis data, special purpose computer programs, and other forms of audiovisual presentation required to guide personnel in the performance of operating and support tasks.

Technical Data Package. A technical description of an item adequate for supporting an acquisition strategy, production, engineering and logistics support. The description defines the required design configuration and procedures required to ensure adequacy of item performance. It consists of all applicable technical data such as drawings and associated lists, specifications, standards, performance standards, quality assurance requirements, software and packaging details.

Technical Manual. A publication containing a description of equipment, weapons, or weapon system(s) with instructions for effective use. Included are one or more of the following sections: instructions covering initial preparation for use, operational instructions, modification instructions, maintenance instructions, parts lists or parts breakdown, and related technical information or procedures, exclusive of those of an administrative.

Temporary Modification. See Modification, Temporary.

Test. The determination of one or more characteristics according to a procedure.

Traceability. Documented evidence that the item to be supplied was/will be manufactured and/or maintained by the prime contractor, approved manufacturer, or FAA certificate/approval holder is identical to the product that was initially manufactured, and is in full compliance with all specifications, drawings, storage, packaging, and handling

requirements, and other associated requirements. Documentation is required to demonstrate, to the government's satisfaction, the Government's ability to obtain all information necessary to trace the items back through the manufacturing and inspection process in the event of the item failure. The manufacturing process information includes, date and place of actual manufacturing and additional information as appropriate, such as verification of all aspects of material, manufacture, special processes, personnel certifications, assembly, inspection, installation, and repair.

Value Added. Additional services or support provided by the prime contractor on CSIs to ensure items purchased from OEMs or items repaired/overhauled from support facilities fully satisfy operational requirements for the designed service life of the component.

Verification. Confirmation through the provision of objective evidence that specified requirements have been fulfilled.

Waiver. A written authorization granted after contract award to accept an item, that during production, or after having been submitted for inspection or acceptance, is found to depart from contract or specified configuration requirements. Waivers are intended only as one-time departures from an established configuration for specified items or lots and are not intended to be repeatedly used in place of formal engineering changes.

Waiver, Critical. A waiver shall be designated as critical when the waiver consists of acceptance of an item having a nonconformance with contract or configuration documentation involving safety or when the configuration documentation defining the requirements for the item classifies defects in requirements and waivers consist of a departure from a requirement classified as critical.

Waiver, Major. A waiver shall be designated as major when the waiver consists of acceptance of an item having a nonconformance with contract or configuration documentation requirements involving health, performance, interchangeability, reliability, survivability or maintainability of the item or its repair parts, effective use or operation, weight, or appearance (when a factor) or when the configuration documentation defining the requirements for the item classifies defects in requirements and the waivers consist of a departure from a requirement classified as major.

Waiver, Minor. A waiver shall be designated as minor when the waiver consists of acceptance of an item having a nonconformance with contract or configuration documentation which does not involve any of the factors of a critical or major waiver or when the configuration documentation defining the requirements for the item classifies defects in requirements and the waivers consist of a departure from a requirement classified as minor.

Wholesale. The highest level of organized DoD supply, and as such, procures, repairs, and maintains stocks to resupply the retail levels of supply.

AIRWORTHINESS CERTIFICATION FORMAT

ONE-TIME MANUFACTURED CRITICAL SAFETY ITEM

COMPONENT PART NUMBER _____

NOMENCLATURE _____

PROCESS PLAN NUMBER _____

QUANTITY PRODUCED _____ SERIAL NUMBER(S) _____

DIRECTOR OF RESOURCES FOR MATERIAL

Director of Resources for Material certifies correctness of NSN/purchased critical safety item sub-components.

DIRECTOR _____ DATE _____

Signature

_____ CODE _____

Printed Name

The responsible Research and Engineering Department Head signature certifies airworthiness of this component/ part.

PRODUCTION HEAD _____ DATE _____

Signature

_____ CODE _____

Printed Name

QUALITY HEAD _____ DATE _____

Signature

_____ CODE _____

Printed Name

COGNIZANT ENGINEER _____ DATE _____

Signature

_____ CODE _____

Printed Name

RESEARCH AND ENGINEERING

LEVEL 2 DEPARTMENT HEAD _____ DATE _____

Signature

_____ CODE _____

Printed Name

USE AND INSTALLATION AUTHORIZATION FORMAT
OF MANUFACTURED CRITICAL SAFETY ITEM

COMPONENT PART NUMBER _____

NOMENCLATURE _____

DRAWING NUMBER AND REVISION _____

DRAWING CAGE CODE _____

END ITEM (e.g. H-53, F-404, etc.) _____

PROCESS PLAN NUMBER _____

PROCESS PLANNER _____ _____ _____
Print Name Signature Date

QUALITY ORGANIZATION HEAD _____ _____ _____
Print Name Signature Date

MANUFACTURING HEAD _____ _____ _____
Print Name Signature Date

SYSTEM SAFETY ENGINEER _____ _____ _____
Print Name Signature Date

COGNIZANT ENGINEER _____ _____ _____
Print Name Signature Date

VERIFICATION OF NSN / PURCHASED MATERIAL FORMAT
FOR MANUFACTURED CRITICAL SAFETY ITEM

MATERIAL PART NUMBER _____

MATERIAL STOCK NUMBER _____

THE ABOVE MATERIAL IS VERIFIED TO BE ACCURATE AS ORDERED

MATERIAL SHIPPING / RECEIVING SECTION (_____)

NIF STORE SECTION (_____)

PRODUCTION SHOP SUPPORT CENTER (_____)

LAB ANALYSIS REPORT NUMBER _____

SIGNATURE _____ DATE _____

PRINTED NAME _____ CODE _____

MATERIAL
ENGINEER _____ _____ _____
Print Name Signature Date

THE ABOVE MATERIAL IS VERIFIED RECEIVED AS ORDERED AND STORED

AT: _____
Location

UNTIL READY FOR ASSEMBLY.

SIGNATURE _____ DATE _____

PRINTED NAME _____ CODE _____

Significant Product Characteristics/Features for CSIs

This guidance applies to items contractually identified by the cognizant ESA as CSI, but without defined critical characteristics. Although the ESAs are working to formally define critical characteristics, there will always be an outstanding population of CSIs without defined critical characteristics. The following criteria is being made available for DCMA to use when critical characteristics are not otherwise defined in the technical data package, contract, or specific instructions provided by the procuring activity. The intent of these criteria is to define those significant product characteristics/features that the DCMA Quality Assurance Representative (QAR) will focus on where there is absence of ESA defined critical characteristics. GCQA shall not be limited to verification of the significant product characteristics/features identified through these guidelines, see paragraph F.6(b).

This enclosure is applied by comparing the contractual technical requirements e.g. drawing characteristics to the criteria below. Any characteristics meeting these criteria would be considered as significant product characteristics/features for GCQA purposes only. Application of these criteria does not impose any additional contractual requirements on the supplier.

The criteria is not intended to bar the QAR from requesting guidance from the procuring activity when there is a belief the item is misidentified as a CSI, believes the ESA should provide specific critical characteristics due to the nature of the particular CSI, no product characteristics meet the criteria, or application of the criteria would result in excessive resource expenditure.

Typical Significant Characteristic Criteria for CSIs (if not otherwise specified in the contract, technical data package or customer direction):

- Diametrical and linear dimensions having a total tolerance of ".001" or less.

- Any other (not diametrical and linear dimensions) geometric features with a total tolerance of ".002" or less (e.g. run out, perpendicularity, parallelism, concentricity).

- Surface finishes having a value of "16 RMS" or less.

- Threads specified to class 3 or greater or classified as Safety Critical.

- Angular dimensions with total tolerance range of 1 degree (60 minutes), or less.

- Test Methods & Acceptance Criteria for Nondestructive Testing (e.g. magnetic particle, liquid penetrant, radiographic inspection, ultrasonic, eddy current, etc.).

- Hardness requirements (e.g. Rockwell requirements) and shot peen requirements.

- Material physical properties and material certifications.

- Dynamic balancing of rotating units and static balancing of flight control surfaces.

- Flow checks for blades and vanes.

- Spray pattern requirements for fuel nozzles (incl. afterburner rings).

- Weight checks

Appendix II

Acronyms

ACO	Administrative Contracting Officer
AIA	Aerospace Industries Association
ALRE	Aircraft Launch and Recovery Equipment
AMC	Acquisition Method Code
AMSC	Acquisition Method Suffix Code
AMCOM	Aviation and Missile Command (Army)
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASQ	Alternate Source Qualification
CAGE	Commercial and Government Entity
CAI	Critical Application Item
CAO	Contract Administration Office
CAR	Corrective Action Request
CAT	Category
CC	Critical Characteristic
CDA	Commercial Derivative Aircraft
CDRL	Contract Data Requirements List
CI	Critical Item
CIM	Critical Item Management
CIPRD	Critical Item Procurement Requirements Document
CoC	Certificate of Conformance
CoP	Community of Practice
COTS	Commercial-Off-The-Shelf
CPL	Category Parts List
CQA	Contract Quality Assurance
CSI	Critical Safety Item (For this Handbook, CSI refers to AVIATION CSI)
DCA	Design Control Activity (Synonym: Engineering Support Activity (ESA))
DCMA	Defense Contract Management Agency
DCN	Design Change Notice
DFARS	Defense Federal Acquisition Regulations Supplement
DLA	Defense Logistics Agency
DMWR	Depot Maintenance Work Requirement
DoD	Department of Defense
DRMS	Defense Reutilization and Marketing Service

DRN	Data Record Number
DSCR	Defense Supply Center, Richmond
DSN	Defense Switched Network
ECP	Engineering Change Proposal
EDM	Electro-Discharge Machining
EMC	Electromagnetic Compatibility
ESA	Engineering Support Activity
ESD	Electro-Steam Drilling
FAA	Federal Aviation Administration
FAQ	Frequently Asked Questions
FAR	Federal Acquisition Regulations
FAT	First Article Test
FAX	Facsimile
FLIS	Federal Logistics Information System
FMEA	Failure Modes and Effects Analysis
FMECA	Failure Modes, Effects, and Criticality Analysis
FMS	Foreign Military Sales
FSCAP	Flight Safety Critical Aircraft Part
FOD	Foreign Object Damage
GCQA	Government Contract Quality Assurance
GFE	Government-Furnished Equipment
GFM	Government-Furnished Material
GQA	Graded Quality Assurance
GSI	Government Source Inspection
HAZREPs	Hazard Reports
ICP	Inventory Control Point
IMM	Integrated Materiel Manager
ISO	International Standards Organization
JACG	Joint Aeronautical Commanders Group
JALC	Joint Aeronautical Logistics Commanders
JDRS	Joint Deficiency Reporting System
JSSG	Joint Service Specification Guide
MOA	Memorandum of Agreement
MRB	Material Review Board
M&TE	Measurement and Test Equipment
NAVICP	Naval Inventory Control Point
NATO	North Atlantic Treaty Organization
NDE	Non-destructive Evaluation
NDI	Non-destructive Inspection

NDT	Non-destructive Test
NIST	National Institute of Standards & Technology
NSN	National Stock Number
OEM	Original Equipment Manufacturer
OP Sheet	Manufacturing Process/Operations sheet
PAS	Product Assurance Specialist
P/N	Part Number
PBL	Performance Based Logistics
PCA	Physical Configuration Audit
PCO	Procurement Contracting Officer
PLT	Production Lot Test
PMA	Parts Manufacturer Approval
POC	Point of Contact
PQDR	Product Quality Deficiency Report
PVA	Product Verification Audit
PVT	Product Verification Test
QA	Quality Assurance
QALI	Quality Assurance Letter of Instruction
QAP	Quality Assurance Provision(s)
QAR	Quality Assurance Representative
QDR	Quality Deficiency Report
QPL	Qualified Products List
REMP	Reverse Engineering Management Plan
ROMM	Repair, Overhaul, Maintenance and Modification
SAE	Society of Automotive Engineers
SAR	Source Approval Request
SHA	System Hazard Analysis
SSHA	Subsystem Hazard Analysis
SM&R	Supply, Maintenance & Recoverability
SOW	Statement of Work
SPC	Statistical Process Control
STANAG	Standardization Agreement (NATO)
TDP	Technical Data Package
T&E	Test & Evaluation
TFOA	Things Falling Off Aircraft
USC	United States Code

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16 March 2011

APPENDIX III

FREQUENTLY ASKED QUESTIONS (FAQ)
About
Aviation Critical Safety Items (CSIs)

The following Frequently Asked Questions were developed to provide informal answers to commonly asked questions regarding Department of Defense (DoD) aviation Critical Safety Items (CSI). The FAQ discussions are not intended to substitute for nor intended to supersede existing CSI laws, regulations, policies, or procedures.

1. What are aviation Critical Safety Items (CSIs)?

Aviation CSIs are defined in Public Law (Title 10, United States Code, Section 2319 (g)) and the Defense Federal Acquisition Regulation Supplement (DFARS), 48 Code of Federal Regulations 209.270-2) as a part, an assembly, installation equipment, launch equipment, recovery equipment, or support equipment for an aircraft or aviation weapon system that contains a characteristic any failure, malfunction, or absence of which could cause—

(a) a catastrophic or critical failure resulting in the loss of or serious damage to the aircraft or weapon system;
(b) an unacceptable risk of personal injury or loss of life; or
(c) an uncommanded engine shutdown that jeopardizes safety.

2. In the definition of CSI, what is meant by 'serious damage' to the aircraft and 'personal injury?'

Serious damage is defined as damage sufficient to be classified as a severity Category I (Catastrophic) mishap. Military Service regulations and MIL-STD-882D on System Safety currently establish these types of situations as those where the resulting total cost of damages to the Government and other property is $1 million or more or a DoD aircraft is destroyed. (MIL-STD 882D allows for the dollar value to be tailored on a system by system basis.) Personal injuries include those that involve a

fatality, permanent total or partial disabilities, or injuries or occupational illness that results in hospitalization of at least three personnel.

