NATO Guidance on the use of AQAP-160 Edition 1

AQAP-169 Edition 1

(July 2001)

NORTH ATLANTIC TREATY ORGANIZATION

MILITARY AGENCY FOR STANDARDIZATION (MAS)

NATO LETTER OF PROMULGATION

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(Signed) Jan H ERIKSEN
Rear Admiral, NONA
Chairman MAS

Record of Changes

Change Date	Date Entered	Effective Date	By Whom Entered

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Chapter 1

General

1.1 Purpose

1.1.1 This publication contains background information, interpretation guidance and application guidance on AQAP-160 Edition 1 'NATO integrated quality requirements for software throughout the life cycle'.

1.1.2 As a background for AQAP-160 Edition 1, it is important to stress NATO's policy to adopt International Standards wherever possible. The basis for AQAP-160 Edition 1 is ISO/IEC 12207 and ISO 9001. This guide intends to explain the full context of the adoption of International Standards in AQAP-160 Edition 1.

1.1.3 The interpretation guidance explains the AQAP-160 Edition 1 model and the concept behind the standard. For guidance on the adopted International Standards please refer to the guides, ISO has published for them: ISO/IEC 15271 for ISO/IEC 12207 and ISO 9000-3 for ISO 9001.

1.1.4 The application guidance primarily focuses on the implementation of the tailoring of AQAP-160 Edition 1. The application guidance tries to contribute to the visibility of the tailoring process, but it is not intended to be exhaustive.

1.1.5 This publication is not a contractual document. Its content has no legal or contractual status, nor does it supersede, add to or cancel any of the AQAP-160 Edition 1 requirements. However, some implementation issues (e.g. tailoring methodologies) can be made contractual on a case-by-case basis.

1.2 Prerequisites

1.2.1 The user of this guide has to be familiar with the model, the concept and the contents of AQAP-160 Edition 1.

1.2.2 AQAP-160 Edition 1 is primarily based on the standards ISO/IEC 12207 and ISO 9001. The user of this document has to be familiar with both International Standards. Familiarizing with the ISO-guides (ISO/IEC 15271 and ISO 9000-3) will be helpful to accomplish this task.

1.2.3 AQAP-160 Edition 1 has to be tailored for use by an organization. The user of AQAP-160 Edition 1 has to be familiar with all relevant organizational policies.

1.2.4 AQAP-160 Edition 1 is written at the intersection of the quality domain and the engineering domain. The user of AQAP-160 Edition 1 has to be familiar with general quality practices and with system/software engineering.

1.3 Intended audience

1.3.1 The guide is written for those who will apply or implement AQAP-160 Edition 1: in contractual situations, on an in-house software development, on self-assessment activities and/or for software process improvement initiatives.

1.3.2 AQAP-160 Edition 1 addresses the software life cycle as a whole from an acquisition perspective. For the organizational-level and project-level tailoring/implementation of AQAP-160 Edition 1, it is recommended to involve all life cycle parties, e.g. as an Integrated Project Team.

1.3.3 As a consequence this guidance, interpretation as well as application, can be utilized by acquirers, suppliers, developers, producers, operators, maintainers of software, as well as quality managers, and is not aimed at a particular category.

1.4 Informative references

1.4.1 ISO/IEC 12207 Edition 1: 1995, Information technology – Software life cycle processes

1.4.2 ISO/IEC 15271 Edition 1: 1997, Information technology – Guide for ISO/IEC 12207 (Software life-cycle processes)

1.4.3 ISO 9001:2000: Quality management systems – Requirements

1.4.4 ISO 9001 Edition 2: 1994, Quality systems – Model for quality assurance in design, development, production, installation and servicing

1.4.5 AQAP-150 Edition 2: 1997, NATO Quality assurance requirements for software development

1.4.6 AQAP-110 Edition 2 : NATO Quality assurance requirements for design, development and production

1.4.7 ISO 9000-3 Edition 2: 1997, Guidelines for the application of ISO 9001: 1994 to the development, supply, installation and maintenance of computer software.

1.4.8 ISO/IEC 9126 Edition 1: 1991, Information technology – Software product evaluation – Quality characteristics and guidelines for use

1.4.9 ISO 10012-1 Edition 1992: Quality assurance requirements for measuring equipment -– Part 1: Meteorological Confirmation system of measuring equipment

1.4.10 IEEE/EIA-Std-12207 Edition 1: 1998, Industry implementation of International Standard ISO/IEC 12207 Software life-cycle processes

1.4.11 IEEE/EIA-Std-016 : 1995, Software life-cycle processes –Software development (Acquirer-Supplier agreement)

1.5 Informative references (Work In Progress)

1.5.1 ISO/IEC 9126 (Part 1-4): Information Technology – Software product quality

1.5.2 ISO/IEC 15939: Software Engineering - Software measurement process framework

1.5.3 ISO/IEC 15504 (Part 1-9): Information Technology - Software process assessment

1.5.4 ISO/IEC 14598 (Part 1-6): Information Technology – Software product evaluation

1.5.5 ISO/IEC 15288: System life-cycle processes

Chapter 2

Background

2.1 AQAP-160 Edition 1: the successor of AQAP-150 Ed.2

2.1.1 AQAP-160 Edition 1 is the natural successor of AQAP-150 Edition 2 'NATO Quality assurance requirements for software development'. AQAP-150 Edition 1 nor AQAP-150 Edition 2 were based on an international standard, because at the time when the work started there was no international standard available.

2.1.2 NATO disposes of the AQAP-100-series, which are based on the ISO 9000-series, and was striving for a similar adoption in the software field. In the mean time, AQAP-150 Edition 2 was created as a project-specific software-supplement to AQAP-110 Edition 2.

2.1.3 While adopting ISO/IEC 12207 into AQAP-160 Edition 1, NATO has made sure that the AQAP-150 Edition 2 requirements remained completely covered. However, AQAP-160 Edition 1 is based on a different model, which leads to a different structure of the standard, and introduces a different (international) terminology, which adds to the common understanding in the software field.

2.2 AQAP-160 Edition 1: the NATO adoption of ISO/IEC 12207 Edition 1

2.2.1 ISO/IEC 12207 'Software life cycle processes' establishes a common framework for software life cycle processes, with a well-defined terminology, that can be referenced by the software industry. ISO/IEC 12207 remains at the what-to-do engineering level: it is a performance-based standard.

2.2.2 ISO/IEC 12207 is not intended to be used 'as-is' in contractual situations, but has to be selectively applied or implemented.

2.2.3 NATO decided to use also ISO/IEC 12207 as a basis for AQAP-160 Edition 1. Since AQAP-160 Edition 1 will primarily be used in contractual situations, NATO has implemented ISO/IEC 12207 with the focus on the acquisition point of view. However, this allows also the use of AQAP-160 Edition 1 for supplier qualifications and engineering activities.

2.2.4 AQAP-160 Edition 1 maintains the well-defined international terminology, the life cycle thinking and the process-approach of ISO/IEC 12207. To a large extent ISO/IEC 12207 requirements (the processes with associated activities and tasks) were adopted without modification. In some occasions however, NATO deemed it necessary to supplement ISO/IEC 12207, due to experience with AQAP-150 Edition 2 or due to areas where ISO/IEC 12207 fell short.

2.2.5 The major supplement added by NATO is the encapsulation of the ISO/IEC 12207-model and associated processes into the quality system-concept of the ISO 9000- and AQAP-100-world. NATO believes it is essential that quality and software engineering do not march separately. To achieve this, AQAP-160 Edition 1 tries to marry the engineering-(ISO/IEC 12207) and the quality-(ISO 9000) world.

2.3 AQAP-160 Edition 1: a structure consistent with the evolution of ISO-standards

2.3.1 The marriage of the engineering domain and the quality domain is becoming more easy with the evolution of the ISO 9000:2000 series, of the ISO/IEC 15288 and ISO/IEC 12207. This is valid either at the software level or at the system level.

2.4 AQAP-160 Edition 1: a step towards the integrated systems approach

2.4.1 In the end NATO is pursuing an integrated systems approach: i.e. an approach where software, hardware, human interaction, infrastructure and processes are integrated into a system and where the corresponding disciplines and technologies are harmonized into a system discipline, i.e. systems thinking and systems engineering.

2.4.2 NATO strives towards the integrated systems approach, and looks for opportunity to adopt an international 'integrated systems' standard. At the time of this writing, NATO is supporting ISO-initiatives under way in the integrated systems arena. However, this might take a few more years.

2.4.3 Although ISO/IEC 12207, and as a consequence AQAP-160 Edition 1, is not an integrated system standard (it addresses only software and no other system components), its Development Process contains the crucial 'system definition'- and 'system integration'-activities. The Acquisition, Supply and Operation processes can also be interpreted at the system level. In that sense, adopting ISO/IEC 12207 into AQAP-160 Edition 1 provides NATO with a first step towards the integrated systems approach.

2.4.4 AQAP-150 Edition 2 had to be used as a project-specific supplement to AQAP-110 Edition 2, because AQAP-150 Edition 2 does not contain any organizational requirements, such as the quality system-concept and associated requirements. Unfortunately, AQAP-110 Edition 2 contains no explicit system-level activities, such as system definition and system integration, which makes the AQAP-110/150 Edition 2 combination rather implicit and not always straightforward to use for complex systems with an important software component.

2.4.5 NATO tried to solve this problem by incorporating organizational level requirements into AQAP-160 Edition 1, which no longer requires a reference to AQAP-110 Edition 2. In addition, AQAP-160 Edition 1 does contain the explicit system-level activities. AQAP-160 Edition 1 takes care of the system-level and software-related activities. AQAP-110 Edition 2 should then be called to cover the hardware, human interaction and other elements in between system definition and system integration.

Chapter 3

Interpretation guidance on AQAP-160 Edition 1

3.1 AQAP-160 Edition 1: the model

3.1.1 AQAP-160 Edition 1 Para 1.5.1 describes the model.

3.2 AQAP-160 Edition 1: the concept

3.2.1 The AQAP-160 Edition 1 concept is a marriage of quality (ISO 9001) and engineering (ISO/IEC 12207).

3.2.2 The marriage-concept is based on the following principles:

3.2.2.1 Adopt the ISO/IEC 12207-terminology and –model untouched (expressed in 'engineering'-language).

3.2.2.2 Encapsulate the ISO/IEC 12207-processes in an untouched ISO 9001-quality system concept (expressed in 'quality'-language).

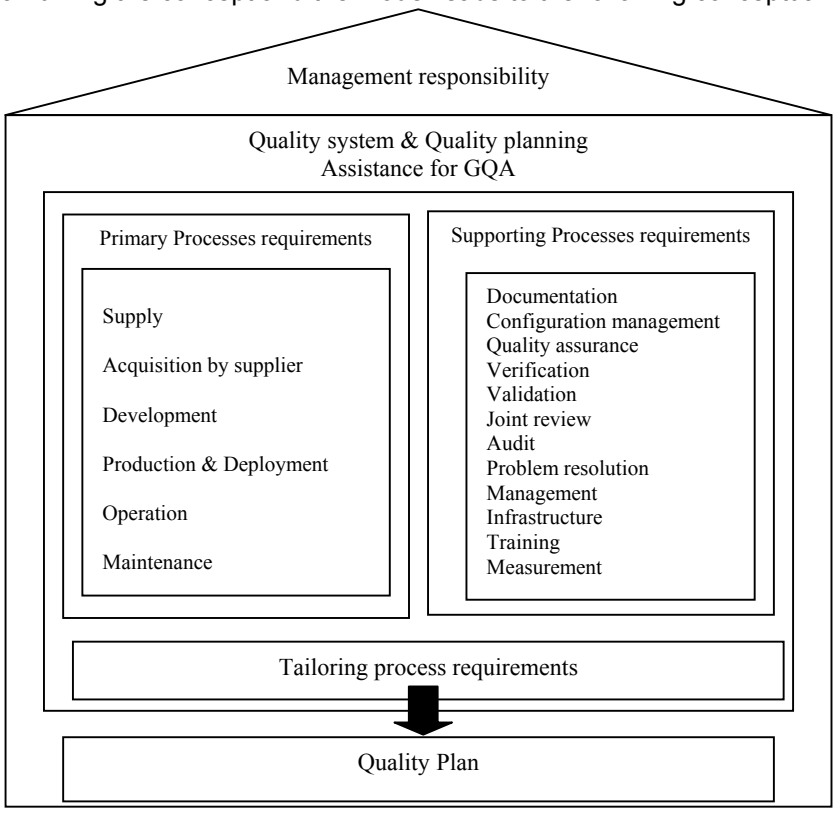
3.2.2.3 Supplement ISO/IEC 12207- and ISO 9001-requirements in an efficient and disciplined manner (minimal supplements).

