

DCMA's Government Contract Quality Assurance Program

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Abstract

The Defense Contract Management Agency (DCMA) is responsible for helping to assure that products and services provided by industry on U.S. Department of Defense, NASA and international contracts comply with business and technical requirements. Where contracts include technical and management system requirements, DCMA performs technical surveillance of supplier, and where necessary, sub-supplier operations. This paper describes the new DCMA Product Assurance Policies that implement the Agency's contract quality assurance program required under the United States Government Federal Acquisition Regulation (FAR) Part 46, Quality Assurance. The new policies concentrate on specific government surveillance activities to be executed during the Systems Development and Demonstration, Production and Deployment, and the Operations and Support phases of the life cycle. Knowledge, understanding and cooperation between DCMA and the DoD acquisition community, including customers and suppliers, are important to the success of the Agency's program as implemented by its new policies.

1. Introduction

The Defense Contract Management Agency, hereafter referred to as DCMA or Agency, is a contract management organization within DoD that serves as an honest broker to help DoD buying offices, other government agency customers, and contractors successfully deliver products that meet contract requirements and customer needs. The Agency has 50 major field office locations and more than 11,048 civilian, active duty and reserve personnel working in the continental U.S. and around the world. It manages a contract business base of 290,962 contracts valued at over \$957 billion with 16,381 contractors [1]. In many cases, the Agency has technical and other personnel permanently located on-site at contractor facilities to perform its mission that includes assuring products are fully compliant to contract requirements and meet the expectations and outcomes desired by its customers.

2. Contract Management

2.1 Contract management of DoD contracts is the core business of DCMA. The core business is established by the authority of codified uniform policies, known as the Federal Acquisition Regulation (FAR), for acquisition of supplies and services by U.S. Government Executive Branch agencies. In accordance with the FAR, and when assigned contract responsibility by its

customers, the Agency has broad business and technical responsibilities to ensure contract compliance. Technical responsibilities include

- Ensuring contractor compliance with contractual quality assurance requirements,
- Performing surveillance to assess compliance with contractual terms for schedule, cost, and technical performance in the areas of design, development, and production, and
- Evaluating for adequacy and performing surveillance of contractor engineering efforts and management systems that relate to design, development, production, engineering changes, subcontractors, tests, management of engineering resources, reliability and maintainability, data control systems, configuration management, and independent research and development.

2.2 The Agency is required to develop and apply efficient procedures for performing government contract quality assurance actions to ensure that contractor quality assurance requirements are being met; perform all actions necessary to verify whether products conform to contract quality requirements; and report any defects observed in design or technical requirements [2&3]. The new DCMA Product Assurance Policies implement these FAR requirements.

3. Product Assurance Policies and Practices

3.1 Product assurance policies and practices are based on a performance-based management (PBM) strategy to enable organizational performance that focuses on and achieves outcomes (results) that are most important to customers. Customers operate in two distinctly different environments: program managed and item managed. These environments directly relate to the different phases of the Defense Acquisition Life Cycle [4&5]. Figure 1 depicts the relationship between the program managed and item managed environments, and the System Development & Demonstration, the Production & Deployment and the Operations & Support phases of the acquisition life cycle. Also shown in Figure 1 are the critical safety item (CSI), program managed, standard and limited product assurance approaches that will be discussed later in this paper.

