Exception Management Guide

MITP
v5.1

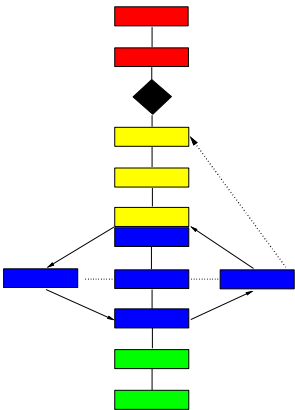Document Number MICG1EXC

Edition Notice
First Edition (September 1995)

This edition applies to Version C5.0 of Managing the Implementation of the Total Project (MITP), and to all subsequent releases and modifications until otherwise indicated in new editions.

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PREFACE About This Document

In any project, there are events that are not going according to plan. These exceptions will need to be managed. There are four types of exception:

- Exceptions that have occurred but where it is fairly clear what has to be done to get back on plan (but these things to be done need to be managed properly). These are changes.
- Exceptions that have occurred but which can be solved by the person who discovered the condition. These are problems.
- Exceptions that have occurred but where it is not clear what has to be done to get back on plan. In general, a number of chained actions (meetings, decisions, etc.) are required, and these actions may be unpredictable. These are issues.
- Exceptions that arise either because someone has made a mistake (these are errors) or because something is not working properly (these are faults).

This document deals with these exceptions and the associated exception management processes.

For information about the MITP life cycle, the key techniques, and the support techniques, see the MITP Handbook. A glossary of terms can be found at the back of the MITP Handbook

Who Should Read This Document

The 'you' in this document is the Project Manager, but other people can read it too and extract useful information from it.

How to Use This Document

The table of contents provides a clear roadmap to the main topics outlined in this document.

ISO9000 Control Information

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1   What is Exceptions Management?

Exception management ensures that:
- Management are properly appraised of project health
- The project is driving for a successful conclusion
- Status is adequately communicated

There are four types of exceptions management review:
- Change
- Problem
- Issue
- Error and fault

Processes (and the associated procedures) should be in place to manage these situations to prevent undesirable impacts on the project schedules, deliverables, or resources.

Subtopics
1.1   Change management
1.2   Problem management
1.3   Issue management
1.4   Error and fault management

1.1   Change management

Changes are exceptions where it is fairly clear what you have to do to get the project back under control, where the action required is within the scope of your authority, and all that is needed is for you to manage the things that have to be done.

Your processes to manage changes should contain the following activities:
- Directing all requests for change to one central point, where they are logged.
- Specifying unambiguously, in writing, each change request on a standard form.
- Distributing all change requests to Subproject Managers for comment.
- Assessing the consequences of implementing each change for input into the decision-making process.
- Deciding whether or not to accept the change, and defining processes to handle dissent.
- Communicating of the decision to all Subproject Managers and anyone else who has a need to know.

1.2   Problem management

Problems are out of line situations requiring action to be taken within the project to resolve them.

Your processes to resolve problems should contain the following actions:
- Identifying and capturing each problem.
- Appointing a person to be responsible for getting the problem resolved.
- The logging and periodic reviewing of all outstanding problems, and maintaining a status report.

1.3   Issue management

An issue is an unplanned item which threatens the well-being of the project in some way, but which may be outside your authority to resolve. Each issue may need a series of actions to be taken (such as detailed investigation, escalation) before it can be resolved.

Your processes to track and control issues to their resolution should contain the following activities:
- Identifying and capturing each issue.
- Appointing an Action Manager to be responsible for getting the issue resolved.
- Logging and reviewing of all outstanding issues, and maintaining a status report.

1.4 Error and fault management

Errors are defined as a human mistake that leads to something wrong and requires correction, for example a documentation or a program error.

Faults are defined as something which is not functioning properly and which requires fixing, for example, a hardware failure.