3. What types of equipment are candidates for aviation CSIs?

CSIs are found on many different types of equipment in the aviation environment. They are not limited to equipment that are integral parts of an aircraft and they are not limited to components necessary to keep the aircraft flying. The military Services define the types of equipment considered for aviation CSIs differently. Service-specific guidance should be referenced, if there is any question. Aviation CSIs could include critical components used in aircraft structures (e.g., bulkheads, critical spars and ribs, engine support structures, etc), escape systems (e.g., ejection seats, canopy release and fracturing systems, seat sequencing devices, harness restraints, parachute harnesses and fittings, etc), life support systems (e.g., oxygen delivery systems, acceleration protection systems, crash survival seats and equipment, anti-G garments, laser eye protection, chemical/biological respirator, etc), flight control systems (e.g., linkages, actuators, yokes, hydraulic and electrical controls and actuators flight control surfaces, etc), propulsion, transmission, and power systems (e.g., high speed rotating components, bearings, propellers, turbine blades and vanes, critical parts used in fuel and lubrication systems, tail rotor blade assemblies, etc.), key air vehicle subsystems (e.g., portable and engine fire suppression equipment, refueling, stores, etc), survival and rescue gear (e.g., life vests and floatation devices, emergency radios, life rafts, helmets, anti-exposure suits, rescue harnesses, etc) aircraft launch and recovery systems (e.g., holdback bars, release elements, purchase cables, annulus rings, launch valves, arresting gear, catapult water brakes, etc.), landing and braking systems (e.g., nose wheel steering, wheels and hubs, hydraulic systems, brake pistons and assemblies, axles, trunnions, and drag pins, etc), and so forth.

4. Why was the DoD's aviation CSI process started and why is it important?

DoD aviation CSI processes were developed to standardize terminology, definitions, criteria, and management procedures across the military Services and Defense agencies throughout the acquisition life cycle. Because of repeated receipt of defective, suspect, improperly documented, unapproved, and fraudulent parts, it was clear that rigorous procedures needed to be established. The Multi Service/Defense Agency aviation CSI process is intended to ensure that:

(a) CSI suppliers are capable of consistently producing high quality, conforming items;

(c) changes or deviations to technical requirements are properly documented, evaluated, and approved;

(d) inspection, installation, maintenance, and repair requirements are applied as specified; and

(e) disposal practices preclude re-introduction of defective, suspect, or invalid parts into DoD systems.

Prior to the development of the CSI processes, each DoD acquisition organization, program office, functional specialty, supply center, contract management office, and contractor established and applied their own approaches for managing critical items. This created unacceptable opportunities for confusion and error.

5. How do Failure Modes, Effects, and Criticality Analysis (FMECA) or Failure Modes and Effects Analysis (FMEA) relate to criticality decisions?

FMECA and FMEA methodologies establish the ways in which an item could fail, the causes of each failure, the probability of the failures, and the probability of consequence should the item fail if built, used, and maintained as designed. FMECA and FMEA are key tools in criticality determinations, much as they are in reliability and maintainability analysis, system safety and risk assessments, manufacturing and quality control establishment, and troubleshooting analysis. The FMECA and FMEA methodologies facilitate actions to reduce an item's failure probability or mishap severity through redesign, increased design margins, development of physical or functional redundancies, mandated testing, inspection or maintenance requirements, establishment of operational limits, or similar safeguards. Before applying analyses to CSI criticality determinations, however, FMECA and FMEA ground rules and assumptions should be carefully reviewed to ensure consistency with CSI criteria. CAT I failure modes that result in 'mission abort' or similar mission failure with no safety impact should not be considered for CSI designation.

6. How does probability of failure, as determined from a FMECA or FMEA, factor into criticality decisions?

The primary determining factor in criticality decisions is the consequence of failure not the probability of failure. FMECA/FMEA probability assumes that an item will be manufactured, tested/inspected, installed, used, maintained, and repaired as specified. However, if prescribed engineering, manufacturing, quality control, maintenance, or other requirements are violated, the previously determined probability of failure is no longer valid and safety can be compromised in a way that is difficult or impossible to predict.

7. How does identifying aviation CSIs help assure adherence to technical requirements, thus instilling confidence in probability of failure determinations based on design parameters?

There have been recent changes to the public law and acquisition regulations that govern supplier approval for aviation CSIs. These enable DoD to better assure that prospective suppliers are capable of repeatedly producing products that meet design and manufacturing requirements. The key is ensuring that aviation CSIs are properly identified so these laws and regulations can be applied.

8. What are the competition and supplier qualification laws and regulations for aviation CSIs?

The Competition in Contracting Act (Public Law 98-369 and 10 United States Code 2304), the implementing Federal Acquisition Regulation (FAR) Part 6 (Competition Requirements), and the Defense Federal Acquisition Regulation Supplement (DFARS) Part 206 (Competition Requirements) establish "full and open" competition as the standard for federal contracting. Seven exceptions are provided, but aviation CSIs are not one of them. 10 USC 2319 (Encouragement of new competitors), FAR Part 9.2 (Qualification Requirements), and DFARS Part 209.2 (Qualification Requirements) limit testing or other quality assurance demonstrations that must be completed by an offeror before award of a contract. Until passage of Public Law 108-136 Section 802 (enacted as part of the 2004 Defense Authorization Act), the contracting officer had exclusive authority to determine that a supplier or its products met or could meet technical requirements. P.L. 108-136 Section 802, the conforming 10 USC 2319, and the implementing DFARS 209.2 now recognize that:

(a) the military Service organization responsible for determining an aviation system's airworthiness (i.e., the Design Control Activity)

is responsible for identifying aviation CSIs and establishing source approval requirements;

(b) aviation CSIs will be acquired only from sources approved by the Design Control Activity; and

(c) only aviation CSIs that meet the Design Control Activity's requirements will be accepted.

9. Are there other policy documents governing aviation CSIs?

Yes. DoD issued DoD-4140.1-R*, DoD Supply Chain Materiel Management Regulation*, Section C8.5; DoD Aviation Critical Safety Item (CSI)/Flight Safety Critical Aircraft Part Program; and DoD 4120.24M, *DoD Standardization Practices*, Chapter on QPLs. A Multi Service/Defense Agency policy, SECNAVINST 4140.2/AFI 20-106/DA Pam 95-9/DLAI 3200.4/DCMA INST CI (AV)), *Management of Aviation Critical Safety Items*, was also issued. Additionally, the military Services, DLA, and DCMA have internal policies governing aviation CSIs.

10. What is the difference between Design Control Activity (DCA) and Engineering Support Activity (ESA)?

For the purpose of aviation CSIs, the terms DCA and ESA are synonymous. The term 'ESA' has been in-use within DoD for more than a decade (joint Service/Defense Logistics Agency Instruction DLAI 3200.1/PAM 715-13/NAVSUPINST 4120.30/AFI 21-405/MCO 4000.46) to describe the military Service organization responsible for providing engineering support to DLA, regardless of product line (e.g., parts used in aircraft, ships, land vehicles, etc). The Public Law and DFARS use the term 'DCA' to define the organization responsible for providing the same engineering support for aviation products.

11. Can there be more than one DCA or ESA for a specific aviation CSI?

Yes, a CSI may be used in multiple aircraft (e.g., an F-18 and an F-15) or in the same aircraft "type" used by multiple Services (e.g., an H-60 used by all Services or a C-130 used by Air Force and Marines). Each Service is responsible for certifying the airworthiness of its aircraft given the Service's unique operating environments, flight profiles, maintenance practices, and other factors.

12. Who decides whether a potential supplier is approved to produce aviation CSIs?

The cognizant ESA (DCA) makes the supplier approval decision for aviation CSIs. In the case of common use items with multiple ESAs, the approval decision will be coordinated using the common use item coordination process discussed in Section 2.5.2 of the JACG CSI Handbook. This typically is performed in response to a request from the procuring office.

13. Why is it important to identify CSIs?

CSI identification ensures that appropriate source approval requirements are applied to potential new suppliers. This is particularly important when evaluating offers from sources that have no or only limited knowledge of the item's application, design intent, failure modes, failure effects, critical design characteristics, or critical manufacturing, repair, or installation processes. Additionally, identification helps prioritize Government quality assurance approaches and resources. CSI identification establishes approval authority for changes or deviations to specification requirements. Identification triggers specific disposal procedures when the products are beyond their useful life or performance limits, or are defective, suspect, unapproved, or unreliably documented.

14. Why are there differences between contractor and DoD criticality determinations for a given item?

Differences between contractor and DoD criticality determinations occur because of different criteria used. There is no industry-established single approach for determining criticality. The DoD CSI statutes, regulations, and instructions provide consistency across DoD acquisition and logistics support practices.

Some contractors consider an item to be safety critical (by whatever terminology they use) only if the item is an air vehicle or propulsion system component whose failure would cause a catastrophic in-flight condition. DoD's criteria address a variety of subsystems and situations, as indicated in question #3. Other contractors consider items to be safety critical only if the item represents a single point failure situation that would result in a catastrophe Some contractors address criticality at the level for which a FMECA or FMEA was performed, not necessarily at the

replaceable piece part level. Many contractors exclude situations where there are physical redundancies, functional redundancies, interlocks, or other protective measures. Still others consider an item to be safety critical only if the probability of failure is frequent or likely, presuming their normal internal quality and supplier management controls will adequately protect against nonconformances.

15. What type of coordination should be done between the DoD and the system/subsystem prime contractor/Original Equipment Manufacturer (OEM) to determine criticality?

System, subsystem, and OEM contractors are invaluable resources for identifying item criticality. Regardless of terminology and criteria, virtually all have approaches beneficial to DoD CSI determinations.

16. When there are differences of opinion in criticality determinations between DoD and the system, subsystem, or OEM contractor, which determination applies?

For DoD acquisition and support purposes, the DoD criticality determination is the one that is applied when there are irreconcilable differences between DoD and a contractor. This is necessary because critical items are often procured from other than the system, subsystem, or OEM contractor. Because of the safety implications, assurance is needed that an alternate manufacturer has satisfactory manufacturing, configuration management, quality assurance, and subcontractor control practices.

17. Is there a single, consolidated list of CSIs for all Services and where is this?

A Joint Services CSI Management DataViewer that provides cross-Service visibility of CSIs. The Joint Services CSI Management DataViewer (https://remote2.amrdec.army.mil/csiviewer/index.aspx) is accessible only by individuals holding a DoD Common Access Card (CAC) that have been approved for access. The website maintained by the Defense Supply Center, Richmond, (http://www.dscr.dla.mil/ExternalWeb/UserWeb/AviationEngineering/EngineeringSupport/CSI.htm) provides access to separate CSI lists for DLA-managed Naval aviation CSIs, DLA-managed Army CSIs, and select Air

Force CSIs. Contact Service CSI POCs for additional information about Service-specific CSI lists and how to access them.

18. Are there special requirements for aircraft, subsystems, parts, or processes that are under FAA certification control?

Commercial aircraft and aircraft subsystem, parts, or process purchased, operated, and maintained under FAA certification control are not subject to DoD CSI requirements unless specifically determined by the ESA and specified in the contract to be otherwise. However, when commercial aircraft and components are modified, operated, or maintained to unique military requirements that do not meet FAA auspices, the manufacturing, modification, repair, overhaul, or maintenance practices must adhere to DoD requirements.

19. How do Commercial Off The Shelf (COTS) parts relate to CSI policies?

Safety implications apply whether an item is uniquely developed for the military, already existed within the military inventory, or is available as COTS. Parts used in DoD aviation systems that have critical safety implications need to be identified as such. Products approved by FAA for use in civil aircraft and produced, used, and maintained in a comparable manner by the military are not subject to DoD CSI requirements, unless otherwise determined by the ESA and specified in the contract.

20. What is meant by a 'new replenishment' item?

A replenishment item is a repairable or consumable part purchased after provisioning for replacement; replenishment of stock; or use in the overhaul and repair of equipment such as aircraft, engines, ships, tanks, etc. For the purpose of CSI policies, a new replenishment item is either a newly designed part that has been or will be assigned a part number and National Stock Number (NSN) for the first time or an existing item that has had configuration changes, thus requiring a new part number (and possibly a new NSN).

21. What are standard parts and common use items?

The term 'standard part' describes an item manufactured and inspected in complete conformance with US Government specifications and standards

(e.g., military specifications, military standards, etc.), U.S. ratified international standardization agreements (e.g. NATO STANAGS, etc), or non-Government standards published by widely recognized standards developing organizations (e.g., SAE, ASME, ANSI, AIA, etc). This definition is consistent with that used by FAA for civil aircraft (Federal Aviation Administration Advisory Circular 21-29C, *Detecting and Reporting Suspected Unapproved Parts*).

The term 'common use item' refers to a part that is used in multiple platforms (e.g., the same part used in an F-15 and an F-18, the same item used in an H-53 and an H-60. etc.), across Services (e.g., Army, Navy, and Air Force H-60s, Air Force and Marine Corps C-130s, etc), or both. A common use item may be a standard part or one that is unique to the aviation system or military Service.

22. Can standard parts and common use items be CSIs?

Yes. When the standard part is known to be safety-critical, it is classified as CSI. This approach is virtually identical to that established by FAA for civil aircraft. Common use items are evaluated by each using Service to determine the criticality in their applications. The same common use item or standard part may be CSI in one application but absolutely not-critical in different applications.

23. What happens when a standard part or common use item is critical in only one or a few of its multiple applications?

When a common use item or standard part is determined to be CSI in a specific aviation system, the ESA is expected to identify the specific system and application where the product is safety critical. The ESA is also expected to identify whether the item is critical from a manufacturing, installation, or depot (maintenance, overhaul or repair) perspective in these applications.

Because items with the same NSN are commingled in the supply system, the most severe criticality determination of a standard part or common use item governs the criticality. In other words, a specific item considered CSI in any application is coded CSI. However, where it makes good business sense to differentiate identical items in the DoD supply system, separate NSNs may be created to distinguish the item when used in safety critical situations from all other applications. Where the acquisition cost of a standard item or common use item of supply having both safety-critical

and not-critical applications increases by 25% or more because of CSI requirements, the Integrated Material Manager and CSI-designating Service should discuss the benefits of creating separate NSNs for the item.