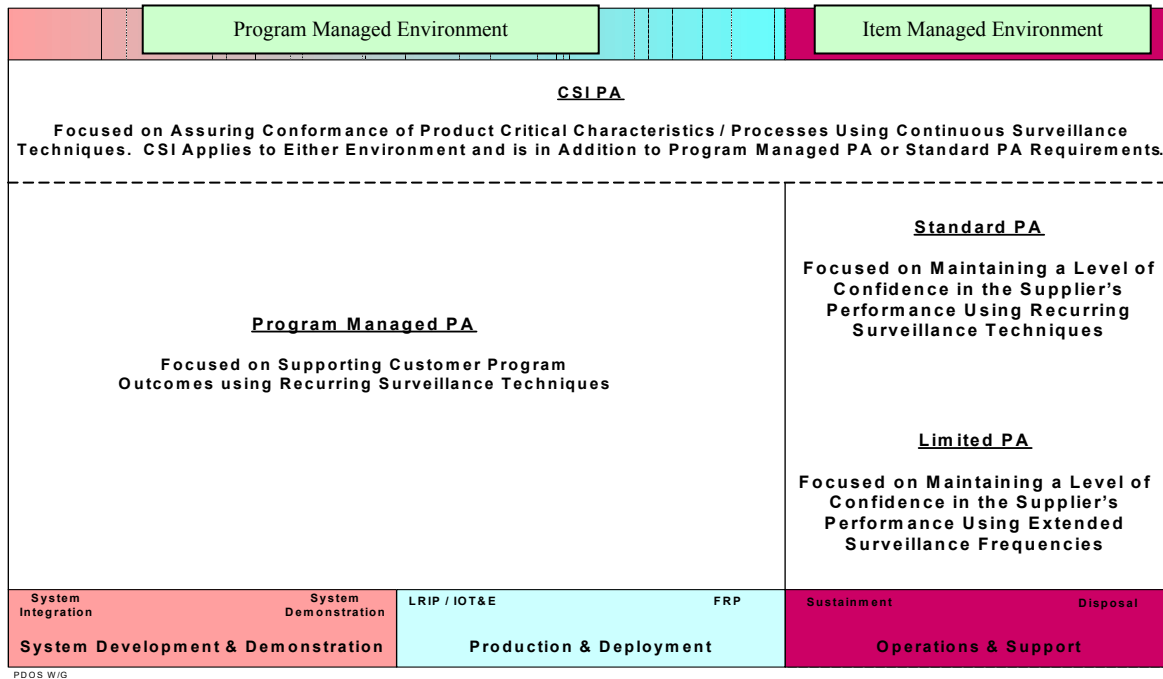


Figure 1. Product Assurance (PA) Relationships

3.2 In order to apply an effective PBM strategy, customer outcomes must first be determined. In the program-managed environment, outcomes are determined through continuing dialogue with the customer's program management office. Customer outcome product assurance support meetings are conducted to exchange information between the program office and Agency product assurance personnel. Desired outcomes, surveillance strategies and performance measures are discussed and agreed upon at these meetings. Initial meetings are held early in the System Development & Demonstration phase and are recurring as desired outcomes change, as significant changes in program risks develop and as a program progresses through major milestones and into Production & Deployment. In the item managed environment, i.e. during the Operations & Support phase of acquisition, it is impractical to engage with customers to discuss outcomes simply because the volume of contracts being administered is very large and cognizant customer technical representatives are not readily available. In this situation, performance-based agreements with customers at the agency level are established and serve as the basis for customer outcomes regarding all contracts issued by a respective customer.

3.3 Once customer outcomes have been determined, Agency product assurance personnel identify and assess the risks associated with contractor systems, processes and specific product characteristics that if not controlled would likely have a negative effect on achieving outcomes. Mitigating risk to customer outcomes is the basis for determining the scope and depth of the Agency's specific product assurance surveillance strategy to be implemented on a particular program or at a particular contractor facility. There may be multiple risks potentially affecting a single outcome, or a single risk affecting multiple outcomes. In the program managed

environment, a Product Assurance Risk Matrix tool is used to assess each individual risk that has been identified. This tool is used to determine the consequence or impact of a risk event and the likelihood or probability of its occurrence. Figure 2 depicts the relationship between likelihood and consequence in determining risk levels.