Your processes to manage project error and faults should contain the following activities:

- Identifying and logging, as early as possible, all errors and faults.
- Assigning the error or fault to an "owner" who will be responsible for its correction, and ideally the person who was responsible for the cause.
- If applicable, specifying an action plan, to be initiated by the owner, that will lead to the timely resolution of the error or fault.
- Where several errors or faults remain outstanding, prioritizing each error or fault in order to use resources most efficiently.
- Regularly reviewing the status of the error and fault log. If appropriate, this could be done by the Subproject Manager.

2 Change Management

Note: The Procedures for Techniques are contained in the Project Control Book Guide.

Subtopics

2.1   What is a Change?

A change is a proposed modification to something that has already been agreed in the project definition. The change may relate to either the work content or the management of the project.

2.2   What is Change Management?

Change management is a process to ensure that all changes are incorporated with minimum impact to the project and have a managed implementation. The change management system is designed to reduce the impact of the implementation by tracking and controlling the changes. Change management covers:

- Identification and capture of each change request
- Assessment of a change
- Decision whether to accept, reject or defer the change
- Incorporation of accepted changes
- Logging of changes

2.3   Why Do You Need Change Management?

Change management is important to you because it:

- Manages each request for change to ensure that the scope of the project is kept under control.
- Ensures each request for change is assessed by key project players.
- Allows each change to be accepted (or rejected, or deferred) by the appropriate authority.
- Enables the orderly implementation of each accepted change.
- Allows the impact of all changes to be understood and managed.
- Allows small changes to be implemented with the minimum of effort.

If there is no change management system, or if changes are not controlled, there will be:
1. No control over the scope and cost of the project
2. Missed milestone and delivery dates
3. A lack of communication of the changes throughout the project team members and eventually
4. Project failure

2.4   Who Reviews Changes?

Changes can be identified as either necessary, or possible, at any time during the project cycle by anyone connected with the project. Who is involved is dependent upon the size and nature of the change, but all changes or change requests should be logged by the Project Office and reviewed by you. A change requested by the client, or deemed necessary within the project, can have such a large impact that it may require amendment to the contract for it to be included.

2.5   When Do You Need a Change Management System?

You need to establish a change management system at the beginning of the project, because changes can occur at any time throughout the project.

2.6   How are Changes Managed?

Change management is required to control the scope of work, assess the impact of implementing a change, implement changes in a timely and orderly manner, and to communicate information on changes within a project team. The Project Office is the organization which provides staff support to you. The processes for running a change management system are detailed below:

1. All requests for change should be processed by the process; however, internal changes to documents that are in draft form may by-pass the procedure, if they have no further impact on the project.
2. Once accepted as valid, change requests are circulated for assessment.
3. When all assessment is complete, a decision whether to accept, reject or defer the change is made.
4. Accepted changes are incorporated into plans at an appropriate time.
5. All change requests are logged to provide status information.
6. Small changes (that have no impact on costs or timescales) are logged, but are circulated for information only.

You must understand:
- What a change is.
- That change management cannot be avoided or delegated.
- That time will be required to evaluate and implement changes.

2.6.1 Scope

Any request for a change to any project deliverable (including plans and management information) must be processed by the change management procedure.

Internal changes to documents which are in draft status (that is, still being worked upon) can by-pass the procedure, provided that the changes have no other effect on the project. If in doubt, follow the procedure.

2.6.2 Processes

2.6.2.1 Managing an Individual Change

Responsibility Action

Any project member

Recognize the need for a change and describes the required change on a change request form.

Note: An agreed approach should be established before the change request is raised.

Project Manager

Accept the change as valid and gives a priority and target date for the completion of the evaluation. If the change is small, you may decide to accept it directly using the procedure described in "Managing a Small Change" in topic 2.6.2.4.

Project Office

Log the change request into the change management system and gives it the next change number. The original form and attachments are filed in the Project Control Book (PCB). Copies of the change request are sent to each Subproject Manager for evaluation.

Subproject Manager

Assess the impact of the proposed change upon the subproject. Return the assessments to the Project Office.

Note: If further work is necessary at this stage to understand or evaluate the change, alert the Project Manager.

Project Office

Collect evaluations, file them in the PCB, and consolidate them to show the total impact.

