APS DT

Quality Performance Indicators

in support of Counter Measure Dispensing System (CMDS) contract 701264395.

& GQA Plan

[redacted]

Air Support OC ASET Eng QA

Introduction

This document is to assist the Air Platform Systems (APS) DT to identify, measure and monitor the elements of the CMDS project that can be established as Quality Indicators and which then supports the progressive achievement of contract Key Performance Indicators (KPIs).

Important Note: The recommendation for use of Quality Performance Indicators (QPIs) in defence contracts is to be made in consultation with the Project Manager/Originator of the Contract Requisition and the responsible Commercial Officer.

Note: Determination of QPIs must be relevant to the contract for which they are to be used.

Purpose

This document meets the requirement of JSP940 - MOD Policy for Quality Part 2, Chapter 4 for an approach to establishing QPIs within defence contracts.

Definitions

Note: Terms and definitions in ISO 9000:2015 apply unless listed below.

Table 1
Terms and Definitions

TERM	DEFINITION	REFERENCE
Key Performance Indicator	a quantifiable measure used to evaluate the success of an organization in meeting objectives for performance.	
Quality Performance Indicator	a quantifiable measure of an element of the management approach being used or planned to be used in meeting an organisations objective.	
Acquirer	Governmental and/or NATO Organisations that enter a contractual relationship with a Supplier, defining the product and quality requirements.	NATO Allied Quality Assurance Publications
GQAR	The personnel with responsibility for Government Quality Assurance acting on behalf of the Acquirer.	NATO Allied Quality Assurance Publications
Supplier Quality Plan	Suppliers document that specifies which procedures and associated resources shall be applied by whom and when to a specific project, product, process or contract requirement.	NATO Allied Quality Assurance Publications
Competent GQA Practitioner	The personnel who are suitably qualified and experienced in quality assurance skills and techniques to perform quality related activities and decision making. This may include the Acquirers organisation, GQAR organisation and the Supply chain quality resources.	NATO Allied Quality Assurance Publications / JSP940 Part 2
Key or Critical Product Characteristics or Processes	Processes or product elements or features which, if not properly controlled, can have an adverse impact on the product delivery, cost and performance.	NATO Allied Quality Assurance Publications
Product	The result of activities, processes and tasks. A product may include service, hardware, processed materials, software or a combination thereof. A product can be tangible (e.g., assemblies or processed materials) or intangible (e.g., knowledge or concepts), or a combination thereof.	NATO Allied Quality Assurance Publications

References

The following standards were referred to in the generation of this guidance, though it is recognised that different contractual AQAPs may also be used. NATO published guidance on the use of referenced AQAPs is also listed to assist both the user and Supplier.

AQAP 2105	NATO Requirements for Quality Plans.
AQAP 2105 SRD 1	Guidance on the use of AQAP 2105
AQAP 2110	NATO Quality Assurance Requirements for Design, Development and Production.
BS EN ISO 9001	Quality Management Systems - Requirements
Def Stan 05-057	Configuration Management of Defence Materiel
Def Stan 05-061	Quality Assurance Procedural Requirements - Part 1 Concessions
Def Stan 05-135	Avoidance of Counterfeit Materiel
ISO 9000	Quality Management Systems Fundamentals and Vocabulary
JSP 940 Pt 1	MOD Policy for Quality – Part 1 Directive
JSP 940 Pt 2	MOD Policy for Quality - Part 2 Guidance
CoMPI 14	Publications

General

The use of QPIs is a key enabler to understanding the Suppliers risks associated to the product development, manufacture and release. The QPIs initially identified early in the acquisition lifecycle may be developed through the contracts placed during the progression through the lifecycle phases. The use of QPIs on a contract may enable Quality staff to determine risks and dependencies on the product delivery. The additional application of a joint Quality Assurance Group (QAG)[1] will enable the Authority and Supplier to maintain a dialogue through the life of the contract.

Note: Where mandated by the organisation, the Engineering Lifecycle detailed in the Guide to Engineering Activities and Review (GEAR) requires Government Quality Assurance (GQA) planning to be conducted; the use of QPIs should be documented in the GQA planning. A bespoke GQA Plan will be drafted in due course.

