Lucent Technologies
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subject: **Scheduling and Holding a Technical Review**
COMPAS ID 4668

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INTERNAL MEMORANDUM

1. Introduction

This memorandum describes the process of scheduling and holding a technical review. It should serve as a guide for technical review leaders, presenters and review participants.

2. Informal Review

The purpose of an informal review is to identify faults that the developer can correct before conducting a formal review. It consists of circulating a preliminary version of the document, clearly marked "draft", to others who are qualified to make technical comments. These comments should identify specific predicted failures and their associated faults. While the informal review is expected to detect many faults, it is not a substitute for the technical review described in the next section.

3. Technical Review

A Technical Review is a formal verification procedure for a specification. The main purpose of a technical review is to accurately report on the technical quality of a specification as early as possible in the development process. Technical quality is assessed in a review meeting which concentrates on identifying and recording faults that could lead to system failures. All technical specifications that can affect the quality of the software product should be reviewed. In most cases, these specifications are used by other project members and other project activities.

4. Scheduling a Technical Review

The procedure for scheduling a technical review is described in detail in the attachment "How To Schedule A Review".

5. Review Reports

Each review produces a review summary report and scribes notes describing the faults detected during the review.

The *review summary report* (see attachment) provides a public synopsis of the review results. It consists of the review date, title of the reviewed material, names and signatures of reviewers, and recommended disposition of the reviewed material. Dispositions are described in Table 1.

The *scribes notes* identify the faults detected in the reviewed material. Each fault is accompanied by the name of the person who detected the fault. This allows the developer to consult with the appropriate reviewers for clarification of issues after the review meeting. A Scribe's Notes Template, COMPAS ID 8364, describes in detail the fault classification scheme and fault recording procedures to be used by the scribe.

6. Technical Review Roles

For the review to operate efficiently, responsibilities must be assigned for leading the review, making the technical presentation, participating in the review, and recording review results. This section discusses each of the major roles in a technical review.

6.1 Review Leader

Each review requires a leader who is responsible for the overall success of the review. A "Review Leader Checklist" summarizing the responsibilities of the review leader is attached.

Table 1. Review Dispositions

1. Accepted as is **2. Accept after revision**	Indicates that the material being reviewed is either completely or essentially correct, and that further review of this material is not required.
3. revisions needed	Indicates that, while the work done so far provides a reasonable basis for producing an acceptable product, major revisions remain to be done. This level requires that the material be reviewed again after the revisions have been made.
4. Review Not Completed	Indicates that the review could not be completed either because of lack of attendance, lack of preparation, or lack of time.

Like any other quality assurance activity, a review is intended to provide an independent, objective assessment of the product quality. The leader must ensure that the interaction between the presenter and participants results in detecting the maximum number of faults. The review leader should have the interpersonal communication skills required to handle the wide variety of problems that can arise during a review. Because this responsibility requires the full attention of one individual, and because it may conflict with the goals of the presenter, the leader should not present the material. A list of qualified review leaders for each project can be found in COMPAS by querying for "leaders" in the title field of the Document Search Form.

The first responsibility of the review leader is to review the participants list with the presenter and collectively appoint a scribe.

The scribe should have good written communication skills and sufficient technical competence in the area reviewed to understand the terms used and issues raised.

The leader and presenter should choose participants based on their ability to contribute to the main purpose of the review - detection of faults. Since there are many classes of potential faults, the participants should be selected for their different technical viewpoints. For example, the leader should consider inviting the developer of the specifications for the product, users of the product, and testers.

There are two types of people who should not be invited to a given review.

1. Those who lack the technical qualifications to identify faults in the material being reviewed.
2. Those who have positions or roles that might cause a conflict in the review. In particular, managers of review participants might not be invited to the review if there appears to be a conflict between evaluation of the product and evaluation of the subordinate reviewer.

The review leader should check the list of required participants to ensure that the number invited to the review is a minimum. Experience shows that reviews become less effective when more than seven people attend. However, it may at times be necessary to exceed that number in order to have an effective review as is the case in most of our larger projects.