When all evaluations have been received by the project office:

Project Manager

Decide on whether to implement, reject or defer the change. If necessary, add implementation details, such as in which phase or release the change is to be implemented, to the change request form.

Project Office

File the decision and implementation details in the PCB and communicates them to all subprojects and the change requester.

Project Managers and Subproject Managers

Incorporate the change into project deliverables and subproject plans following the implementation details.

2.6.2.2 Project Manager Responsibilities

Frequency   Action

At project meetings

    Review all outstanding changes with Subproject Managers.

Monthly

    Report to the Project Sponsor the total impact of all accepted changes and all outstanding changes to the overall project plans and timescales.

2.6.2.3 Project Office Responsibilities

Frequency   Action

Continually

    Maintain the file of all changes and up-to-date change log in the PCB.

Weekly

Check all outstanding requests (those being assessed) to ensure evaluations are taking place and assessments being returned to the Project Office.

For project meetings

    Prepare report with status of each outstanding change request as required:
1. Circulate new change requests for assessment.
2. Collect assessments from Subproject Managers.
3. Assemble all assessments for Project Manager to decide on the change.
4. Circulate accepted, rejected, and deferred changes to Subproject Managers.

2.6.2.4 Managing a Small Change

Small changes are those that you can accept (usually because they are small, necessary, and self-evident) without the formality of the change request procedure outlined in "Managing an Individual Change" in topic 2.6.2.1. The small change procedure enables you to log these changes and communicate them effectively to the project.

Responsibility Action

Any project member

    Recognize the need for a change and describes the required change on a small change note form.

Project Manager

    Accept the change as a valid small change.

Project Office

    Log the change request in the small change notelog and give it the next small change number. File the original form and attachments in the PCB. Send copies of the small change note to each Subproject Manager for information.

Project Managers and Subproject Managers

    Incorporate the small change into project deliverables and subproject plans.

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Note: By definition, there should be no significant alteration to the total effort or milestone dates caused by the small change. If a small change grows during its life to a size that justifies handling by the full process, the small change note should be closed and a change request raised.

2.7   Change Management Checklist

1. Has a change management procedure been set-up?
2. Has the procedure been documented?
3. Is the documented change procedure available to all project members?
4. Do all requests for change use this procedure?
   If 'No', document which changes bypass the system and why.
5. Have the activities and authorities been defined for:
   - Project members
   - Project Manager
   - Subproject Managers
   - Project Sponsor
   - Project Office
6. Are all responsibilities and required actions defined for:
   - Project members
   - Project Managers
   - Subproject Managers
   - Project Office
   - Project Sponsor
7. Are the following present in the change control processes?
   - Change request form
   - Change request form for a contractual element of a project
   - Change log
   - Small change request form
   - Small change request log
8. Are all outstanding changes included in the agenda at all progress and technical reviews?

3   Problem Management

Note: The Procedures for Techniques are contained in the Project Control Book Guide.

Subtopics

3.1 What is a Problem?

A problem is an out-of-line situation requiring action to be taken within the project to resolve it. A problem:
- Interrupts the progress plan of a project.
- Is ideally solved solely by the person whom it impacts.
- Should be resolved within the bounds of the project itself.

If the action needed to be taken by you is straightforward and within your power, you will act on your own and, apart from checking that the action is having the desired effect and perhaps keeping management informed, the matter ends there.

3.2 What is Problem Management?

A central problem management system may be appropriate for a medium to large project as it is an effective way of auditing the problems and their resolution through a problem log. A problem log provides an audit trail for problems by recording:
- How long problems have been outstanding
- Who owns each problem
- How each problem was solved and the cost to the project.

In many projects, it is unnecessary to develop a central problem management process. Each professional is responsible for fixing problems in his or her area of the project and should keep an individual problem log.

3.3 Why Do You Need Problem Management?

A problem is an exception condition that can be handled at the point at which it appears; something has gone wrong, but it is not necessarily serious.

A problem log is an effective means of determining a quality process in that the number of problems occurring and the speed of the resolution can be measured.