24. If a common use item or standard part is CSI in one application, does that automatically make it CSI for all applications?

No. The same item may be safety-critical when used in one or only a few applications but have absolutely no safety implications when used in many or most other applications. For DoD item acquisition and supply management purposes, the part is coded CSI because there is no way to predetermine which items with the same stock number in the same stock bin will be distributed to which aviation programs over time. Separate NSNs can be created when it makes good business sense to do so. From a design, manufacturing, assembly, installation, repair, or maintenance perspective, the item is CSI only in those applications where it has been determined to have safety-critical implications. Blanket CSI applicability is not implied when an item is coded CSI.

25. Can you have a CSI without identified Critical Characteristics?

Yes. The key word in this question is "identified". Every CSI has characteristics, processes, or features that, if missing, nonconforming, or defective, could cause catastrophic results or render the item ineffective. These critical characteristic(s) and processes may not have been documented or communicated to the customer. For example, the brake system in an automobile is unquestionably safety-critical. The brake pads, brake calipers, brake rotors, master cylinder, and other vital components are clearly critical to the safe operation of the brake system. Many, if not all, of the internal components of the brake caliper and master cylinder are critical to the safe operation of these assemblies. These items would be considered CSIs because their failure could result in a catastrophic situation, not whether the customer knows the specific critical characteristics, critical processes, design details, or manufacturing processes for the items. However, once the CSI determination is made, the ESA should work toward gathering sufficient data (through FMEA/FMECA or other methods) to establish the critical characteristics.

In some cases, parts will be over-engineered such that a supplier could manufacture a part that does not conform with the drawing requirements and still not affect the true critical characteristics. Parts are sometimes also designed to meet requirements other than the fatigue strength or other requirements that would typically determine a CSI's design

specifications. An example would be a flight control link assembly. The link assembly may be designed for stiffness instead of fatigue strength. The thickness may be a critical characteristic, but a supplier could machine the link assembly to a dimension under the minimum drawing tolerance and still meet the dimensional requirement to meet the critical fatigue strength. In this case, it would be difficult to determine the true critical characteristic.

Many designers historically elected not to distinguish critical or major characteristics on their technical documentation. Their expectation is that all features identified on the drawings, specifications, standards, manufacturing process sheets and inspection criteria are to be satisfied and it is better not to imply that some characteristics are more important than others. Other designers also expected all characteristics in the technical data to be satisfied, but believed it important to identify the critical characteristics to make sure manufacturers and quality assurance personnel know the features that absolutely could not be compromised. The consequences of failure are what determine an item's criticality, not whether the technical documentation highlights or does not highlight the critical characteristics and critical processes. Because of variations in industry practice, CSI procedures require that drawings that are created or updated because there is a newly designed or modified CSI are required to reflect the item's criticality and its critical characteristics.

26. When are critical characteristics and processes particularly beneficial?

Suppliers who have no affiliation with the system or subsystem prime contractor or OEM (or for which quality oversight by the system/subsystem/OEM contractor doesn't exist) generally don't have the design, manufacturing, or application insight that system/subsystem/OEM contractors have. They don't receive the technical assistance and oversight generally provided by the prime and OEM companies. Alternate sources may or may not know how and where the parts they manufacture are used and are typically totally reliant on the drawings, manufacturing data, and inspection requirements provided by DoD. Government quality assurance representatives may also be in the same situation. Because of this, the identification of critical characteristics and processes for alternate sources is particularly important. Critical Characteristics are normally identified by the ESA as part of the process for approving an alternate source (i.e., Source Approval Request process), while doing an item criticality determination, or during First Article Testing. Critical

characteristics or inspections may be included in mandatory Quality Assurance Provisions (QAPs) that are incorporated in a contract.

27. Do all CSI technical data need to define Critical Characteristics?

Many DoD systems have been in service for years and involve millions of existing individual piece parts, each with existing technical data. Parts that fall into this category are considered legacy items. As indicated in the Multi-Service/Defense Agency CSI Instruction and the JACG CSI handbook, drawings and associated technical data for legacy CSIs do not have to be changed or updated to define critical characteristics if the ESA believes there are sufficient protections in place to assure delivery of quality products. In other words, drawings and associated technical data do not need to be revised just to identify critical characteristics. The next time the drawings and data are revised for other reasons, the CSI identifier and critical characteristics are required to be included.

New replenishment CSIs require a new part number and almost always involve development or revision of drawings and associated technical data. The new or revised drawings for new CSIs are required to reflect the item's criticality and the critical characteristics.

28. Do critical characteristics and processes need to be identified for system prime contractors, subsystem contractors, and OEMs when the existing technical data don't identify them?

System prime contractors, major subsystem contractors, OEMs, and licensed manufacturers of the system/subsystem prime contractors and OEMs know how and where the CSI is used in a specific aviation system and usually have a comprehensive understanding of the item's design intent, failure modes, failure effects, and failure consequences. They are expected to have current and complete design, manufacturing, and quality assurance documentation for the parts they produce. Because of the above, the manufacturing and inspection procedures established by these suppliers are usually satisfactory to ensure that critical characteristics and processes are evaluated, whether or not these are specifically identified in drawings or other technical documentation available to DoD. The need to identify critical characteristics, processes, and Quality Assurance Procedures for CSIs manufactured by system/subsystem prime contractors, OEMs, and licensed manufacturers of these companies is governed by individual ESA requirements.

29. Can only CSIs have Critical Characteristics or can Critical Application Items (CAIs) have these, also?

Critical Characteristics apply to other than just CSIs. The term 'Critical Characteristic' has been in use since at least 1979 when MIL-STD-2101 was last revised. The term is used in a wide variety of military and civil product lines beyond aviation. There are multiple similar but slightly different definitions of 'Critical Characteristic,' most of which recognize that the term applies beyond just the potential for a catastrophic event. The term can apply to both CSIs and CAIs.

30. What is the difference between a Critical Characteristic and Critical Safety Characteristic?

The term 'critical safety characteristic' was originally defined in MIL-STD-100, *DoD Standard Practice for Engineering Drawings*, to address critical characteristics for CSIs. When MIL-STD-100 was canceled and replaced by the non-Government standard ASME Y14.100 (and its related drawing standards), the term 'critical safety characteristic' was not continued. The term 'critical characteristic' was used and defined to relate to any critical item. Because 'critical safety characteristic' is still commonly mentioned, it is defined in the Multi-Service/Defense Agency CSI Instruction and handbook.

31. The Multi-Service/Defense Agency CSI Instruction and Handbook introduce the concept of 'Significant Product Characteristics/Features.' What are these?

Because technical data do not always highlight which characteristics are critical, the CSI instruction and handbook identify typical indicators that a feature may be important. The objective is to provide assistance to the Government Product Assurance Specialist in planning Government Contract Quality Assurance (GCQA). Examples of significant characteristics/features include diametrical and linear dimensions with a tolerance of .001 or less, surface finishes having a value of 16 RMS or less, threads specified to class 3 or greater, hardness and shot peening requirements, etc. Significant product characteristics/features such as these may be applied when critical characteristics and processes are not otherwise specified. However, they may not be pertinent in all situations and are not intended to supersede existing critical characteristics or quality assurance criteria established for a particular part.

32. What are Installation Critical Characteristics or Depot Critical Characteristics and are these relevant to a manufacturing environment?

There are many instances where the only likely way an item can fail and have catastrophic affects is through improper installation or incorrect repair. In these instances, Installation Critical Characteristics and Depot Critical Characteristics are applied. These characteristics may have little relevance in the production of CSIs at the piece part level because there is nothing the manufacturer can do to affect compliance. Installation or depot critical characteristics, however, are extremely important in building higher level assemblies or performing maintenance, overhaul, or repair.

These definitions are presented in the Multi-Service/Agency CSI handbook:

DEPOT CRITICAL CHARACTERISTIC (D): Any feature during maintenance/overhaul/repair such as dimension, finish, material, assembly, inspection process, special process (i.e. heat treat, brazing/welding, plasma, shot peening, non-destructive testing, chemical cleaning, grit blast, plating and paint), installation, operation (acceptance test), or depot overhaul/repair requirement which, if nonconforming, missing or degraded during maintenance/overhaul/repair could cause the failure or malfunction of the Critical Item.

INSTALLATION CRITICAL CHARACTERISTIC (I): Any feature such as proper assembly/orientation, installation sequence or technique, use of special tools/fixtures, hardware, safety wire, or torque which, if nonconforming, missing or degraded, could cause the failure or malfunction of the CI. Installation Critical does not imply that the part simply must be installed. Sometimes, the only plausible way a part can fail is through improper installation. In the case that a piece part has proper installation as its only critical characteristic, consideration should be given to designating the next higher assembly as CSI with the appropriate critical installation characteristic(s).

33. What is frozen planning and is it required for all aviation CSIs?

Frozen planning is the solidification of manufacturing plans and process (e.g., materials, manufacturing operations and sequences, sources of supply, required testing and inspections, etc). Planning is considered

frozen upon approval of a first article test, production lot test, or upon passing approval testing, if approval testing is required. The objective is to ensure that manufacturing practices that have demonstrated acceptability will continue to be used by the supplier. Unless specifically authorized, changes to frozen planning require ESA approval. Prime system contractors, major subsystem contractors, and OEMs with approved CSI quality programs may make changes to their planning, in accordance with their quality program guidelines and contract requirements. Alternate sources must submit any changes to their planning to the DoD for review and approval prior to the change being implemented per contract requirements.

34. Is serialization required for all CSIs?

Serialization is required unless it is not practical due to size, material property, unreasonable or excessive cost, or other requirements specified by the cognizant Service ESA. When serialization is not required on a CSI, some form of distinguishable identification should be applied (e.g., lot or batch indicator, contractor and part identifier, etc).

35. Do all CSIs need to be tracked over their life?

CSI tracking is required when specified in the contract or by the ESA. Typical situations where CSI tracking is required include fracture critical parts, fatigue sensitive items, select life-limited components, etc.

36. Are contractors required to perform 100% inspection of all CSIs?

The contract, technical specifications, or approved quality plans and program direct the nature of quality assurance on aviation CSIs. Because of the consequence of failure, 100% inspection may be required but sampling or Statistical Process Control (SPC) techniques may also be authorized. Several factors influence decisions regarding contract quality assurance. For example, while it may be essential to require 100% inspection of small production quantities, it may be impractical to require 100% inspection of large quantity product runs.

37. Is the contractor required to perform 100% inspection of every Critical Characteristic?

The contract, technical specifications, or approved quality plans and programs define the quality assurance requirements. All critical characteristics which can be nondestructively inspected/tested are potentially subject to 100% inspection, but sampling or SPC approaches may be authorized.

38. Is the DCMA Product Assurance Specialist required to perform 100% inspection or verification of aviation CSIs?

The extent and nature of Government contract quality assurance depends on several factors including the volume of parts produced, the history of the contractor in producing the specific CSI, the quality track record of the supplier, stability of the production line, the existence of well-functioning SPC practices, etc. GCQA must be sufficient to ensure conformance of all critical characteristics and critical processes. While it may be appropriate for the Government Product Assurance Specialist to fully inspect procurements of small quantities of CSIs, it may be impractical, inefficient, and unnecessary to perform 100% inspection. In those cases, verification by the Government Product Assurance Specialist would be sufficient to ensure that the contractor used proper inspection practices as authorized by the ESA and that the results were satisfactory.

39. What is the difference between inspection and verification?

The terms are occasionally interchanged but usually connote different expectations. Inspection is the evaluation by observation and judgment accompanied, as specified, by the physical act of measurement, testing or gauging to assess conformance with specified requirements. In practice, Government inspection means either the physical act of measuring, testing, or gauging products or witnessing someone else's actual measurement, testing, and gauging of products. Verification is confirmation through review of objective evidence that specified requirements have been fulfilled. Objective evidence includes the records, data, analyses, and similar documentation that demonstrate inspections and tests were performed as required, procedures were followed, equipment and individuals were properly certified, and inspection and test results were factual.

40. What is an alternate source?

An alternate source is a supplier (commercial or Government) of CSIs to the DoD that is not the system prime contractor; major subcontractor; or OEM for the system, subsystem, or assembly in which the CSIs will be used.

41. Can contractors make subcontract awards to new suppliers of CSIs without DoD approval?

Unless specifically required in the contract, system prime contractors and OEMs do not need DoD approval prior to awarding CSI subcontracts to new suppliers. System prime contractors and OEMs generally have DoD reviewed and approved supplier management and CSI programs that govern acceptance of new sub-tier suppliers. While there may be specific circumstances when subcontracting approval is required of these major contractors, notification of changes to CSI subcontractors is generally what is expected.

Alternate sources are required to obtain approval for changes to key subcontractors, suppliers, or special processors that were identified or used by the alternate source to demonstrate their acceptability to supply the CSI to DoD.

42. What is a Source Approval Request (SAR) package?

A SAR package is an assembly of information required of a prospective new supplier of a Critical Item (i.e., NSN). A SAR package contains all technical data needed to demonstrate that the prospective contractor can competently manufacture the Critical Item to the same level of quality or better than the system prime contractor, major subsystem contractor, or OEM.

43. Do system prime contractors, major subsystem contractors, or OEMs need to submit Source Approval Request (SAR) packages to DoD on their prospective subcontractors?

No. SAR packages are required of suppliers that have not been formally approved by an ESA to directly supply specific aviation CSIs (i.e., NSNs) to DoD. These contractors are considered "alternate sources".

44. Can DoD accept Certificates of Quality Compliance (CoQC) for CSIs from their suppliers or is government inspection required for all purchased CSIs?

Origin Inspection is required on all government CSI contracts, unless acceptance of a Certificate of Quality Compliance (CoQC) has been specifically authorized by the ESA. A CoQC is a contractor's certification that provides specific detailed information and objective evidence that the material offered for acceptance meets all contract and specification requirements. A CoQC could be recommended by the contracting office for approval by the ESA.