As soon as the acquisition activities are being planned and engagement with the defence industrial supply chain is being considered, this document can be used to determine firstly, the need for QPIs and secondly the approach best suited to aiding evidence-based decision making.

The following sections look at the application of QPIs within the GQA Framework[2] and through the MOD acquisition lifecycle phases[3].

GQA Framework

Planning for Quality

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[1] Refer to JSP 940 Part 2 Chapter 4 Section 4.5.4 - Quality Assurance Groups

[2] Government Quality Assurance - A Functional Framework for Acquisition. Refer to Managing Quality within Knowledge in Defence.

[3] Concept, Assessment, Demonstration, Manufacture, In-service and Disposal (CADMID)

At the planning stage the Air Support Quality Assurance Engineer has determined that QPIs will be required, and that QPIs will be used contractually as part of the CMDS Quality Assurance activities.

Requirements Preparation

The selection of the appropriate QPIs can be further defined during Requirements Preparation stage; where the contractual requirements are determined.

It is important to note that the prospective Supplier will need to be notified of the intent to use QPIs. This is to be stated within the contractual SoR (thereby advising a Supplier of our intent to use QPIs).

Where QPIs are to be used contractually the final QPIs are included as an annex to the contract (in an appropriate recordable format).

Supplier Selection and Contract Award

As acquisition moves into tender evaluation there will be a requirement to understand a Supplier's approach to meeting a contractual AQAP (when applied in a contract), while gaining an understanding of the effectiveness of the Supplier's own quality measures.

Where QPIs are to be used, they can advise the APS DT of the specific requirements that may need to be evaluated, through a combination of tender questions and (if appropriate) a Draft Quality Plan. This will then support their use in the measurement, assessment and maturity of the Supplier's applied Quality Management System (QMS) processes.

QPIs can be reviewed against the tender response, especially when a Draft Quality Plan has been requested. Should the need for additional QPIs be identified, this should be discussed with the Commercial Officer; noting that the Supplier will not be aware of them.

Contract Execution

As acquisition moves into Contract Execution and the realisation of services and/or equipment, the QPIs and their method of reporting should be finalised (if not already done); ideally in consultation with the Supplier.

As the project progresses through Contract Execution, QPIs can start to be measured and reviewed to assure quality. The most advantagous forum for this review would be through a QAG.

Note: An example QPI Control Matrix has been developed, at Annex A, for use when evaluating a Supplier Quality Plan. Use of this form of QPIs within a spreadsheet format will enable filtering/grouping of the QPIs by theme.

A clause is to be within the contract that any or amendment will require an assessment on QPIs utilised since contract award; this will be in addition to other impact assessments to be conducted.

Delivery

As acquisition continues towards the delivery of the planned solution the gathering of evidence of the planned intent being realised through the delivered solution is required. At this stage indicators need to be recorded and measures need to be verified.

Contract Completion

After contract completion the QPI achievement can be assessed to establish the potential for Lessons Learnt that will enable the APS DT to benefit from what went well and what could be improved in the next acquisition.

Project Continued Improvement

The QPI's will help identify risks/threats to the delivery for a Quality Practitioner, it will also identify any Strengths, Weaknesses or Opportunity to improve and Threats to the project delivery (SWOT). The QPI SWOT may determine the need for further assurance activities and address any quality-based Risks which should then be captured, managed and mitigated in the projects Risk Tool.

A SWOT analysis is to be conducted after each review of the QPI approach being used. An example SWOT based on the QPI Matrix can found at Table 6.

Within the Acquisition cycle

In-Service

This phase is usually the most complex from a contractual perspective. It is generally the longest phase in the acquisition lifecycle and may involve multiple contracts to maintain the defence capability for which the System of Interest has been selected to fulfil.

As the traditional method of supporting defence capability in-service has given way to contracting for availability or capability, this has resulted in fewer contracts needing to be placed. But those fewer contracts are generally of a higher monetary value, involving complex support arrangements, and for a longer contract life. Therefore, the potential range of activities under these contracts may involve the application of the whole range of lifecycle processes for design/development, production, test and acceptance in addition to an increase in associated risk.

It is also important to note that the evaluation of contractual amendments is vital, as these may have a greater impact on QPIs utilised since contract award.

