

**Office of the  
Government Chief Information Officer**

**QUALITY ASSURANCE REVIEW PROCEDURE**

**[Q3]**

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**TABLE OF CONTENTS**

**1. PURPOSE .....1-1**

**2. SCOPE.....2-1**

**3. REFERENCES .....3-1**

3.1 STANDARDS .....3-1

3.2 OTHER REFERENCES .....3-1

    3.2.1 OGCIO Documentation.....3-1

    3.2.2 Bibliographies .....3-1

**4. DEFINITIONS AND CONVENTIONS .....4-1**

4.1 DEFINITIONS .....4-1

4.2 CONVENTIONS.....4-1

**5. PROCEDURE.....5-1**

5.1 CONTROL CHECKPOINTS IN SDLC PROJECT.....5-1

5.2 RESPONSIBILITIES .....5-1

    5.2.1 The Project Manager.....5-1

    5.2.2 The Reviewer .....5-1

    5.2.3 Professional Development Team.....5-2

    5.2.4 The Support Teams .....5-2

5.3 PLANNING THE QA REVIEWS .....5-2

5.4 PURPOSE OF THE QA REVIEWS .....5-2

    5.4.1 Feasibility Study - End of Phase Review .....5-2

    5.4.2 Systems Analysis and Design - End of Phase Review.....5-3

    5.4.3 Implementation .....5-3

    5.4.4 Post Implementation Review.....5-3

    5.4.5 Checkpoint for QA Reviews .....5-4

    5.4.6 Combined Phases Review .....5-4

    5.4.7 Guidelines on Conducting QAR.....5-4

5.5 THE QA REVIEW PROCESS.....5-5

    5.5.1 The Preparation.....5-5

    5.5.2 The Evaluation.....5-5

    5.5.3 The Consolidation.....5-5

5.6 THE APPROVAL .....5-6

5.7 QUALITY CONTROL OF THE QA REVIEW .....5-6

**6. DOCUMENT .....6-1**

6.1 QUALITY RECORDS .....6-1

    6.1.1 Request For Review .....6-1

    6.1.2 Quality Assurance Review Checklist .....6-1

    6.1.3 Review Report.....6-2

    6.1.4 General Form .....6-2

6.2 LIST OF STANDARD FORMS .....6-2

**1. PURPOSE**

The Quality Assurance Review Procedure establishes the minimum requirements and procedure of formal quality assurance processes for SDLC projects in OGCIO. The objectives of this document are to establish standards for:

- the inclusion of quality assurance requirements (including the resources required for these activities) in the project quality plan for these activities;
- identification of the Quality Assurance Checkpoints and the responsibilities of personnel and parties performing the verification;
- procedure to verify quality controls of products against requirements and standards;
- documenting the review results;
- monitoring of processes and products during system development; and
- provide evidence that the completed product conforms to the requirements.

## 2. SCOPE

This procedure provides a standard procedure for reviewing the effectiveness of the execution of the quality assurance processes in an SDLC project. This shall apply to all SDLC projects as stipulated in the Information Systems Procedures Manual (ISPM).

All verification requirements at every Quality Assurance Review specified in this manual shall be performed unless waiver is given by the appropriate authority at the project initiation stage of the project.

As this standard procedure states the minimum requirements for quality assurance of a project, Project Manager shall assess the nature and risk of the project and shall include additional specific quality assurance reviews (for examples: site preparation and hardware and software acceptance) in the project as necessary.

**3. REFERENCES**

**3.1 STANDARDS**

- ISO9001-1994 International Standard: Quality Systems - Model for quality assurance in design/development, production, installation and servicing
- AS3563.1-1991 Australian Standard: Software Quality Management System
- IEEE Std 1028-1068 IEEE Standards for Software Reviews and Audits (ANSI)

**3.2 OTHER REFERENCES**

**3.2.1 OGCIO Documentation**

<u>Standard/Procedure</u>	<u>Ref. No.</u>
Information Systems Procedure Manual	P1
SSADM Practitioner standards and guides	S3, S4, G15, G16
Practitioner Guide on Project Management	G38
Quality Planning Procedure	Q2
Guidelines for Application Software Testing	G20

**3.2.2 Bibliographies**

- Quality Assurance Manager Handbook, QAI
- Establishing Quality Control, Quality Assurance Practices Manual (Volume 1), QAI
- K.Daily, Quality Management for Software, NCC Backwell Limited, 1992
- William F. Perry, Quality Assurance for Information Systems, QED Technical Publishing Group, 1991

**4. DEFINITIONS AND CONVENTIONS**

**4.1 DEFINITIONS**

**Quality Control** The process by which product quality is compared with applicable standards and actions taken when non-conformances are detected. Quality control is the responsibility of the worker.