45. Can DoD contractors accept Certificates of Conformance (CoCs) or comparable certifications for CSIs from their suppliers or are contractors required to inspect all purchased CSIs?

CSI procedures governing CoCs are intended for DoD procurements of CSIs, not contractor procurements from their suppliers. All contractors with higher level quality system requirements on contract are required to have subcontract management practices that evaluate and re-evaluate suppliers to ensure selection of reliable suppliers, ensure receipt of conforming products, and provide controls over the sub-tier supplier. The prime contractor is ultimately responsible for purchased products and should establish inspection or other activities to ensure conformity of purchased products. CoCs are one of the techniques often used by contractors, but CoCs alone typically do not constitute acceptable control of purchased products. The techniques used by contractors with higher level quality requirements should be evaluated for effectiveness in accomplishing subcontract management objectives.

46. If a prime contractor/OEM's technical data package calls out special processes (e.g., heat treating, plating, etc), are alternate suppliers required to have the processes performed only by special process facilities approved by that specific prime contractor/OEM?

Processes unique or proprietary to system prime contractor, major subsystem contractor, and OEMs are required to be performed only at facilities approved by the particular system, subsystem, or OEM contractor. Special processes, however, are often defined in publicly available and broadly recognized specifications and standards (e.g., military specifications and standards and those published by non-

government organizations such as SAE, AIA, ASME, ASTM, etc). In many instances, a company's process specified in technical data is identical to or a modification of a process that is publicly available. When the contractor's special process requirements are identical to the broadly recognized standard, facilities approved by other major aerospace companies, the military, or the National Aerospace and Defense Contractors Accreditation Program (NADCAP) can be used. Where the contractor's special process requirements differ slightly from the standard requirement (e.g., additional inspections, tightening of specific tolerances or ranges, etc), special process facilities approved by these other organizations can be used provided the specific tailoring of the standard has been accounted for and will be accomplished by an alternate special process facility. Alternately, the DoD ESA may approve an alternate process or specification to replace a proprietary process.

47. What are Control drawings?

Control drawings are used to establish an item's detail and performance technical requirements and to identify suppliers that, at time of drawing release or update, were determined capable of meeting these requirements. There are several types of Control Drawings, including Source Control Drawings, Vendor Item Drawings (sometimes called Vendor Item Control Drawings), Specification Control Drawing, and similar variations. Control drawings can be used as a basis to develop, find, or help qualify new sources when appropriate.

48. Are suppliers listed on Control Drawings automatically approved for the specified CSI? Are suppliers listed on Control Drawings the only sources that can be used?

As a general rule, suppliers listed on source control drawings are considered approved to manufacture CSIs while suppliers listed on vendor item control drawings (sometimes called a specification control drawings or vendor item drawings) are suggested sources of supply (reference ASME Y14.24, *Types and Applications of Engineering Drawings*). Unfortunately, the terminology is not always used consistently within industry. Additionally, control drawings are not always updated simply to add, modify, or remove sources if there is no technical change to the item itself. As a consequence, suppliers listed on control drawings may no longer be in business, may no longer have the interest or capability in producing the product, may have experienced quality problems, may not be cost effective, or may not be able to meet schedule timelines, etc.

Procuring activities should validate that available control drawings are the most current version, that listed suppliers are still in business and are interested in supplying the CSI, that the suppliers remain as an approved source by the system prime contractor, major subsystem contractor, or OEM for the item, and whether any additional sources not identified on the control drawing have been subsequently approved. If alternative sources to those listed on the control drawing need to be identified, care must be taken not to compromise proprietary information contained on the drawing.

49. How do Unique Identification (UID) requirements apply to CSIs?

UID requirements are specified in acquisition regulations and the contract. When applied to CSIs, UID will greatly facilitate verification of item manufacture and part traceability over the life of the item.

50. Are there specific rules for disposing of aviation CSIs?

To prevent the inadvertent use of CSIs that are defective, suspect, or beyond their specified life limits, CSIs are to be mutilated or demilitarized prior to disposal. DOD 4160.21-M-1, *Defense Demilitarization Manual*, provides specific guidelines.

16 March 2011

Exhibit A

Common Use Item Coordination Sheet, Instructions and Samples

TRACKING NO. __-___-___-__	**Common Use Item Coordination Sheet**	☐ OPEN ☐ CLOSED

NOMENCLATURE: _____
NSN: _____ **P/N:** _____ **PRIMARY CAGE:** _____
ISSUE DATE: _____ **CLOSURE DATE:** _____
ISSUE ORIGINATOR: _____ **POC:** _____
☐ Army ☐ Navy ☐ Air Force ☐ DLA

SERVICES AFFECTED:

☐ Army
☐ Navy
☐ Air Force
☐ DLA

DLA FORM 339 # (if applicable): _____

PLATFORM/SUBSYSTEM: _____

CATEGORY:

☐ CSI/CC Determination
☐ Alternate Source Qualification
☐ First Article Test
☐ Site Survey
☐ CSI Alert
☐ Coordination of Approved Sources
☐ Other _____

ISSUE DESCRIPTION:

RECOMMENDED CLOSURE:

ASSESSMENT:

Army	Date: _____	**Air Force**	Date: _____
POC: _____ POC Phone: _____ POC e-mail: _____	☐ Concur ☐ Non-Concur ☐ Not Applicable	POC: _____ POC Phone: _____ POC e-mail: _____	☐ Concur ☐ Non-Concur ☐ Not Applicable
Help POC: 256-313-8981	(If non-concur, provide rational in "Review Comments" section)	Help POC: 937-257-5448	(If non-concur, provide rational in "Review Comments" section)

TRACKING NO. ___-___-___-___	**Common Use Item Coordination Sheet**	☐ OPEN ☐ CLOSED

Navy Date: _____	**DLA** Date: _____
POC: _____ POC Phone: _____ POC e-mail: _____ ☐ Concur ☐ Non-Concur ☐ Not Applicable Help POC: 301-757-2505 (If non-concur, provide rational in "Review Comments" section)	POC: _____ POC Phone: _____ POC e-mail: _____ ☐ Concur ☐ Non-Concur ☐ Not Applicable Help POC: 804-279-4628 (If non-concur, provide rational in "Review Comments" section)

INTRASERVICE PROGRAMS AFFECTED AND ASSESSMENT:

Service/Program	POC	Phone	Date	Concur	Non-concur	Not Applicable
_____	_____	_____	_____	☐	☐	☐
_____	_____	_____	_____	☐	☐	☐
_____	_____	_____	_____	☐	☐	☐
_____	_____	_____	_____	☐	☐	☐
_____	_____	_____	_____	☐	☐	☐

REVIEW COMMENTS:

Army:

Air Force:

Navy:

DLA:

Instructions for Completing the Common Use Item Coordination Sheet

Note: *The Common Use Item Coordination process is discussed in Section 2.6.2 of the Handbook. If additional assistance is required, contact your Service POC (listed in Section 1.6 of the Handbook) or the Help POC listed on the Common Use Item Coordination Sheet.*

Tracking Number Scheme: xx/xxxxx/xxxxxx/xx

The first field is a two-letter Service/Agency code (AR, NA, AF, DL, DC).

The second field is a one to five-letter activity code (PAX, JAX, CP, LKHST, CL, ICP, etc.). This field may be used as required for internal Service/Agency coordination, or may be left blank.

The third field requires a date – ddmmyy.

The fourth field requires a sequential numbering in cases where there are more than one coordination sheets initiated on a given date (i.e., 1, 2, 3, 4, 5…).

Nomenclature: Enter a short description of the part or assembly of concern.

NSN: Self-explanatory.

P/N: Self-explanatory.

Primary CAGE: Enter the CAGE code of the manufacturer who maintains the drawings. If there is a proposed CAGE which is not presently recognized by all Services, the details of that nomination should be included in the "Issue Description" area below.

Issue Date: Self-explanatory.

Closure Date: Projected date of closure or actual closure date for closed actions.

Issue Originator: Self-explanatory.

POC: Name, phone and e-mail of the POC within the originator's organization.

Services Affected: Self-explanatory.

Category: Self-explanatory.

DLA FORM 339 #: Self-explanatory.

Platform/Subsystem: Aircraft and subsystem(s) on which the part is used.

Issue Description: Self-explanatory; should include any details of a proposed new CAGE for inclusion.

Recommended Closure: Originating Service's near-term and long-range recommendations for completing this coordination.

Assessment: Service POCs will be assigned to provide coordination between all affected Services and DLA. Help POCs from each Service will be available to assist in the process. Service POCs will be identified by the Help POCs, and will work non-controversial actions to their conclusion. When there are differences that cannot be resolved at the Help POC level, the problem resolution process will take place at the lowest level possible. Lack of resolution will result in elevation to the head of the engineering activity for each affected ESA.

Intraservice Programs Affected and Assessment: In those instances where an item requiring Inter-service coordination affects more than one weapon system/program within a given Service, this section can be used to identify and coordinate intraservice resolution of the item of concern.

Review Comments: Self-explanatory.

A continuation sheet may be used as required for any areas.

16 March 2011

Samples of Completed Common Use Item Coordination Sheets

Sample #1 (Army initiated)

TRACKING NO. AR-XXX-040505-02

Common Use Item Coordination Sheet

☒ **OPEN** ☐ **CLOSED**

NOMENCLATURE: Thrust Bearing, SB7002-048
NSN: 3110-01-158-9607 **P/N:** SB7002-048 **PRIMARY CAGE:** 80201
ISSUE DATE: 8/10/2004 **CLOSURE DATE:** _____
ISSUE ORIGINATOR: **POC:** Sally X. Jones (256) xxx-xxxx, Sally.Jones**@army.mil
☒ Army ☐ Navy ☐ Air Force ☐ DLA

SERVICES AFFECTED:

☒ Army
☒ Navy
☒ Air Force
☒ DLA

CATEGORY:

☒ CSI/CC Determination
☐ Alternate Source Qualification
☐ First Article Test
☐ Site Survey
☐ CSI Alert
☒ Coordination of Approved Sources
☐ Other _____

DLA FORM 339# (if applicable): _____

PLATFORM/SUBSYSTEM: H-60

ISSUE DESCRIPTION:

Based on Category I QDR, System Engineer for Army requested addition of item to CSI list. Part failure causes damage to Main Rotor Spindle, which could result in loss of blade and aircraft.

RECOMMENDED CLOSURE:

This DLA-managed item should be categorized as CSI due to similar QDR on HH-60H part. Chicago Rawhide (CR, CAGE 80201) removed temporarily as source at least until CCs Identified. Need other Service coordination on CCs prior to source reapproval process for CR. Lord Corporation remains as source.

ASSESSMENT:

Army	Date: _____	**Air Force**	Date: _____
POC: _____ POC Phone: _____ POC e-mail: _____ Help POC: 256-313-8981	☐ Concur ☐ Non-Concur ☐ Not Applicable (If non-concur, provide rational in "Review Comments" section)	POC: _____ POC Phone: _____ POC e-mail: _____ Help POC: 937-257-5448	☐ Concur ☐ Non-Concur ☐ Not Applicable (If non-concur, provide rational in "Review Comments" section)

TRACKING NO. AR-XXX-040505-02	**Common Use Item Coordination Sheet**	☒ **OPEN** ☐ **CLOSED**

Navy	Date: _____	**DLA**	Date: _____
POC: _____ POC Phone: _____ POC e-mail: _____ Help POC: 301-757-2505	☐ Concur ☐ Non-Concur ☐ Not Applicable (If non-concur, provide rational in "Review Comments" section)	POC: _____ POC Phone: _____ POC e-mail: _____ Help POC: 804-279-4628	☐ Concur ☐ Non-Concur ☐ Not Applicable (If non-concur, provide rational in "Review Comments" section)

INTRASERVICE PROGRAMS AFFECTED AND ASSESSMENT:

Service/Program	POC	Phone	Date	Concur	Non-concur	Not Applicable
_____	_____	_____	_____	☐	☐	☐
_____	_____	_____	_____	☐	☐	☐
_____	_____	_____	_____	☐	☐	☐
_____	_____	_____	_____	☐	☐	☐
_____	_____	_____	_____	☐	☐	☐

REVIEW COMMENTS:

ARMY:

AIR FORCE:

NAVY:

DLA:

16 March 2011

Sample #2 (Navy initiated)

TRACKING NO. NA-PAX-040605-01

Common Use Item Coordination Sheet

☒ **OPEN** ☐ **CLOSED**

NOMENCLATURE: H-60 Clevis Assembly Criticality Non-Concurrence
NSN: 1560-01-233-8316 **P/N:** 70308-03801-121 **PRIMARY CAGE:** 78286
ISSUE DATE: 10/5/2004 **CLOSURE DATE:** _____
ISSUE ORIGINATOR: _____
☐ Army ☒ Navy ☐ Air Force ☐ DLA
POC: John Y. Smith (301) xxx-xxxx, John.Smith**@navy.mil

SERVICES AFFECTED:

☒ Army
☒ Navy
☒ Air Force
☒ DLA

CATEGORY:

☒ CSI/CC Determination
☐ Alternate Source Qualification
☐ First Article Test
☐ Site Survey
☒ CSI Alert
☐ Coordination of Approved Sources
☐ Other _____

DLA FORM 339 # (if applicable): DSCR-JA-04-14842
PLATFORM/SUBSYSTEM: H-60

ISSUE DESCRIPTION:

339 Issued Requesting Criticality Determination, CDRLs or other quality requirements, approved sources, sector 2800 information update, and AMC/AMSC code validation. Navy defined part as CSI, with AMC/AMSC of 1B. Army defined as CAI with AMC/AMSC code 1B. Air Force defined as CAI with AMC/AMSC cod of 3B.

RECOMMENDED CLOSURE:

Recommend that Services discuss and come up with a common determination and AMC/AMSC code. Part is used in same location and application for each Service, so determination should be the same.