Disposal

Contractual activity during this phase is entirely dependent upon what the System of Interest is and the activities required to remove it from the defence inventory. This might range from termination of a capability contract through to decommissioning of a nuclear-powered submarine. The required method of disposal and associated activities will have been planned for before by the DT prior to entering this phase. Review of contractual requirements and consultation with the relevant stakeholders will advise of the suitability of QPIs.

Application of QPIs in MOD Contracts

The APS DT is to to ensure that:

a) A statement of intent to use QPIs is included in the contractual Statement of Requirements (SoR).
b) Prospective bidders are given notification of QPIs to be used prior to the start of contract ITT/ITN;
c) QPIs to be used are detailed within an annex to the contract.

Important Note: The use of QPIs in contracts needs to conform to MOD Commercial practice and be discussed with the relevant project commercial officer, to ensure that they are applied consistently and appropriately.

Note: 'a' to 'c' above have been included to enable DTs to comply with commercial practice.

Methods and Approach for Establishing QPIs

General

The need for QPIs must be considered with respect to the net value of the effort and time it will take to establish, monitor and report the QPIs. There will need to be consideration of the critical characteristics and processes being used, as well as the technical complexity/challenge of the Supplier's solution.

Quality Performance Indicators that are Contract Specific Linked to AQAP 2110 Requirements, and Chief of Materiel Policy Instruction 14 Publications.

General

The Primary contract Quality conditions for the UK MOD, linked to the Supplier's QMS is AQAP 2110 which is to be invoked.

The composition of AQAP 2110 requires the Supplier to establish, document, implement, assess and improve an effective and economical Quality Management System in accordance with this publication which includes the requirements of BS EN ISO 9001:2015 as necessary to satisfy the contract requirements.

As a project progresses to Contract Award and then into Contract Execution it is important to make sure that the Supplier fully understands the requirements of AQAP 2110 and objective evidence must be made available that demonstrates they are planning for and implementing their approach to meeting the requirements. The NATO additions have been composed to aid the acquisition management for a DT.

Measurement Criteria for an Indicator – This is limited to a simple Yes or No answer and a Green or Red traffic light can be applied that aids the clarity.

Measurement criteria for Performance – A range of achievement and value of the QPI needs to be expressed and for the purposes of this document the following criteria have been set to aid analysis.

Table 2

[redacted]

[redacted]	

Table 3

[redacted]

QPI Score	Criteria
4	The QPI being met, is optimised and can improve the delivery of the project HIGH VALUE ADDED
3	The QPI is being met, managed and demonstrates clearly that a SET of requirements are being met – VALUE ADDED
2	The QPI is being met and demonstrates achievement of a SINGLE/LIMITED requirement – VALUED
1	The QPI is being met and continues in place. The QPI provides some evidence that a requirement is or will be met - LIMITED VALUE
-1	The QPI is only an indicator and has limited ability to demonstrate that a requirement is being or will be met – LOW VALUE
-2	The QPI in only an indicator and has no ability to demonstrate that a requirement will be met – MINIMAL VALUE
-3	The QPI is established but there is conflicting evidence that it is being met or does not help demonstrate requirements are being or will be met – NO VALUE
-4	The QPI has not been met and there is an increasing risk that the contract requirement(s) will not be met, or the QPI has not been established and remedial action needs to be put in place – RISK INCREASES

It may be sufficient to request the following QPI information and data;

1. The information available that forms evidence of addressing the NATO additional requirements from AQAP 2110 in Table 4 and score those QPIs using the suggested criteria in Table 3.
2. Any other Supplier self-identified quality performance evaluation measurements.
3. A SWOT (table 6) analysis will need to be conducted after each QPI analysis to inform decision making on Supplier performance, project risk management and progress.