The leader is also responsible for insuring that each participant has ample opportunity to comment on the work being reviewed. This can be accomplished by controlling the pace of the review so that adequate time is spent on each part of the review material. The leader should make sure that the review is restricted to the process of detecting faults and does not stray into unproductive areas such as trying to correct faults, or discussing style.

The leader terminates the review after reaching one of the dispositions in Table 1. Worthy of special mention is the fact that the review leader may terminate the review as incomplete for one of the following reasons:

- Non-attendance by key participant(s)
- Lack of preparation by participant(s)
- Unresolvable personal conflicts that interfere with the process
- Exceeded time allotted for review (maximum of 2 hours recommended)

After a successful review, the leader must ensure that the scribes notes are distributed to the review participants and attendees. Once the technical document has been updated,

the leader must deliver it together with the summary report and scribes notes to the project librarian. If a disposition was not reached, the reason must be included in the Review Summary Report and the review must be rescheduled.

6.2 Presenter

The presenter is the technical expert responsible for presenting the material and answering questions raised by participants. Since this requires a thorough knowledge of the material, the presenter should be the developer of the product.

When going over the material, the presenter should discuss the assumptions made and major alternatives considered while developing the product. The presenter should state where the product fits in the overall system and provide a description of how the product meets its requirements. The presenter should avoid a section by section restatement of the written material. Instead, a summary of the material could be presented together with the issues, tradeoffs, and considerations. The material should be presented in enough detail to enable the participants to accurately assess its quality.

6.3 Participants

The main responsibility of the participants is to detect faults (or potential failures) in the material being reviewed.

Before the review, participants must carefully study the material, concentrating on the detection of faults within their own area of expertise. Lack of preparation is essentially equivalent to failure to attend and is cause for terminating and rescheduling the review.

During the review, participants should raise issues indicating faults or potential system failures with any aspect of the material being reviewed. Although some discussion may be required to determine whether or not an issue should be raised, participants should resist the temptation to try to determine solutions. The producer has the responsibility for changing the material; however, review participants may present their ideas to the producer outside of the review meeting.

When raising issues, participants should be specific, clear, and objective. Remember that the purpose of the review is to evaluate the material and not the producer, so phrase issues without reference to the producer, either directly or by use of personal pronouns.

At the conclusion of the review, participants are asked to agree on disposition of the materials. In case of persistent disagreement after a reasonable amount of discussion (as determined by the review leader) the individual opinion requesting the most rework is recorded as the disposition. For example, if one participant insists on a disposition of "revisions needed-new review required" while the others only require "accept after revision", the disposition will be the former. This insures that potential faults in limited but important parts of the material being reviewed are properly attended to and, if necessary, re-reviewed.

Once a disposition has been recorded, each participant signs the Review Summary Report. By signing, the participant is affirming that, in his/her informed technical opinion, the reviewed materials require no more work than is indicated by the disposition.

6.4 Scribe

The scribe records the information required to accurately report the results of the review. The scribe records faults as they are raised by the participants along with the initials of the person who identified the fault. The format for recording and classifying faults is given in the "Scribe's Notes Template", COMPAS ID 8364. The fault classifications are similar to those used in the code inspection process[3]. Each item recorded in the notes is preceded by it's Type, Severity, and Originator. A complete description is provided in the template [2]. At the end of the review, the scribe should briefly review the recorded faults. After the meeting, the scribe assists the review leader as necessary in preparing the review reports.

7. Review Procedure

The basic review procedure is as follows:

1. Presenter follows procedures for scheduling a review (see attachment "How to Schedule a Technical Review").
2. The review leader follows procedures on the attached "Review Leader Checklist" prior to the review.
3. Participants examine review materials in preparation for review. Those who cannot attend must notify the review leader at least three days before the review.
4. Review Leader opens the meeting and acts as moderator.
5. Presenter states how the design fits into the overall system, describes how it meets its requirements, and summarizes material together with any issues, tradeoffs, assumptions, or considerations. Enough detail should be presented to enable participants to accurately assess the quality.
6. Participants identify faults or potential system failures.