ASSESSMENT:

Army	Date: _____	**Air Force**	Date: _____
POC: _____ POC Phone: _____ POC e-mail: _____	☐ Concur ☐ Non-Concur ☐ Not Applicable	POC: _____ POC Phone: _____ POC e-mail: _____	☐ Concur ☐ Non-Concur ☐ Not Applicable
Help POC: 256-313-8981	(If non-concur, provide rational in "Review Comments" section)	Help POC: 937-257-5448	(If non-concur, provide rational in "Review Comments" section)

16 March 2011

TRACKING NO. NA-PAX-040605-01	**Common Use Item Coordination Sheet**	☒ OPEN ☐ CLOSED

Navy	Date: _____	**DLA**	Date: _____
POC: _____ POC Phone: _____ POC e-mail: _____ Help POC: 301-757-2505	☐ Concur ☐ Non-Concur ☐ Not Applicable (If non-concur, provide rational in "Review Comments" section)	POC: _____ POC Phone: _____ POC e-mail: _____ Help POC: 804-279-4628	☐ Concur ☐ Non-Concur ☐ Not Applicable (If non-concur, provide rational in "Review Comments" section)

INTRASERVICE PROGRAMS AFFECTED AND ASSESSMENT:

Service/Program	POC	Phone	Date	Concur	Non-concur	Not Applicable
_____	_____	_____	_____	☐	☐	☐
_____	_____	_____	_____	☐	☐	☐
_____	_____	_____	_____	☐	☐	☐
_____	_____	_____	_____	☐	☐	☐
_____	_____	_____	_____	☐	☐	☐

REVIEW COMMENTS:

Army:

Air Force:

Navy:

DLA:

16 March 2011

Exhibit B

Critical Safety Item (CSI) Websites

CSI PARTS LISTS

Title	Address	Notes
Air Force CSI Management Community of Practice	https://afkm.wpafb.af.mil/ASPs/CoP/EntryCoP.asp?Filter=OO-EN-MC-07	Contains listings of Air Force aviation CSIs. Accessible to .mil users with a CAC card. Others may request access via the USAF Portal which can be found at https://www.my.af.mil
Army Aviation and Missile Command (AMCOM) CSI Data	https://csi.army.mil	Contains a complete, up-to-date listing of all Army aviation CSIs, including CC's, sources, etc. It is only open to military users and their support contractors. Submit Request for Access to AE-K-TTS@amrdec.army.mil
Army Aviation and Missile Command (AMCOM) CSI Data (via Competition Management Office website).	https://www.redstone.army.mil/cmo *(Select the "CASL" link in the left column.)*	Enables public access to a listing of all Army aviation CSIs which is updated weekly. Does not include information such as CC's, sources, etc.
Defense Logistics Agency (DLA) Critical Item Procurement Requirements Document (CIPRD) Website	http://www.dscp.dla.mil/qi/prod_services/ciprds.html	Provides public access to a listing of all current Critical Item Procurement Requirements Documents

CSI PARTS LISTS (Continued)

Title	Address	Notes
Defense Supply Center Richmond (DSCR) Critical Item Management (CIM)	http://www.dscr.dla.mil/ExternalWeb/UserWeb/AviationEngineering/TechnicalOversight/CSI.htm	Provides public access to a listing of CSIs by Service
Joint Deficiency Reporting System (JDRS) Critical Item Management (CIM) module	https://www.jdrs.mil	Contains database of Naval aviation CSIs, CAIs, and not-critical items, as well as source and critical characteristics data. A CAC card and user account is required to access this site.
Joint Services CSI Management DataViewer	https://remote2.amrdec.army.mil/csiviewer/index.aspx	This site includes CSI data from all the Services. A CAC card and user account is required to access this site. An account can be requested via AE-K-TTS@amrdec.army.mil
Product Data Management Initiative (PDMI)	https://pcf1.bsm.dla.mil/esa	PDMI provides an online means for DLA to send CSI and non-CSI Requests for Engineering Support (DLA Form 339) to the ESA, as well as allowing the ESA to respond to DLA's requests. For access, contact the PDMI helpdesk at 1 (866) 335-4357 or DSN 695-4357.

CSI POLICY LINKS

Title	Address	Notes
Air Force CSI Management Community of Practice (CoP)	https://afkm.wpafb.af.mil/ASPs/CoP/EntryCoP.asp?Filter=OO-EN-MC-07 https://www.my.af.mil/faf/FAF/fafHome.jsp	Provides USAF guidance regarding CSI management. Accessible to .mil users with a CAC card. Others may request access via the USAF Portal which can be found at https://www.my.af.mil
Army Aviation and Missile Command (AMCOM) Competition Management Office	www.redstone.army.mil/cmo	Competition Advocates Shopping List; contains information regarding the AMCOM spare parts acquisition program and Source Approval procedures. This site is updated live and is only open to military users and their support contractors. Request for Access can be submitted to AE-K-TTS@amrdec.army.mil
Defense Contract Management Agency (DCMA) Product Assurance Instruction and Guidance	http://guidebook.dcma.mil/226/instructions.htm	Provides public access to DCMA product assurance guidance, including information regarding surveillance of CSIs.
Defense Acquisition Guidebook	https://akss.dau.mil/dag/DoD5000.asp?view=document	Provides public access to the Defense Acquisition Guidebook. Chapter 4 (Systems Engineering) Section 4.4.21 contains information regarding CSIs.

CSI POLICY LINKS (Continued)

Title	Address	Notes
Defense Logistics Agency (DLA) Deskbook	https://headquarters.dla.mil/j-3/j-334/ESTS-techsuppdeskbook.asp	This Deskbook provides policy, defines responsibilities and establishes uniform procedures for technical support functions at DLA.
Defense Standardization Program	www.dsp.dla.mil	Public access to the Defense Standardization Program information, including CSI presentations and initiatives.
Federal and Defense Department Procurement and Acquisition Policy	http://farsite.hill.af.mil	Provide public access to all FAR and DFARS.

CSI SOURCE APPROVAL REQUEST LINKS

Title	Address	Notes
Air Force SAR Instruction, AFMCI 23-113	*http://www.e-publishing.af.mil/shared/media/epubs/AFMCI23-113.pdf*	Contains Air Force SAR requirements and guidance. Request for access is via the USAF Portal which can be found at https://www.my.af.mil
Army Aviation and Missile Command (AMCOM) Standardized Aviation and Missile Source Approval Request	http://www.redstone.army.mil/cmo/samsar.html	Public access to AMCOM's aviation SAR requirements.
Defense Supply Center-Richmond (DSCR) Critical Item Source Approval Request Guide	http://www.dscr.dla.mil/userweb/sarguide.doc	Public access to DSCR's critical item SAR requirements.

CSI SOURCE APPROVAL REQUEST LINKS (Continued)

Title	Address	Notes
Naval Inventory Control Point (NAVICP) Source Approval Information Brochure (Spares)	https://www.navsup.navy.mil/navsup/ourteam/navicp/business_opps/SAR%20Spares%20Brochure.pdf	Public access to NAVICP's source approval information brochure for CSI spares
Naval Inventory Control Point (NAVICP) Source Approval Information Brochure (Repair)	https://www.navsup.navy.mil/navsup/ourteam/navicp/business_opps/SAR%20Repairs%20Brochure.pdf	Public access to NAVICP's source approval information brochure for repairs.
Naval Inventory Control Point (NAVICP) Source Approval Information Brochure (Commercial Items)	https://www.navsup.navy.mil/navsup/ourteam/navicp/business_opps/comm_item_id_brochure	Public access to NAVICP's brochure for commercial item identification and submission of market research data.

OTHER RELATED LINKS

Title	Address	
Federal Aviation Administration (FAA) Suspect & Unapproved Parts Program	http://www.faa.gov/aircraft/safety/programs/sups	Public access to information regarding the FAA's detection, reporting and processes for addressing suspected unapproved parts in civil aviation.
CSI Public Law	http://thomas.loc.gov	Provides public access to legislative information from the Library of Congress, including public laws regarding CSIs.
Military Specifications and Standards – Assist Quicksearch	http://assist.daps.dla.mil/quicksearch	Public access to Defense and Federal specifications and standards available in the official DoD repository.

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Exhibit C

Critical Characteristics

C.1. Purpose

The purpose of this Exhibit is to provide additional explanation, examples and decision aids for determining CSI critical characteristics.

C.2. Definitions

Critical characteristics are any feature throughout the life cycle of a CSI, such as dimension, tolerance, finish, material or assembly, manufacturing or inspection process, operation, field maintenance, or depot overhaul requirement that if nonconforming, missing or degraded may cause the failure or malfunction of the item. As critical characteristics are identified, the type or category of each characteristic should also be noted. Critical characteristics are sub-divided into manufacturing-, depot-, and installation-critical, defined as follows.

- **Manufacturing Critical Characteristic (M):** Any characteristic resulting from or produced during the manufacture of an item, such as a dimension, finish, material or assembly, manufacturing or inspection process, special process (i.e. heat treat, brazing/welding, plasma, shot peening, non-destructive testing, chemical cleaning, grit blast, plating and paint), installation, or operation (acceptance test), which if nonconforming, missing or degraded, could cause the failure or malfunction of the CSI. Examples of critical manufacturing processes and critical process elements are listed below.

- **Depot Critical Characteristic (D):** Any characteristic resulting from or present during the maintenance/overhaul/repair such as a dimension, finish, material, assembly, inspection process, special process (i.e. heat treat, brazing/welding, plasma, shot peening, non-destructive testing, chemical cleaning, grit blast, plating and paint), installation, operation (acceptance test), or depot overhaul/repair requirement which, if nonconforming, missing, or degraded during maintenance, overhaul, or repair could cause the failure or malfunction of the CSI.

- **Installation Critical Characteristic (I):** Any characteristic resulting from or present during the installation of an item such as the proper assembly/orientation, installation sequence or technique, use of special tools/fixtures, hardware, safety wire, or torque which, if nonconforming,

missing or degraded, could cause the failure or malfunction of the CSI. Installation-critical does not imply that the part simply must be installed. Occasionally, the only plausible way a part can fail is through improper installation. If proper installation is a part's only critical characteristic, consideration should be given to designating the next higher assembly as CSI, with the appropriate critical installation characteristic(s) identified.

C.3. Common Use Items

When identifying critical characteristics for a common use item, the engineer should coordinate with engineering counterparts for each affected DoD aviation system and should ensure that records reflect the most stringent requirements.

C.4. Assemblies

Critical characteristics for an assembly should be the sum of the critical characteristics of the subcomponents and critical characteristics created in the assembly process, if any.

C.5. Distinguishing Critical Characteristics from Other Types of Characteristics

Engineers frequently question how critical characteristics can be distinguished from other types of characteristics. Characteristics that are not critical must still conform to all applicable technical specifications. They are SAMPLED for conformance and, if nonconforming, are subject to Material Review Board disposition. Critical characteristics must conform to technical specifications, are 100% verified or inspected, and would be scrapped if found to be nonconforming. In accordance with the Multi-Service/Defense Agency CSI Instruction (Appendix I), non-conformances in critical characteristics must be approved by the cognizant Service ESA.

Sanity check: If a nonconforming critical characteristic might be acceptable, seriously question whether it is a 'critical characteristic.'

C.6. Examples of Unacceptable Critical Characteristics

If FMECA and critical characteristics result in dimensions, tolerances, specifications or instructions that are clearly inappropriate, change them in the applicable technical documentation. Do not identify an unrealistic requirement as a critical characteristic only to be faced with a non-conformance during the manufacturing/repair process.

Before listing a characteristic as critical, determine whether or not an inspector would have the ability to measure it. Consider both the inspection methodology and acceptance criteria. If that capability does not exist, then identify other methods, characteristics, etc.

Many examples of unacceptable critical characteristics have been observed. Some of the more common types of errors are discussed here. Consider these examples:

- "Evidence of balance accomplishment must be maintained on file."
- "Evidence of inspection accomplishment must be maintained on file."
- "Material traceability must be maintained on file."
- "Evidence of oil passage inspection accomplishment must be maintained on file."

In these examples of poorly worded critical characteristics (above), the characteristic is not a feature of the part but is the existence of a piece of paper. These examples do not require that the parts be compliant or that the records/evidence contain useful information, only that some form of evidence shows that a part was inspected.

- "Re-temper after Nital Temper Etch Inspection is required. (This applies to presence or absence of the re-temper operation only, not the details of the re-temper process)."
- "Bake after (Cadmium, Chromium, Tin, and Nickel) plate required. (This applies to presence or absence of the bake operation only, not the details of the bake process)."

In these examples of unacceptable critical characteristics (above), the characteristic does not require any compliance to specification, only that the temperature of the part be somehow raised after processing. In addition, Nital Etch is typically used to identify undesired hard spots and over tempering. This should be a relief bake, not a re-temper operation.

- "Shot peen set up approval required. (This applies to shooting sketch approval only.)"

In this example of a poor critical characteristic (above), the characteristic does not require any compliance to specification (e.g., coverage, size of shot, intensity). Not only is a sketch provided of the setup but also the almen curves are supplied which indicate that the shotpeener has proven that the particular setup will produce acceptable results on almen strips mounted to a dummy part. This dummy part is a close representation to the real part to the specified shotpeening conditions.

- "No MRB action permitted below minimum Rockwell hardness."

This example of an unacceptable critical characteristic (above) does not account for the possibility of a part being too hard.

Additional examples of unacceptable critical characteristics include:

- Armament alignment (bore sight)
- Software safety inhibits to armament firing
- Calibration of electronics
- Sensor sensitivity
- Gyro drift
- Stray voltage checks
- Conformal coating after manufacture/assembly/repair
- Electro Magnetic Interference (EMI)/Environmental seals
- Buy From OEM Only

C.7. Examples of Acceptable Critical Characteristics

The scope of possible critical characteristics is extensive. The examples provided below do not constitute an all-encompassing list since critical characteristics are not limited to these examples.

