

AQAP-110
(Edition 2)

NATO QUALITY ASSURANCE REQUIREMENTS
FOR DESIGN, DEVELOPMENT
AND PRODUCTION

AQAP-110

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**(Signed) Major General G.B. FERRARI, ITAF
Chairman , MAS**

RECORD OF CHANGES

CHANGE DATE	DATE ENTERED	EFFECTIVE DATE	BY WHOM ENTERED

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CHAPTER II

REQUIREMENTS

ISO 9001

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CHAPTER I**GENERAL****1. Introduction**

Defence materiel is characterized by advancing technology and correspondingly increasing complexity and is subject to regulatory requirements, all of which can combine to impact on costs. In this environment it is essential that the products be designed, manufactured and provided so as to conform to the requirements of the purchasers and that the activities involved be effected as economically as practicable.

For this reason quality assurance in NATO nations' procurement is based on a clear concept which includes:

- (a) A primary requisite of any industrial company must be the quality of its products. In order to achieve maximum effectiveness, companies must maintain systems for the management of quality which include planning, controlling, inspection and assurance activities; each appropriate to the products being offered. The principles of quality management as well as the quality system elements are laid down in the international standards ISO 9000 and ISO 9004.
- (b) The contractor is responsible for carrying out the obligations as set forth in the terms and conditions of the contract and in the applicable specifications. This includes the responsibility for the management of quality and for offering for acceptance to the purchaser only product that conforms to contract requirements and for the furnishing of required objective evidence of this conformance.
- (c) For protection the purchaser will conduct Government Quality Assurance as necessary to assure that the contractor will achieve the required quality. This quality assurance will extend to sub-contractors when appropriate. The extent of the quality assurance performed by the purchaser will be a function of the demonstrated effectiveness of the contractor's quality system to meet contract requirements and of the demonstrated quality of product. Consequently, the purchaser stipulates the assurance required to provide confidence that the contractor utilizes all the applicable elements of the quality system necessary for the fulfilment of the contract by means of this AQAP which includes the requirements of the international standard ISO 9001.
- (d) The purchaser, or the authorized representative, will have reason to discontinue the verification or acceptance of product pending action by the contractor to correct any deficiency in the quality system that could result in delivery of nonconforming product.

2 Scope

This document establishes requirements for a quality system, herein referred to as the System, to be established and maintained by the contractor for the purpose of demonstrating that product conforms to contract requirements and for the furnishing of objective evidence.

3 Applicability

This document, when referenced in a contract or purchase order, applies to all products referenced therein. If any inconsistency exists between the contract requirements and this document, the contract requirements shall prevail.

4 References

ISO 8402, Edition 1994	Quality Management and Quality Assurance - Vocabulary.
ISO 9000, Edition 1994,	Quality management and quality assurance standards -guidelines for selection and use.
ISO 9001, Edition 1994,	Quality systems - Model for quality assurance in design/development, production, installation and servicing.
ISO 10012-1, Edition 1992,	Quality assurance requirements for measuring equipment - Part 1: Metrological Confirmation system for measuring equipment.

5 Definitions

For the purpose of this AQAP the definitions given in ISO 8402 apply.

Note 1: The term "supplier" as used in ISO requirements is to be read as "contractor" in the context of this AQAP.

Note 2: For the purpose of this AQAP, the term "product" is also used to denote "service" as appropriate.

Note 3: The term "customer" as used in ISO requirements is to be read as "purchaser" in the context of this AQAP.

Note 4: The term "design" as used in ISO requirements includes "development" and in this AQAP is referred to as "design and development" or "D & D".

6. Format of Chapter II and III Requirements

Since all requirements of ISO 9001 form part of this document and users are expected to be in the possession of ISO 9001 the following format has been chosen:

In Chapter II the requirements of ISO 9001 paragraph 4 are referred to by the original number and heading and expanded by a NATO supplement, as necessary.

Chapter III contains additional NATO requirements. Text in this section, which is identified as a "Note", has no contractual status, and is solely provided for information purposes.

CHAPTER II**REQUIREMENTS****ISO 9001 Paragraphs****4 Quality System Requirements****NATO Supplement**

The contractor shall establish, document and maintain an effective and economical system in accordance with this document which includes the requirements of ISO 9001 as necessary to satisfy the contract requirements.

The system shall be acceptable to the purchaser's authority designated in the contract or its authorized representative, herein referred to as the Quality Assurance Representative (QAR). Objective evidence that the System is effective shall be readily available to the QAR.