3.2.2.4 Establish the links between quality and engineering in an efficient and disciplined manner (connect 'quality'-language and 'engineering'-language with minimal impact).

3.2.3 This concept and its associated principles was followed by NATO in order to maximize consistency, maintainability and reusability.

3.3 AQAP-160 Edition 1: the conceptual model

3.3.1 Combining the concept and the model leads to the following conceptual model:



3.3.2 The conceptual model is built up as follows:

3.3.2.1 The core of AQAP-160 Edition 1 is formed by a set of primary life cycle processes requirements (AQAP-160 Edition 1 Chapter 3.) with a set of supporting life cycle processes requirements (AQAP-160 Edition 1 Chapter 4.), most of them originating from ISO/IEC 12207. NATO supplemented or transformed ISO/IEC 12207 by:

a. deleting the Acquisition process;

b. adding an Acquisition process (to be invoked by the supplier);

c. adding a Production & Deployment process;

d. transforming the Management process to a supporting process;

e. transforming the Infrastructure process to a supporting process;

f. transforming the Training process to a supporting process;

g. adding a Measurement process;

h. exploding the Improvement process into its three constituent activities (establishment, assessment, and improvement of processes) and incorporating them into the corresponding ISO 9001-quality system concept (AQAP-160 Edition 1, Chapter 2).

3.3.2.2 In some processes activities have been added, changed or deleted.

3.3.2.3 The primary and supporting life cycle processes requirements have to be tailored and implemented. Tailoring has to be done in accordance with the Tailoring process requirements, that has been incorporated from ISO/IEC 12207 (AQAP-160 Edition 1 Chapter 5).

3.3.2.4 The core, consisting of the AQAP-160 Edition 1 processes requirements, has to be institutionalized into a quality system. This leads to the incorporation of the appropriate requirements from ISO 9001 (AQAP-160 Edition 1 Chapter 2).

3.3.2.5 The quality system has to function at an organizational level under an umbrella of Management Responsibility with an appropriate organization and resources. Again this gives rise to the incorporation of the appropriate requirements from ISO 9001 and ISO/IEC 12207 (AQAP-160 Edition 1 Chapter 2).

3.3.2.6 AQAP-160 Edition 1 is a quality standard for NATO use. As with other quality standards, NATO requires appropriate Government Quality Assurance, which leads to the incorporation of the appropriate requirements from AQAP-110 Edition 2 (AQAP-160 Edition 1 Chapter 2 and 6).

3.3.3 The implementation of the conceptual model into the AQAP-160 Edition 1 document based on a practical composition scheme is explained in AQAP-160 Edition 1 Para 1.5.2.

3.4 Guidance on Chapter 2. Quality system requirements

3.4.1 Chapter 2 contains quality system requirements, originating from ISO 9001, in some places supplemented with requirements originating from ISO/IEC 12207. Chapter 2 is expressed in quality language, with the appropriate links to Chapters 3 and 4 (in engineering language).

3.4.2 Guidance on AQAP-160 Edition 1 ‘2.1. Management responsibility’

In general, this requirement is based on ISO 9001:1994 ‘4.1 Management Responsibility’/ISO 9001:2000 ‘6.2.2 Competence, awareness and training’, but a few supplements have been included, in particular:

a. ISO 9001:1994 ‘4.18. Training’/ISO 9001:2000 ‘6.2.2 Competence, awareness and training ’

Training at the organizational level is considered an important asset for human resources and it is the responsibility of management (from ISO 9001:1994 4.18).

b. ISO/IEC 12207 ‘7.2 Infrastructure Process’

Infrastructure at the organizational level is considered an important resource and it is the responsibility of management (from ISO/IEC 12207, 7.2).

3.4.3 Guidance on AQAP-160 Edition 1 ‘2.2. Quality system’

In general, this requirement is based on ISO 9001:1994 ‘4.2 Quality system’/ ISO9001:2000 ‘4.1, 5.1, 5.4.1 and 4.2.2’, and contains the fundamental links between quality (ISO 9001) and engineering (ISO/IEC 12207). The structure of the requirement is defined in three steps.

a. Establishment of the quality system

The primary and supporting life cycle processes requirements of AQAP-160 Edition 1 have to be tailored/implemented in accordance with the need of the organization and incorporated into a quality system (this step corresponds to activity ‘7.3.1 Process establishment’ of ISO/IEC 12207’s Improvement process).

b. Assessment of the quality system

Internal quality audits have to be performed on the established quality system. The internal quality audits have to include the primary and supporting life cycle processes of AQAP-160 Edition 1. In response to the internal quality audits appropriate corrective action has to be taken (this step corresponds to activity '7.3.2 Process assessment' of ISO/IEC 12207's Improvement process).

c. Improvement of the quality system

Based on the application of the quality system and other experience, the quality system may be improved and as such appropriate preventive action has to be taken (this step corresponds to activity '7.3.3 Process improvement' of ISO/IEC 12207's Improvement process).

3.5 Guidance on Chapter 3. Primary life cycle processes requirements

3.5.1 Chapter 3 of AQAP-160 Edition 1 contains primary life cycle processes requirements, originating from ISO/IEC 12207, in some places supplemented with requirements originating from ISO 9001. Chapter 3 is expressed in engineering language.

3.5.2 Guidance on AQAP-160 Edition 1 '3.2. Acquisition process (to be invoked by the supplier)'

3.5.2.1 If the supplier decides to acquire part(s) of the contract, he is obliged to perform this acquisition in accordance with this process. 'Acquisition' should be interpreted in the broadest sense:

a. subcontracting part of the effort;

b. buying an off-the-shelf product (including incorporating a customer-supplied or government-furnished product)

3.5.2.2 The rationale behind this new process is ISO/IEC 12207's requirement 5.2.5.4 that mandates a call to a new instance of ISO/IEC 12207 in case of a subcontracting by the supplier. NATO has followed this principle, but has introduced additional requirements originating from ISO 9001:

a. the appropriate evaluation of subcontractors (ISO 9001:1994 '4.6.2' / ISO 9001:2000 '5.1.4 and 5.1.5 and 7.4.1');

b. appropriate purchasing data (ISO 9001:1994 '4.6.3' / ISO 9001:2000 '7.4.2');

c. if required, the verification by the supplier at the subcontractor's premises (ISO 9001:1994 '4.6.4.1' / ISO 9001:2000 '7.4.3');

d. if required, the verification of the subcontracted product by the customer (ISO 9001:1994 '4.6.4.2' / ISO 9001:2000 '7.4.3');

e. the appropriate control of a customer-supplied product (ISO 9001:1994 '4.7' / ISO 9001:2000 '7.5.4);

f. the appropriate receiving inspection and testing (ISO 9001:1994 '4.10.2' / ISO 9001:2000 '7.4.3 and 7.5.1 and 8.2.4').

3.5.2.3 These additional requirements are risk areas identified in ISO 9001, that are not explicitly addressed by ISO/IEC 12207 '5.1 Acquisition Process'. NATO prefers to introduce these additional requirements at the level of the 'Acquisition process to be invoked by the supplier' itself, instead of rewriting the process and its associated activities. It is up to the user of the standard to introduce the additional requirements at the appropriate time.

3.5.3 Guidance on AQAP-160 Edition 1 '3.4. Production & Deployment process'

After the design and the development of a system, a phase or process that may be called 'Production & Deployment' follows. ISO/IEC 12207 does not contain such a process for software. Although the Production process for software is microscopic (e.g. replicating the software on disks or burning-in EPROMs), the production process needs to be controlled.

Delivery and installation are also important activities. ISO/IEC 12207 addresses them as part of the Supply (ISO/IEC 12207 5.2) and Development (ISO/IEC 12207 5.3) processes.

NATO prefers to create a new software process and regroup the appropriate activities into this new process: Production & Deployment.

The general basis for this process is provided by ISO 9001:1994 '4.9 Process control'/ISO 9001:2000 '6.3 Infrastructure' and '6.4 Work environment' and '7.1 Planning of product realization' and '7.5.1 Control of production and service provision' and '7.5.2 Validation of processes for production and service provision', supplemented with the appropriate activities of ISO/IEC 12207:

a. ISO/IEC 12207 '5.2.7 Delivery and completion';

b. ISO/IEC 12207 '5.3.12 Software installation';

c. ISO/IEC 12207 '5.3.13 Software acceptance support'.

In adopting ISO/IEC 12207's processes, these supplementary activities are of course deleted in the processes, where they were originally present (see AQAP-160 Edition 1, Annex A – crossreference tables).

3.6 Guidance on Chapter 4. Supporting life cycle processes requirements

3.6.1 Chapter 4 of AQAP-160 Edition 1 contains supporting life cycle processes requirements, originating from ISO/IEC 12207, in some places supplemented with requirements originating from ISO 9001. Chapter 4 is expressed in engineering language.

3.6.2 Guidance on AQAP-160 Edition 1 '4.9. Management process'

3.6.2.1 In ISO/IEC 12207 the Management process is a generic organizational process that has to be instantiated when executing any primary process.

3.6.2.2 In AQAP-160 Edition 1 the Management process is adopted from ISO/IEC 12207 without modification, but as a supporting process. The supporting Management process should be interpreted as project-level management.

3.6.3 Guidance on AQAP-160 Edition 1 '4.10. Infrastructure process'

The necessary infrastructure (e.g. engineering environment, test tools, etc.) has to be allocated to a project. That is why at the project level the Infrastructure process is a supporting process.

3.6.4 Guidance on AQAP-160 Edition 1 '4.11. Training process'

The participants at a project should have the necessary personnel skills and receive the proper training. That is why at the project level the Training process is a supporting process.

3.6.5 Guidance on AQAP-160 Edition 1 ‘4.12. Measurement process’

3.6.5.1 The general basis for this process is provided by ISO 9001:1994 ‘4.20 Statistical techniques’ or by ISO 9001:2000 ‘8.2.3 Monitoring and measurement of processes’ & ‘8.2.4 Monitoring and measurement of product’. ISO/IEC 12207 does not have a separate measurement process, therefore this process was added in AQAP-160 Edition 1. For process measurement, ISO/IEC 12207 contains an Improvement process. For product measurement, ISO/IEC 12207 refers to ISO/IEC 9126.

3.6.5.2 There are several ISO-initiatives in the software measurement arena. Although the state of software measurement is somewhat immature, NATO believes some sort of measurement should be undertaken. The extent of software measurement and the application of certain standards or methods should be decided on a contract-by-contract basis. Therefore AQAP-160 Edition 1’s Measurement process requirements have to be tailored for each contract.

Chapter 4

Application guidance on AQAP-160 Edition 1

4.1 Purpose

4.1.1 The main objective of the application guidance is to increase the visibility on AQAP-160 Edition 1, without being prescriptive.