In some projects, a problem log may include faults or errors that have occurred in development and, therefore, the action to be taken is fixing or correcting, as appropriate. See "Error and Fault Management" in topic 5.0 for further information.

Problem management is necessary to the project as it is a means of logging and tracking the status of problems throughout the project and identifying those that may have been outstanding for some time and if not quickly resolved may lead to an issue. The logging of problems is also important to the financial aspects of the project as resolving them costs money and thereby tracking them provides evidence of project costs.

In a large project it is advisable to hold a regular problem status meeting in order to keep track of project progress.

3.4 Who Should Resolve Problems?

Problems are identified and actioned, where possible, by members of the project team. Depending upon the severity of the problem, it may be resolved without you being aware of it. If a problem is referred to you, you should resolve the problem through the action of the project team members.

It is your responsibility to resolve all problems, but you may delegate a problem to the appropriate person in the project team, who becomes the owner of the problem and responsible for resolving it.

3.5 When Do You Need Problem Management?

Problems may arise in the initial stages of a project. It is, therefore, imperative that you establish a problem management log system at the beginning of a project. This ensures that all impacts to the project are resolved as soon as possible and are available for reporting, auditing, and reference at a later stage, if and when necessary, for review purposes.

You should maintain the problem management system throughout the total project cycle and retain the records, records so that historical data, including lessons learnt, may be analysed.

3.6 How Are Problems Managed?

The project team at all levels must be able to identify and understand:
What a problem is
- That it might become an issue
- That problems are to be expected in every project
- That problem management cannot be avoided or delegated
- That time will be needed, at short notice, to handle problems

The problem management process in outline is:
- Identify and log each problem, with the date
- Identify the owner of the problem
- Identify responsibility for resolution and escalation path, where necessary
- Define and log actions
- Record problem resolution
- Identify where problem has led to an issue
- Record, track and manage outstanding issues
- Escalate issues, where necessary
- Record resolution of issues, with the date

The problem management system ensures that problems are resolved within the required timeframe and that you and all managers are aware of the status and impact of outstanding problems. The Project Office is the organization which provides staff support to you. In a smaller project, you may undertake the responsibilities of the Project Office yourself.

3.6.1 Scope

Any problem that interrupts the progress of a project, but which can be solved within the project, should be processed by the problem management system.

Internal subproject problems which will have no other effect on the project or other subprojects may by-pass the process. If in doubt, follow the process.

3.6.2 Objectives

A problem may impact the original project schedules and resource and, therefore, the system that manages them must aim to increase the speed with which they are resolved by:

- Capturing and recording each problem.
- Appointing team members to be responsible for resolving the problem
- Monitoring the progress of the problem until it is resolved.

3.6.3 Processes

The following sections describe how it is achieved by adopting a standard process and by making use of simple forms.

Responsibility Action

Project team members
Identify the problem on a problem form (see Figure 1) and forward the form to the Project Office for logging into the control management system.

Subproject Managers
Identify and log problems. If you identify the problem as an issue, see "Issue Management" in topic 4.0.

Project Manager
Accept the problem as valid and define the action required to resolve it.

Project Office
Log the problem using the Project Problem Log form (see Figure 2) and allocate the next number in the problem numbering sequence. If a problem has been identified as becoming an issue, keep the problem in the problem log and transfer the relevant data to the issue log for resolution as an issue. See "Issue Management" in topic 4.0 for further information.

Project Manager
Appoint an Action Manager to manage the resolution of the problem.

Action Manager
Log on the appropriate form the actions necessary to get the problems or issues resolved. Record the target date for planned actions, and the actual date that actions take place. These dates, with the date that the status was last checked, show the progress made with the problem or issue.

Project Manager
Accept the problem as resolved and closed. Make an entry on the appropriate form to show the date a problem has been resolved.

Project Manager or Project Office
Communicate the decisions taken to resolve the problem to the appropriate project team members.
Document all changes resulting from a problem using the Change Management System.