Critical component dimensions

- Diametric or linear dimensions having a total tolerance of 0.001 inch or less
- Angular dimensions with total tolerance range of 1 degree (60 minutes) or less
- Any other (not diametrical and linear dimensions) geometric features with a total tolerance of .002" (e.g., run out, perpendicularity, parallelism, concentricity) or less

Surface finishes (e.g., having a 16 value or less)

Thread characteristics (e.g., specified to class 3 or greater for safety critical threads)

Balancing

- Dynamic balancing of rotating units and static balancing of flight control surfaces
- Dynamic and static balancing of aircraft components

Flow checks (e.g., for blades and vanes)

Spray pattern requirements for fuel nozzles (including afterburner rings)

Weight checks

Material

- Composition
- Physical Properties
- Hardness requirements (e.g. Rockwell requirements)
- Grain Direction
- Composite (Physical and Chemical Properties, i.e. resin composition, fiber weave, directionality, or stitching)

Processes

- **Chemical Cleaning Processes**
  - Degreasing compounds used
  - Cleaning and/or etching compound used
  - Cleaning and/or etching compound controls (i.e., storage contamination, temperature used, cycle time used):
    - Method of neutralizing after chemical cleaning
    - Cleaning sequence used
    - Pre or post cleaning preparation

- **Mechanical Cleaning Processes Using Energized Media (Vapor Blast, Dry Grit Blast, Tumbling and Allied Processes)**
  - Cleaning media used (Type, AL_2O_3, Sand, Shot, etc.)
  - Size of cleaning media used
  - Method of applying energy to media (e.g., air pressure, mechanical, etc.)
  - Liquid vehicle used (water, additives, etc.)
  - Cleaning sequence and operating parameters used
  - Pre or post cleaning preparation

- **Welding Processes**
  - Geometry of weld joint
  - Preparation of weld joint including cleaning:
    - Control and type of coverage and backup atmosphere used
    - Weld sequence and schedules used
    - Type and control of filler material used (size, form, chemistry, cleaning)
    - Pre or post cleaning preparation

- **Brazing Processes**
  - Surface preparation used (cleaning, etching, etc.)
  - Fit up and/or joint geometry
  - Location of and form of alloy used
  - Flux media used
  - Brazing temperature and time cycle used
  - Furnace temperature and control of atmosphere (vacuum, etc.)
  - Brazing sequence used
  - Flux removal process used
  - Stop-off system used including compounds and their control
  - Pre-braze furnace control and preparation
  - Braze line thickness

- **Soldering Processes**
  - Joint preparation used (tinning, dip, etc.)
  - Fit up of joint geometry
  - Flux media and system used
  - Soldering method used (dip, resistance, etc.)
  - Pre and post preparation and cleaning
  - Soldering alloy used

- **Casting Processes**
  - Melting practice used
  - Mold or investment constituents used (wax, sand, etc.)
  - Number and position of items per mold
  - Pouring temperatures used
  - Mold cooling techniques used
  - Gating and riser locations used
  - Casting method used (permanent, mold, sand mold, centrifugal, etc.)
  - Mold temperature and control used
  - Melting or casting atmosphere used (vacuum, inert gas, etc.)
  - Number and location of chill bars used
  - Source and kind of raw material used
  - Post casting treatment used (chemical, mechanical, etc.)

- **Forging Process**
  - Forging Temperature used
  - Number of and temperature of reheats used during forging
  - Number of strikes or amount of reduction per strike and reheats
  - Total percentage of reduction during the forging process
  - Type of forging die used
  - Forging method used (drop forge, pressure forge, ring rolling, etc.)
  - Cropping method used

- Billet size or shape used
- Source and/or process of ingot to billet conversion process used
- Die insulation and/or lubricant used
- Canning or blockdown process used
- Post forging treatment process used
- Forging press rate

- **Heat Treatment and Surface Hardening Processes**
  - Pre-heat treat cleaning process used
  - Pre-heat treat coating used
  - Furnace preparation, atmosphere, and control used
  - Furnace temperatures and/or time cycles used
  - Heat treat sequence used
  - Cooling cycles and/or cooling rates used
  - Quenching media and control used
  - Use and control of sub zero stabilization processes

- **Peening Processes**
  - Type and size of media used
  - Type of equipment used
  - Control of peening parameters (pressure, nozzle size, impingement angle, etc.)
  - Almen strip placement for intensity control

- **Electrochemical Machining (ECM) Processes (Cavity Sinking, Drilling, Grinding)**
  - Electrolyte and Electrode:
    - Type and control of electrolyte used
    - Type of electrode used
  - Operation:
    - Feed and speed rates used
    - Operating voltage limits and controls
    - Sequence of operations
    - Operation pressure of electrolyte
    - Electrolyte operation temperature limits
    - Sludge build-up rate and limits

- **Electro-Discharge Machining (EDM)**
  - Dielectric Fluid and Electrode:
    - Type of dielectric fluid used
    - Type of electrode used
  - Operation:
    - Type of feed rate used (vibrating, rotating, pulsing, etc.)

  - Voltage, frequency, polarity, wave shape, spark duration, and related parameters used
  - Sludge build-up rate and limits
  - Control of dielectric fluid (temperature, contamination, etc.)

- **Electro-Stream Drilling (ESD)**
  - Electrolyte:
    - Type of and control of electrolyte used
  - Operation:
    - Feed rate used
    - Operating voltage and control parameters used
    - Tool design and/or nozzle diameter used
    - Sequence of operation
    - Electrolyte operating temperatures and pressures used

- **Metal Electroplating Processes**
  - Plating parameters and control (voltage, current, agitation rate, etc.)
  - Solution makeup and control limits
  - Pre and post plating processes (heating, chemical cleaning, etc.)
  - Use and evaluation of test specimens
  - Stripping and re-plating procedures
  - Anode and fixture control

- **Protective Finishing Processes**
  - The application and control of:
    - Hot Dip Coating
    - Metal Spraying
    - Oxide Coating
    - Phosphate Coating
    - Paints, Varnishes, Lacquers, Enamels
    - Rust Inhibitors
    - Ceramic Coatings
    - Silicates
    - Epoxies
    - Plastics
  - Pre and post item treatment processes
  - Coating testing procedures
  - The control and thermal processes when used
  - Stripping and recoating processes

- **Metal Forming Processes**
  - Die control
  - Pre-, in process, or post-heat treatment controls
  - Process sequence

- Die lubricant used and control

- **Stress-free Grinding Processes**
  - Speeds and feed used
  - Type of abrasive used
  - Type and control of coolant used
- **Tooling**
  - Use of low melting point (high volatility) material where impurities could remain
  - Equipment that could affect item properties such as dies, winding machines, etc.
  - Temporary tooling which could affect chemical, electrical, physical or mechanical properties of the material

- **Laser Drilling**
  - Maximum charge voltage or beam output energy
  - Number of pulses per hole
  - Internal packing material

- **Process/Operation Sequence**
  - Process/operation sequence which, if changed or adjusted, could result in a change in the physical, chemical, electrical, or mechanical properties

- **Composite Construction and Fabrication Processes**
  - Final Composite Properties:
    - Cure
    - Shear Strength
    - Density
    - Resin Content to Fiber
    - Physical Properties (Porosity, Voids, Bubbles or Blisters, delamination, cracks, inclusions, and wrinkles)
  - Bonding Adhesives:
    - Type of adhesive used
    - Adhesive application method used
    - Form of adhesive used
    - Source of adhesive supply
    - Type of adhesive primer used
    - Acceptance and re-qualification requirements
    - Storage control of adhesive (shelf life, storage temperature, etc.)
  - Bonding - Cleaning:
    - Cleaning solution type, strength, time and temperature control
    - Pre and post cleaning item controls

  - Bonding - Processing:
    - Bond times, temperatures, pressure and atmosphere controls
    - Bond facility and controls (clean room, etc.)
    - Item handling controls
  - Bonding - Tooling:
    - Tool configuration and control
    - Tool qualification and re-qualification
  - Bond Line Thickness

- **Manufacture of Metal Powder Compacts**
  - Melting
  - Atomizing
  - Screening
  - Out-gassing
  - Blending
  - Transfer technique
  - Container filling
  - Pre-form manufacture
  - Filling procedures
  - Cleaning procedures
  - Hot isostatic pressing

- **Electrical Component Processes**
  - Coil winding
  - Molding
  - Potting
  - Swaging
  - Crimping and staking
  - Curing
  - Water-proofing
  - Insulating
  - Splicing

- **Proper assembly (e.g. sequence, torque, locking retaining features, alignment, stack up and orientation)**

- **Staking**
  - Retention Proof Loads

- **Non-destructive Testing**

- Test Methods and Acceptance Criteria for Non-destructive Testing (e.g. magnetic particle, liquid penetrant, radiographic inspection, ultrasonic, eddy current, etc.)

- **Proof Testing**

- **Fatigue Testing**
  - Component performance checks
  - Electrical bonding
  - Electromagnetic Compatibility (EMC) testing

Note: *Even with the examples given above, a desired result should be given (e.g., heat treat should result in a certain hardness and possibly conductivity).*

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Exhibit D

Examples of CSI Contract Requirements/Clauses

The contract clauses provided below are intended to be examples, only. They should be tailored, in coordination with the ESA, as appropriate for a given product, contract, or need. They are not all inclusive, i.e., other clauses might also be appropriate. See Chapter Seven of this Handbook for further information and additional discussion and explanation of these provisions.

1.0 DEFINITIONS

> **Note:** *The terms defined below in Section 1.0 are used extensively in the sample clauses that follow. These definitions may differ from those in practical use by contractors; it is therefore strongly recommended that they be included in CSI solicitation using the sample clauses.*

1.1 CRITICAL SAFETY ITEM (CSI): A CSI is defined as a part, assembly, installation equipment, launch equipment, recovery equipment, or support equipment for an aircraft or aviation weapons system that contains a characteristic any failure, malfunction, or absence of which could cause a catastrophic or critical failure resulting in the loss or serious damage to the aircraft or weapons system, an unacceptable risk of personal injury or loss of life, or an uncommanded engine shutdown that jeopardizes safety. Damage is considered serious or substantial when it would be sufficient to cause a "Class A" accident or a mishap of severity category I (as defined by MIL-STD 882). The determining factor in CSIs is the consequence of failure, not the probability that the failure or consequence would occur.

1.2 CRITICAL CHARACTERISTIC: Any feature throughout the life cycle of a CSI, such as 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 the 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.

1.3 DESIGN CONTROL ACTIVITY (DCA): The systems command of a military department that is specifically responsible for ensuring the airworthiness of an aviation system or equipment in which the item is to be used.

1.4 APPROVED SOURCE: A manufacturer or repair vendor who has satisfied, prior to contract award, all Government source approval requirements to include, if applicable, engineering qualification testing requirements (fatigue, endurance, and/or interchangeability).

2.0 QUALITY REQUIREMENTS

2.1 PLACE OF INSPECTION/ACCEPTANCE: Government Contract Quality Assurance (GCQA) must be at the source.

2.2 QUALITY PROGRAM: Contractor must comply with one of the following quality systems: AS9100, ISO 9001, or ANSI/ASQ 9001, NATO-AQAP-110.

2.3 MEASURING & TEST EQUIPMENT (M&TE):

2.3.1 CALIBRATION: Contractor must comply with one of the following calibration requirements: ISO 10012-1, ANSI/NCSL Z540-1. (Note: the contract should reference the most current version of ISO-10012 or ANSI/NCSL Z540.)

2.3.2 TOLERANCE OF M&TE: M&TE used to inspect CSIs must have discrimination/accuracy to within 10% (10:1 Rule) of the total tolerance spread for the feature being inspected except as follows: for total tolerance spreads of less than .001, M&TE must be discriminate to 20% of the spread. The test system/measurement uncertainty must not exceed 25% as compared with the tolerance range (4:1 Ratio). Test system uncertainty is determined via a Gage Repeatability & Reproducibility (GR&R) study.

2.4 MARKING/IDENTIFICATION:

2.4.1 PART MARKING: Locations and methods of markings must be in accordance with drawings, technical data packages, contract quality assurance provisions, or through other contract requirements/clauses. Data format must be in accordance with MIL-STD-130.

2.4.2 SERIALIZATION AND MARKING: All CSIs require individual serialization or identification by lot number for traceability. Serial number requirements may be identified on drawings, in technical data packages, in contract quality assurance provisions, or through other contract requirements/clauses. Unless otherwise specified in the contract the contractor must develop an internal system for assigning serial numbers. Serialization should occur so that any individualized inspection/process that involves a critical characteristic is traceable to a specific serial number. All item serial numbers required by drawings, technical data package, contract quality assurance provision or through other contract requirements or clauses must be documented and reported to the Contracting

Officer or designee (i.e., DCMA). This includes material scrapped during manufacturing (if item/product serialization has been assigned prior to final marking). Serial numbers used in this program must not be used on any other part with the same basic part number (i.e., only a dash number or revision letter difference) manufactured by that contractor. Serial numbers must adhere to the requirements of MIL-STD-130 (latest issuance).

2.5 ORDER OF PRECEDENCE: The contractor must notify the Procurement Contracting Officer (PCO) immediately of any contradictions between this document and other contractual requirements. A written resolution to the contradiction will be issued to the contractor from the PCO.

2.6 REQUIREMENTS FLOWDOWN: If a process or processes that involve a critical characteristic or a CSI is subcontracted, this document must be imposed, in its entirety, on the subcontractor performing the work.

2.7 WARRANTY: Request Contracting Officers to cite FAR clause 52.246-17, Warranty of Supplies of a Noncomplex Nature, or 52.246-18, Warranty of Supplies of a Complex Nature, or a tailored warranty clause.

3.0 TECHNICAL DATA REQUIREMENTS

3.1 CLASSIFICATION: The Contractor must institute a classification system that establishes whether a part is considered a CSI. The classification of an item as a CSI must be based solely on its influence on flight safety. The Contractor must not classify a part as a CSI based on considerations such as cost, complexity, or the procurement time for the part. Unlimited life should not, in and of itself, prevent a part from being identified as a CSI. Any redesign effort that incorporates or modifies existing CSI components or assemblies should consider cross-Service commonality, elimination of the part/assembly as a CSI, or reduction of sensitivity to manufacturing, assembly, and/or installation variances. The Contractor must clearly identify on part or assembly drawings the critical characteristics for each CSI. The Contractor must prepare the critical characteristic identification and applicable control procedures to facilitate inclusion in related maintenance and overhaul documents, including applicable preservation, packaging and handling, and shipping instructions.

