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**THE MANAGEMENT OF QUALITY ASSURANCE FOR AN
 INTEGRATED DEFENSE SYSTEM**

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Abstract:

The AQAP 2000 (Allied Quality Assurance Publication) series is structured to be the NATO requirements for an Integrated Systems Approach to Quality through the Life Cycle, to be selected and applied for all nations and contractual relationships, and to match tailoring processes embodied in modern standards.

Romania, as part of NATO country ratified STANAG 4107 - Mutual Acceptance of Government Quality Assurance and Usage of the AQAPs.

AQAP 2000 series represents ISO 9001 Quality Management Systems plus specific, supplementary, NATO requests. I will have a short presentation of AQAP 2000 family.

Romania MoD by the Armaments Department, through Government Quality Assurance Representative (GQAR-military representative) can perform quality control at the supplier facility during performance of contract. I will present main activities for GQAR.

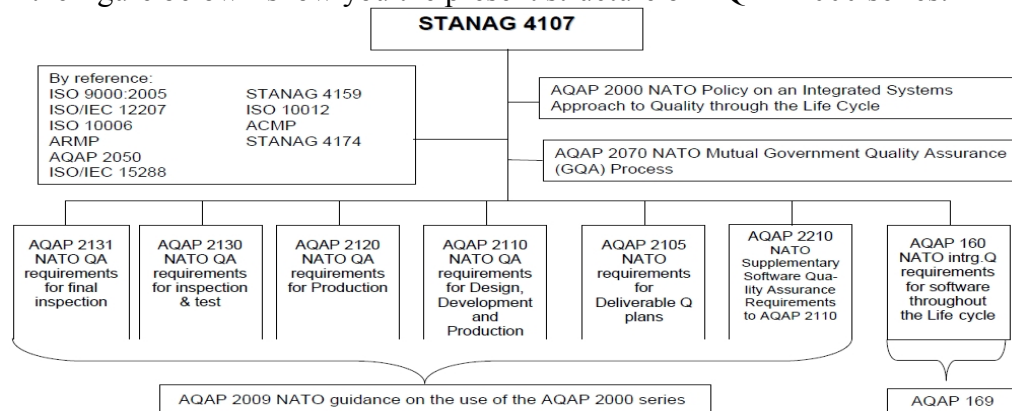
1. Introduction

The AQAP 2000 series of contractual AQAPs is structured as a series of stand alone publications. Some of which subsume pre-selections of ISO9001 Quality Management Systems- Requirements. NATO has made these pre-selections after careful deliberation.

The structure allows the most appropriate publication to be selected and invoked in a contract, thus allowing the Acquirer and the Supplier to target resources efficiently thereby enhancing value for money. The relevant publication of the AQAP 2000 series can be invoked in contracts during any of the stages of a systems life cycle. The publications of the AQAP 2000 series will allow for the continuous application of a quality management process to the products and all life cycle processes during the stages of life cycle covered by the contract.

2. The structure of AQAP 2000 series

In the figure below I show you the present structure of AQAP 2000 series:



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The AQAP 2000 series contains Policy, Guidance and Contractual publications. The NATO contractual Quality Assurance requirements subsume ISO 9001:2008. For low risk products few quality assurance requirements will be imposed, while for higher risk products increased quality assurance will be imposed. This basis will be found in NATO's policy publication, AQAP 2000, on an Integrated Systems Approach to Quality through the Life Cycle.

The structure of AQAP 2000 series is:

AQAP 2000 Policy on an Integrated Systems Approach to Quality through the Life Cycle (guidance type): This policy provides the framework for an integrated system approach to achieve quality in products and services throughout the life cycle. This policy paper provides the framework for an integrated systems approach to achieve quality of products and services throughout the life cycle.

AQAP 2009 NATO Guidance on the use of AQAP 2000 series (guidance type): This publication provides guidance on the structure, interpretation of the NATO additional requirements and the use of the AQAP 2000 series.

AQAP 2131 NATO Quality Assurance Requirements for Final Inspection (contractual type): The purpose of AQAP 2131 is to give the Government Quality Assurance Representative (GQAR) and/or Acquirer the right of access to the Supplier and that the Supplier's final inspection provides objective evidence that the product conforms with contract requirements. This publication should be made a requirement of the contract when conformance with the requirements can be demonstrated satisfactorily on receipt of the final product.