4.1 Management Responsibility**4.1.1 Quality policy**

ISO requirement applies

4.1.2 Organization**4.1.2.1 Responsibility and authority**

ISO requirement applies

4.1.2.2 Resources

ISO requirement applies

4.1.2.3 Management representative

ISO requirement applies

NATO Supplement

The Management Representative shall have the necessary authority and organizational freedom to resolve matters pertaining to quality.

41.3 Management review

ISO requirement applies

NATO Supplement

Review results shall be available to the QAR.

42 Quality System

4.2.1 General

ISO requirement applies

NATO Supplement

The contractor shall ensure that only acceptable product is presented to the QAR.

4.2.2 Quality System Procedures

ISO requirement applies

4.2.3 Quality Planning

ISO requirement applies

NATO Supplement

Quality Planning shall include:

- a) **the identification of requirements for the product;**
- b) **the establishing of quality characteristics of processes and products to be proven including acceptance criteria, and of related procedures for the conduct of verification, validation, inspection and test.**
The contractor shall submit a quality plan which is acceptable to the QAR.

43 Contract review

4.3.1 General

ISO requirement applies

4.3.2 Review

ISO requirement applies

4.3.3 Amendment to contract

ISO requirement applies

4.3.4 Records

ISO requirement applies

4.4 Design control**4.4.1 General**

ISO requirement applies

4.4.2 Design and development planning

ISO requirement applies

4.4.3 Organizational and technical interfaces

ISO requirement applies

4.4.4 Design input

ISO requirement applies

NATO Supplement

Design and Development (D&D) Control

The control of D & D process shall ensure, as a minimum,

- a) provision of technical documentation setting out the company internal, national and international standards and regulations;
- b) application of design standards;
- c) application of standards to establish and maintain specifications including drawings;
- d) use of data feedback from any previous appropriate designs;
- e) monitoring of the process to enable early identification of problem areas deriving from the D & D process;
- f) application of design analysis;

4.4.5 Design Output

ISO requirement applies

4.4.6 Design Review

ISO requirement applies

NATO Supplement

Design reviews shall be performed

- (a) **by a team chaired by a person not directly responsible for the results to be verified;**
- (b) **in accordance with contractor's standardized procedures to prepare and conduct design reviews.**

4.4.7 Design verification

ISO requirement applies

NATO Supplement

- a) **Functional tests shall be performed to demonstrate conformance with the corresponding requirements at appropriate stages up to the final product.**
- b) **Verification tests shall cover the complete specified environmental conditions. Alternative calculations and/or simulations shall be as agreed upon by the purchaser. Verification and demonstration testing shall include demonstration of process capability as necessary.**
- c) **In advance of each design verification activity a review of the configuration shall be conducted to assure that the item to be verified is of the valid configuration.**

4.4.8 Design validation

ISO requirement applies.

4.4.9 Design changes

ISO requirement applies

See Chapter III Additional NATO requirements.

NATO Supplement

These procedures shall be established and maintained in accordance with the Configuration Management Requirements in Chapter III of this document.

4.5 Document and Data Control**4.5.1 General**

ISO requirement applies.

4.5.2 Document approval and issue

ISO requirement applies.

4.5.3 Document changes

ISO requirement applies.

4.6 Purchasing**4.6.1 General**

ISO requirement applies.

4.6.2 Evaluation of sub-contractors

ISO requirement applies.

4.6.3 Purchasing data

ISO requirement applies.

NATO Supplement

Purchasing documents shall include the provision for Government Quality Assurance at the sub-contractor's facilities when requested by the QAR.

4.6.4 Verification of purchased product**4.6.4.1 Supplier verification at sub-contractors**

ISO requirement applies

4.6.4.2 Customer verification of sub-contracted product

ISO requirement applies

NATO Supplement

Government verification at a sub-contractor's facilities may be requested only by the QAR. When the QAR determines that government verification is required at a sub-contractor's facilities the contractor shall provide for this in the purchasing document and forward copies with relevant technical data to the QAR on request.

4.7 Control of Customer Supplied Product

ISO requirement applies.

NATO Supplement

When the contractor establishes that the purchaser supplied product is not compatible with the product to be designed, he shall immediately report to and negotiate with the purchaser the remedial actions to be taken.

