BY ORDER OF THE SECRETARY OF THE AIR FORCE

AIR FORCE INSTRUCTION 63-501

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Acquisition

AIR FORCE ACQUISITION QUALITY PROGRAM

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction implements AFPD 63-5, *Quality Assurance*. Personnel engaged in acquisition must follow this instruction to ensure that products delivered to the Air Force meet or exceed quality requirements. It applies to service contracts when Federal Acquisition Regulation (FAR) higher-level contract quality requirements are applicable.

SUMMARY OF REVISIONS

This is the initial publication of AFI 63-501. It implements AFPD 63-5, substantially revising AFR 74-1; incorporates new concepts for performing acquisition quality functions and updates organizational functions and responsibilities for quality due to major reorganizations in the Air Force, including the formation of Air Force Materiel Command, and the Air Force acquisition system defined in AFPD 63-1, *Acquisition System*.

1. Process Overview:

1.1. The Air Force Acquisition Executive (AFAE), Program Executive officers (PEO), Designated Acquisition commanders (DAC), System Program Directors (SPD), Product Group managers (PGM), Materiel Group managers (MGM), Program managers (PM), and other Air Force acquisition officials are responsible for assuring superior quality of their assigned products during all acquisition phases.

1.2. The Air Force Acquisition System relies on an integrated approach to ensure products meet or exceed user quality requirements. All personnel involved in the acquisition process are responsible for performing quality functions inherent in their assigned duties. These functions include identifying quality requirements; translating them to contractual documentation; monitoring quality of contractor performance; and performing product verification and acceptance activities.

1.3. Using commands identify essential quality requirements for their products.

1.4. Using and acquisition activities use the product quality deficiency reporting and correction system (TO 00-35D-54) to provide visibility of overall product quality.

1.5. Users of this instruction should refer to **Attachment 1**, section A for additional information on acquisition quality functions.

2. Quality in Acquisition Program Management:

2.1. The AFAE, PEOs, and DACs provide quality management oversight of their assigned products.

2.2. SPDs, PGMs, MGMs, PMs and other Air Force acquisition officials develop and manage effective and efficient quality programs for their assigned products that:

- Provide for open and clear lines of communication between the acquisition activity, the using command, the Contract Administration Office (CAO), and the contractor.
- Incorporate user product quality requirements into contractual requirements (e.g., product specifications and drawings).
- Define and quantify essential quality requirements; emphasize quality improvement of both products and processes; and verify products meet or exceed essential quality requirements for each acquisition phase.
- Give suppliers the flexibility to efficiently achieve quality requirements commensurate with user requirements.
- Focus on designing robust products and capable manufacturing processes that minimize variability around target values traceable to significant quality characteristics.
- Integrate quality requirements and strategies into all acquisition strategies and plans throughout all phases of a product's life cycle.
- Link quality assessments to contractual commitments.
- Assess quality of design, quality of conformance, suitability of manufacturing quality systems, and fitness for use in program and contract reviews during each acquisition phase.
- Tailor quality requirements for use in the specific solicitation or contract.
- Use quality audits and product-oriented surveys and evaluations, as necessary, to assure the adequacy of technical requirements relating to quality and product conformance with design intent.

2.3. Acquisition officials and supervisors of acquisition personnel ensure personnel performing acquisition quality functions meet applicable requirements for acquisition professional development and certification (reference DoD Directive 5000.52, *Defense Acquisition Education, Training and Career Development Program*, October 25, 1991).

3. Quality Requirements Management Process:

3.1. The using activity teams with the acquisition activity to identify objective quality criteria for products.

3.2. The acquisition activity responsible for design, development, production or logistical support during deployment translates user requirements into plans and procedures to provide quality products to the user. It specifies, measures, and assesses product quality, based on user requirements, for each phase of the system acquisition and sustainment process.

3.2.1. For products acquired through contracting, the acquisition activity, in coordination with using command and commands and CAO and CAOs, translates user requirements into effective and efficient contract quality requirements and specifications.