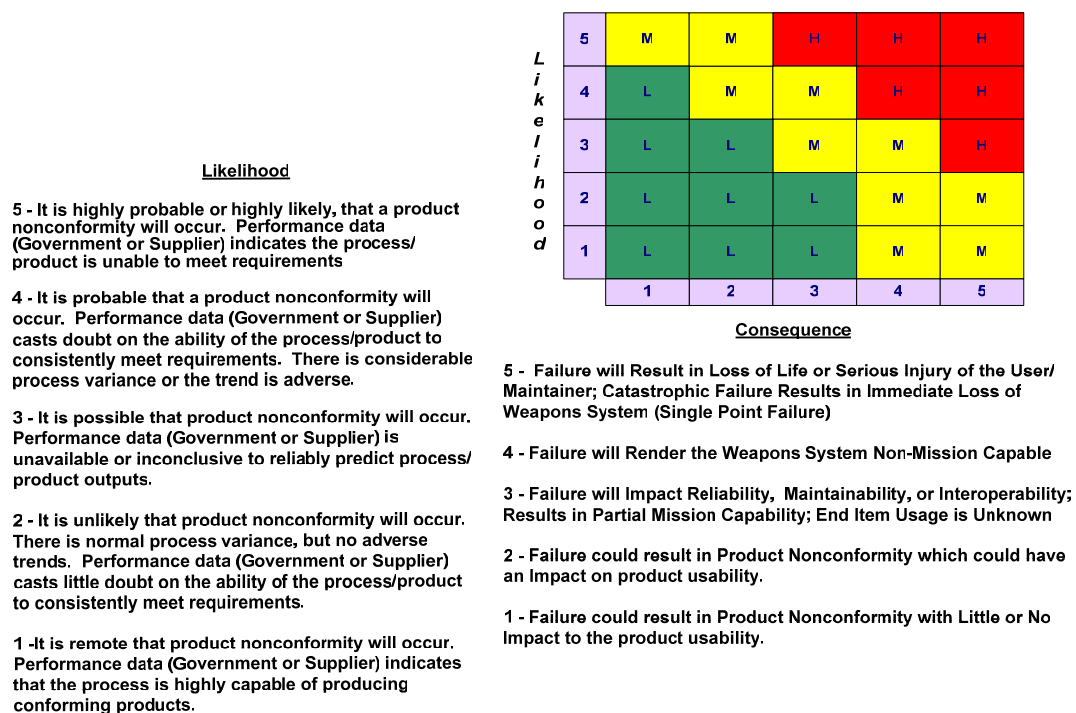


Figure 2. Product Assurance Risk Matrix

In the item managed environment, risk identification and assessment is determined using a risk surrogate approach. Risk surrogates fall into three distinct categories: non-complex/non-critical products, complex/critical products, and critical safety items (CSIs). Non-complex/non-critical products are evidenced by a Federal Acquisition Regulation (FAR) 52.246-2, Inspection of Supplies-Fixed Price, contract quality requirement, and risks that are identified are assessed as either moderate or low. Complex/critical products are evidenced by a FAR 52.246-11, Higher-Level Contract Quality Requirement, contract quality requirement, and risks are assessed as high, moderate or low. Critical safety items are evidenced by formal identification in a contract, technical data package, or customer quality letter of instruction. Risks associated with CSIs are assessed as either high or moderate.

4. Product Assurance Approaches

4.1 The Agency uses four distinct product assurance approaches to implement government contract quality assurance surveillance. These approaches are also known as surveillance strategies. As stated earlier, Figure 1 depicts the four strategies and their relationship to the Defense Acquisition Life Cycle. All four surveillance strategies address specific product

assurance methods and techniques, however the importance and emphasis of the different methods and techniques varies from one surveillance strategy to another. Each surveillance strategy is documented in a plan that describes the level of effort and interval applicable to the methods and techniques being used.

4.2 The program managed surveillance strategy focuses on activities that influence customer outcomes identified during customer outcome product assurance support meetings and on associated risks. The strategy addresses specific methods and techniques to be used to surveil the systems, processes and product characteristics that pose the greatest risk to the identified customer outcomes. During the System Development & Demonstration phase, emphasis is placed on mitigating risks associated with contractor systems that need to be robust in order to ensure successful system development and a smooth transition into Production and Deployment. The use of system audit and process review methods is emphasized. An interdisciplinary team effort is essential to the program managed surveillance strategy. A mix of engineers and other technical specialists is employed to gain a deeper insight into contractor plans, systems and processes that drive product quality.