4.1.2 This chapter provides supporting information for tailoring the requirements of chapter 3 and chapter 4 of AQAP-160 Edition 1. Since these chapters constitute the NATO adoption of ISO/IEC 12207, the supporting information addresses essentially the tailoring of ISO/IEC 12207.

4.1.3 The supporting information for tailoring tries to help users of AQAP-160 Edition 1 to apply and to implement chapter 5 'Tailoring process requirements' in a successful manner. The supporting information in Tables 4-1, 4-2, and 4-3 provide a conceptual structure or method that may be used in the tailoring process. In addition, the contents of each table is based on expert judgement and as such should be used as tools to assist in the tailoring process.

4.1.4 This chapter also introduces software life cycle data as an additional dimension to the process dimension already provided by AQAP-160 Edition 1.

4.1.5 This chapter provides a first-level guidance and is not intended to be exhaustive. Nations, organizations, industry and/or individuals may want to improve or extend this guidance.

4.2 Scope

4.2.1 The application guidance can be useful for a wide range of potential users of AQAP-160 Edition 1: acquirers, suppliers, developers, operators, maintainers, engineers, quality managers, project managers, etc. When tailoring AQAP-160 Edition 1 requirements and using the supporting information for tailoring on a project, all possible influences from the relevant parties should be taken into account.

4.2.2 The application guidance can be consulted for all types of products and/or systems ranging from complex weapon systems, over database-oriented applications, to simple software products.

4.2.3 The application guidance is not dependent on the particular contractual situation (e.g. sole source, competitive, etc.).

4.2.4 The application guidance does not address issues related to when (e.g. pre-contractual tailoring, tailoring by negotiation, post-contractual tailoring, etc.) and by whom (supplier, acquirer, or other) the tailoring of AQAP-160 Edition 1 is performed.

4.2.5 The application guidance does not absolve the supplier of the ultimate responsibility for the quality of the software.

4.3 The life cycle data

4.3.1 In order to increase visibility on the application of the process-dimension of AQAP-160 Edition 1, an additional dimension has been added: the life cycle data. If a task produces a life cycle data item, this item is identified and named in accordance with the terminology of ISO/IEC 12207 or ISO 9001.

4.3.2 A life cycle data item can be part of the actual software product (e.g. an engineering product like a specification, source code, etc.) or can be of a supporting nature (e.g. a plan, an evaluation report, etc.).

4.3.3 The application guidance does not address the required contents or format of each life cycle data item. Contents may be deduced from the corresponding task and/or may be retrieved from more detailed standards (e.g. IEEE/EIA-Std-12207, IEEE/EIA-Std-016).

4.3.4 The life cycle data identified in the application guidance constitute the 'AQAP-160 Edition 1-complete set'. Nations, organizations, industry and/or individuals may want to adjust, improve or extend the set of life cycle data.

4.4 Use of the supporting information for the tailoring process

4.4.1 The tailoring process is driven by project and product characteristics (drivers for tailoring). The drivers are either an implicit part of the project team's collective expertise, or can be explicitly derived for a specific project, application within a project, or organization.

4.4.2 In order to support the explicit derivation of appropriate drivers, Table 4-3 of Para 4.8 provides a non-exhaustive list. This list may be adjusted, improved or extended by nations, organizations, industry and/or individuals in order to be more direct in line with their policy or business.

4.4.3 In some cases supplier and/or acquirer may decide not to use the tailoring support offered in this chapter to obtain a tailored version of the requirements of AQAP-160 Edition 1.

4.4.4 The tailoring process may follow two different roads, each using the supporting information provided by this chapter in a different way:

4.4.4.1 Based on the implicit drivers, tailoring proceeds task-by-task and life-cycle data item-by-life-cycle data item. The tailoring process and related result is supported by, and may be checked against the tailorability Table 4-1 in Para 4.6.

4.4.4.2 Based on the explicit table of characteristics generated for driving the tailoring process (see Table 4-3 in Para 4.8), and their value for the specific project, tailoring proceeds by identifying their impact on the sets of interrelated tasks for tailoring (see Table 4-2 in Para 4.7). The tailoring process and related result is supported by, and may be checked against the tailorability (Table 4-1 in Para 4.6).

4.5 Supporting information provided in AQAP-169 Edition 1

4.5.1 Tailorability Table 4-1 for AQAP-160 Edition 1 at the task and life cycle data item level.

4.5.1.1 In Para 4.6, an indication of the tailorability of each task as well as of the corresponding life cycle data item has been provided in a table-format. This table provides the following information:

a. which tasks should never be tailored;

b. which tasks should only be tailored under exceptional circumstances;

c. which tasks can be tailored partially in some circumstances;

d. which tasks can be tailored totally in some circumstances.

4.5.1.2 The table contains an analogue indication with respect to the tailorability of the (possible) life cycle data produced by the tasks.

4.5.2 Sets of interrelated tasks and life cycle data items: Table 4-2.

4.5.2.1 In Para 4.7, sets of interrelated tasks of AQAP-160 Edition 1 have been provided in table-format. Functionally interrelated tasks are being abstracted into ‘sets’, which in turn are grouped into ‘groups of sets’.

4.5.2.2 The sets provide different functional views on AQAP-160 Edition 1. In short, a set can be considered to be a functional abstraction of interrelated tasks.

4.5.2.3 The sets of interrelated tasks serve two purposes:

a. enhance the understanding of the AQAP-160 Edition 1-model, more specifically its relationship and implementation by different life cycle participants (e.g. supplier, developer, maintainer) and disciplines (e.g. engineer, project manager, quality manager);

b. indicate the influence of drivers for tailoring (product and project characteristics) on the tailoring of these sets of interrelated tasks (see Para 4.5.3).

4.5.2.4 By checking which set of interrelated tasks a particular task belongs to, it becomes possible:

a. to determine the category of the possibly associated life cycle data item;

b. to get an indication on which discipline (e.g. engineering, project management, quality management, etc.) should be involved in the tailoring of that particular task and possible life cycle data item;

c. to get an indication on which discipline (e.g. engineering, project management, quality management, etc.) should be involved in the implementation, execution and follow-up of a particular task;

4.5.3 Impact of drivers on the sets of interrelated tasks : Table 4-3.

4.5.3.1 In Para 4.8, a correlation between drivers and sets of interrelated tasks is provided.

4.5.3.2 The drivers are organized in two categories:

a. Product-related characteristics;

b. Project-related characteristics.

4.5.3.3 When the value of a particular driver is high, the impact can be described as an indication of which sets of interrelated tasks become very important for the product or the project;

4.6 Table of tailorability for AQAP-160 Edition 1

4.6.1 The Tailorability Table 4-1 written at the task level contains the following information:

4.6.1.1 For each task of AQAP-160 Edition 1 is indicated:

a. the process and activity the task belongs to;

b. the activity number, the AQAP 160 Edition 1 task numbers when an activity contains modified tasks or a newly created task, and for each task the original number from the corresponding standard is referenced: ISO/IEC 12207, ISO 9001:2000 or ISO 9001:1994.

c. the task level of tailorability, where the following definitions apply:

(1) N(ot): the task cannot be tailored, and shall be executed to the full extent as required by the standard.

(2) E(xceptional): the task should be executed to the full extent as required by the standard, but can be tailored (partial or full) under exceptional conditions; tailoring this task might compromise software quality.

(3) P(artial): the task can be tailored to be executed to a lesser extent as required by the standard (i.e., portions of the task may be omitted, or the level of performance may be reduced).

(4) F(ull): the task can be tailored out (i.e., may be omitted) under specific conditions.

It should be clear that a task may be tailored partially in some circumstances and the same task may be tailored fully in other circumstances. Rationale for tailoring decisions should be documented in accordance with Annex B of AQAP-160 Ed 1.

4.6.1.2 If applicable, for each life cycle data item produced by a task is indicated:

a. the name of the life cycle data item based on ISO/IEC 12207 or ISO 9001;

b. the category of the life cycle data item. The category is based on the sets of interrelated tasks (see Table 4.2 in Para 4.7). The following categories are identified:

(1) Ag(reement) data

(2) E(ngineering) data

(a) R(equirements specification) data

(b) Co(nstruction) data

(c) T(esting) data

(d) Ch(ange analysis) data

(3) Co(nfiguration management) data

(4) Ch(ange management) data

(5) P(roject management) data

(6) Q(uality management) data

(7) Pr(oduction and deployment) data

(8) O(peration) data

(9) R(esource management) data

c. the type of the life cycle data item, where the following types are identified:

(1) P(lan)
Define when, where, how, and by whom specific activities are to be performed, including options and alternatives, as required.

(2) S(pecification)
Specify a required function, performance, or process.

(3) D(escription)
Describe a concept, function, design, as-built product, test, or process.

(4) Rep(ort)
Document and submit the results of tasks, findings, studies, evaluations, and other activities.

(5) R(ecord)
Document and retain objective evidence of the results of tasks, findings, studies, evaluations, and other activities.

(6) M(anual)
Describe the installation and use of the product(s).

d. the life cycle data item level of tailorability, where the following definitions apply:

(1) N(ot): the life cycle data shall be produced and documented in a formal way addressing all issues required by the standard.

(2) E(xceptional): the life cycle data should be produced and documented in a formal way addressing all issues required by the standard, but can be tailored (partial or full) under exceptional conditions; tailoring these life cycle data might compromise software quality.

(3) P(artial): the life cycle data can be produced and/or documented in an informal way, or addressing not all issues required by the standard, or combined with other life cycle data.

(4) F(ull): the life cycle data can be tailored out (i.e., may be omitted) under specific conditions.

It should be clear that a life cycle data item may be tailored partially in some circumstances and the same item may be tailored fully in other circumstances. Rationale for tailoring decisions should be documented in accordance with Annex B of AQAP-160 Ed 1.

Process	AQAP-160 ed 1 Act. number	Activity	AQAP-160 ed 1 Task ^=modif	ISO/IEC 12207 *= ISO 9001:2000 **= ISO 9001:1994	Task (paraphrased)	Task Level of Tailorability				Life cycle data item	Data item cat.	Data item type	Data Item Level of Tailorability			
						N	E	P	F				N	E	P	F
3.1. Supply	3.1.1.	Initiation		5.2.1.1	Review RFP, policies, regulations			P	F	Review of requirements record	Ag	R			P	F
				5.2.1.2	Decide to bid or accept contract			P	F	Bid or letter of acceptance (L.o.a.)	Ag	R			P	F
	3.1.2.	Preparation of response		5.2.2.1	Prepare proposal in response to RFP			P	F	Proposal	Ag	D	N			
	3.1.3.	Contract		5.2.3.1	Negotiate and enter into contract			P	F	Contract	Ag	S	N			
				5.2.3.2	Mod contract per change mechanism			P	F	Modification request	Ag	R	N			
	3.1.4.	Planning		5.2.4.1	Review the acquisition requirements			P		Framework for management and assurance	P	S			P	
				5.2.4.2	Select a software life cycle model	N				Software life cycle model description	E	D			P	
				5.2.4.3	Establish requirements for plans			P	F	Requirements for plans	P	P			P	F
				5.2.4.4	Evaluate make-or-buy decision			P		Software options analysis record	P	R			P	
				5.2.4.5	Document project management plans			P		Project management plan	P	P			P	
	3.1.5	Execution and control	3.1.5.1.	5.2.5.1	Execute project management plans	N				N/A						
			3.1.5.2.^	5.2.5.2	Develop, Operate, or Maintain law process			P		N/A						
			3.1.5.3.	5.2.5.3	Monitor progress, identify problems			P		Progress and problem records	P	R			P	
			3.1.5.4.^	5.2.5.4	Control subcontractors law Acq.Process			P	F	Subcontractor control procedures / contractual requirement	P	P			P	F
			3.1.5.5.	5.2.5.5	Interface with V&V and test agent				F	N/A						
			3.1.5.6.	5.2.5.6	Interface with others per contract and plans			P	F	N/A						
	3.1.6.	Review and evaluation		5.2.6.1	Coordinate contract reviews			P		N/A						
				5.2.6.2	Support meetings, reviews, tests, audits			P		Joint review & Audit results	P	Rep			P	F
				5.2.6.3	Conduct V&V per 6.4 and 6.5				F	Verification & Validation results	P	Rep				F
				5.2.6.4	Report evaluations, audits, tests to acquirer			P		Reports and problem resolutions	P	Rep			P	
				5.2.6.5	Provide access to facilities			P		N/A						
				5.2.6.6	Perform quality assurance law 6.3			P		Quality assurance results	P	Rep				F

Table 4-1: Tailorability of AQAP-160 Edition 1 at the task and life cycle data item level.