Project Office
Daily, check the problem log to identify those problems that need to be "chased" for an update, in particular, those that have been classified as high priority. Record the date last chased in the problem log.

Project Office
For reviews, prepare reports, every two weeks on updated forms, of outstanding problems.

Project Manager
Every two weeks, review all outstanding issues and problems and their associated action plans with Subproject Managers.

Project Manager
Report on the status of outstanding high priority problems to senior management on a regular basis.

Problem Form

Date Raised	Raised By	Number
Summary		

Action Mgr	Priority	Target Date

Description and Possible Action

	Problem Action Log			
Status Date	**Action and Status**	**Resp**	**Target Date**	**Actual Date**

Figure 1. Project problem form

Problem Log

No.	Subject	Raised By	Date Raised	Date Corrected (if required)

Figure 2. Project problem log

Problem Form

Date Raised	11Nov1994	Raised By	DWD	Number	06

Summary
Acceptance of project deliverables within or without the project?

Action Mgr	GDE	Priority	H	Target Date: 11Dec1994

Description and Possible Action

Some of the project deliverables, e.g. operational processes and environmental equipment control processes are likely to be accepted by parts of the project that created them.

How can a set of acceptance processes be written to ensure an unbiased acceptance and handover.

This problem is aimed at Operations Section as recipient of the project deliverables.

Problem Action Log				
Status Date	Action and Status	Resp	Target Date	Actual Date
25 Nov	Meet with JAP to discuss best way to provide acceptance, in or out of project scope	GDE	1 Dec	13 Dec ¦
13 Dec	Acceptance to be carried out within project. Subproject scope expanded to cover this.			
	*** PROBLEM CLOSED ***			

Figure 3. Completed project problem log

3.7   Problem Management Checklist

The following should be in place for a problem management system to be successful:

1. Definitions for:
   - Problem
   - Concern (possibly)
   - Problem escalation

2. Processes for:
   - Problem handling at subproject level (too small to be project issue)
   - Problem escalation to issue

3. Forms for:
   - Problem logs for use within subproject structures
   - Continuation forms of above (if single sheet not enough)

4. People to handle problems:
   - Active sponsor
   - Project Manager
   - Project Office Manager (or function in small project) for chasing actions
   - Action Managers (active Subproject Managers)

5. Review meetings:
   - Problems as agenda item in Progress Review Meetings
   - Problems as agenda item in Technical Review Meetings

4 Issue Management

Note: The Procedures for Techniques are contained in the Project Control Book Guide.

Subtopics

4.1 What is an Issue?

Issues are problems requiring discussion with a person or body outside the project, before action can be taken to resolve them.

An issue is:
- Something that stops or slows the planned progress in a project.
- A problem that cannot be solved by the person whom it impacts.
- An unplanned item, impacting the outcome of the project, and may be outside your authority to resolve.

Each issue may need further investigation or escalation before the appropriate action and changes to project plans can be made.

4.2 What is Issue Management?

Many issues that arise can be complicated and there is a range of activities necessary to get them resolved:
- Meetings
- Technical work
- Evaluation
- Estimation
- Escalation

In general, an issue needs a number of events to get it fixed and you may not have the authority to take all the decisions needed in the course of resolution. On all but the smallest project, there may be a number of issues outstanding at any one point and you will need an Issue Management system to keep track of all these issues and to ensure that they are resolved swiftly and efficiently. On a large project, or one which is having lots of problems, you may need to log and track problems as well as issues. For further information on managing problems, see "Problem Management" in topic 3.0.

Issue management is a process to ensure that all project-related issues are resolved as soon as possible. As, by definition, issues are problems requiring discussion and/or intervention by a person, or body external to the project, the issue management system should:
Identify each issue
- Appoint an action manager, internal or external to the project, to be responsible for getting each issue resolved.
- Periodic reviews of outstanding issues and, where necessary, the appropriate escalation process to be followed.

4.3   Why Do You Need Issue Management?

You need an issue management system because:
- There are likely to be many issues outstanding at any one time.
- An issue may have the potential to impede the project.
- The actions necessary to resolve an issue (to the point where an agreed change to project plans can be made) may be complex, prolonged, and not apparent at the outset.

