

Software Engineering Group Projects – Review Standards

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1 INTRODUCTION

1.1 Purpose Of This Document

The purpose of this document is to specify the conditions for the successful conduct of reviews and walkthroughs of significant project items. It should provide the project team with a structured review mechanism (which forms a key part of the assessment of the quality of project items).

1.2 Scope

This document describes the procedures to be followed when conducting formal reviews of significant project items, such as specifications and test documentation. It also covers the procedures for interim reviews known as walkthroughs, which will be used to assess the appropriateness of significant project items part way through their development. It should be read by all project members.

This document is written with the assumption that the reader is already familiar with the QA Plan [1]. The project management standards document [2] specifies the reviews and walkthroughs which must be conducted. Useful background information concerning reviews is presented in sections 24.1 and 30.2 of Sommerville's textbook [6].

1.3 Objectives

- To provide a framework;
- describe the mechanisms;
- and specify the procedures,

for conducting reviews and walkthroughs of significant project items.

2 REVIEWS

2.1 Overview

The scope of a review or walkthrough is the detection of problems, but not the correction of them. Thus, a reviewed item will be scrutinised for errors, omissions, inconsistencies, etc. and any problems found will be formally recorded. The changes which have to be made will be determined after the review meeting, according to the change control process described in QA document SE.QA.08 [5].

Each group member should regard every item that they develop as the product of the group, not the individual. Comments made about a reviewed item should not be taken as personal criticism of the individual who wrote it. The criticism is intended

to be constructive, since the purpose of the review is to detect problems, thereby reducing difficulties later in the project and resulting ultimately in a high quality product.

Items to be reviewed must have **draft** or **release** status. An item cannot have **release** status until it has been reviewed, thus the first time an item is reviewed it will have a status of **draft**.

The review process should follow the steps listed below [6]:

- select the review team;
- arrange review time and place;
- distribute relevant documents;
- hold review;
- note actions and complete problem report forms (PRFs) [5].

Each of these steps is described below.

2.2 Selecting A Review Team

The review team must always include the Project Leader, the QA Manager and the person(s) who wrote the item to be reviewed. Where possible, all other project members will attend and contribute to the review meeting.

2.3 Arranging A Review Meeting

The QA Manager is responsible for arranging the review meetings. He or she must contact all relevant members of the review team and arrange a date and time at which all those persons can attend. A review meeting should not take more than two hours, and may take less. The QA Manager is responsible for finding a room in which the review will be conducted, and for giving adequate notice of the date, time and place of the review meeting. Normally, notice of at least one week should be given.

2.4 Distribution Of Relevant Documents

All relevant documents must be distributed to the review team by the QA Manager in advance of the review meeting. The following documents should be made available together with any other documents the QA Manager considers appropriate:

- for a requirements specification review, the requirements specification must be distributed;
- for a design specification review, the requirements specification and the design specification must be distributed;

- for a test plan and specification review, the requirements specification, the design specification, and the test plan and specification must be distributed;
- for a software verification review, the design specification and the code must be distributed.

It is most important that the appropriate versions of documents are distributed, and it is the QA Manager's responsibility to ensure that each review team member gets the correct version of each relevant document. Distribution can be effected electronically, since all the relevant project documents will be held in the project's configuration directory [5]. The QA Manager could effect distribution by e-mailing each review team member, specifying in the mail message:

- the date, time, and place of the review meeting;
- the configuration reference, name, and version of each item necessary for the review.

The team member could then extract the appropriate items from the configuration directory, format them, and print them under his/her personal printer allocation.

2.5 Conduct Of The Review

The review meeting will be chaired by the Project Leader. The QA Manager will be responsible for recording problems and actions. All other review team members should contribute to the meeting and criticise constructively the item being reviewed.

The exact way the review should be conducted depends on the nature of the project and of the item being reviewed, but the guidelines listed below should be followed.

1. For a requirements specification review, the objective is to determine whether all the client's requirements are adequately described, whether there are any inconsistencies, and whether the desired system is feasible.
2. For a design specification review, the objective is to determine whether the design covers all the client's requirements as described in the requirements specification, i.e., it is a software verification activity. Thus, the review should proceed by considering each section in the requirements specification and attempting to verify that the requirements specified in that section are catered for in the design.
3. For a test plan and specification review, the objective is to determine whether the testing will comprehensively exercise the system such that if all tests are passed, the system can be said to meet the client's requirements. The test plan must be shown to represent an appropriate testing scheme. The test specification must be shown to specify tests which exercise the system comprehensively such that all system functions are performed.