Process	AQAP-160 ed 1 Act. number	Activity	AQAP-160 ed 1 Task ^ =modif	ISO/IEC 12207 *= ISO 9001:2000 **= ISO 9001:1994	Task (paraphrased)	Task Level of Tailorability N	E	P	F	Life cycle data item	Data item cat.	Data item type	Data Item Level of Tailorability N	E	P	F
3.1. Supply	3.1.7.	Contract review		5.2*	Customer focus			P		Customer requirements	P	S			P	
				7.2.1*	Determination of requirements related to the product			P		Customer-, intended use-, product-, additional requirements	P	S			P	
				7.2.2*	Review of requirements related to the product			P		Review results and action records	P	R			P	
				7.2.3*	Customer communication			P		Communication arrangements	P	P			P	
				4.3.1**	General			P		Contract review and coordination procedures	P	P			P	
				4.3.2**	Review			P		Contract review record	Ag	R			P	
				4.3.3**	Amendment to a contract			P	F	Contract amendment	Ag	D			P	F
				4.3.4**	Records			P	F	Contract review record	Ag	R			P	F
3.2. Acquisition (invoked by supplier)	3.2.1.	Initiation		5.1.1.1	Describe concept or need for product		E			Concept description	Ag,ER	S			P	
				5.1.1.2	Analyze system requirements			P	F	System requirements	Ag,ER	S			P	F
				5.1.1.3	Approve analyzed requirements			P	F	Approval of analyzed requirements	Ag,ER	S			P	F
				5.1.1.4	Define software requirements			P		Software requirement description	Ag,ER	S			P	
				5.1.1.5	Use Devel.Process for 5.1.1.2 and 5.1.1.4			P	F	N/A						
				5.1.1.6	Consider acquisition options			P	F	Acquisition options analysis record	Ag,P	R			P	F
				5.1.1.7	Evaluate off-the-shelf products			P	F	COTS acceptance records	ET	R			P	F
				5.1.1.8	Document and execute acquisition plan			P	F	Acquisition plan	P	P			P	F
				5.1.1.9	Document acceptance criteria		E			Acceptance strategy and criteria	Ag,ET	S			P	
	3.2.2.	Request-for-proposal[-tender] preparation		5.1.2.1	Document acquisition requirements (RFP)		E			Request-for-proposal	Ag	S			P	
				5.1.2.2	Tailor Standards		E			Tailored AQAP-160 Ed 1 for subcontractor	P	P			P	F
				5.1.2.3	Define contract milestones and audits			P		Contract milestones review and audit plan	P	P			P	
				5.1.2.4	Give requirements to performer			P	F	Acquisition requirements issued	P	S			P	F
	3.2.3.	Contract preparation and update	3.2.3.1.	5.1.3.1	Establish selection procedure			P	F	Supplier selection procedure	P	P			P	F
			3.2.3.2.	5.1.3.2	Select supplier based on evaluation				F	Supplier selection record	P	R				F
			3.2.3.3.	5.1.3.3	Get inputs on tailoring this Standard			P	F	Tailored AQAP-160 Ed 1 for subcontractor	Ag	S			P	F
			3.2.3.4.	5.1.3.4	Prepare and negotiate contract			P	F	Contract/order	Ag	S				F
			3.2.3.5.^	5.1.3.5	Negotiate changes to contract			P	F	Contract change control record	Ag	R			P	F

Table 4-1: Tailorability of AQAP-160 Edition 1 at the task and life cycle data item level.

Process	AQAP-160 ed 1 Act. number	Activity	AQAP-160 ed 1 Task ^=modif	ISO/IEC 12207 *= ISO 9001:2000 **= ISO 9001:1994	Task (paraphrased)	Task Level of Tailorability N	E	P	F	Life cycle data item	Data item cat.	Data item type	Data Item Level of Tailorability N	E	P	F
3.2. Acquisition (invoked by supplier)	3.2.4.	Supplier monitoring		5.1.4.1	Monitor supplier activities iaw 6.6 and 6.7			P	F	Subcontractor joint review and audit results Subcontractor verification and validation results	P	Rep			P	F
				5.1.4.2	Cooperate with timely resolutions			P	F	Neccessary information provided	P	R			P	F
	3.2.5.	Acceptance and completion		5.1.5.1	Define acceptance tests and procedures			P		Test or validation procedures	Ag,P,ET	D			P	
				5.1.5.2	Conduct acceptance review and testing		E			Acceptance record	Ag	R			P	F
				5.1.5.3	Perform CM after acceptance				F	CM transfer records	Co	R			P	F
	3.2.6.			7.4.1.*	Purchasing process				F	Sub-contractor selection criteria and records	Ag	R				F
		Evaluation of subcontractors		4.6.2**	Evaluation of subcontractors				F	Quality records on subcontractors	Ag	R				F
	3.2.7.			7.4.2.*	Purchasing information				F	Purchasing documents	Ag	R				F
		Purchasing data		4.6.3**	Purchasing data				F	Purchasing documents	Ag	R				F
	3.2.8.			7.4.3.*	Verification of purchased product				F	Purchased product verification records	Ag	R				F
		Verification of purchased product		4.6.4.1**	Supplier verification at subcontractor's premises				F	Verification arrangements	Ag	R				F
	3.2.9.			7.4.3.*	Verification of purchased product				F	Purchased product verification records	Ag	R				F
		Verification of purchased product		4.6.4.2**	Customer verification of subcontracted product				F	Verification right(s)	Ag	R				F
	3.2.10.			7.5.4.*	Customer property			P	F	Procedures for control of customer-supplied products	P	P			P	F
		Control of customer-supplied product		4.7**	Control of customer-supplied product			P	F	Procedures for control of customer-supplied products	P	P			P	F

Table 4-1: Tailorability of AQAP-160 Edition 1 at the task and life cycle data item level.

Process	AQAP-160 ed 1 Act. number	Activity	AQAP-160 ed 1 Task ^=modif	ISO/IEC 12207 *= ISO 9001:2000 **= ISO 9001:1994	Task (paraphrased)	Task Level of Tailorability				Life cycle data item	Data item cat.	Data item type	Data Item Level of Tailorability			
						N	E	P	F				N	E	P	F
3.2. Acquisition (invoked by supplier)	3.2.1.1.			7.1.*	Planning of product realization			P	F	Product realization plan	P	P			P	F
				7.5.1.*	Control of production and service provision			P	F	Production and service plan	P	P			P	F
				8.1.*	General			P	F	Monitoring and measuring plan	P	P			P	F
				8.2.4.*	Monitoring and measuring of product			P	F	Product monitoring and measuring records	Q	R			P	F
		Receiving inspection and testing		4.10.2.1**	Ensuring not-use or process incoming products			P	F	Procedure incoming products	P	P			P	F
				4.10.2.2**	Consider amount of control of subcontractor			P	F	Subcontractors rating	P	P			P	F
				4.10.2.3**	Positive identification and recording			P	F	Procedure for identification of unverified products used	P	P			P	F
3.3.Development	3.3.1.	Process implementation	3.3.1.1.	5.3.1.1	Define software life cycle model			P		Software life cycle model description	ER	D			P	
			3.3.1.2.	5.3.1.2	Document and control outputs			P		N/A						
			3.3.1.3.	5.3.1.3	Select and use standards, tools, languages			P		Software development standards description	P	P			P	
			3.3.1.4.	5.3.1.4	Document development plans			P		System/software development plan	P	P			P	
			3.3.1.5.^	5.3.1.5	Deliver all needed products				F	Non-deliverable item independance verification report	P	Rep				F
	3.3.2.	System requirements analysis		5.3.2.1	Specify system requirements			P		System requirements specification	ER	S			P	
				5.3.2.2	Evaluate requirements against criteria		E			System requirements evaluation record	Q	R			P	F
	3.3.3.	System architectural design		5.3.3.1	Establish top-level architecture	N				System architecture description	ECo	D			P	
				5.3.3.2	Evaluate architecture against criteria		E			System architecture evaluation record	Q	R			P	F
	3.3.4.	Software requirements analysis	3.3.4.1.^	5.3.4.1	Document software requirements			P		Software item requirements specification	ER,ET	S			P	
			3.3.4.2.	5.3.4.2	Evaluate requirements against criteria		E			Software item requirements evaluation record	Q	R			P	F
			3.3.4.3.	5.3.4.3	Conduct joint reviews iaw 6.6				F	Joint review result	P	Rep			P	F

Table 4-1: Tailorability of AQAP-160 Edition 1 at the task and life cycle data item level.

Process	AQAP-160 ed 1 Act. number	Activity	AQAP-160 ed 1 Task ^=modif	ISO/IEC 12207 *= ISO 9001:2000 **= ISO 9001:1994	Task (paraphrased)	Task Level of Tailorability N	E	P	F	Life cycle data item	Data item cat.	Data item type	Data Item Level of Tailorability N	E	P	F
3.3. Development	3.3.5.	Software architectural design		5.3.5.1	Transform requirements into architecture	N				Software item architecture description	EC o	D			P	
				5.3.5.2	Document top-level design for interfaces	N				Interface design description	EC o	D			P	
				5.3.5.3	Document top-level design for database				F	Database design description	EC o	D			P	F
				5.3.5.4	Document preliminary user documentation				F	User documentation	EC o	M			P	F
				5.3.5.5	Document preliminary test requirements			P	F	Software item integration test description	EC o,ET	D			P	F
				5.3.5.6	Evaluate architecture against criteria		E			Software item architecture evaluation record	Q	R			P	F
				5.3.5.7	Conduct joint review s iaw 6.6				F	Joint review result	P	Rep			P	F
	3.3.6.	Software detailed design		5.3.6.1	Document design for each component				F	Software item detailed design description	EC o	D			P	F
				5.3.6.2	Document design for interfaces				F	Interface detailed design description	EC o	D			P	F
				5.3.6.3	Document design for database				F	Database detailed design description	EC o	D			P	F
				5.3.6.4	Update user documentation				F	User documentation	EC o	M			P	F
				5.3.6.5	Document unit test requirements			P	F	Software unit test descriptions	ET	D			P	F
				5.3.6.6	Update integration test requirements				F	Software item integration test description	EC o,ET	D			P	F
				5.3.6.7	Evaluate detailed design against criteria		E			Software item detailed design evaluation record	Q	R			P	F
				5.3.6.8	Conduct joint review s iaw 6.6				F	Joint review result	P	Rep			P	F
	3.3.7.	Software coding and testing		5.3.7.1	Document each unit, database and tests			P	F	Source code Executable code Software unit test description	EC o,ET	D			P	F
				5.3.7.2	Conduct and document unit testing			P		Software unit test result	ET	R			P	F
				5.3.7.3	Update user documentation				F	User documentation	EC o	M			P	F
				5.3.7.4	Update integration test requirements				F	Software item integration test description	EC o,ET	D			P	F
				5.3.7.5	Evaluate code and test results		E			Software item code and testing evaluation record	Q	R			P	F