Table 4

QPIs Against the Primary AQAP 2110, and [redacted]

QPI Serial Number	QPI Title	Description	Criteria	Indicator	Continued Performance	Performance Measure +4 to -4
1	GQA Management Representative	AQAP para 5.1.1 requires top management to appoint a representative for GQA.	Resource Nominated.	Yes	Resource is Effective in role.	
2	Supplier's Quality Plan (SQP)	AQAP para 5.4.1.1 requires a Supplier's Contract Quality Plan to be in place.	A Supplier's Quality Plan is available prior to start of work. (AQAP 2105 does apply)	Yes	Supplier's Quality Plan is effective	
3	Risk Approach	AQAP para 5.2.1 requires evidence of risks including external Supplier risks to be planned for.	A method of risk identification is in place.	Yes	Risk Approach is effective.	
4	Configuration Management Plan (CMP)	AQAP para 5.4.1.2.2 requires a contract CMP to be in place.	A CMP is available. (Def Stan 05-057 applies).	Yes	CMP is being implemented and is effective.	
5	Post Award GQA	AQAP para 5.4.2 has an option for a Post Award GQA Meeting.	A Post Award GQA Meeting is planned for or has taken place.	Yes	GQA Meetings are regular valued and planned.	
6	Critical Characteristics (CC)	AQAP para 5.4.3 requires Health, Safety, Performance and dependability CC to be identified.	CC are identified.	Yes	CC are regularly reviewed and managed.	
7	Purchasing Information	AQAP para 5.4.6.1 requires flow down of relevant AQAP(s) to the supply chain.	Purchase orders and sub-contracts include all applicable AQAP(s).	Yes	Considered decisions on applicability are effective.	
8	Counterfeit Material (CMat)	Def Stan 05-135 requires a process for the avoidance, detection, mitigation and disposition of CMat.	A description for the avoidance, detection, mitigation and disposition of CMat is provided. (Def Stan 05-135 applies)	Yes	Process is Effective.	

QPI Serial Number	QPI Title	Description	Criteria	Indicator	Continued Performance	Performance Measure +4 to -4
9	Communications	AQAP para 5.4.6.3 requires that the Acquirer/GQAR is notified of products that are rejected, reworked or repaired including GFE.	An agreed time limit and method of notification is in place.	Yes	Communications are being managed and are effective.	
10	Traceability	AQAP para 5.4.8 requires items or components to be traceable where failure could lead to loss of equipment or life.	Components that present risk to equipment loss or loss of life are identified.	Yes	Regular reviews are in place that enable traceability requirement to be determined.	
11	Certificate of Conformity (CofC)	AQAP para 5.4.11 provides option on a CofC at point of release.	The need and format for a CofC is agreed. (Defcon 627 may apply)	Yes	Where CofCs are requested they continue to be delivered.	
12	Product Verification	AQAP para 5.4.11 requires a minimum of 10 working days notification to Acquirer/GQAR for any final inspection or formal acceptance activities. This must include deliverable documentation.	A delivery plan is in place including the 10-day notification period for Acquirer/GQAR.	Yes	Deliverable items, including documents, are made available with a minimum of 10 days.	
13	Control of Non-Conforming Product (NCP)	AQAP para 5.4.12 requires a documented procedure which identifies, controls and segregates all NCP.	An NCP procedure is in place. (Def Stan 05-061 Pt1 applies)	Yes	The procedure for control of NCP effective.	
14	Supply Chain Management	AQAP para 5.4.12 requires the Supplier to notify the Acquirer/GQAR of any NCP from an External provider that has been subject to GQA	An agreed time limit and method of notification is in place.	Yes	NCP, including documents, are notified to Acquirer/GQAR within the timescales agreed.	
15	Internal Audit	AQAP para 5.5.2 requires the Supplier to identify contract related critical processes and activities.	Critical Processes and Activities are identified and included in an annual audit plan.	Yes	Audits are being conducted to plan. Risks are mitigated.	

16	Improvement	AQAP para 5.6.1 requires the Supplier to define process and tool and techniques to support Root Cause Analysis (RCA) for N/C's.	A description for RCA process including tool and techniques are provided.	Yes	Root cause analysis is effective.	