To determine the adequacy of the module tests, the test plan and specification must be examined by considering in turn each section of the *design specifica-*

tion. The review team should attempt to verify that the items described in each design section are catered for in the test plan and specification.

If verification has been achieved, the test plan and specification should be reviewed in the meeting to see if they are valid, i.e., that they consider all aspects of the client's requirements. Thus, the review should proceed by considering in turn each section of the *requirements specification* and attempting to confirm that the requirements specified in each section are catered for in the testing.

4. For a software verification review, the objective is to determine whether the code implements all aspects of the design as described in the design specification, i.e., it is a software verification activity. Thus, the review should proceed by considering each section in the design specification and attempting to verify that the design information specified in that section is implemented in the code.

2.6 Recording Problems And Actions

The QA Manager should take brief minutes of the review meeting and these minutes must adhere to the general documentation standards [3]. The QA Manager must also complete a problem report form (PRF) [5] for each identified problem. Since the problem details will be described on a PRF, the minutes simply need to record for each section in the reviewed item the PRF numbers that describe problems in that section.

After the meeting, the PRFs will be processed by the QA Manager, and if necessary, change control forms (CCFs) will be completed and corrective actions initiated. The problem reporting and corrective action procedures are described in detail in QA document SE.QA.08 [5].

It is possible that persons will be directed to carry out actions that are not associated with problems. For example, the client might be requested to supply background information concerning the operation of his/her factory. In such situations, the desired action must be described in the meeting minutes, and the person responsible for carrying out the action clearly indicated.

3 WALKTHROUGHS

3.1 Purpose

The purpose of a walkthrough is to review an item during its development to determine whether any major omissions, inconsistencies, or errors are present. Some of the detail will be absent from the reviewed item, but it should address the major issues relevant to that item's purpose (e.g., for a design specification, the main decomposition of the system might have been identified, but some of the details will not yet have been decided). The walkthrough is thus used to identify problems with

an item in a partially completed state, leading to the early resolution of problems and preventing propagation of errors through later stages.

3.2 Procedure

The procedure for the conduct of walkthroughs is the same as that for reviews, except that only items with a status of **initial development** or **draft** can be reviewed by walkthrough¹.

Note that items needed in a walkthrough other than the reviewed item must have a status of **release** (e.g., a **draft** design specification would be reviewed by walkthrough with the aid of a **released** requirements specification).

REFERENCES

- [1] H.R. Nicholls. Software engineering group projects – quality assurance plan. Technical Report SE.QA.01, University of Wales, Aberystwyth, 1997.
- [2] H.R. Nicholls. Software engineering group projects – project management standards. Technical Report SE.QA.02, University of Wales, Aberystwyth, 1997.
- [3] H.R. Nicholls. Software engineering group projects – general documentation standards. Technical Report SE.QA.03, University of Wales, Aberystwyth, 1997.
- [4] H.R. Nicholls. Software engineering group projects – review standards. Technical Report SE.QA.07, University of Wales, Aberystwyth, 1997.
- [5] H.R. Nicholls. Software engineering group projects – operating procedures and configuration management standards. Technical Report SE.QA.08, University of Wales, Aberystwyth, 1997.
- [6] I. Sommerville. *Software Engineering*. Addison-Wesley, Wokingham, 5th edition, 1995.

¹Since by definition an item being reviewed by walkthrough is incomplete, it is acceptable for a document to be reviewed which has a status of **initial development**.

DOCUMENT CHANGE HISTORY

<i>Version</i>	<i>CCF No.</i>	<i>Date</i>	<i>Sections changed from previous version</i>	<i>Change d b y</i>
1.1	N/A	1 Dec 92	initial development	HRN
1.2	N/A	2 Dec 92	Corrections to 2.2, 2.4, detail added to section 3	HRN
1.3	N/A	2 Dec 92	Corrections to 2.1, 2.3, 2.4, 3.1	HRN
2.1	10	2 Dec 92	First Draft	HRN
3.1	11	2 Dec 92	First Release	HRN
3.2	31	15 Nov 93	sccs style incorporated corrected typography	FWL
3.3	39	8 Oct 94	Page break after Doc. Chg. Hist.	MBR
3.4		3 oct 95	moved change history revised section 1	GCC
3.5		6 oct 97	Updated for 97 proj	CJP
3.6		17 Oct 2000	Minor updates for 2000 proj	CJP
3.7		7 Dec 2000	Removed need for client to attend reviews	CJP