7. All faults are formally recorded by the scribe as described in the Scribe's Notes Template [2].
8. Review leader announces intent to terminate meeting.
9. Scribe summarizes major faults.
10. Disposition is determined and recorded (see Table 1).
11. Participants sign off on disposition.
12. Scribe prepares the Scribe's Notes and distributes to participants and attendees after approval by the review leader no later than one week after the review.
13. Technical issues are resolved by presenter (and others) and the document is updated.
14. Review leader approves the updated document. There should be a "diff" document to expedite review of updates by the review leader.
15. Review leader delivers the updated document, Scribe's Notes, and the Review Summary Report to software librarian.
16. The software librarian updates the COMPAS review history information. The status of the document will be changed to "rework" if another review is required. If no further review is required, the librarian will change the document status to "sign_off" and distribute review reports to the control team.
17. If there is no rebuttal on review disposition after 10 days, the librarian will baseline the document and notify the presenter and leader. The document status will be changed to "chg_ctl".

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REFERENCES

[2] Barnard, H. J. and A. L. Price, "Scribe's Notes Template," *Engineer's Notes*, COMPAS ID 8364, October 1987.

[3] Barnard, H. J. and A. L. Price, "Code Inspection Methodology," *Technical Memorandum*, COMPAS ID 1000, July 1987.

ATTACHMENTS

1. How to Schedule a Technical Review
2. Review Leader Checklist - Before the Review
3. Review Leader Checklist - During the Review
4. Review Leader Checklist - After the Review
5. Closing a Review Guideline
6. Technical Review Summary Report

HOW TO SCHEDULE A TECHNICAL REVIEW

1. **Select a "Review Leader"**. Contact one of the review leaders from the review leader list in COMPAS to see if they are available for leading your review.
2. The Presenter and leader must **establish a review date**. Call "Conference Room Reservations" to schedule the *date*, *place*, and *time*.

   NOTE: Use the "Review Calendar" to make sure there are no conflicts and that no more than 2 reviews are scheduled per day.
3. To check the "Review Calendar" in COMPAS, select "Reviews" from the main menu. A Review Search Form will appear. Set the "Date" field to '>today', and then press return. All reviews with dates greater than today are displayed in a list.
4. The Presenter and Leader must **prepare a list of required Participants** and a list of those who may attend but are not required (attendees). Attendees are not required to sign-off at the close of the review. These lists will be needed when using COMPAS to schedule a review, step 8.
5. Combine all files for a document into one file. Any document format can be stored into COMPAS.
6. Execute COMPAS.
7. Select "File/New/Document" from the COMPAS main menu. Fill in the document attribute fields and then select "File/Save" when fields are complete. Select "Edit/Add document" and the Source File Form is then displayed. Enter the path to the file containing the document text and press OK. You can use the relative path to your document file if it is in the current directory.
8. Select "File/Schedule Review" and then select the "Review Wizard" to guide you through scheduling the review.

REVIEW LEADER CHECKLIST - BEFORE THE REVIEW

1. Review procedures described in the memorandum "Scheduling and Holding a Technical Review" COMPAS ID 4668.
2. Verify that no conflicts exist with other scheduled reviews (see review calendar) and that no more than 2 reviews are scheduled per day.
3. Verify that the review date allows at least 8 *working days* for distribution of review material and for preparation by participants.
4. Verify that the review length is not greater than 2 hours.
5. Verify that no more than 20 pages per hour are covered. Schedule two reviews if the document is greater than 40 pages.
6. Verify that there are no more than 10 required participants.
7. Assist presenter in using COMPAS to *enter* document and to *schedule* review (verify that COMPAS entries are correct).
8. Instruct presenter to save the original document source for diff marking purposes.
9. Ensure that the Project Librarian distributes the Scribe's Notes and updated document with the Review Notice when a document has been previously reviewed.
10. Ensure adequate attendance at review (i.e., architect, performance guru, admin., maint., tester, design interfaces, etc.). **Contact the required participants at least one or two days in advance of the review to ensure their attendance.**
11. Ensure that scribe is not intimately involved with the review material and review their role with them.
12. Complete sections of the "Review Summary Report" just prior to review.