Table 5

Quality Plan Review and Evaluation Form to AQAP 2105 Edition C

AQAP	Title	Requirement	Acceptable (Y/N)	Comments
3.1	**Preparation**			
3.1.3		The Quality Plan is to be clearly linked to the relevant stage/phase of the contractual activity.		
3.1.4		The Quality Plan shall be clearly linked to the contract and the product/service.		
3.1.5		The Quality Plan shall be clearly linked to processes and procedures within their QMS, including reference to applicable contractual documents and plans.		
3.2.1	**Approvals**	Supplier authorized personnel shall approve the Quality Plan prior to submittal to the GQAR and/or Acquirer for evaluation.		
3.4	**Reviews, Revision and Change Control**			
3.4.1	**Review of Quality Plan**	The Quality Plan shall be reviewed periodically by the Supplier within the phases through the contract life cycle.		
3.4.3	**Amendment of Quality Plan**	**The Supplier's procedure for review and amendment** of the Quality Plan shall be included.		
3.4.4	**Change Control**	The Quality Plan must be under, and demonstrate, evidence of change control.		
4.1	**General**			

AQAP	Title	Requirement	Acceptable (Y/N)	Comments
4.1.1	**Link to Contract and/or Product**	The content of the Quality Plan must be adequately precise and detailed enough to reflect the ongoing Supplier activities specific for the contract.		
4.1.2	**Reference to documentation**	The Quality Plan shall refer to and/or include all procedures, plans and other documents applicable to the contract.		
4.2	**Project Description**	The purpose and applicability of the project shall be described in a short form.		
4.3	**Acronyms, Abbreviations**	All acronyms and abbreviations used in the Quality Plan shall be listed.		
4.4	**Quality Management System Activities**			
4.4.1	**Processes**	The Quality Plan shall include how processes are identified along with their application, their sequence and interaction.		
		Criteria and methods to ensure that processes are effective shall be included, as well as resources to support and monitor the implementation of them. Emphasis shall be put on processes that are complex or involve significant levels of risk as well as new processes.		
		The Quality Plan shall include how the supplier will control outsourced products, processes and activities including the avoidance, detection, mitigation and disposition of counterfeit materiel.		
		The Quality Plan shall include how processes are monitored, measured, analysed and continually improved. Appropriate performance indicators shall be determined.		

AQAP	Title	Requirement	Acceptable (Y/N)	Comments
4.4.2	**Documentation Requirements**	The Quality Plan shall describe how documentation requirements, including quality policy, quality objectives, scope of QMS, procedures, records and other documents are maintained and controlled, including retention periods. A document status list shall be available at all times, formalised during transitions between phases and/or baselines e.g. prior to design reviews.		
4.5	**Referenced Documents**			
4.5.1		Where applicable, the Quality Plan shall refer to other quality related documents and plans. The interfaces and relationships to these documents shall be described.		
4.5.2		The Quality Plan shall list the contractual and other related documents that are used by the Supplier to provide assurance of product conformance.		
4.5.3		The order of precedence of referenced documents and their relationship to the contract, including the Quality Plan, shall be specified.		
4.6	**Access to Supplier and External providers and support for GQA activities.**	The Quality Plan shall describe the provisions and support to be provided to the GQAR and/or Acquirer for access to the Supplier and/or external providers.		
4.7	**Organisational Role, Responsibilities and Authorities**			

AQAP	Title	Requirement	Acceptable (Y/N)	Comments
4.7.1		The Quality Plan shall include a contract specific description of the organizational structure and identify those responsible for ensuring that the required activities are carried out. The responsibilities and authorities of responsible personnel related to quality, including the Management Representative, shall be described. The independence of personnel designated for contract related quality responsibilities shall be clearly documented. The inter-relationships between those responsible personnel shall be explained.		
4.7.2		The relations to the GQAR and/or Acquirer shall be described.		
4.8	**Risk Management**	The Quality Plan shall describe the contract specific activities for Risk Management and/or give reference to the required Risk Management Plan.		
4.9	**Support**	The Quality Plan shall describe how the Supplier manages resources.		
4.9.1	**Resource Management**	The provision of resources, human resources, infrastructure and work environment needed to implement the contract requirements shall be specified in the Quality Plan.		
4.9.2	**Monitoring and Measuring Resources**	The Quality Plan shall describe the processes used to ensure that measurement processes and measuring equipment meet requirements. The measurement management system shall be described; including the metrological function, measurement processes and the metrological confirmation process. The control of monitoring and measuring equipment in order to provide evidence of product conformity to contract requirements shall be described.		
4.10	**Operation**	The planning of activities derived from the requirements and risks shall be defined but is not limited to the processes below.		