AQAP 2130 NATO Quality Assurance Requirements for Inspection and Test (contractual type): This publication defines the requirements for the Supplier's Quality Management System and associated requirements for minimum Configuration Management. A system needs to be established, documented, applied, maintained, assessed and improved, and/or evaluated, in accordance with requirements contained in the publication. This publication is used when the design related to the product is established and conformance with requirements can be demonstrated solely on the basis of inspection, during the manufacturing and processing of materials, parts, components, sub-assemblies and the final product, as appropriate.

AQAP 2120 NATO Quality Assurance Requirements for Production (contractual type): This publication defines the requirements for the Supplier's Quality Management System and associated requirements for Configuration Management capable of producing objective evidence that processes and product conforms to contract requirements whether manufactured or processed by the Supplier or Sub-suppliers. This publication should be made a requirement of the contract when the design related to the product is established. Usually the complexity of the product requires comprehensive quality control and the need for servicing may arise. Life, reliability and other quality characteristics can only be ensured by the Supplier, throughout the manufacturing or processing phases, by use of materials and parts of proven quality and by means of detailed work instructions, process control and procedures whose purpose is to permit the earliest possible corrective action.

AQAP 2110 NATO Quality Assurance Requirements for Design, Development and Production (contractual type): This publication defines the requirements for the Supplier's Quality Management System and associated requirements for Configuration Management when design activities are included in the contract. This publication should be made a requirement of the contract when requirements are specified in terms of functional and technical requirements and the Supplier is, therefore, responsible for design, development and production.

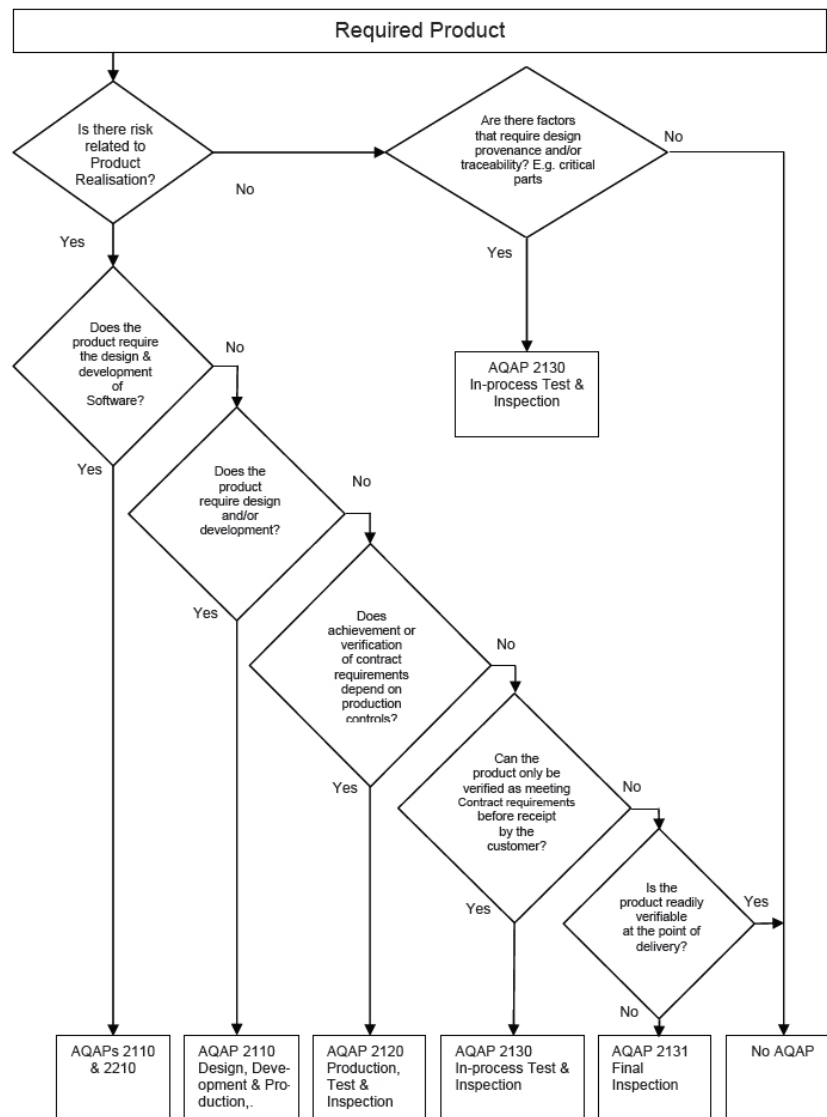
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AQAP 2210 NATO Supplementary Software Quality Assurance Requirements to AQAP 2110 (contractual type): This publication specifies the project oriented requirements to manage the quality of the software development process. Both managerial and technical processes must be addressed in order to:

- a. establish visibility of the software development process;
- b. detect software quality problems as early as possible in the software life cycle;
- c. provide quality control data for the timely implementation of effective corrective action;
- d. confirm that quality is engineered in during the software development process;
- e. provide assurance that the software produced conforms to contractual requirements;
- f. ensure that appropriate software support is provided to activities at system engineering level, if required by the contract; and
- g. ensure that the safety and security conditions of the project are addressed.

AQAP 2210 is intended for use with AQAP 2110 as software specific and project oriented supplement.

The method for selecting the appropriate AQAP is shown in next figure:



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This method will be of use to personnel responsible for contract preparation, contract surveillance and/or evaluating a Supplier for compliance to the appropriate AQAPs. It will also contribute to common understanding of the requirements between Suppliers and the personnel responsible for Government Quality Assurance (GQA) and between National Quality Assurance Authorities (NQAA) when GQA is to be performed within the provisions of STANAG 4107 "Mutual Acceptance of Government Quality Assurance and usage of the Allied Quality Assurance Publications".

AQAP 2070 NATO Mutual Government Quality Assurance (GAQ) Process - GQA is the process by which NATO Nations provide each other and NATO organizations Quality Assurance services on defense products, to establish confidence that the contractual requirements relating to quality are met. GQA is performed on those contractual requirements either posing risks to or required by law of the acquiring Nation.

AQAP-160 NATO Integrated Quality Requirements for Software throughout the Life Cycle. This publication contains the requirements for a software quality (management) system. A compliant software quality (management) system needs to be established, documented, applied, maintained, assessed and improved, and/or evaluated, in accordance with requirements contained in the subsequent chapters. These requirements should provide confidence in the supplier's capability to deliver a software product or service that conforms to customer requirements.

3. Government Quality Assurance in Romania Ministry of Defense

According Decision no. 1073 of November 1, 1996, about assessment, certification and quality surveillance at suppliers of armed forces, issued by Romanian Government, Ministry of Defense organizes and performs quality evaluation and certification of body the common armed forces suppliers, and specifically by the supplier or Military Body for Certification, Accreditation and Supervision-OMCAS established procurement within the Armaments Department.

The Ministry of Defense contracting authorities are required to select and define quality assurance requirements in the tender documentation and contracts for defense systems and equipments in accordance with AQAP 2009-NATO guide to AQAP 2000 series use. Suppliers shall allow contracting authorities representatives access to supplier and sub-suppliers facilities and support them to performance assessment and surveillance activities.

Quality assessment and certification at suppliers for defense systems and equipments of the Ministry of Defense, registered in Romania, are performed by audits, organized and conducted by the Military Body for Certification, Accreditation and Surveillance- OMCAS from Armaments Department structure.

Assessment of quality assurance at suppliers for defense systems and equipments during contract validity, shall be made by **Government Quality Assurance Representative (GQAR)** at the suppliers, employing Quality Surveillance Service (QSS), in accordance with Government Quality Assurance plan at the supplier is attached to the contract.

Government Quality Assurance Representatives, can perform surveillance tasks at the Romanian suppliers of a NATO body or a NATO or non-NATO member country, as stated in AQAP 2070, AQAP 2000, and STANAG 4107, after case.

Government Quality Assurance, stated by AQAP 2070, related to procurement contracts for defense systems and equipments concluded by Ministry of Defense with suppliers who have established in a NATO member country, is made by the National Quality Assurance Authority in accordance with contract requirements, the provisions of STANAG4107 and AQAP requirements.