3.2.2. For products provided from Government sources, the acquisition activity develops procedures and quality assurance plans to ensure the user receives quality products.

4. Quality in Design, Development, Production, and Deployment:

4.1. Quality in the Systems Engineering Process. Personnel responsible for systems engineering:

- Identify product characteristics and critical manufacturing processes that have a significant influence on performance, producibility, supportability, and service life to focus quality efforts.
- Identify quality requirements (e.g., process controls, specifications, tests, standards, training and certification, and evaluations) for products and validate them as part of the design review process.
- Ensure that product designs are robust so they will withstand variations in the manufacturing, operating, and environmental conditions.
- Use technical analysis techniques and quality engineering tools (e.g., Quality Function Deployment (QFD), Design of Experiments (DOE)) to optimize each product's design, producibility, and "first pass" yield for production processes.
- Use quality engineering test evaluations to establish manufacturing process capability and provide feed-back to improve both the product design and manufacture.
- Emphasize use of manufacturing processes that minimize variability around target values for critical product characteristics.
- Monitor development of manufacturing and assembly processes and test and evaluation (developmental and operational) results for early identification of design, manufacturing, or quality assurance deficiencies.
- Monitor design and manufacture of critical subsystems, especially those crucial to personnel and flight safety, environmental protection, and prevention of system loss or damage.
- Analyze available quality information on parts, materials or components before approving their use in proposed systems or equipment. (***Note: Exploit available sources of this information, including the Defective Parts and Components Control Program and the Government-Industry Data Exchange Program.***)

4.2. Quality in the Production Process:

4.2.1. Before start of production, personnel responsible for manufacturing and quality assurance:

- Ensure completion of all specifications, standards, inspections, tests, training and certification require-ments and evaluations required to control quality.
- Identify quality control requirements for critical manufacturing processes (e.g., statistical process control).
- Emphasize defect prevention activities over defect detection and correction activities.
- Evaluate manufacturing and assembly operations for ability to perform appropriate examination and testing.

- Ensure availability of any special acceptance inspection equipment and that test equipment calibration procedures and metrology and calibration plans are ready.

4.2.2. For initial production, personnel responsible for manufacturing and quality assurance assess the capability to achieve product quality requirements through:

- First article testing of preproduction samples.
- Initial production evaluations.
- Product-oriented surveys and evaluations.

4.2.3. During production, personnel responsible for manufacturing and quality assurance verify whether product quality requirements are being met through:

- Contractor objective evidence of product quality.
- Quality audits.
- Product-oriented surveys and evaluations.

4.3. Quality in Logistics. Personnel responsible for logistics requirements and initial product support:

- Identify quality requirements for logistical support early in the acquisition life cycle.
- Identify, throughout the development and production phases, processes and materials that require special verification procedures and quality controls.
- Tailor logistic quality requirements according to product and process complexity, criticality, and maturity.
- Document quality information that affects the re-acquisition of materiel (including inspection and testing requirements, and quality requirements) for the designated support management organization.
- Ensure that Commercial Off-The-Shelf (COTS) and Non-Developmental Items (NDI) meet the operational quality and supportability requirements.

4.4. Quality in Contracting and Purchasing. Personnel responsible for contracting and purchasing:

- Apply quality assurance requirements on contracts per FAR, Part 46 and DFARS, Part 246.
- Define contract quality requirements and provisions that are practical, enforceable, necessary, and verifiable. Do not use requirements that amount to or imply that a fixed level of defects is acceptable, such as "acceptable quality levels" (AQL), as acceptance criteria in specifications, standards, or other contractual documents for products.
- Tailor contract quality requirements to the specific product or products being acquired. This includes tailoring of quality and related specifications and standards to their application based on design complexity, design maturity, manufacturing process complexity and maturity, required performance, safety, and economics.
- Develop product verification requirements for each phase of the acquisition.
- Maximize flexibility for contractors to tailor quality plans and programs to meet product quality requirements.
- As appropriate, use contractual incentives linked to actual performance of the product in the field to encourage the highest level of contract performance.