3.2 DESIGN: The Contractor must validate each CSI to ensure that all aspects of the design are thoroughly considered, parts/materials operate within design constraints, and the design allows for assessment by non-destructive evaluation (NDE), where possible. The Contractor's validation must include engineering analysis of the item's critical characteristics, and must consider changes/deterioration through time, use, fatigue life, and operating conditions.

4.0 MANUFACTURING/REPAIR PLANNING

4.1 PLAN CONTENT: All manufacturing, assembly, and inspection points for CSIs must be controlled by detailed procedures outlining each step or parameter of the manufacturing/repair process along with any materials, tooling, equipment, environmental control, and operator certification required that leads to the specific production/repair of an end item. Plans should clearly identify all critical characteristics and will include identification, in accordance with contractor procedures, as to its particular revision. All process plans must clearly define sequence of operation, machine type, and accept/reject limits for the specific process or operation. Critical processes not easily verified by subsequent inspection must clearly define process-operating parameters with tolerances.

4.2 FROZEN PLANNING REQUIREMENTS: If the offeror is a source other than the prime contractor or Original Equipment Manufacturer (OEM), frozen planning is required for CSIs. Once frozen, plans should remain frozen throughout the existing contract and all subsequent contracts for the item unless changes to the planning are made in accordance with this document. Frozen planning may also be required for the prime contractor or OEM when specific requirements for such have been negotiated between the cognizant ESA and the prime contractor/OEM.

4.3 CHANGES TO FROZEN PLANNING: All changes to CSI frozen planning affecting the method of manufacturing or sources will be submitted (via DCMA and the PCO) to the cognizant ESA.

5.0 AUDITS

5.1 CONTRACTOR AUDITS: Contractors are to perform self-audits of their frozen planning when that planning applies to a CSI or critical characteristics produced or verified in house. At a minimum, audits will be performed at the start of each production contract, annually, and when process changes occur. It is incumbent upon the contractor to assure that subcontractors accomplish self-audits, and the contractor must maintain records verifying that their vendors are in full compliance with the audit requirement. All audit findings will be recorded and corrective action will be documented.

5.2 GOVERNMENT AUDITS:

5.2.1 BASIC AUTHORITY: Authority to perform visits to determine the effectivity of a contractor's CSI program is contained in the FAR clause 52.246-2, Inspection of Supplies - Fixed Price.

5.2.2 MULTI-YEAR PROCUREMENT AUDITS (OPTIONAL): The Contractor must support annual Government audits of the Contractor's implementation of CSI

requirements, to include subcontractors and suppliers. The Contractor must make the following CSI documentation available to the Government audit team: CSI database, frozen planning, minutes and records, and existing supporting documentation. The Government will notify the Contractor a minimum of 30 days prior to the conduct of the audit. The audits will consist of up to two weeks at the Contractor facility and two weeks at subcontractor or supplier facilities. The visits may be scheduled for a single two-week visit or divided into two one-week visits. The Contractor must provide a response addressing each finding of the audit report within 30 days of notification. The Contractor must prepare the response IAW DI-MISC-80508 and deliver IAW CDRL (---). The response must address each finding of the audit report. The Government will conduct follow-up audits to ensure that corrections have been accomplished. The Government may conduct unscheduled audits on specific CSIs where potential issues are identified, as necessary.

6.0 CRITICAL CHARACTERISTICS

6.1 INSPECTION OF CRITICAL CHARACTERISTICS: All critical characteristics that can be non-destructively inspected/tested must be subjected to 100% inspection by the contractor or subcontractor unless specific approval is received from the cognizant ESA. Critical characteristics that require destructive testing are to be tested on a lot or batch basis (as determined by DCMA), with no skip lots allowed. All inspection records must identify the CSI part number, serial or lot number, and characteristic(s) inspected. Critical characteristics must be identified on the inspection records in such a manner as to draw attention to them. Inspection records must reflect the exact readings or dimensions, date of inspection, identity of inspector, and any required inspection documentation. These requirements are in addition to other contractual inspection requirements.

6.2 VARIABILITY REDUCTION METHODS: Once the manufacturing program/repair procedure demonstrates that the critical processes are statistically in control, stable, and capable, the contractor may submit to the ESA (via the PCO) for approval its documentation with a request to implement a Statistical Process Control (SPC) program in lieu of 100% inspection for critical characteristics. At the Government's discretion, 100% inspection may be reinstated if the process controls prove inadequate.

6.3 SAMPLING INSPECTION: Unless otherwise specified, characteristics not identified as critical may be inspected on a sampling basis in accordance with ANSI/ASQC Z1.4. Use of any other sampling plan is subject to DCMA approval.

7.0 CONTROL OF NONCONFORMING MATERIALS

7.1 DISPOSITION OF NONCONFORMING CRITICAL SAFETY ITEMS: All CSI non-conformances (critical, major and minor) will be forwarded through DCMA to the PCO for disposition. CSI non-conformances should not be dispositioned "use as is" or "repair" through contractor action, however "rework to print" is acceptable. Request for deviations to critical characteristics must be classified as critical. Only the cognizant ESA has the approval authority for disposition of CSI non-conformances (via the PCO), unless specifically delegated.

7.2 DISPOSAL OF NONCONFORMING PARTS: Product dispositioned for scrap should be conspicuously and permanently marked or positively controlled until physically rendered unusable.

7.3 DELIVERED NON-CONFORMANCES: Contractors must notify the PCO immediately of any discovered non-conformances that may exist in previously delivered CSIs. Notification is required whether or not the characteristic in question has been classified as a critical characteristic. Notification must include a description of the suspected non-conformance, contract number, part number, and affected serial numbers or lot numbers, when applicable.

8.0 RECORDS

> **Note**: For Commercial, Surplus, and PBL procurements, some tailoring may be required.

8.1 TRACEABILITY AND CERTIFICATIONS:

8.1.1 TRACEABILITY: All records relating to CSIs must be traceable to the date and place of production/repair. Records must provide the degree of traceability required to enable subsequent verification of all aspects of material, manufacture and/or repair, special process, personnel certification, variability control charts (if applicable), assembly, and inspection of critical characteristics. Special processes include but are not limited to heat treat, shot peening, and non-destructive testing.

8.1.2 CERTIFICATION OF PERSONNEL: Contractor personnel performing work or having inspection responsibilities pertaining to critical characteristics, must be certified to the appropriate professional level as outlined in the applicable national standards, best commercial practices, or as contractually required. A records system for tracking personnel certification should be an element in the contractor internal audit program to assure all certifications are maintained in a current status.

8.2 PURCHASING RECORDS: All purchase orders for subcontracted products or processes that contain critical characteristics must clearly identify the critical characteristic and reference this document for compliance. All documents and referenced data for CSIs must be available for review by the Government to determine compliance.

8.3 RETENTION OF RECORDS: The contractor must retain copies of all records generated pursuant to this standard and make these records available to the Government upon request. Records must be retained for a period of at least ten years after final payment. At the end of this period, or in the event of relocation or shutdown, all records must be offered to the PCO prior to disposal.

9.0 NOTIFICATIONS

9.1. SUPPLIER REMOVAL: In the event that a previously approved source utilized for the manufacturing/repair of CSIs (parts, special processes, NDT, etc.) has been removed, the contractor must promptly notify the PCO. As a minimum the notification should include the name of the supplier, address, CAGE code, products or services provided by this source, and the reason for source approval removal.

9.2 RELOCATION OF MANUFACTURING/REPAIR FACILITIES: In the event that a contractor or subcontractor relocates the manufacturing or repair location of a CSI product or part, the contractor must promptly notify the PCO via DCMA. As a minimum the notification must include the contract number, part(s) affected, scope and impact of the relocation effort, re-qualification plans, and any other pertinent information.

9.3 BUSINESS STATUS CHANGE: If any changes occur in the Contractor's business status pertaining to technical/quality-related issues related to CSI manufacture/repair (e.g., license agreement expiration, indictment, bankruptcy), the Contractor must immediately provide notification and supporting documentation of the changes to the Procurement Contracting Officer (PCO).

10.0 SOURCING

10.1 SOURCING AND PROCUREMENT: For contractors responsible for design and/or delivery of aviation systems or platforms/equipment (such as aircraft, engines, ground communications and electronics systems, and test equipment), when a new source of supply for a CSI is required, the Contractor must complete all original qualification testing as was required during the original qualification of the approved source(s). Reductions in such testing must be submitted to the Contracting Officer for Government review and approval.

11.0 STANDARD CSI CONFIGURATION MANAGEMENT CLAUSE

> **Note**: *This "Standard CSI Configuration Management Clause" is intended to be used in its entirety. Exclusion or alteration of any portion of this requirement is discouraged. The terminology in this section aligns with the terminology and definitions in the Multi-Service/Defense Agency CSI Instruction (Appendix I). Specific configuration management (CM) requirements should be included in contracts via inclusion of example clauses below and/or state IAW a specific CM standard. The terminology used in MIL-HDBK 61A and EIA-649 differs slightly from the specific terms used here; however, there is no difference in technical meaning (e.g., Class I and/or Class II ECP versus Major and/or Minor Variances).*

The Contractor must maintain the total baseline configuration of the contract items, including, but not limited to, hardware, software and firmware, in accordance with the configuration management provisions of this contract.

11.1 DEFINITIONS:

11.1.1 ENGINEERING CHANGE PROPOSAL (ECP): An ECP is the documentation by which an engineering change and its implementation for items to be delivered under this contract are proposed, justified and submitted to the appropriate authority for approval or disapproval. Class I and Class II ECPs will be classified as follows:

11.1.1.1 CLASS I ECP: An engineering change will be classified as Class I if:

a. it affects any physical or functional requirement in approved functional or configuration documentation, or

b. it affects any approved functional, allocated or product configuration documentation, cost to the Government, warranties or contract milestones, or

c. it affects approved product configuration documentation and one or more of the following: Government furnished equipment (including Government test equipment and associated programs such as Test Program Sets/Software); safety; compatibility, interoperability, or logistic support; delivered technical manuals for which changes are not funded; will require retrofit of delivered units; preset adjustments or schedules affecting operating limits or performance to the extent a new identification number is required; interchangeability, substitutability, or replacement of any item down to non-repairable assemblies, sources on a source control drawing; or skills manning, training, biomedical factors or human engineering design.

11.1.1.2 CLASS II ECP: An engineering change is Class II if it does not impact any of the Class I factors specified above.

11.1.2 DEVIATION: A deviation is the specific written authorization to depart from a particular requirement of the item's configuration for a specific number of units or for a specific amount of time. It is also a specific written authorization to accept items, which are found to depart from specified requirements, but which nevertheless are considered suitable for use "as is" or after correction by a specified method. The term deviation encompasses what previously had been defined as both a deviation and waiver and therefore includes requests to depart from a known requirement before, during or after manufacture and/or repair of an item. Deviations will be classified as follows:

11.1.2.1 CRITICAL DEVIATION: A deviation is designated as critical when the deviation consists of a departure involving safety or when the configuration documentation defining the requirements for the item classifies defects in requirements and the deviations consist of a departure from a requirement classified as critical. A critical deviation deals with a critical nonconformance.

11.1.2.2 MAJOR DEVIATION: A deviation is major when it consists of a departure from requirements or specifications involving: health, performance, interchangeability, reliability, survivability, maintainability or durability of the item or repair parts, effective use or operation, weight or size, and appearance (when a factor) or when the configuration documentation defining the requirements for the item classifies defects in requirements and deviations consist of a departure from a requirement classified as major. A major deviation is associated with a nonconformance that is major, and not a critical, as is likely to result in failure of the item or materially reduce the usability of the item for its intended purpose.

11.1.2.3 MINOR DEVIATION: A deviation is minor when it consists of a departure that does not qualify as Critical or Major deviations or when the configuration documentation defining the requirements for the item classifies defects in requirements and the deviation consist of a departure from a requirement classified as minor. A minor deviation is associated with a minor nonconformance in that the nonconformance is not likely to materially reduce the usability of the item for its intended purpose, or is a departure from established standards having little bearing on the effective use or operation of the item.

11.2 CONFIGURATION MANAGEMENT/ECPs:

11.2.1 CONFIGURATION CONTROL: The Government will maintain configuration control and change authority for all modifications or changes affecting form, fit, function, or interface parameters of the contract items and sub-assemblies. Guidelines for preparing Class I and Class II ECPs may be found in MIL-HDBK-61A, Configuration Management Guidance and similar guidance with different terminology in ANSI/EIA-649, National Consensus Standard for

Configuration Management**.** The Contractor will maintain configuration of the items in accordance with the requirements of this contract.

11.2.2 ECPs: The Contractor must submit an Engineering Change Proposal (ECP) for any Class I or II changes that impact the items covered by this contract. An ECP must be designated Class I or Class II, as defined in this contract.

11.2.2.1 PENDING/APPROVED: If the Contractor has an ECP pending with another Government activity or has an approved ECP that the Contractor proposes to incorporate under this contract, the Contractor will notify the PCO of the status of the ECP and provide a copy of the ECP submission. Any such Class I ECPs, however, will be incorporated only by modification to the contract.

11.2.2.2 PROCESSING: A properly documented ECP submitted under this contract should be processed as follows:

11.2.2.2.1 CLASS I: Class I ECPs must be submitted to the contracting officer for approval/disapproval. A Class I change will be not be implemented until a contract modification is issued by the contracting officer.

11.2.2.2.2 CLASS II: Class II ECPs involving CSIs must be clearly identified as involving a CSI, must be submitted to the contracting officer for review by the contracting officer and the cognizant ESA, and may be implemented only upon the approval of the contracting officer**.** When authorized in writing by the contracting officer, where the cognizant ESA has formally delegated approval authority to DCMA to concur in Class II ECPs involving CSIs (which is specific to the Contractor's location and CAGE code), a Class II ECP involving a CSI may be submitted to the DCMA and implemented upon DCMA's concurrence**.** Class II changes must be made at no additional cost to the Government; however, specific contract clauses may cause the Government to incur costs (i.e., FAR 52.246-xx for cost- reimbursement contracts).