The contractor shall promptly inform the QAR of any problems that are detected relating to purchaser supplied product including product not intended for incorporation into the supplies such as inspection, measuring and test equipment.

4.8 Product identification and traceability

ISO requirement applies.

4.9 Process control

ISO requirement applies.

NATO Supplement

Where accept and reject criteria for workmanship are defined by representative samples, these samples shall be inspected and agreed by the contractor and the QAR.

4.10 Inspection and testing

4.10.1 General

ISO requirement applies.

NATO Supplement

Criteria for acceptance and rejection shall be documented. Where acceptance and rejection criteria are not established by specifications and/or drawings they shall be defined to the greatest practical extent by written standards or by samples.

4.10.2 Receiving inspection and testing

ISO requirement applies

NATO Supplement

The contractor shall notify the QAR of non-conforming product received from a sub-contractor that has been subject to Government Quality Assurance.

4.10.3 In-process inspection and testing

ISO requirement applies

4.10.4 Final inspection and testing

ISO requirement applies

410.5 Inspection and test records

ISO requirement applies

411 Control of inspection, measuring and test equipment**411.1 General**

ISO requirement applies

411.2 Control Procedure

ISO requirement applies.

NATO Supplement

The measurement and calibration system shall be in accordance with the requirements of ISO 10012-1.

412 Inspection and test status

ISO requirement applies

413 Control of nonconforming product**413.1 General**

ISO requirement applies

NATO Supplement

The contractor shall provide holding areas and procedures which are agreed by the QAR for the control of non-conforming product.

413.2 Nonconforming product review and disposition

ISO requirement applies

NATO Supplement

Procedures for the disposition of non-conforming product are subject to disapproval by the QAR when it can be shown that they do not provide the necessary controls. All repair and use-as-is dispositions must be acceptable to the QAR.

414 Corrective and Preventive action**414.1 General**

ISO requirement applies

414.2 Corrective Action

ISO requirement applies

414.3 Preventive Action

ISO requirement applies

415 Handling, storage, packaging, preservation and delivery

415.1 General

ISO requirement applies

415.2 Handling

ISO requirement applies

415.3 Storage

ISO requirement applies

415.4 Packaging

ISO requirement applies

415.5 Preservation

ISO requirement applies

415.6 Delivery

ISO requirement applies

416 Control of Quality records

ISO requirement applies.

NATO Supplement

All quality records shall be made available to the QAR.

417 Internal quality audits

ISO requirement applies.

NATO Supplement

The elements found in NATO supplements shall be included in quality audits. The contractor shall correct promptly deficiencies detected during audits and notify the QAR of any major deficiencies and the revisions required in the quality system to correct them. Audit results shall be available to the QAR.

418 Training

ISO requirement applies.

419 Servicing

ISO requirement applies.

4.20 Statistical techniques

4.20.1 Identification of need

ISO requirement applies.

4.20.2 Procedures

ISO requirement applies

CHAPTER III**ADDITIONAL NATO REQUIREMENTS****1. Configuration Management (CM)**

The contractor shall establish and maintain a configuration management system appropriate to the product to ensure that configuration items and their related documents, including those from sub-contractors are controlled.

CM shall commence at the beginning of the design process or earlier in the life cycle if appropriate. CM continues during production and support phases for the configuration items which have been identified at those stages of the programme.

The CM system shall be documented and describe the contractor's procedures for:

- Configuration Identification
- Configuration Control
- Configuration Status Accounting
- Configuration Audit.

The contractor shall prepare a plan which describes the contractual application of the CM system. The plan shall be available to the QAR.

NOTE:

NATO Configuration Management Policy is established in STANAG 4159 while detailed contractual requirements for Configuration Management are delineated in STANAG 4427 and associated Allied Configuration Management Publications (ACMPs 1 through 6) ACMP 7 provides guidance on the use of the other ACMPs.

2. Assistance for Government Quality Assurance

The contractor shall provide the QAR with the accommodation and facilities required for the proper accomplishment of GQA and shall provide any assistance required by the QAR for evaluation, verification, documentation or release of product.

The QAR shall have the right of access to any area of the contractor's or subcontractor's facilities where any part of the contracted work is being performed. The QAR shall be afforded unrestricted opportunity to evaluate compliance with System procedures and to verify conformance of product with contract requirements. The contractor shall make available for reasonable use by the QAR the equipment necessary for all verification purposes. Contractor personnel shall be made available for operation of such equipment as required.