- Provide enough information to ensure offerors understand quality requirements during contract negotiations.
- Award contracts only to contractors that have the capability to comply with quality requirements.
- Coordinate any unique contractual quality provisions or delegations with the contract administration activity as soon as possible.
- Maintain data about unsatisfactory supplies or services provided by contractors and review this information prior to contract award. Use contractor product quality data, when available, in all contract award decisions.

4.5. Quality in Contract Administration. Ensuring contractor compliance with contractual quality assurance requirements is a normal contract administration function per FAR, Subpart 42.302, *Contract Administration Functions*. The acquisition activity normally delegates this function to the cognizant CAO when it delegates contract administration responsibility per FAR, Subpart 42.202, *Assignment of Contract Administration.*

4.5.1. When the acquisition activity retains responsibility for ensuring that the contractor complies with contractual quality assurance requirements by either retaining responsibility for contract administration or specifically withholding responsibility for quality assurance from the cognizant CAO per FAR, Subpart 42.202, the acquisition activity is responsible for conducting Government Quality Assurance (GQA) per FAR, Part 46 and DFARS 246.

4.5.2. When the acquisition activity delegates responsibility for ensuring that the contractor complies with contractual quality assurance requirements, the cognizant CAO conducts GQA per FAR, Subpart 46.104, *Contract Administration Office Responsibilities*, and DFARS, Subpart 246.104, unless otherwise specified in the assignment of the contract or supplemental written instructions from the acquisition activity. The SPD, PGM, MGM, PM or other acquisition official, in coordination with the contracting officer, develops a written memorandum of agreement with the cognizant CAO or provides a quality assurance letter of instruction (QALI) to the CAO, as required, to identify specific or unusual quality requirements or make modifications to the normal GQA provided by the cognizant CAO. In the memorandum of agreement or QALI, request that the CAO develop an appropriate GQA surveillance plan tailored to the specific acquisition.

4.5.3. For administration of contract quality assurance requirements by the cognizant CAO, the SPD, PGM, MGM, PM or other Air Force acquisition official:

- Provides the contract GQA activity with the product information needed to perform contract quality assurance. This includes identification of critical parts and processes and unique product quality requirements.
- Requests that the contract GQA activity provide the buying office with quality assurance information needed for evaluating contractor performance.
- Specifies inspection and acceptance at source or destination in accordance with the risks involved in verifying compliance with quality requirements.
- Ensures that the GQA surveillance plan is appropriate to the acquisition and that the plan includes the product quality objectives for the acquisition.
- Takes action on product quality deficiencies identified by the contract GQA activity.

4.5.4. Air Force activities performing contract quality assurance functions for an acquisition activity:

- Provide contractors maximum flexibility in setting up efficient and effective quality systems to meet user product quality requirements specified under the terms and conditions of the contract.
- Evaluate contractor compliance with contract quality requirements, including the maintenance of con-tractor quality systems, using objective evidence of product quality and quality audits of contractor processes and data.
- Monitor performance of prime contractor control over purchased materials and subcontractors.
- Focus GQA surveillance on significant product characteristics and processes.
- Analyze contractor and government data to assure that contractor systems provide necessary visibility to identify process improvements and potential to reduce product variability.
- Establish a system to assure that the contractor takes corrective and preventive action to minimize or eliminate the recurrence of defective products.
- Maintain quality assurance surveillance and corrective and preventive action records to support contract administration requirements.
- Use contractor data to the maximum extent practicable for quality audits and objective evidence of product quality.
- Reduce and eliminate GQA surveillance, including quality audits, when the contractor demonstrates effective and efficient quality control.