4.3 There are two item managed surveillance strategies: a standard product assurance approach and a limited product assurance approach. Both approaches are facility-wide approaches not specific to any one customer or product line that apply during the Operations and Support phase of the acquisition life cycle. The standard approach is used for complex or critical products where product quality cannot fully be verified through end item product examination. Both process review and product examination (ex. functional testing and inspection) methods are used. The primary focus of standard product assurance is on the assessment of processes and product characteristics, that if nonconforming, would render the product unusable. Usually, assessment of contractor processes for product realization planning and control of purchases is included in the standard product assurance approach. Where process reviews and product examinations result in high confidence in contractor performance, the contractor can be placed on alternate release procedures [6] and surveillance frequencies can be extended up to six months. The limited product assurance approach is used for non-complex, non-critical products. If customer outcomes are not associated with these products then products are released through either a certificate of conformance (when allowed by contract) [7] or via alternate release procedures. When alternate release is used, surveillance is only accomplished on an exception basis when negative performance information such as customer complaints is known. If non-complex, non-critical products are associated with agency level customer outcomes, product assurance surveillance consists of initial product examination to establish a level of confidence in the contractor's performance and then use of alternate release procedures with product examinations conducted only on extended intervals from three to twelve months.

4.4 The fourth and final surveillance strategy is critical safety item (CSI) product assurance. This surveillance strategy applies whenever CSIs are present and in any phase of the Defense Acquisition Life Cycle. It applies to both aviation and non-aviation products. CSI product assurance is in addition to product assurance surveillance strategies developed based on the program and/or item managed environments. The strategy consists of both initial and continuing surveillance of customer defined CSI critical characteristics. If a defined critical characteristic is a product feature, initial product examination is performed on the first available production piece

and continuing surveillance is performed using a zero based statistically valid sampling plan. If a defined critical characteristic is a process, initial surveillance consists of conducting a process review in addition to verifying process output through product examination, and continuing surveillance consists of incremental process reviews until all process characteristics have been evaluated and periodic product examination to verify continued process integrity. Additional surveillance requirements exist for aviation CSIs including surveillance of important processes and significant characteristic [8].

5. Product Assurance Methods and Techniques

The principal methods and techniques used to perform government quality assurance surveillance are system audit, process review and product examination. A surveillance strategy includes one or more of these methods applied to each risk area identified for surveillance.

5.1 System audit is a systematic, independent, and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which audit criteria are fulfilled. System audits are used to determine the extent to which contractor management systems requirements, including contractual quality management systems, are fulfilled. An audit of a supplier's quality management system is a formal process conducted in accordance with ISO 19011. An interdisciplinary team of product assurance personnel performs system audits.

5.2 Process review is an assessment to determine the suitability, adequacy, and effectiveness of a process, element of the system, or program event. It can be performed on a complete process or conducted on an incremental basis at an established interval. Product assurance personnel have the flexibility to determine depth and scope when conducting a process review.

5.3 Product examination is a method to determine conformance of one or more physical characteristics of a product. A product is either an item delivered to the government such as a contract line item (a weapon system or supporting technical data) or the output of a process such as a weld, engineering analysis report or a test result. Product examination techniques include:

- Inspection - conformity evaluation by observation and judgment accompanied as appropriate by measurement or gauging.
- Testing - determination of one or more characteristics according to a procedure.
- Witness - to observe the contractor or subcontractor performing an inspection or test.
- Verification - confirmation, through the provision of objective evidence, that specified requirements have been fulfilled.

When sampling procedures are used to accept products using product examination, a zero based sampling plan is used with an initial quality release level (QRL) of 0.40% for CSIs, 1.0% for complex/critical products, and 4.0% for non-complex/non-critical products.

6. Summary

DCMA has established a new government contract quality assurance program that is performance-based and tailored to specific circumstances such as customer environment and product complexity and criticality. The new program applies specific high impact surveillance strategies that mitigate risks and provides confidence that customer outcomes will be achieved.

7. References

1. Agency Level Data (January 2006)
2. FAR Part 46, Quality Assurance
3. FAR SubPart 42.3, Contract Administration Office Functions
4. DoD Directive 5000.1, The Defense Acquisition System
5. DoD Directive 5000.2, Defense Acquisition Guidebook
6. DFAR 246.471, Authorizing Shipment of Supplies
7. DFAR 52.246-15, Certificate of Conformance
8. SECNAVINST 4140.2, Management of Aviation Critical Safety Items