**Quality Assurance** A planned and systematic set of activities necessary to provide adequate confidence that requirements are properly established and products or services conform to specific requirements. It is sometimes called quality control over quality control because it evaluates whether quality control is working. It is a management responsibility.

**Quality Assurance Review** The process is a quality assurance process conducted by independent reviewers to verify the proper executions of product quality control and follow up actions of non-conformance.

**Quality Assurance Checkpoint** It is a specifically defined milestone/point stipulated in the ISPM for a SDLC project of which Quality Assurance Review of project processes is required before proceeding further.

**4.2 CONVENTIONS**

**SDLC** The Systems Development Life Cycle (SDLC) is a standard model adopted by OGCIO for application software development.

**PRINCE** Projects in Controlled Environments, a project management methodology adopted by OGCIO for application system development.

## 5. PROCEDURE

### 5.1 CONTROL CHECKPOINTS IN SDLC PROJECT

The SDLC model in the ISPM stipulated a complete set of phases, methods, practices and responsibilities which together provides everything that is needed to produce the required products, services and to manage an application system development project. The control checkpoints in SDLC define at which points of the project that Quality Assurance Reviews are required, to verify the proper execution of the quality control processes that have been carried out by the project team for meeting the basic quality requirements of an application software system.

Quality Assurance checkpoints are specified in the ISPM for SDLC project activities:

- Feasibility Study Phase
- Systems Analysis and Design Phase
- Implementation Phase

The results of the Quality Assurance Reviews together with the set of project deliverables for the phase should satisfy the stated standards and requirements, and obtain proper management approvals before proceeding to the next phase or further project activities.

### 5.2 RESPONSIBILITIES

#### 5.2.1 The Project Manager

The Project Manager of the development project shall be fully responsible for the quality of the project deliverables. In particular, he shall ensure that all reviews stipulated in this procedure are included in the project quality plan and are effectively executed.

#### 5.2.2 The Reviewer

The Reviewer (preferably in the rank of SSM or equivalent and independent of the project) of the Quality Assurance Review is appointed by the Senior Technical (for PRINCE project) or the fund controller (for non-PRINCE project); he shall be responsible for reviewing the project processes in a professional manner. He shall ensure that the purpose of the review is met.

### 5.2.3 Professional Development Team

The team shall provide general advice to the project team and the reviewers in the use of this procedure.

### 5.2.4 The Support Teams

The technical teams and the Professional Development Team are responsible for producing technical guidelines, standards, procedures and manuals. Member of the support teams should not be appointed as the reviewer of the Quality Assurance Review.

## 5.3 PLANNING THE QA REVIEWS

It is recommended that peer reviewer appointed according to the project quality plan should have no direct involvement in producing the deliverables. The responsible reviewers of the formal review shall be specified in the project quality plan. The time and resource requirements for the review together shall be included in the project schedule and plan at the project initiation stage, and approved by the appropriate authority. Any subsequent changes to the plan (including changes of the QAR date and QAR reviewers) shall be approved by the approving authority and baselined. A copy of the revised project quality plan shall be sent to Professional Development Team for information.

For project with special characteristics that the standard QAR checklist is not applicable, Project Manager shall co-ordinate with the QAR reviewer to prepare a QAR checklist for the project at the project initiation stage. A copy of the tailor-made QAR checklist shall be sent to Professional Development Team for information.

## 5.4 PURPOSE OF THE QA REVIEWS

### 5.4.1 Feasibility Study - End of Phase Review

The objectives of this review are:

- to ensure that OGCIO technical standards and resource estimation methods have been followed;
- to ensure that the deliverables have been examined and commented by the relevant parties;
- to ensure that a complete and consistent system baseline in the form of Feasibility Study Report is established for the next phase;
- to ensure that the viability of the business and technical solutions, and the project plan (including the project quality plan) have been assessed and accepted by the user;
- to ensure that the phase has been completed satisfactorily; and
- to assess the business risk for the next phase.