5. Quality Assurance for International Acquisitions:

5.1. North Atlantic Treaty Organization (NATO) Acquisitions. Acquisition activities and quality assurance activities involved in NATO acquisitions:

- Upon request, perform GQA actions on NATO contracts for military materiel and services in accordance with NATO Standardization Agreement (STANAG) 4107, *Mutual Acceptance of Government Quality Assurance.*
- For contracts awarded to other NATO countries, specify the NATO quality requirements outlined in STANAG 4108, *Allied Quality Assurance Publications (AQAP)* and AQAP 100, *General Guidance on NATO Quality Assurance*.
- Delegate GQA services to the host Government whenever satisfactory services are available as specified in STANAG 4107.
- Keep Government personnel and contractors involved in the acquisition informed on the use of NATO quality assurance publications.

5.2. Military Assistance Program (MAP) Acquisitions. Acquisition activities and quality assurance activities handle GQA requirements on MAP acquisitions the same as for US Air Force acquisitions.

5.3. Foreign Military Sales (FMS). On FMS acquisitions, acquisition activities and quality assurance activities perform GQA under the conditions of the FMS Letter of Offer and Acceptance (LOA).

Unless otherwise agreed to in the LOA, the Air Force uses the same procedures as would be used in contracting for itself.

5.4. Direct Acquisition by Foreign Governments and International Organizations. On these acquisitions, quality assurance activities provide GQA as an FMS service under an FMS LOA. When a Memorandum of Understanding (MOU) exists with a foreign country, quality assurance activities check the MOU for applicable quality guidance and reciprocal performance of quality assurance for reference or incorporation in the FMS LOA. Refer to DFARS, Subpart 225.801, *International Agree-ments,* for specific information on current international agreements.

6. MAJCOM Responsibilities:

6.1. MAJCOMs develop and publish additional guidance, as needed, to define and allocate specific internal responsibility for ensuring compliance with this instruction. Within 30 calendar days after issuing any additional guidance, provide a copy to SAF/AQX.

6.2. Each MAJCOM establishes a central management focal point to:

- Serve as the command office of primary responsibility for monitoring compliance with the provisions of this instruction.
- Evaluate the quality of products at regular intervals. In this evaluation, review the degree of compliance with quality requirements in the various functional areas. MAJCOMs may accomplish this review as part of other scheduled reviews.
- Perform analyses of quality information (i.e., deficiency data, audit reports, studies), as neces-sary, to institute appropriate corrective and preventive actions and improve procedures.
- Ensure cross-feed of quality assurance information among all management levels and to other com-mands, agencies, the Air Staff, and SAF/AQXM.
- Assess the training requirements and the training of assigned quality assurance personnel to ensure that they meet applicable requirements for assigned tasks and for acquisition profes-sional development certification.
- Advise SAF/AQX of actual or potentially significant quality assurance problems involving other Air Force commands or other DoD components that may require SAF/AQX attention or coordination to resolve.

6.3. Headquarters, Air Force Materiel Command (HQ AFMC) establishes and maintains a product deficiency reporting and correction system (TO 00-35D-54) to provide feedback to the system devel-oper to track and record the status of the operational quality condition of the system. Use existing data systems to report metrics prescribed in AFPD 63-5.

RICHARD E. HAWLEY, Lt General, USAF
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Attachment 1

GLOSSARY OF REFERENCES, ABBREVIATIONS, ACRONYMS, AND TERMS EXPLAINED

References

Federal Acquisition Regulation (FAR), current edition, Part 46, *Quality Assurance.*

Defense FAR Supplement (DFARS), current edition, Part 246, *Quality Assurance.*

DoD Directive 5000.1, *Defense Acquisition*, February 23, 1991. *Policies and Procedures*, February 23, 1991, with change 1, Part 6, Section O, *Design for Manufacturing and Production* and Section P, *Quality*.

Air Force Supplement 1 to DoD Instruction 5000.2, *Acquisition Management Policies and Procedures,* August 31, 1993, Part 6, Sections O and P as supplemented.

AFPD 63-5, *Quality Assurance*, 7 September 1993.

TO 00-35D-54, *The USAF Material Deficiency Reporting and Investigating System*.