11.2.2.3 COORDINATION: The Contractor must coordinate with the cognizant Program Management Office prior to any ECP submission.

11.2.2.4 FORMAT: Under this contract, a Class I ECP may be prepared in the contractor's format but in a medium compatible with Government information management systems. In addition, a Class I ECP must provide all information required by DI-CMAN-80639C – Engineering Change Proposal. A Class II ECP may be prepared in the contractor's format. The minimum required data is: name and part number of item affected; name and part number of next higher assembly; description of the engineering change; need and reason for the

change; all government contract numbers for which the change applies; and the change document number. Justification codes are not required for Class II ECPs.

11.2.2.5 DISPOSITION: The contractor is not entitled to any equitable adjustment to the contract price or terms based on the Government's disapproval of a Class I or Class II ECP.

11.3 DEVIATIONS:

11.3.1 AUTHORIZATION: The Contractor must not manufacture any item for acceptance by the Government that incorporates a known departure from technical or contractual requirements unless a request for a deviation has been approved. Authorized deviations are a temporary departure from the requirements only and do not authorize a change to the item's configuration baseline.

11.3.2 PREPARATION: Deviation requests must be prepared in accordance with DI-CMAN-80640C – Request for Deviation. Guidelines for preparing deviations may also be found in MIL-HDBK-61A, Configuration Management Guidance and ANSI/EIA-649, National Consensus Standard for Configuration Management**.**

11.3.3 PROCESSING: A Request for Deviation must be processed as follows upon submission of a properly documented request:

11.3.3.1 CRITICAL/MAJOR: For items involving a critical or major deviation, delivery and/or shipment of such items under this contract is not permitted until authorized in writing by the contracting officer.

11.3.3.2 MINOR: Minor deviations affecting CSIs must be identified as involving a CSI, must be submitted to the contracting officer for review by the contracting officer and the cognizant ESA, and may be delivered only upon the approval of the contracting officer. When authorized in writing by the contracting officer, where the cognizant ESA has formally delegated approval authority to DCMA to disposition minor deviations involving CSIs (which is specific to the Contractor's location and CAGE code), a minor deviation involving a CSI may be submitted to DCMA and implemented upon DCMA's concurrence**.**

11.3.4 RECURRING DEVIATIONS/CONSIDERATION: Recurring deviations are discouraged and shall be minimized. The contractor is not entitled to any equitable adjustment to the contract price or terms based on the Government's disapproval of a major/critical or minor deviation. In addition, the Government may be entitled consideration from the contractor if a deviation is approved.

12.0 MATERIAL TESTING AT GOVERNMENT LABORATORY

Material procured under this contract will be subjected to testing at the following designated Government Testing facility or laboratory. The contractor will deliver the material to:

Government Facility: [specify name and address]

16 March 2011

Exhibit E

Checklist for Companies Relocating Manufacturing Facilities

A contractor planning to relocate manufacturing facilities should provide the following information:

1. A list and status of DoD contracts currently in place at the closing facility.

2. A complete list, by part number, of products being relocated.

3. Identification of any product controlled by a Qualified Products List (QPL)

4. A copy of the company transition plan or product re-certification plan.

5. Estimated dates when the move will be completed and when products manufactured by new facility will be ready for shipment.

6. What percentage of factory personnel, if any, will be relocating to the new facility.

7. If product is being relocated to an existing facility manufacturing similar product lines, provide a description of the facility receiving the work, including type of products currently made there, personnel skills and qualifications, current facility certifications, and equipment available.

8. Provide a description of the training that gaining key personnel will receive on the relocated products (i.e. on-the-job training conducted by skilled artisans from the closing facility, formal classroom training, etc.)

9. If applicable, provide a description of any significant product manufacturing changes that may be implemented as a result of the relocation. (i.e. outsourcing of special processes, changes in vendor base, updating/changes to drawings, modifications to automated test equipment, etc.)

10. Provide a listing of manufacturing equipment, tooling and gauging that will be transferred to the new facility and verification methods that will be used.

11. Describe what method will be used to re-certify products manufactured by the new facility, including conformance to drawings and specifications (i.e. certification samples, first article testing, co-relation testing, first piece layout, etc.).

12. Identify and provide telephone numbers of key personnel (transition manager, quality manager, chief engineer, contract manager) assigned to the relocation effort.

16 March 2011

Exhibit F

Example CSI Quality Assurance Letter of Instruction

DEPARTMENT OF THE NAVY
NAVAL INVENTORY CONTROL POINT
700 ROBBINS AVENUE 5450 CARLISLE PIKE PO BOX 2020
PHILADELPHIA, PA 19111-5098 MECHANICSBURG, PA 17055-0788

IN REPLY REFER TO:

[Date and office code]

From: Commanding Officer, Naval Inventory Control Point - Philadelphia
To: Commander, Defense Contract Management Agency, **[*Specify area*]**

Subj: QUALITY ASSURANCE LETTER OF INSTRUCTION (QALI), CRITICAL SAFETY ITEMS

Ref: (a) DoD Instruction XXXX.XX, Management of Aviation Critical Safety Items
Ref: (b) DFAR 246.103, Contracting Office Responsibilities

Encl: (1) QALI Requirements

1. This QALI is issued in accordance with references (a) and (b).

2. The requirements stated on enclosure (1) apply to contract N00383- XX-X-XXXX, NSN: [_____], P/N: [_____], Noun: [_____] awarded to (CAGE CODE) Allied Signal, Guidance Systems Operations, 123 Nowhere Ave, Los Angeles, CA.

3. QAR acknowledgement of this QALI is requested within fifteen workdays by returning or faxing a signed copy or by email notification.

4. If for any reason the QAR is unable to execute this QALI, a written response stating the reasons shall be forwarded to the POC listed below.

5. Any comments, questions or correspondence regarding this QALI shall be directed to [_____ _____, Code _____, DSN 442-_____ or Commercial (215) 697-_____, FAX (215) 697-2524, E-Mail Address _____]

Supervisor's Signature
By Direction

16 March 2011

QUALITY ASSURANCE LETTER OF INSTRUCTION (QALI) REQUIREMENTS

Contract: *XXXXX* **CAGE CODE:** *YYYYY*
Contractor:_____
Nomenclature: _____
Part Number: _____
NSN: _____

1. General Quality Requirements

a. Item Application: This item is a component of the Nose Landing Gear used on the F-18 Aircraft. It has been designated as a Critical Safety Item (CSI) by the ESA. In accordance with reference (a), a CSI is defined as a part, assembly, installation, or production system with one or more critical characteristics that, if not conforming to the design data or quality requirements would result in an unsafe condition. The critical characteristics identified for this item are those specified in the Specific Quality Requirements section of this QALI.

b. Part and Contractor History: Our records indicate that two valid PQDRs have been received against this item or contractor **(whichever is appropriate)** in the last two years. Both PQDRs were related to dimensional discrepancies. **(Note: This would apply only when the procuring activity has information available on past procurement history.)**

c. Delegation: Government Source Inspection (GSI) on characteristics identified below that cannot be accomplished in-plant, shall be delegated to the subcontract level.

d. Nonconforming Supplies: [This paragraph should state the level of authority delegated to DCMA, if any, for acceptance of nonconforming material. It should be in accordance with the terms and conditions of the contract and should specify the approval authority for minor, major and critical deviations. MRB authority should be addressed here.]

e. Contract Quality Assurance (CQA): CQA actions shall include, but not be limited to, the specific actions listed below.

2. Specific Quality Requirements (Critical Characteristics):

[In this section, the procurement office identifies the product characteristics to be verified, witnessed, or performed by the Product Assurance Specialist (PAS), including the type and extent of inspection (i.e., one time, first lot only, sampling, or 100%) The level of inspection should not exceed what has been imposed on the contractor.]

Verify (Review contractor's records) the following characteristics:
- *Hardness per Note # 3 of drawing 12434556*
- *Magnetic Particle Inspection per Note # 6 of drawing 1234566*
- *Material Certification, per Note # 1 of drawing 12434556*

Perform 100% inspection (Physically accomplish inspection) of the following:
- *Drawing 123456, Zone 3C, Dia. 5.2280, +.0022/-.0000, before plating.*
- *Drawing 123789, Zone 4E, Dia. 5.224, +.003/-.000, after plating and polishing*

Exhibit G

Example Surplus Procurements Clause

A. The following information should be submitted with offers of SURPLUS SUPPLIES.

(1) The SURPLUS SUPPLIES are new, unused, and were manufactured by (insert name and address):

(2) The SURPLUS SUPPLIES were purchased by the offeror from the Government selling agency or other source identified below. If the supplies were purchased from the Government by a source other than the offeror, identify that source. (If complete information is not available, attach an explanation as to when, where and how the property was acquired). Provide the following:

SELLING AGENCY _____

CONTRACT DATE _____

CONTRACT NUMBER SOURCE_____

(3) The SURPLUS SUPPLIES: --

(i) [ ] have, [ ] have not been altered, modified or refurbished;

(ii) [ ] have, [ ] have not been 100% inspected for correct part number and for absence of corrosion or any defects; and

(iii) [ ] do, [ ] do not contain cure-dated components.

(4) The SURPLUS SUPPLIES: --

[ ] will, [ ] will not be reconditioned, refurbished or altered. If the supplies contain cure-dated components, identify components to be replaced and the applicable rebuild standard. If the SURPLUS SUPPLIES are to be reconditioned or altered, attach complete description of the work to be done.

B. For SURPLUS SUPPLY ITEMS identified by manufacturer's code and part number, furnish the following information:

(1) Identify the applicable specification/drawings in possession of the offeror:

SPEC./DRAWING NO. _____

REVISION (IF ANY) _____

DATE _____

(**Note**: The offeror is responsible for furnishing supplies conforming to the requirements of the purchase description, even though the applicable specifications/drawings are not available. If any CoCs, manufacturing certification, etc. exist, copies should be included.)

(2) The offeror [ ] has, [ ] does not have the SURPLUS SUPPLIES. If the offeror does not have the SURPLUS SUPPLIES, attach an explanation as to how the offered quantities will be secured, their present location, the basis for the information provided in paragraph A.(1) above, and where a pre-award survey of the supplier may be performed.

(3) If SURPLUS SUPPLY ITEMS have data plates attached, furnish copy of information contained thereon.

(4) If the SURPLUS SUPPLY ITEMS are marked with serial/part numbers, indicate these numbers:

If the SURPLUS SUPPLY ITEMS are not marked with serial/part numbers, the offeror must be able to identify the items by manufacturer's drawings or other data acceptable to the Government inspector.

(5) The offered SURPLUS SUPPLY ITEM(s) --

[ ] have, [ ] have not been previously packaged, and

[ ] are, [ ] are not in their original package. If the original package is being used, state here all markings and data, including contract number, cited on the package.

The offeror agrees that in the event of award and notwithstanding the provisions of this solicitation, inspection and acceptance of the SURPLUS SUPPLIES will be performed at origin or destination subject to all applicable provisions for origin or destination inspection.

Failure to provide the information requested by this clause may require rejection of the offer for failure to meet the requirements of the solicitation.

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Exhibit H

Commercial Contract Clause

Addendum to FAR 52.212-4 Contract Terms and Conditions – Commercial Items (Applicable to attached order)

1. Under paragraph (a), "inspection and acceptance", add the following:

Specify the Technical requirements that the contractor should meet. (Repair manual, drawings, specifications, etc.)

Example: All repairs shall be performed in accordance with publication 03-16XXX-20 or drawing (CAGE) XXXXXX-X, specify revision level.

Specify a Quality Assurance requirement:

Example: The contractor shall maintain a quality system that addresses the elements of ISO9001-2000, Quality System Model for Quality Assurance in Design/Development, Production, Installation and Servicing; AS9100C Quality Management Systems - Requirements for Aviation, Space and Defense Organizations, or an equivalent program approved by the Navy.

Specify a Calibration requirement:

Example: The contractor shall maintain a calibration system that addresses the elements of ISO-10012-1, ANSI/NCSL Z540 or an equivalent program approved by the Navy.

Specify Data to be made available:

Example: The government reserves the right to assess the contractor's compliance to its documented quality system. The quality system procedures, planning, and all other documentation, media, and data that comprise the quality system shall be made available to the government for their review and use. The acceptance of nonconforming supplies is a prerogative of and shall be as prescribed by the government. The government reserves the right to disapprove the quality system or portions thereof when it fails to meet its intended objectives.

Specify stages of material inspections:

Example: End items assemblies, subassemblies, or components manufactured or repaired under this contract are subject to in-process or final inspection by the Government. All product audits shall be performed at the discretion of the local Government QAR on a non-interference basis. (When advanced notification is furnished of the time contractor inspections or tests are to be performed, and that time arises and the QAR is not available, the contractor may proceed. Verification shall then be accomplished by records review.) This exception does not apply to Critical Safety Items.

Specify a Configuration Management requirement:

Example: The Contractor shall not make any configuration changes, engineering changes or part number changes to the contract/purchase order items, including, but not limited to, the item's hardware, software or firmware, unless approved by the Procurement Contracting Officer (PCO). In addition, approval by the appropriate technical authority may also be required. Guidance on how to submit a proposed engineering or part number change may be obtained from the PCO.

The Contractor shall not manufacture any item for acceptance by the Government that incorporates a known departure from technical or contractual requirements unless a request for a deviation has been approved. Authorized deviations are a temporary departure from the requirements only and do not authorize a change to the item's configuration baseline. Any deviation, major or minor, must be approved by the PCO prior to acceptance.

Specify if material intermingling is acceptable:

Example: The contractor shall maintain material control within the type model series, preventing any mixture of components between Government units and commercial or other customers' related programs.

Specify what documents must be sent with material:

Example: The contractor shall provide in writing a certificate of conformance with each delivery consistent with contractor's commercial practice.