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Quality Surveillance Service (QSS) is the specialized structure of the Romania MoD which, within the defense procurement integrated management system, performs Government Quality Assurance (GQA) by the products and service supplier's facilities as weapon systems and principal military equipment from Romania, by applying the provisions of:

- government Decision HG1073/ 1996 regarding quality assessment, certification and surveillance at the MoD suppliers;
- quality assurance NATO documents, in the series AQAP 2000, related to article 6, 7 and 8 in the Decision DA4 on 05.09.2006 concerning Quality assurance policy, requirements and procedures related to Defense Acquisition Process, approved by Secretary State for Armaments (Head of Armaments Department);
- military technical standards;
- plans for product quality assessment and surveillance;
- AQAP 2000 series.

QSS subordinate structure and working under the direct coordination of the Armaments Department.

Based on the quality assurance requirements defined in procurement contracts and NATO publication in the series AQAP 2000, the service staff performs the following activities:

- Analyze the acquisition contract and its related documents (product/ service specification/ test-evaluation plans, assembly and test logs, design documentation, technology documentation, product standards) or **Request for Government Quality Assurance (RGQA)**;
- Designate the responsible/ representative or the team responsible/ representative for quality surveillance at the supplier. Where appropriate, require expanding team with staff from other structures of Armaments Department;
- Analyze the quality plan, the procedures, work instructions and other documents of the quality management system implemented by the supplier that are applicable to make the product specified in the contract. Supplier assessment work is aimed to identify the level and volume of surveillance activities to be planned;
- Request clarification from acquirer whenever contractual requirements or requirements RGQA are missing, are ambiguous or contradictory;
- Identify and establish potential risks associated to the product, supplier and contract that can be monitored at the supplier and/ or the sub-supplier, to plan quality surveillance activities in their premises;
- On the basis of potential risks identified prepare, sign and ensure quality surveillance plan approval, according to intern operational procedure;
- Determine the most appropriate surveillance fields, methods or techniques to monitor or limits the identified risks, plan and run quality surveillance activities in accordance with regulations of operational procedure.
- If a RGQA is received, answer it, sign and send to the applicant, through the structure chief a deputy of chief Armaments Department as national authority for quality assurance in accordance with STANAG4107 and specifications in AQAP2070.
- Communicate tasks and responsibilities of quality surveillance to people involved;
- Inform the provider management of non-conformities during surveillance of contracted products/ services quality, and require setting and applying appropriate corrections and corrective actions;
- Through the Head of QSS, report the stage of conducting quality surveillance activities at the suppliers.

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The Supplier and/or Sub-suppliers shall provide the GQAR and/or Acquirer:

- The right of access to facilities where parts of the contracted activities are being performed.
- Information pertaining to the fulfillment of requirements in the contract.
- Unrestricted opportunity to evaluate Supplier compliance with this Publication.
- Unrestricted opportunity to conduct verification of product conformity with the contract requirements.
- Required assistance for evaluation, verification, validation, testing, inspection or release of the product for the accomplishment of GQA to contract requirements.
- Accommodation and facilities.
- The necessary equipment available for reasonable use for performing GQA.
- Supplier and or Sub-suppliers personnel for operation of such equipment as required.
- Access to information and communication facilities.
- The necessary Supplier documentation, to confirm product conformance to specification.
- Copies of necessary documents, including those on electronic media.

The Supplier shall ensure that only acceptable products, intended for delivery, are released. GQAR and/ or Acquirer reserve the right to reject non-conforming products.

4. Conclusions

Government Quality Assurance for Romania MoD's contracts is performed by QSS (including any stage of manufacture) and places (including the subcontractors' plant) as may be necessary to determine that the supplier or services conform to contract requirements. Each contract shall designate the place or places where the MoD reserves the rights to performs quality assurance, including foreign contracts with non-NATO nations. Romania MoD, through his representatives can perform quality control at the supplier facility during performance of contract. MoD has the right to make inspections and tests while work is in process, subsequent manufacturing documentation, tests result, without relieve the contractor from responsibility. In the entire situations, **Government Quality Assurance Representative** is responsibility and he has authority to accept or reject materials, components or services furnished by suppliers.

References:

- [1] ISO 9001/2008 Quality Management Systems- Requirements
- [2] STANAG 4107- Mutual Acceptance of Government Quality Assurance and Usage of the Allied Quality Assurance Publications
- [3] AQAP 2009 -NATO Guidance on the use of the AQAP 2000 Series (Allied Quality Assurance Publication)
- [4] AQAP 2110 -NATO Quality Assurance Requirements for Design, Development and Production
- [5] <https://nsa.nato.int>
- [6] Tasks Quality Surveillance Service