Federal Acquisition Regulation (FAR), current edition, Part 46, *Quality Assurance.*

Defense FAR Supplement (DFARS), current edition, Part 246, *Quality Assurance.*

DoD Directive 5000.1, *Defense Acquisition*, February 23, 1991.

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AFPD 63-5, *Quality Assurance*, 7 September 1993.

TO 00-35D-54, *The USAF Material Deficiency Reporting and Investigating System*.

Abbreviations and Acronyms

AFAE—Air Force Acquisition Executive

AFI—Air Force Instruction

AFMC—Air Force Materiel Command

AFPD—Air Force Policy Directive

AFR—Air Force Instruction

AQAP—Allied Quality Assurance Publication

AQL—Acceptable Quality Level

CAO—Contract Administration Office

COTS—Commercial Off-The-Shelf

DAC—Designated Acquisition Commander

DFARS—Defense FAR Supplement

DOE—Design of Experiments

FAR—Federal Acquisition Regulation

FMS—Foreign Military Sales

GQA—Government Quality Assurance

LOA—Letter of Offer and Acceptance

MAJCOM—Major Command

MAP—Military Assistance Program

MGM—Materiel Group Manager

MOU—Memorandum of Understanding

NATO—North Atlantic Treaty Organization

NDI—Non-Developmental Item

OPR—Office of Primary Responsibility

PEO—Program Executive Officer

PGM—Product Group Manager

PM—Program Manager

QA—Quality Assurance

QALI—Quality Assurance Letter of Instruction

QFD—Quality Function Deployment

SAF—Secretary of the Air Force

SPD—System Program Director

STANAG—Standardization Agreement

TO—Technical Order

Terms

Characteristic—A physical, chemical, visual, functional, or any other identifiable property of a product or material.

Commercial Item—An item regularly used in the course of normal business operations for other than Government purposes which:

1. Has been sold or licensed to the general public.
2. Has not been sold or licensed, but has been offered for sale or license to the general public.
3. Is not yet available in the commercial marketplace, but will be available for commercial delivery in a reasonable period of time.
4. Is described in paragraphs (1), (2) or (3) above and would require only minor modification in order to meet the requirements of the procuring agency.

Commercial Off-The-Shelf Item—A commercial item that has been produced and placed in stock by a

contractor, or stocked by a distributor, before receiving orders or contracts for its sale.

Contract Quality Requirements—The technical requirements in the contract relating to the quality of the product or products and those contract clauses prescribing inspection, and other quality controls incumbent upon the contractor, to assure that the product or products conforms to contractual requirements.

Fitness for Use—The effectiveness of the design, manufacturing, and support processes in delivering a system that meets operational requirements under all anticipated operational conditions.

Government Quality Assurance (GQA) Plan—This plan describes the Government surveillance of a contractor's performance on a program, contract, or in a facility to determine whether a contractor fulfills contract obligations pertaining to quality and quantity.

Metrology—The science of weights and measures used to determine conformance to technical requirements including the development of standards and systems for absolute and relative measurements.

Nondevelopmental Item—An item not requiring development. Nondevelopmental items include:

1. Any item available in the commercial marketplace;
2. Any previously developed item in use by a Federal, State, or local agency of the United States or a foreign government with which the United States has a mutual defense cooperation agreement;
3. Any item described in subparagraph (1) or (2) above that requires only minor modification to meet the requirements of the procuring agency; or
4. Any item being produced that does not meet the requirements of subparagraph (1), (2), or (3) above, solely because the item is not yet in use or is not yet available in the commercial market-place.

Process Capability—The measure of the output variability of a stable process, typically a manufacturing process. A process is considered "stable" when it is capable of producing conforming product and all special causes of variation (those not a normal part of the process) have been eliminated. Measures of process capability include the Process Capability Index (C_p) and the Process Performance Index (C_{pk}). A "capable" process is usually defined as one that is both stable and operating at a C_{pk} of 1.33 or higher.

Product—Supplies, services, systems or materiel. When appropriate, raw materials, components, and intermediate assemblies may also be classified as products.