#### 5.4.2 Systems Analysis and Design - End of Phase Review

The objectives of this review are :

- to ensure that OGCIO technical standards and resource estimation methods have been followed;
- to ensure that a proper project management framework has been set up;
- to ensure that the deliverables have been examined and commented by the relevant parties;
- to ensure that a complete and consistent system baseline is established in the form of a Systems Analysis and Design Report for the next phase;
- to ensure that the viability of the business and technical solutions, and the project plan (including the project quality plan) have been assessed and accepted by the user;
- to ensure that the phase has been completed satisfactorily; and
- to assess the business risk for the next phase and the business case of the project is still viable.

#### 5.4.3 Implementation

##### 5.4.3.1 Design Review

This control is a project level evaluation process which aims:

- to access that the physical system design review has been conducted to ensure that the design satisfies the specified requirements including all technical issues (such as database design, network design, data conversion, teleprocessing requirements, security, audit and performance requirements etc.);
- to ensure that a detail test plan has been developed;
- to ensure that the physical system design and the test plan conform to the OGCIO standards and guidelines; and
- to ensure that a complete and consistent set of system baselines is established and maintained for system implementation.

##### 5.4.3.2 Pre-production Review

This control is an end of phase review before a system is formally handed over to the production units. The objectives of this review are:

- to ensure that the system developed has been accepted by the user;
- to ensure that the system tests are completed according to criteria stated in the test plan;
- to ensure that all required system documentations are satisfactorily completed and accepted by the parties concerned; and
- to establish that the system is ready for production.

#### 5.4.4 Post Implementation Review

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A programme for the reviews should be prepared according to the priority of management concerns. The planning of the post implementation reviews shall be done annually. Schedule of this review may not appear in the project quality plan.

#### 5.4.5 Checkpoint for QA Reviews

There are four checkpoints in the SDLC, namely the Feasibility Study Phase Review, the Systems Analysis and Design Phase Review, the Design Review (Implementation Phase) and the Pre-production Review (Implementation Phase). QA Reviews should be separately conducted in each of these checkpoints. The timing of conducting the QA reviews should be pre-defined in the Project Quality Plan. The reviews should be conducted in accordance with the time-schedule defined in the Plan.

#### 5.4.6 Combined Phases Review

The existing Quality Assurance checkpoints of FS, SA&D and Implementation should be retained and should normally not be waived for those Combined Phases projects stated in ISPM. However, for small projects as defined under PRINCE, their QA Reviews shall follow the combined phase QAR checklists in order to minimize the administrative overheads.

- For FS Phase QAR, please refer to the checklist QR/CK/FS
- For SA&D Phase QAR, please refer to the checklist QR/CK/SAD
- For Design Review QAR under Implementation Phase, please refer to the checklist QR/CK/IDR
- For Pre-production Review QAR under Implementation Phase, please refer to the checklist QR/CK/IPR
- For Combined Phases QAR, please refer to the checklist QR/CK/SDLC

The possible groupings of the Combined Phases Reviews are as follows :

- Combined FS and SA&D Phases Review
- Combined FS, SA&D and Implementation Phases Review
- Combined SA&D and Implementation Phases Review

#### 5.4.7 Guidelines on Conducting QAR

QAR should be conducted according to the following guidelines:

- For projects below \$5M with funds covering the total need for FS, SA&D, and Implementation, one QAR is required at Pre-production Review.
- For projects costing \$5-10M with funds acquired in two stages:
  - (a) first for a FS, then for SA&D plus Implementation; or
  - (b) first for a combined FS/SA&D, then for Implementation.

QAR is required at end of FS for case (a) or at end of SA&D for case (b) and Pre-production Review (i.e. a total of 2 QARs).

- For projects costing more than \$10M, the standard SDLC would be followed. QAR is required at end of FS, SA&D, Design Review and Pre-production Review (i.e. a total of 4 QARs).
- Exception to the above should be justified to the approving officer in accordance with the delegated authority stipulated in the ISPM. The requirement to perform QAR is subject to the discretion of the approving officer. Decision shall be documented in corresponding Quality Plan of a project.

## 5.5 THE QA REVIEW PROCESS

A review process is typically comprises of the three stages:

- Preparation
- Evaluation
- Consolidation

### 5.5.1 The Preparation

The developer (usually the project manager) is responsible for arranging the review. The Request for Review Form, the products for review and all relevant supporting documents (including comments from the support groups and Treasury Accountant, acceptance from the user, and evidence of corrective/follow-up actions taken) shall be sent to the reviewer.

### 5.5.2 The Evaluation

The reviewer shall make use of the checklists, standards and his own experience to evaluate the quality assurance processes and shall document his findings on the appropriate Quality Assurance Review Checklist. The reviewer can also add to it a list of suspected problems and possible non-compliance using a General Form for evaluation. If all the supporting documents and information are available to the reviewer, the time required for the review should not be more than a day.