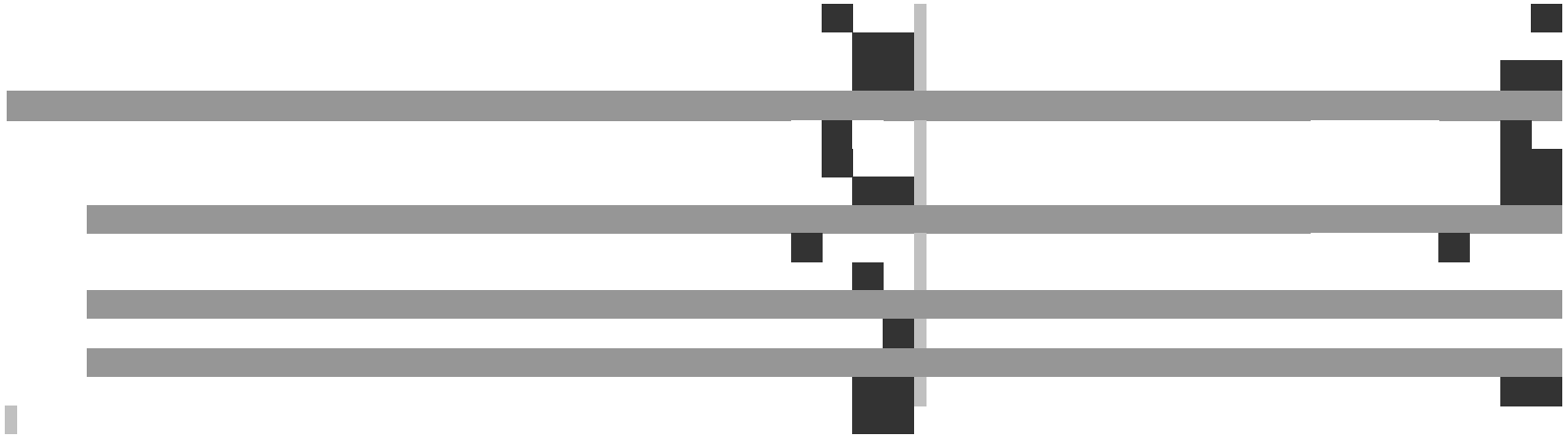
Table 4-1: Tailorability of AQAP-160 Edition 1 at the task and life cycle data item level.

Process	AQAP-160 ed 1 Act. number	Activity	AQAP-160 ed 1 Task ^=modif	ISO/IEC 12207 *= ISO 9001:2000 **= ISO 9001:1994	Task (paraphrased)	Task Level of Tailorability				Life cycle data item	Data item cat.	Data item type	Data Item Level of Tailorability			
						N	E	P	F				N	E	P	F
3.3. Development	3.3.8.	Software integration		5.3.8.1	Document integration plans			P	F	Software item integration test plan	P	P			P	F
				5.3.8.2	Conduct and document integration tests			P		Software item integration test results	EC o, ET	R			P	F
				5.3.8.3	Update user documentation				F	User documentation	EC o	M			P	F
				5.3.8.4	Document qualification tests				F	Software item qualification test description	EC o	D			P	F
				5.3.8.5	Evaluate plans and tests against criteria		E			Software item integration test evaluation record	Q	R			P	F
				5.3.8.6	Conduct joint reviews iaw 6.6				F	Joint review result	P	Rep			P	F
	3.3.9.	Software qualification testing		5.3.9.1	Conduct and document qualification testing			P	F	Software item qualification test result	ET	R			P	F
				5.3.9.2	Update user documentation				F	User documentation	EC o	M			P	F
				5.3.9.3	Evaluate tests against criteria		E			Software item qualification test evaluation result	Q	Rep			P	F
				5.3.9.4	Support audits iaw 6.7				F	Software item qualification audit result	Q	Rep				F
				5.3.9.5	Prepare product for next phase				F	System integration test description Software item baseline	EC o, ET, C o	D				F
	3.3.10.	System integration		5.3.10.1	Integrate software with hardware & others			P		System integration test result	EC o, ET	Rep			P	F
				5.3.10.2	Document integration tests		E			System qualification test description	ET	D			P	
				5.3.10.3	Evaluate integrated system against criteria		E			System integration evaluation record	Q	R			P	F
	3.3.11.	System qualification testing		5.3.11.1	Conduct and document qualification tests	N				System qualification test result	ET	Rep	N			
				5.3.11.2	Evaluate system against criteria		E			System qualification evaluation record	Q	R			P	F
				5.3.11.3	Support audits iaw 6.7				F	System qualification audit result	Q	Rep				F
				5.3.11.4	Prepare product for installation				F	System baseline	C o	S				F
	3.3.12.	System validation	3.3.12.1.		Validate system against intended use	N				System validation result	Q	Rep	N			
			3.3.12.2.		Document result of validation		E			System validation evaluation record	Q	R			P	F

Table 4-1: Tailorability of AQAP-160 Edition 1 at the task and life cycle data item level.

Process	AQAP-160 ed 1 Act. number	Activity	AQAP-160 ed 1 Task ^=modif	ISO/IEC 12207 *= ISO 9001:2000 **= ISO 9001:1994	Task (paraphrased)	Task Level of Tailorability				Life cycle data item	Data item cat.	Data item type	Data Item Level of Tailorability			
						N	E	P	F				N	E	P	F
3.4. Production and deployment	3.4.1.	Process implementation	3.4.1.1.		Document and execute plans and procedures			P		Production and Deployment plan	P	P			P	
			3.4.1.2.		Implement or establish documented interface with CM process			P		Procedure for interface to CM proces	P	P			P	
			3.4.1.3.		Record encountered problems			P		Problem records	Pr	R			P	F
	3.4.2.	Replication	3.4.2.1.	7.1.*	Planning and product realization			P		Product realization plan	P	P			P	F
			3.4.2.2.	7.5.1.*	Control of production and service provision			P		Production and service plan	P	P			P	F
			3.4.2.3.	7.5.2.*	Validation of processes for production and service provision			P		Production processes validation records	Pr	D	N			
		Process control		4.9**	Identify and plan replication			P		Software copy	Pr	D	N			
	3.4.3.	Release	3.4.3.1	7.1.*	Planning and product realization			P		Product realization plan	P	P			P	F
			3.4.3.2.	7.5.1.*	Control of production and service provision			P		Production and service plan	P	P			P	F
			3.4.3.3.	7.5.2.*	Validation of processes for production and service provision			P		Production processes validation records	Pr	D	N			
		Process control		4.9**	Identify and plan release			P		Software version description	Pr	D	N			
	3.4.4.	Delivery	3.4.4.1.	7.5.1.*	Control of production and service provision			P		N/A						
				4.9**	Identify and plan delivery			P		Software product	Pr	D	N			
			3.4.4.2.	5.2.7.1	Deliver the product per contract	N				Delivery documents	P	R			P	F
				5.2.7.2	Support acquirer with product per contract			P	F	Support report	P	Rep			P	F
	3.4.5.	Installation	3.4.5.1.	7.1.*	Planning and product realization			P		Product realization plan	P	P			P	F
				7.5.1.*	Control of production and service provision			P		Production and service plan	P	P			P	F
				7.5.2.*	Validation of processes for production and service provision			P		Production processes validation records	Q	R			P	F
				4.9**	Identify and plan installation			P		Software installation plan	Pr	P			P	F
			3.4.5.2.	5.3.12.1	Plan installation in target environment			P		Software installation plan	P	P			P	
				5.3.12.2	Install software iaw plan			P		Software installation record	Pr	R			P	F

Table 4-1: Tailorability of AQAP-160 Edition 1 at the task and life cycle data item level.



4.7 Table with the sets of interrelated tasks

4.7.1 Table 4-2 with the sets of interrelated tasks for AQAP-160 Edition 1 contains the following information:

4.7.1.1 the process and activity the task belongs to;

4.7.1.2 the activity number, the AQAP 160 Edition 1 task numbers when an activity contains modified tasks or a newly created task, and for each task the original number from the corresponding standard is referenced: ISO/IEC 12207, ISO 9001:2000 or ISO 9001:1994.

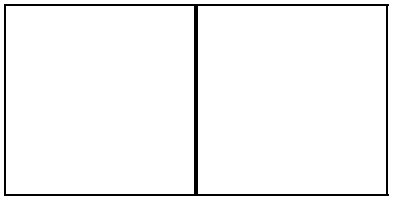
4.7.1.3 if applicable, the associated life cycle data item;

4.7.1.4 if applicable, the category of the life cycle data item (based on the set of interrelated tasks the corresponding task belongs to);

4.7.1.5 if applicable, the type of the life cycle data item;

4.7.1.6 an indication whether a task with associated life cycle data item belongs to a particular set of interrelated tasks (black box).

4.7.2 In order to further increase the visibility on AQAP-160 Edition 1, the functional abstraction has been further extended by grouping sets.



Process	AQAP-160 ed 1 Activity number	Activity	AQAP-160 ed 1 Task ^ = modif	ISO/IEC 12207 task * = ISO 9001:2000 ** = ISO 9001:1994	Life cycle data item	Data item cat.	Data item type	N	E	P	F
3.2. Acquisition (invoked by supplier)	3.2.8.			7.4.3.*	Purchased product verification records	Ag	R				F
		Verification of purchased product		4.6.4.1**	Verification arrangements	Ag	R				F
	3.2.9.			7.4.3.*	Purchased product verification records	Ag	R				F
		Verification of purchased product		4.6.4.2**	Verification right(s)	Ag	R				F
	3.2.10.			7.5.4.*	Procedures for control of customer-supplied products	P	P			P	F
		Control of customer-supplied product		4.7**	Procedures for control of customer-supplied products	P	P			P	F
	3.2.11.			7.1.*	Product realization plan	P	P			P	F
				7.5.1.*	Production and service plan	P	P			P	F
				8.1.*	Monitoring and measuring plan	P	P			P	F
				8.2.4.*	Product monitoring and measuring recor	Q	R			P	F
		Receiving inspection and testing		4.10.2.1**	Procedure incoming products	P	P			P	F
				4.10.2.2**	Subcontractors rating	P	P			P	F
				4.10.2.3**	Procedure for identification of unverified products used	P	P			P	F
3.3. Development	3.3.1.	Process implementation	3.3.1.1.	5.3.1.1	Software life cycle model description	ER	D			P	
			3.3.1.2.	5.3.1.2	N/A						
			3.3.1.3.	5.3.1.3	Software development standards descrip	P	P			P	
			3.3.1.4.	5.3.1.4	System/software development plan	P	P			P	
			3.3.1.5.^	5.3.1.5	Non-deliverable item independance verification report	P	Rep				F
	3.3.2.	System requirements		5.3.2.1	System requirements specification	ER	S			P	
				5.3.2.2	System requirements evaluation record	Q	R			P	F
	3.3.3.	System architectural		5.3.3.1	System architecture description	ECo	D			P	
				5.3.3.2	System architecture evaluation record	Q	R			P	F
	3.3.4.	Software requirements analysis	3.3.4.1.^	5.3.4.1	Software item requirements specificatio	ER,ET	S			P	
			3.3.4.2.	5.3.4.2	Software item requirements evaluation r	Q	R			P	F
			3.3.4.3.	5.3.4.3	Joint review result	P	Rep			P	F