REVIEW LEADER CHECKLIST - DURING THE REVIEW

1. Open review with introduction statement and explain how review will be conducted.
2. Reschedule review if 2 or more required participants do not attend, have no representation, or have not provided written issues.
3. Act as moderator at review and focus attention to identifying and recording issues.
4. Control pace and keep an eye on the clock.
5. Ensure adequate coverage of material and even group participation.
6. Ensure review topics don't stray to unproductive areas such as correcting faults, side issues, etc. (leaders choice, depending on progress of meeting).
7. Ensure scribe records fault types, severities, and originator initials as described in the "Scribe's Notes Template", COMPAS ID 8364.
8. Announce intent to terminate review if:
   - time exceeded (reschedule)
   - no more issues can be identified.
9. Ensure scribe summarizes major faults at end of session.
10. Determine and record disposition (1 of 4). If disagreement:
    - majority rule,
    - document exception as issue,
    - baseline then MR,
    - go to control team representative.
11. ensure *required participants* sign off on "Review Summary Report".

REVIEW LEADER CHECKLIST - AFTER THE REVIEW

1. The scribe retains the "Technical Review Summary Report" and returns it to the review leader with a hard copy of the Scribe's Notes.
2. The Scribe's Notes are published within one week of review.
3. The presenter modifies the document to include comments received at the review.
4. The presenter submits a "dmmx" (or optionally a "diff-marked") copy to the review leader for approval. "dmmx" is an exptool which shades the words that were changed rather than placing a mark in the margin. See the exptools man page.
5. If another review is required, the leader delivers the Scribe's Notes and the Review Summary Report to the Software Librarian. Upon receipt, the Software librarian will change the document status to "rework" and maintain an active review file.
6. If no further review is required, continue steps below.
7. The leader reviews the diff marked document carefully to ensure all modifications (and no more) have been applied to the new draft. Once the review leader has approved the document, the presenter adds, as the first line of the document, a line of the form:

   .ND "date"

   where date is the current date.
8. The presenter then replaces the copy of the document stored in COMPAS with the updated version.
9. The presenter delivers a hard copy (not diff marked) of the revised document to the review leader.
10. The review leader will send the Review Summary Report, Scribe's Notes, and updated document to the Software Librarian.
11. Once confirmation of baselining (document status is chg_ctl) is received, the author should publish the document. This includes obtaining a permutted number from your department secretary, who will also see to distribution of the document.

CLOSING A REVIEW

1. Leader announces intent to close the meeting.
2. Leader asks scribe to summarize the important issues.
3. Leader asks participants if any major issues were identified in the meeting.

   An issue is MAJOR if:

   (a) participants need to review the solution to the issues, or

   (b) the resulting change could potentially impact more than one paragraph.
4. If there are major issues, the leader suggests the review be rescheduled.

   If there are no major issues, the leader asks participants if the document should be re-reviewed.
5. If consensus is not reached,

   (a) ask participants if they will accept the decision of 75% of the participants.

   (b) document the exception as an issue in the scribes notes.

   (c) baseline the document and write the issue as an MR.

   (d) seek resolution from one of the control team representatives.

TECHNICAL REVIEW SUMMARY REPORT

TITLE:

AUTHOR(s):

SYSTEM: **RELEASE:**

SUBSYSTEM: **TYPE:**

ID: **DOCUMENT DATE:**

Participants:

Name (print):	**Signature:**
LEADER:	----------
SCRIBE:	----------
PRESENTER:	----------
4.	----------
5.	----------
6.	----------
7.	----------
8.	----------
9.	----------
10.	----------
11.	----------
12.	----------
13.	----------

The participants agree on the indicated disposition of review material.

Review Date: _____ Number Pages: _____

Total Prep. Hours: _____

Number Problems found _____ Total Review Hours _____

REVIEW DISPOSITION

No Further Review	**New Review Required**
_____ accepted as is	_____ revisions needed
_____ accept after revision	_____ review not completed

revision checked:
document issue/date _____/_____
initials/date _____/_____

CONTENTS

LIST OF TABLES