The reviewer shall look for documented proofs (such as comments, records of acceptance and evidence of correction/follow-up actions taken) for proper execution of the quality controls of the products. (It is important that the reviewer shall record the file reference of the proofs on the checklist for future reference.) If he/she is not satisfied with the proofs provided, he/she shall ask for clarification, additional supporting documents, evidence and information from the project manager. The requests, replies and comments shall be documented in a General Form by the reviewer.

### 5.5.3 The Consolidation

The reviewer shall discuss with the project manager on his/her findings before finalizing the review report which summarizes the findings and concludes the

review. He/she shall complete a formal Review Report and attach to it the set of all supporting quality records and send it to the project manager. The project manager shall state his/her decisions and shall send a copy of the report to the Professional Development Team after he/she has signed off (accepted) the review report.

#### 5.6 THE APPROVAL

If management decision is required for a Go or No-Go situation, it is the responsibility of the project manager to present his case together with the reviewer's comments and the corresponding completed follow-up actions to the management. The management decision shall be documented in the form of an agreed minutes of meeting or an approval document. A copy of the approval documentation should be sent to the Professional Development Team for information.

#### 5.7 QUALITY CONTROL OF THE QA REVIEW

It is the project manager's responsibility to ensure full compliance of this procedure.

## 6. DOCUMENT

### 6.1 QUALITY RECORDS

Quality record is a generic name for all quality-related project information which include comments, acceptance and evidence in forms of acceptance to reviewer. However, Quality Records in this manual are formal review records produced as a result of a Quality Assurance Review at defined Control Checkpoints. They shall be documented using the standard form specified in this manual. It is the project manager's responsibility to maintain the quality records in the project file.

The quality records of a Quality Assurance Review consists of 4 major components :

- Request For Review
- Quality Assurance Review Checklist
- Review Report
- General Form

#### 6.1.1 Request For Review

A Request For Review Form shall be completed by the project manager to request the reviewer for a review . It records which Quality Assurance Review, when and who is requesting the review (the name and post of the originator), by whom (i.e. the name and post of the reviewer), what deliverables with what related documentation and evidence for acceptance are attached and the standards applied.

#### 6.1.2 Quality Assurance Review Checklist

A series of standard checklist questions for the checkpoint review is designed to aid the reviewer in carrying out the Quality Assurance Review. He shall respond to every question on the appropriate checklist. Each checklist question is framed such that a "yes" answer indicates compliance followed by making references to the documented proofs in the "Supporting Doc/Note" column and a "no" indicates non-compliance normally followed by an explanatory note in the "Supporting Doc/Note" column. For the checklist item that is not applicable to the deliverables being reviewed, "Not Applicable" can be put in the "Supporting Doc/Note" column with brief explanation.

General Form can be used by the reviewer for extending the checklist (adding quality items) and to supplement the explanation for the assessment on the checklist if necessary. The left-hand column is used to number the note, which is in turn referenced from the relevant point in the checklist to which it is attached.

6.1.3 Review Report

This form shall be completed by the reviewer and accepted by the project manager. It records the outcome of the review, the reviewer's conclusion and defines the possible alternatives. If the review is incomplete, explanation shall be given in the "Comments/Recommended Actions" section. The project manager shall state his decision on the lower section after reading through and agrees with the comments. Also, he has to sign as a formal acceptance of the conclusion and outcomes of the review.

General Form can also be used for extending the reviewer's comment section or to elaborate on the project manager's decision. The left-hand column is used to reference the relevant parts in the review report which it is attached.

6.1.4 General Form

A general purpose form is designed to supplement the above special purpose forms. It can be used as a record which documents the communication between various parties.

6.2 LIST OF STANDARD FORMS

<u>Standard Forms</u>	<u>Form Reference</u>
1) Request for Review Form	(QR/RFR)
2) Quality Assurance Review Checklist	
2.1) Feasibility Study - End of Phase Review	(QR/CK/FS)
2.2) System Analysis and Design- End of Phase Review	(QR/CK/SAD)
2.3) Implementation - Design Review	(QR/CK/IDR)
2.4) Implementation - Pre-production Review	(QR/CK/IPR)
2.5) FS, SA&D and Implementation	(QR/CK/SDLC)
3) Review Report	(QR/RR)
4) General Form	(QR/GF)