Life cycle data item	Agreement: Supply	Agreement: Acquisition (invoked/supplier)	Requirements specification	Engineering – Construction: Architectural Design	Detailed Design	Coding	Development Documentation	Integration documentation	User documentation	Engineering – Testing: Unit	Integration	Qualification	Change analysis & implementation	Configuration management	Change management	Project Management: Supply	Acquisition (invoked/supplier)	Development	Production & Deployment	Operation	Maintenance	Quality management: Engineering evaluation	Quality assurance	Verification	Validation	Joint review	Audit	Measurement	Production & Deployment	Operation	Resource management: Infrastructure	Training
Purchased product verification records (7.4.3.*)		■																														
Verification arrangements		■																														
Purchased product verification records (7.4.3.*)		■																														
Verification right(s)		■																														
Procedures for control of customer-supplied products (7.5.4.*)		■																														
Procedures for control of customer-supplied products (4.7**)		■																														
Product realization plan		■																														
Production and service plan																																
Monitoring and measuring plan																																
Product monitoring and measuring recor		■																														
Procedure incoming products		■																														
Subcontractors rating		■																														
Procedure for identification of unverified products used		■																														
Software life cycle model description																		■														
N/A																		■														
Software development standards descrip																		■														
System/software development plan																		■														
Non-deliverable item independance verification report																		■														
System requirements specification			■									■																				
System requirements evaluation record																						■										
System architecture description				■																												
System architecture evaluation record																						■										
Software item requirements specificatio			■									■																				
Software item requirements evaluation r																						■										
Joint review result																		■														

Table 4-2: Sets of interrelated tasks and life cycle data items

Process	AQAP-160 ed 1 Activity number	Activity	AQAP-160 ed 1 Task ^ = modif	ISO/IEC 12207 task * = ISO 9001:2000 ** = ISO 9001:1994	Life cycle data item	Data item cat.	Data-item type	Data item Level of Tailorability N	E	P	F
3.3. Development	3.3.5.	Software architectural design		5.3.5.1	Software item architecture description	ECo	D			P	
				5.3.5.2	Interface design description	ECo	D			P	
				5.3.5.3	Database design description	ECo	D			P	F
				5.3.5.4	User documentation	ECo	M			P	F
				5.3.5.5	Software item integration test description	ECo,ET	D			P	F
				5.3.5.6	Software item architecture evaluation record	Q	R			P	F
				5.3.5.7	Joint review result	P	Rep			P	F
	3.3.6.	Software detailed design		5.3.6.1	Software item detailed design description	ECo	D			P	F
				5.3.6.2	Interface detailed design description	ECo	D			P	F
				5.3.6.3	Database detailed design description	ECo	D			P	F
				5.3.6.4	User documentation	ECo	M			P	F
				5.3.6.5	Software unit test descriptions	ET	D			P	F
				5.3.6.6	Software item integration test description	ECo,ET	D			P	F
				5.3.6.7	Software item detailed design evaluation	Q	R			P	F
				5.3.6.8	Joint review result	P	Rep			P	F
	3.3.7.	Software coding and testing		5.3.7.1	Source code Executable code Software unit test description	ECo,ET	D			P	F
				5.3.7.2	Software unit test result	ET	R			P	F
				5.3.7.3	User documentation	ECo	M			P	F
				5.3.7.4	Software item integration test description	ECo, ET	D			P	F
				5.3.7.5	Software item code and testing evaluation	Q	R			P	F
	3.3.8.	Software integration		5.3.8.1	Software item integration test plan	P	P			P	F
				5.3.8.2	Software item integration test results	ECo, ET	R			P	F
				5.3.8.3	User documentation	ECo	M			P	F
				5.3.8.4	Software item qualification test description	ECo	D			P	F
				5.3.8.5	Software item integration test evaluation	Q	R			P	F
				5.3.8.6	Joint review result	P	Rep			P	F
	3.3.9.	Software qualification testing		5.3.9.1	Software item qualification test result	ET	R			P	F
				5.3.9.2	User documentation	ECo	M			P	F
				5.3.9.3	Software item qualification test evaluation	Q	Rep			P	F
				5.3.9.4	Software item qualification audit result	Q	Rep				F
				5.3.9.5	System integration test description Software item baseline	ECo,ET,C	D				F

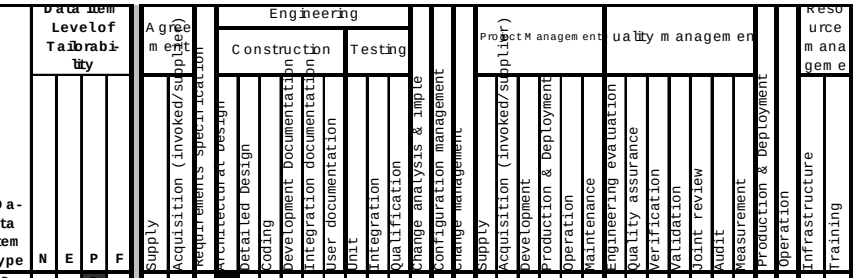


Table 4-2: Sets of interrelated tasks and life cycle data items

Process	AQAP-160 ed 1 Activity number	Activity	AQAP-160 ed 1 Task ^ = modif	ISO/IEC 12207 task * = ISO 9001:2000 ** = ISO 9001:1994	Life cycle data item	Data item cat.	Data item type	Level of Tailorability N	E	P	F
3.3. Devlopment	3.3.10.	System integration		5.3.10.1	System integration test result	ECo, ET	Rep			P	F
				5.3.10.2	System qualification test description	ET	D			P	
				5.3.10.3	System integration evaluation record	Q	R			P	F
	3.3.11.	System qualification testing		5.3.11.1	System qualification test result	ET	Rep	N			
				5.3.11.2	System qualification evaluation record	Q	R			P	F
				5.3.11.3	System qualification audit result	Q	Rep				F
				5.3.11.4	System baseline	Co	S				F
	3.3.12.	System validation	3.3.12.1.		System validation result	Q	Rep	N			
			3.3.12.2.		System validation evaluation record	Q	R			P	F
3.4. Production and deployment	3.4.1.	Process implementation	3.4.1.1.		Production and Deployment plan	P	P			P	
			3.4.1.2.		Procedure for interface to CM proces	P	P			P	
			3.4.1.3.		Problem records	Pr	R			P	F
	3.4.2.	Replication	3.4.2.1.	7.1.*	Product realization plan	P	P			P	F
			3.4.2.2.	7.5.1.*	Production and service plan	P	P			P	F
			3.4.2.3.	7.5.2.*	Production processes validation records	Pr	D	N			
		Process control		4.9**	Software copy	Pr	D	N			
	3.4.3.	Release	3.4.3.1	7.1.*	Product realization plan	P	P			P	F
			3.4.3.2.	7.5.1.*	Production and service plan	P	P			P	F
			3.4.3.3.	7.5.2.*	Production processes validation records	Pr	D	N			
		Process control		4.9**	Software version description	Pr	D	N			
	3.4.4.	Delivery	3.4.4.1.	7.5.1.*	N/A						
				4.9**	Software product	Pr	D	N			
			3.4.4.2.	5.2.7.1	Delivery documents	P	R			P	F
				5.2.7.2	Support report	P	Rep			P	F
	3.4.5.	Installation	3.4.5.1.	7.1.*	Product realization plan	P	P			P	F
				7.5.1.*	Production and service plan	P	P			P	F
				7.5.2.*	Production processes validation records	Q	R			P	F
				4.9**	Software installation plan	Pr	P			P	F
			3.4.5.2.	5.3.12.1	Software installation plan	P	P			P	
				5.3.12.2	Software installation record	Pr	R			P	F

Table 4-2: Sets of interrelated tasks and life cycle data items

Process	AQAP-160 ed 1 Activity number	Activity	AQAP-160 ed 1 Task ^ = modif	ISO/IEC 12207 task * = ISO 9001:2000 ** = ISO 9001:1994	Life cycle data item	Data item cat.	Data item type	Data item Level of Tailorability: N	E	P	F
3.4. [illegible] and Depl.	3.4.6.	Acceptance support		5.3.13.1	Software acceptance test results	P,Pr	Rep				F
				5.3.13.2	N/A						
				5.3.13.3	Training records	Pr	R			P	F
3.5. Operation	3.5.1.	Process implementation		5.4.1.1	Operation plan	P	P			P	
				5.4.1.2	Problem reports handling procedure	P	P			P	F
				5.4.1.3	Test procedure for operational environm	P	P			P	F
	3.5.2.	Operational testing		5.4.2.1	Operational test records	O	R	N			
				5.4.2.2	N/A						
	3.5.3.	System operation		5.4.3.1	N/A						
	3.5.4.	User support		5.4.4.1	User assistance requests	O	Rep			P	F
				5.4.4.2	User assistance resolution reports	O	Rep			P	F
				5.4.4.3	Temporary workarounds	ECh	P			P	F
3.6. Maintenance	3.6.1.	Process implementation		5.5.1.1	Software maintenance plan	P	P			P	
				5.5.1.2	Problem resolution procedure	P	P			P	
				5.5.1.3	Software configuration modification procedure	P	P			P	
	3.6.2.	Problem and modification analysis		5.5.2.1	Modification request	ECh	S	N			
				5.5.2.2	N/A						
				5.5.2.3	Modification proposals	ECh	D			P	
				5.5.2.4	Modification analysis record	ECh	R			P	
				5.5.2.5	Modification approval record	ECh	R	N			
	3.6.3.	Modification implementation		5.5.3.1	Modification implementation description	ECh	D	N			
				5.5.3.2	Modification implementation record	ECh	R	N			
	3.6.4.	Maintenance review/acceptan		5.5.4.1	Joint review result	P	Rep			P	F
				5.5.4.2	Modification closure record	ECh	R	N			

Task	Agreement: Supply	Agreement: Acquisition (invoked/supplier)	Requirements specification	Engineering – Construction: Architectural Design	Detailed Design	Coding	Development Documentation	Integration documentation	User documentation	Engineering – Testing: Unit	Integration	Qualification	Change analysis & implementation	Configuration management	Change management	Project Management: Supply	Acquisition (invoked/supplier)	Development	Production & Deployment	Operation	Maintenance	Quality management: Engineering evaluation	Quality assurance	Verification	Validation	Joint review	Audit	Measurement	Production & Deployment	Operation	Resource management: Infrastructure	Training
5.3.13.1																			■										■			
5.3.13.2																			■										■			
5.3.13.3																			■										■			
5.4.1.1																				■												
5.4.1.2																				■												
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Table 4-2: Sets of interrelated tasks and life cycle data items

Process	AQAP-160 ed 1 Activity number	Activity	AQAP-160 ed 1 Task ^ = modif	ISO/IEC 12207 task * = ISO 9001:2000 ** = ISO 9001:1994	Life cycle data item	Data item cat.	Data-item type	Data item Level of Tailorability N	E	P	F
3.6. Maintenance	3.6.5.	Migration		5.5.5.1	N/A						
				5.5.5.2	Software migration plan	P	P			P	F
				5.5.5.3	Software migration planning notification	ECh	D			P	
				5.5.5.4	Parallel operation record	O	R				F
				5.5.5.5	Software migration notification	ECh	D			P	
				5.5.5.6	Joint review result	P	Rep			P	F
				5.5.5.7	N/A						
	3.6.6.	Software retirement		5.5.6.1	Software retirement plan	P	P	N			
				5.5.6.2	Software retirement planning notification	ECh	D			P	
				5.5.6.3	Parallel operation record	O	R				F
				5.5.6.4	Software retirement notification	ECh	D	N			
				5.5.6.5	N/A						
4.1. Documentation	4.1.1.	Process implementation		6.1.1.1	Documentation plan	ECo	P			P	F
	4.1.2.	Design and development		6.1.2.1	Documents according to standards	E	R			P	
				6.1.2.2	Confirmed document sources	E	R			P	
				6.1.2.3	Approved documents	E	R			P	F
	4.1.3.	Production		6.1.3.1	N/A						
				6.1.3.2	N/A						
	4.1.4.	Maintenance		6.1.4.1	N/A						
4.2. Configuration management	4.2.1.	Process implementation	4.2.1.1.^	6.2.1.1	Software configuration management pl	Co	P	N			
	4.2.2.	Configuration identification		6.2.2.1	Software configuration identification sc	Co	S	N			
	4.2.3.	Configuration control		6.2.3.1	Software change requests	Co	D	N			
	4.2.4.	Configuration status accounting		6.2.4.1	Software configuration index	Co	D	N			
	4.2.5.	Configuration evaluation		6.2.5.1	Functional software configuration audit result Physical software configuration audit result	Co	Rep				F
	4.2.6.	Release management and delivery	4.2.6.1.^	6.2.6.1	Release and delivery procedure	Pr	P			P	