AQAP	Title	Requirement	Acceptable (Y/N)	Comments
4.10.1	**Operational Planning and Control**	1. The Quality Plan shall describe the activities related to how the planning process for product realization/operation will be carried out. This shall include, or be referenced to, the requirement and solution compliance matrix. It shall describe how the matrix is maintained and controlled.		
		2. The Quality Plan shall describe how the contract specific activities for identification, management, traceability, review and validation of requirements is planned. Giving reference to related processes, documents (i.e.: system requirement specification) and test procedures.		
4.10.2	**Configuration Management**	The Quality Plan shall describe the contract specific activities for Configuration Management and/or give reference to the required Configuration Management Plan.		
4.10.3	**Customer Communications**	The Quality Plan shall describe the arrangements for communication with the GQAR and/or Acquirer.		
4.10.4	**Determining the Requirements Related to the products**	The Quality Plan shall identify and describe the activities associated with determining and reviewing requirements.		
4.10.5	**Design and Development controls**	The Quality Plan shall describe how design and development of products are performed, including processes for design and development planning, inputs, controls, reviews, evaluation, acceptance criteria, verification, validation, outputs and changes		
4.10.6	**Dependability**	The Quality Plan shall describe the contract specific activities for Dependability, if required in the contract. *Note: Further information on NATO Dependability Management is contained within Allied Dependability Management Publications (ADMP).*		

AQAP	Title	Requirement	Acceptable (Y/N)	Comments
4.10.7	**Control of Externally Provided Processes, Products and Services**	The Quality Plan shall describe how externally provided products are controlled through the supply chain. This shall include the flow down of requirements, the acquisition process, ensuring product conformity, Supplier evaluation and selection, quality auditing and other activities associated with externally provided products through the supply chain. Specific risks related to the supply chain products shall be identified and managed as part of Suppliers Risk Management. See 4.8 Risk Management above.		
4.10.8	**Control of Production and Service Provision**	The Quality Plan shall describe how the production and service provisioning is carried out under controlled conditions. The process that includes all operations in sequential order from receipt of purchased products through to the storage and release of products shall be included. The Quality Plan shall identify all special processes implemented for the contract. For special processes not yet validated, the Quality Plan shall describe activities in order to achieve this validation.		
4.11	**Release of Products**			
4.11.1		The Quality Plan shall describe how the Supplier will ensure that only acceptable products intended for delivery are released to the Acquirer. The Quality Plan shall refer to the contract specific arrangements for release authority, which may include the use of a Certificate of Conformity.		
4.11.2		The Quality Plan shall describe how the contract specific requirements for identification and control of non-conforming products will be carried out.		
4.12	**Improvement**			
4.12.1		The Quality Plan shall identify the processes/procedures that are required for product/service improvement.		

AQAP	Title	Requirement	Acceptable (Y/N)	Comments
4.12.2		The Quality Plan shall describe how continual improvement and corrective actions will be carried out.		
4.13	**Performance Evaluation**	The planning of applicable improvement activities derived from the requirements and risks shall be defined, but is not limited, to the processes defined below		
4.13.1	**Customer Satisfaction**	The Quality Plan shall describe how the Supplier monitors, measures and improves customer satisfaction		
4.13.2	**Analysis and Evaluation**	The Quality Plan shall describe the analysis of data used in order to demonstrate the suitability and effectiveness of planned activities that lead to improvements.		
4.13.3	**Internal Audit**	The Quality Plan shall describe how internal audits will be performed in order to determine whether the Quality Plan conforms to the requirements and is effectively implemented and maintained.		
5	**Software Project Quality Plan**	If a Software Project Quality Plan (Ref AQAP-2210 2.2.2) is required by the contract, the software specific activities shall be covered by the requirements in chapter 4 of this publication.		

Table 6

Matrix

Strengths	Weaknesses
Documentation is in place and is effective Software codes of practice are strong	Reviews are poor, stages for QP review not defined and no minutes produced for the project review. QDR raised by DQA-FF to address root cause Safety Case requires SME re-write
Opportunities to improve	Threats to Delivery
Audit plan is in place but is not validated as effective. DQA-FF engaged to conduct audit of Supplier's use of Risk Based Thinking	Supply Chain not yet determined for Subsystems 1 and 2. The critical path intersection will occur at week 16. Requirements definitions are holding back tenders. Lack of adequate Safety Case is impacting progress on weapons handling.