Quality—The composite of material attributes, performance features, and characteristics of a product to satisfy a given need.

Quality Assurance (QA)—A planned and systematic pattern of actions necessary to provide confidence that adequate technical requirements are established; products conform to established technical requirements; and satisfactory performance is achieved.

Quality Audits and Product-Oriented Surveys and Evaluations—Systematic examinations of acts and decisions with respect to quality to independently verify or evaluate the operational requirements of the quality program or the specifications and contract requirements for the product or products. It is an objective evaluation of program adequacy from a quality viewpoint independent of other program goals. It examines anything that can impact quality such as improperly specified requirements, poor design, inadequate planning, etc. It investigates process capability and identifies problem areas to make

recommendations for corrective and preventive action. Product-oriented surveys and evaluations, in particular, verify that:

- Quality characteristics are specified and designed into the product or products.
- Quality characteristics are quantified whenever possible.
- Items with critical functions are identified and controlled.
- Quality and technical requirements are achieved or adequate planning has been accomplished to assure their achievement.

Quality Characteristics—Those characteristics that exert a significant influence on performance, producibility, supportability and service life. They are defined as part of the systems engineering process. Process controls, specifications, standards, tests, training and certifications, requirements, and evaluations will be defined, developed, and demonstrated as part of the design review process.

Quality Control—Those actions that control the production of output to fulfill requirements for quality in raw or produced material and services. Quality control includes a feedback process that measures actual performance, compares it to quality requirements, and acts on the difference to minimize variation. Quality control is the measurement of a process or product by an automated process, operator or other person, with comparison to requirements and action to resolve variation from a standard.

Quality Engineering—That aspect of engineering that deals with processes, products, test adequacy, quality assurance, and quality control. It focuses on Design of Experiments; clarity of requirements; measurement to demonstrate process capability and compliance; and activities to ensure that characteristics required to achieve performance requirements are producible, robust, and verifiable. It includes:

- Actions to minimize opportunities for error in manufacturing, operation, and maintenance.
- Evaluation of process capability and requirements to minimize variability, optimize technical risks and costs in testing and inspection programs commensurate with program objectives.
- Certification of testing and related software to accomplish program objectives.
- Validation of advanced metrology to ensure accuracy and consistency of results for Government acceptance.

Quality Improvement—Activities focused on increased productivity, manufacturing or operational efficiency, and product utility, including:

- Improvements in producibility and process capability.
- Reduced process variability and improved uniformity.
- Defect reduction during program activities such as design, manufacturing, test, and inspection; reductions in costs of waste, scrap, rework, and repair; and reductions in engineering changes, waivers and deviations.

Quality Management—The function of management at all levels concerned with planning, organizing activities, allocating resources, and monitoring operations to establish and conduct an effective and efficient quality program.

Quality of Design—The effectiveness of the design process in capturing the operational requirements and translating them into detailed design requirements that can be manufactured (or coded) in a consistent manner.

Quality of Conformance—The effectiveness of design and manufacturing functions in executing product manufacturing requirements and process specifications while meeting tolerances, process control limits, and target yields for a given product group.

Quality Plan—The description of a supplier's program of action for managing quality of products. It describes specific quality policies, procedures, and practices. It includes organizational structure, assignment of management responsibilities and authorities, staffing, planning, technical aspects, and a description of the integration of quality system with other administration and technical programs. It also identifies and describes quality responsibilities for all operational interfaces, including those with subtier suppliers. The quality plan ensures that suitable data are available to determine compliance to product acceptance criteria established for the contract.

Quality Program—A program of action to effectively and efficiently manage the quality of processes and products from concept through validation, engineering and manufacturing development, production, deployment, and disposal.

Quality Requirements—The technical requirements relating to the quality of the product or products and the quality controls, standards, and inspections necessary to assure that the product or products satisfy those requirements.

Verification—Reviewing, inspecting, testing, checking, measuring, auditing or otherwise establishing and documenting that products, processes, or documents conform to specified requirements.