Agreement: Supply; Acquisition (invoked); Requirements specification; Architectural design
Engineering — Construction: Detailed Design; Coding; Development; Integration documentation; User documentation
Engineering — Testing: Unit; Integration; Qualification
Change analysis & imp; Configuration management; Change management
Project Management: Supply; Acquisition (invoked); Development; Production & Deployment; Operation; Maintenance
Quality management: Engineering evaluation; Quality assurance; Verification; Validation; Joint review; Audit; Measurement
Production & Deployment; Operation
Resource management: Infrastructure; Training

Table 4-2: Sets of interrelated tasks and life cycle data items

Process	AQAP-160 ed 1 Activity number	Activity	AQAP-160 ed 1 Task ^ = modif	ISO/IEC 12207 task * = ISO 9001:2000 ** = ISO 9001:1994	Life cycle data item	Data item cat.	Data item type	Data item Level of Tailorability N	E	P	F
4.2. Configuration management	4.2.7.			7.1.*	Product realization plan	P	P			P	
				7.5.5.*	Procedures for Identification, Handl, Pack, Stor & Protection	Q	P			P	
		Handling, storage, packaging, preservation and delivery		4.15.1**	Procedures for Handl, Stor, Pack, Pres & Delivery	Q	P			P	
				4.15.2**	Damage or deterioration prevention	Q	P			P	F
				4.15.3**	N/A						
				4.15.4**	Procedure for packing, packaging and marking	Q	P			P	
				4.15.5**	Procedure for preservation and segregat	Q	P			P	
				4.15.6**	Procedure for protection of product	Q	P			P	F
4.3. Quality assurance	4.3.1.	Process implementation	4.3.1.1.	6.3.1.1	Tailored QA process	Q	P	N			
			4.3.1.2.	6.3.1.2	N/A						
			4.3.1.3.^	6.3.1.3	Quality assurance plan	Q	P	N			
			4.3.1.4.	6.3.1.4	Quality assurance records	Q	R	N			
			4.3.1.5.	6.3.1.5	N/A						
			4.3.1.6.	6.3.1.6	QA authorisation	Q	P	N			
	4.3.2.	Product assurance		6.3.2.1	N/A						
				6.3.2.2	N/A						
				6.3.2.3	N/A						
	4.3.3.	Process assurance		6.3.3.1	N/A						
				6.3.3.2	N/A						
				6.3.3.3	N/A						
				6.3.3.4	N/A						
				6.3.3.5	N/A						
				6.3.3.6	N/A						
4.4. Verification	4.4.1.	Process implementation	4.4.1.1.	6.4.1.1	Criticality analysis report	Q	Rep			P	F
			4.4.1.2.	6.4.1.2	Verification proces description	Q	D			P	F
			4.4.1.3.	6.4.1.3	Selected independent verificator	Q	Rep			P	F
			4.4.1.4.	6.4.1.4	Identification of activities an products to verify	Q	P			P	
			4.4.1.5.	6.4.1.5	Verification plan	Q	P			P	F
			4.4.1.6. ^	6.4.1.6	Verification results	Q	Rep			P	

ISO/IEC 12207 task	Agreement			Engineering: Construction						Engineering: Testing						Project Management						Quality management									Resource management	
	Supply	Acquisition (invoked/supplier)	Requirements specification	Architectural Design	Detailed Design	Coding	Development Documentation	Integration documentation	User documentation	Unit	Integration	Qualification	Change analysis & implementation	Configuration management	Change management	Supply	Acquisition (invoked/supplier)	Development	Production & Deployment	Operation	Maintenance	Engineering evaluation	Quality assurance	Verification	Validation	Joint review	Audit	Measurement	Production & Deployment	Operation	Infrastructure	Training
7.1.*														■																		
7.5.5.*														■																		
4.15.1**														■																		
4.15.2**														■																		
4.15.3**														■																		
4.15.4**														■																		
4.15.5**														■																		
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6.4.1.6																								■								

Table 4-2: Sets of interrelated tasks and life cycle data items

Process	AQAP-160 ed 1 Activity number	Activity	AQAP-160 ed 1 Task ^ = modif	ISO/IEC 12207 task * = ISO 9001:2000 ** = ISO 9001:1994	Life cycle data item	Data item cat.	Data item type	Data item Level of Tailorability N	E	P	F	Agreement: Supply	Agreement: Acquisition (invoked/supplier)	Engineering: Requirements specification	Engineering: Architectural design	Engineering: Construction: Detailed design	Engineering: Construction: Coding	Engineering: Construction: Development documentation	Engineering: Construction: Integration documentation	Engineering: Construction: User documentation	Engineering: Testing: Unit	Engineering: Testing: Integration	Engineering: Testing: Qualification	Change analysis & implementation	Configuration management	Change management	Project Management: Supply	Project Management: Acquisition (invoked/supplier)	Project Management: Development	Project Management: Production & Deployment	Project Management: Operation	Project Management: Maintenance	Quality management: Engineering evaluation	Quality management: Quality assurance	Quality management: Verification	Quality management: Validation	Quality management: Joint review	Quality management: Audit	Quality management: Measurement	Production & deployment	Operation	Resource management: Infrastructure	Resource management: Training
4.4. Verification	4.4.2.	Verification		6.4.2.1	Contract verification results	Q	Rep			P																														
				6.4.2.2	Proces verification results	Q	Rep			P	F																														
				6.4.2.3	Requirement verification results	Q	Rep			P																														
				6.4.2.4	Design verification results	Q	Rep			P	F																														
				6.4.2.5	Code verification results	Q	Rep			P	F																														
				6.4.2.6	Integration verification results	Q	Rep			P	F																														
				6.4.2.7	Documentation verification results	Q	Rep			P	F																														
4.5. Validation	4.5.1.	Process implementation	4.5.1.1.	6.5.1.1	N/A																																		
			4.5.1.2.	6.5.1.2	Validation proces description	Q	D			P	F																														
			4.5.1.3.	6.5.1.3	Selected independent validator	Q	Rep			P	F																														
			4.5.1.4.	6.5.1.4	Validation plan	Q	P			P	F																														
			4.5.1.5. ^	6.5.1.5	Validation results	Q	Rep			P	F																														
	4.5.2.	Validation		6.5.2.1	Test requirements, cases, specs	Q	S	N																																	
				6.5.2.2	N/A																																				
				6.5.2.3	Validation test results	Q	Rep			P	F																														
				6.5.2.4	Software validation results	Q	Rep			P	F																														
				6.5.2.5	Validation results in target environment	Q	Rep			P	F																														
4.6. Joint review	4.6.1.	Process implementation		6.6.1.1	Periodic and ad hoc review records	Q	R			P																															
				6.6.1.2	Agreement on resources	Ag	R			P	F																														
				6.6.1.3	Agreement on reviews	Ag	R			P	F																														
				6.6.1.4	Detected problem records	E	R			P	F																														
				6.6.1.5	Distributed results	Q	R			P	F																														
				6.6.1.6	Agreement on outcome of review	Ag	R			P	F																														
	4.6.2.	Project management		6.6.2.1	Joint review results (management)	Q	Rep			P	F																														
	4.6.3.	Technical		6.6.3.1	Joint review results (technical)	Q	Rep			P	F																														

Table 4-2: Sets of interrelated tasks and life cycle data items

Process	AQAP-1601 Activity number	Activity	AQAP-1601 Task ^ = modif	ISO/IEC 12207 task * = ISO 9001:2000 ** = ISO 9001:1994	Life cycle data item	Data item cat.	Data item type	Data item Level of Tailorability N	E	P	F
4.7. Audit	4.7.1.	Process implementation		6.7.1.1	Audit results	Q	R			P	
				6.7.1.2	N/A						
				6.7.1.3	Agreement on resources	Ag	R			P	F
				6.7.1.4	Agreement on audits	Ag	R			P	F
				6.7.1.5	Problem records	ECh	R			P	F
				6.7.1.6	Distributed audit results	Q	R			P	F
				6.7.1.7	Agreement on outcome of audits	Ag	D			P	F
	4.7.2.	Audit		6.7.2.1	Audit results	Q	Rep			P	F
4.8. Problem resolution	4.8.1.	Process implementation	4.8.1.1.^	6.8.1.1	Problem resolution process description	Q	D			P	F
	4.8.2.	Problem resolution		6.8.2.1	Problem reports	Ch	Rep			P	F
4.9. Management	4.9.1.	Initiation and scope definition		7.1.1.1	Managing process requirements	Q	S			P	F
				7.1.1.2	Resource verification records	Q	R			P	F
				7.1.1.3	Modified process requirements	Ag	D			P	F
	4.9.2.	Planning		7.1.2.1	Management plan(s)	P	P			P	
	4.9.3.	Execution and control	4.9.3.1.^	7.1.3.1	Initiation of implementation (kick off)	P	R			P	
			4.9.3.2.	7.1.3.2	Progress reports	P	Rep			P	
			4.9.3.3.	7.1.3.3	Problems and resolution reports	P	Rep			P	F
			4.9.3.4.	7.1.3.4	Management reports	P	Rep			P	
	4.9.4.	Review and evaluation		7.1.4.1	Product and plan evaluation record	Q	R			P	
				7.1.4.2	Evaluation results assessment	Q	R			P	F
	4.9.5.	Closure		7.1.5.1	Process completion record	P	Rep			P	F
				7.1.5.2	Product completeness record	P	R			P	F
4.10. Infrastructure	4.10.1.	Process implementation		7.2.1.1	Infrastructure definition	Q	D			P	F
				7.2.1.2	Infrastructure plan	R	P			P	F

Process	Agreement (invoked/supplier)	Engineering: Requirements specification	Engineering: Architectural design	Engineering: Construction: Detailed design	Engineering: Construction: Coding	Engineering: Construction: Development Documentation	Engineering: Construction: Integration documentation	Engineering: Construction: User documentation	Engineering: Testing: Unit	Engineering: Testing: Integration	Engineering: Testing: Qualification	Change analysis & implementation	Configuration management	Change management	Project Management (invoked/supplier)	Project Management: Supply	Project Management: Acquisition (invoked/supplier)	Project Management: Development	Project Management: Production & Deployment	Project Management: Operation	Project Management: Maintenance	Quality management	Quality management: Engineering evaluation	Quality management: Quality assurance	Quality management: Verification	Quality management: Validation	Quality management: Joint review	Quality management: Audit	Quality management: Measurement	Production & Deployment	Operation	Resource management	Resource management: Infrastructure	Resource management: Training
4.7. Audit																																	
4.8. Problem resolution																																	
4.9. Management																																	
4.10. Infrastructure																																	

Table 4-2: Sets of interrelated tasks and life cycle data items

Process	AQAP 160 ed 1 Activity number	Activity	AQAP-160 ed 1 Task ^ = modif	ISO/IEC 12207 task * = ISO 9001:2000 ** = ISO 9001:1994	Life cycle data item	Data item cat.	Data item type	Data item Level of Tailorability N	E	P	F
4.10. Infrastruc	4.10.2	Establishment of the		7.2.2.1	Infrastructure configuration	Q	D			P	F
				7.2.2.2	N/A						
	4.10.3	Maintenance of the infrastructure		7.2.3.1	Maiantenance records	Q	R			P	
4.11. Training	4.11.1	Process implementation		7.4.1.1	Training plan	R	P			P	F
	4.11.2	Training material development		7.4.2.1	Training manuals / presentation m	R	M			P	F
	4.11.3	Training plan implementation		7.4.3.1	Training records	R	R			P	
				7.4.3.2	N/A						
4.12. Measurement	4.12.1	Process implementation	.12.1.1	8.1.*	Monitoring and measuring plan	P	P			P	F
				4.20**	Statistical techniques	P	D			P	F
			.12.1.2.		Methods for measurement and m	Q	D,P			P	F
			.12.1.3.		N/A						
	4.12.2	Process measurement	.12.2.1	8.2.3.*	Capability assessment method	Q	D,P			P	F
					Capability assessment method	Q	D,P			P	F
	4.12.3	Product measurement	.12.3.1	8.2.4.*	Product measurement and monito	Q	R			P	
					Product measurement and monito	Q	R			P	
			4.12.3.2.		Product characteristic evaluation m	Q	D,P			P	

Table 4-2: Sets of interrelated tasks and life cycle data items

4.8 Table of influence of drivers for tailoring on the sets of interrelated tasks

4.8.1 Table 4-3 contains the following information:

4.8.1.1 A non-exhaustive list of drivers for tailoring (product and project characteristics);

4.8.1.2 Sets of interrelated tasks for tailoring, as defined in Table 4-2 in Para 4.7;

4.8.1.3 An indication of a positive correlation of the importance of a driver to the importance of the tasks and related life cycle data in a set: i.e. an indication of which sets of interrelated tasks become very important when there is a strong consideration for a particular driver (characteristic).

4.8.2 The list of drivers for tailoring in Table 4-3 is not exhaustive. Nations, organizations, industry and/or individuals may want to adjust, improve or extent this list.

4.8.3 Other drivers that might have to be taken into account on a case-by-case basis when tailoring AQAP-160 Edition 1 are:

a. the type of software product;

b. the type of installation;

c. the software life cycle model;

d. organizational policies and procedures;

e. the supplier's capability level;

f. the acquisition strategy.

	Driver/characteristic	Agreement: Supply	Agreement: Acquisition (invoked by supplie	Requirements specification	Engineering: Construction: Architectural design	Engineering: Construction: Detailed design	Engineering: Construction: Coding	Engineering: Construction: Development documentation	Engineering: Construction: Integration documentation	Engineering: Construction: User documentation	Engineering: Testing: Unit	Engineering: Testing: Integration	Engineering: Testing: Qualification	Change analysis & implementation	Configuration management	Change management	Project management: Supply	Project management: Acquisition (invoked by supplie	Project management: Development	Project management: Production & Deployment	Project management: Operation	Project management: Maintenance	Quality management: Engineering evaluation	Quality management: Qaulity assurance	Quality management: Verification	Quality management: Validation	Quality management: Joint review	Quality management: Audit	Quality management: Measurement	Production & Deployment	Operation	Resource management: Infrastructure	Resource management: Training
Product	safety			X	X	X	X	X			X	X	X	X						X				X	X	X	X		X		X		
	security			X	X					X		X	X	X	X			X												X		
	reliability				X	X					X	X	X	X		X							X	X	X	X			X		X		
	maintainability				X			X				X	X			X						X	X						X				
	interoperability			X	X				X	X			X	X	X											X				X	X		
	availability												X													X					X		
	usablity			X	X								X													X				X	X		
	system complexity				X			X	X			X		X	X								X	X					X		X		
	software complexity				X			X			X	X		X	X								X	X					X				
	software size				X				X										X					X					X				
	hardware/software resources constraints				X	X	X		X														X						X				
	level of reuse				X	X							X										X										
	use of new technologies				X	X	X																X									X	X
Project	project schedule constraints	X	X														X	X	X	X				X			X	X	X				
	project resources constraints	X	X														X	X	X	X				X			X	X	X				
	contractual complexity	X	X	X					X			X	X		X	X	X	X	X	X				X									

X indicates the the tasks and related life cycle data items in this set become very important

Table 4-3: Impact of drivers on sets of interrelated tasks

Chapter 5

Interim solution for an integrated system approach

5.1 Purpose

5.1.1 In paragraph 2.4 of this publication, it was made clear that NATO is pursuing an integrated systems approach: i.e. an approach where software, hardware, human interaction, infrastructure and processes are integrated into a system (the definition 'system' of ISO/IEC 12207 applies).

5.1.2 In AQAP-160 Edition 1 paragraph 1.2.3. on the applicability of the standard, it was stressed that for the supply, the development, the production and deployment, the operation and the maintenance of other system components (e.g. hardware), AQAP-160 Edition 1 has to be used with other appropriate standards (e.g. AQAP-110 Edition 2).

5.1.3 Although AQAP-160 Edition 1 does not permit a full systems approach, the standard tries to function as a bridge towards that approach.

5.1.4 This chapter contains guidance on the level of coverage of AQAP-160 Edition 1 requirements (system-level, software-level) and where exactly the standard needs to be supplemented by additional requirements to reach the system level.

5.1.5 As an example, AQAP-160 Edition 1-requirements are being supplemented with the appropriate AQAP-110 Edition 2-requirements in order to cover the quality for a full system.

5.2 Interim solution for an Integrated Systems approach

5.2.1 The interim solution for an Integrated Systems approach has been provided in a table-format. The Table 5-1 provides the following information:

5.2.1.1 For each AQAP-160 Edition 1-requirement is indicated:

a. which ISO-requirement has been plugged in (sources: ISO/IEC 12207 or ISO 9001);

b. the level of the AQAP-160 Edition 1-requirement (i.e. at which level is the requirement written or to which component the requirement applies):
   (1) quality system level;
   (2) system level;
   (3) software level;
   (4) hardware level;

c. whether an action is needed to reach the system-level (i.e. whether additional requirements need to be added or whether the scope of the AQAP-160 Edition 1 has to be changed in order to cover other system components);

d. as an example, which AQAP-110 Edition 2-requirement is best called up and with which scope;

e. the level reached by combining the AQAP-160 Edition 1 requirement with the appropriate AQAP-110 Edition 2-requirement.

5.2.1.2 The table could be adjusted for the case where other standards than AQAP-110 Edition 2 are called up.

5.2.2 The exercise has been made for hardware. By analogy the same applies for other system components.

AQAP-160 ed 1 requirements	Plug-in			Level				Action to reach system level (Y/N)	Add AQAP-110 ed 2 requirement	Level			
	ISO/IEC 12207 Plug-in	ISO 9001: 1994 Plug-in	ISO 9001: 2000 Plug-in	Quality system	System	Software	Hardware			Quality system	System	Software	Hardware
2.1 Management responsibility													
2.1.1 Quality policy		4.1.1	5,3	■	□			N		■	□		
2.1.2 Organization													
2.1.2.1 Responsibility and authority		4.1.2.1	5.5.2	■	□			N		■	□		
2.1.2.2 Resources	7,2	4.1.2.2 4.18	5.1 6.1 6.2.2	■	□			N		■	□		
2.1.2.3 Management representative		4.1.2.3	5.5.3	■	□			N		■	□		
2.1.3 Management review		4.1.3	5,6	■	□			N		■	□		
2.2 Quality system													
2.2.1 General		4.2.1	4.1 5.1 5.4.1 5.5.5	■		□	□	Y	Expand Quality System to include system, HW and other components	■	□	□	□
2.2.2 Quality system procedures		4.2.2	4,2	■		□		Y	Include procedures related to system, HW and other components	■	□	□	□
2.2.3 Internal quality audits and Corrective action		4.17 4.14.2	8.2.1 8.5.2	■		□		Y	Include activities/procedures related to system, HW and other components	■	□	□	□
2.2.4 Preventive action	7.3.3	4.14.3	8.5.3	■		□		Y	Include activities/procedures related to system, HW and other components	■	□	□	□
2.2.5 Control of quality records		4,16	5.5.7	■		□		Y	Include activities/procedures related to system, HW and other components	■	□	□	□
2.2.6 Quality system maintenance		4.2.3	5.4.2 7.1	■	□			N		■	□		
2.4 Assistance for Government Quality Assurance				■	□			N		■	□		

■: organizational requirement is covered

□: requirement is covered for this type of component

Table 5-1: Interim solution for an Integrated Systems approach

AQAP-160 ed 1 requirements	Plug-in			Level				Action to reach system level (Y/N)	Add AQAP-110 ed 2 requirement	Level			
	ISO/IEC 12207 Plug-in	ISO 9001: 1994 Plug-in	ISO 9001: 2000 Plug-in	Quality system	System	Software	Hardware			Quality system	System	Software	Hardware
3.1 Supply process	5,2	4,3	7.2.2			■		Y	"4.3 Contract review" also applied to system, HW and other components		■	■	■
3.2 Acquisition process to be invoked by the supplier	5,1	4.6.2 4.6.3 4.6.4.1 4.6.4.2 4.7 4.10.2	7.4.1 7.4.2 7.4.3 7.5.3 7.1 7.5.1 8.1 8.2.4			■		Y	"4.6 Purchasing" "4.7 Control of customer-supplied product" also applied to system, HW and other components "4.10.2 Receiving inspection and testing"		■	■	■
3.3 Development process	5,3												
5.3.2, 5.3.3, 5.3.10, 5.3.11, 5.3.14 System definition & system integration					■			N			■		
5.3.4 - 5.3.9 Software development						■		Y	"4.4 Design control" "4.10 Inspection and testing" also applied to system, HW and other components "4.12 Inspection and test status"			■	■
3.4 Production and deployment process	5.2.7 5.3.12 5.3.13	4,9	7.1 7.5.1 7.5.5			■		Y	"4.9 Process control" "4.13 Control of non-conforming product" also applied to system, HW and other components "4.15 Handling, storage, packaging, preservation and delivery"		■	■	■
3.5 Operation process	5,4				■			N			■		
3.6 Maintenance process	5,5					■		Y	"4.19 Servicing" also applied to system, HW and other components		■	■	■
4.1 Documentation process	6,1					■		Y	"4.5 Document and data control" applied to all documents and data	■	■	■	■
4.2 Configuration management process	6,2	4,15	7.1 7.5.4			■		Y	"4.8 Product identification and traceability" "4.15 Handling, storage, packaging, preservation and delivery" also applied to system, HW and other components Ch III Par 1 Configuration management		■	■	■
4.3 Quality assurance process	6,3					■		Y	Product : include system, HW and other components Process : include processes for system, HW and other components		■	■	■
4.4 Verification process	6,4					■		Y	"4.4.7 Design verification" applied to system, HW and other components		■	■	■
4.5 Validation process	6,5					■		Y	"4.4.8 Design validation" applied to system, HW and other components		■	■	■
4.6 Joint review process	6,6					■		Y	"4.4.7 Design review applied to system, HW and other components		■	■	■
4.7 Audit process	6,7					■						■	
4.8 Problem resolution process	6,8					■			"4.14 Corrective and preventive action" applied to system, HW and other components		■	■	■
4.9 Management process	7,1			■						■			
4.10 Infrastructure process	7,2					■						■	
4.11 Training process	7,4			■				Y	"4.18 Training" applied to procedures for system, HW and other components	■			
4.12 Measurement process		4.20	8.1 8.2.3 8.2.4			■		Y	"4. 20 Statistical techniques" applied to system, HW and other components		■	■	■
5.1 Tailoring process	A.1												

■: organizational requirement is covered

■: requirement is covered for this type of component

Table 5-1: Interim solution for an Integrated Systems approach