For these reasons, it is necessary to have a management system to track and control issues. Your system should cover:
- The identification and capture of each issue;
- The appointment of an action manager to be responsible for getting each issue resolved;
- The logging and periodic reviews of all outstanding issues.

If there is no issue management system, or if issues are not controlled, there may be:
- Delays in making decisions
- Delays in getting things started
- Missed milestones and delivery dates and eventually
- Project failure

4.4   Who Should Resolve Issues?

It is your responsibility to resolve all issues, but you may delegate the action to an appropriate person in the project team, who becomes the owner of the issue and responsible for resolving it.

Where a problem becomes an issue requiring involvement outside of the project, you should discuss and escalate the issue with the appropriate bodies to get a resolution as quickly as possible. You should leave the appropriate person owning the issue with an action plan and date to get the issue resolved.

The logging and control of issues should be the responsibility of the Project Office.

4.5   When Do You Need Issue Management?

Issues may arise in the initial stages of a project. It is, therefore, imperative you establish an issue management log system at the beginning of a project. This ensures that all impacts to the project are resolved as soon as possible and are available for reporting, auditing, and reference at a later stage, if and when necessary, for review purposes.

4.6   How Are Issues Managed?

The project team at all levels must be able to identify and understand:
- That issues are to be expected in every project
- That issue management cannot be avoided or delegated
- That time will be needed, at short notice, to handle issues

The issue management process in outline is:
- Identify and log each issue, with the date
- Identify if a problem has led to the issue
- Identify responsibility for resolution and escalation path, where necessary
- Define and log actions
- Record issue resolution
- Record, track, and manage outstanding issues
- Escalate issues, where necessary
- Record resolution of issues, with the date of completion

The issue management system ensures that issues are resolved within the required timeframe and that management is aware of the status and impact of outstanding issues and problems. The Project Office is the organization that provides staff support to you. In a smaller project, you may undertake these responsibilities yourself.

4.6.1 Scope

Any problem that impedes the progress of the project should be regarded as an issue and must be processed by the issue management process.

Internal subproject problems which will have no other effect on the project or other subprojects can by-pass the process. If in doubt, follow the process.

4.6.2 Objectives

An issue may impact the original project schedules and resources and, therefore, the system that manages them must aim to increase the speed with which they are resolved by:
- Capturing and recording issues
- Appointing team members, or people external to the project responsible for their resolution
- Monitoring the progress of issues until resolution

The following topics describe how it is achieved by adopting a standard process and by making use of simple forms.

4.6.3 Procedures

Responsibility
>Action

Project team members
>Identify an issue on an issue form (see Figure 4) and forward it to the Project Office for logging into the control management system.

Subproject Managers
>Identify a problem as being an issue, describe the issue on an issue form (see Figure 4) and forward it to the Project Office.

Project Manager
>Accept the issue as valid, assign a high, medium, or low priority, and assign a target resolution date.

Project Office
>Log the issue in the issue log (see Figure 5) and assign to it the next number in the issue numbering sequence. If you are dealing with a problem that has become issue, keep the problem in the problem log and transfer the relevant data to the issue log for resolution as an issue.

Project Manager
>Appoint an Action Manager to manage the resolution of the issue.

Action Manager
>Record on the appropriate form the actions necessary to get issue resolved, the target date for planned actions, and the actual date that the actions take place. These dates, along with the date status was last checked, show the progress made with the issue.

Project Manager
>Accept the issue as resolved and closed. Make an entry on the appropriate form to show the date an issue was resolved.

Project Manager or Project Office
>Communicate the decisions taken to resolve the issue to the appropriate project team members.

>Document all changes resulting from an issue using the change management system.

Project Office
>Weekly, check the issue log to identify those issues that must be "chased" for an update, in particular, those that have been classified as high priority. Record the dates last chased in the issue log.

Project Office
>Every two weeks, prepare on updated forms reports of the status of outstanding issues for reviews.

Project Manager

Every two weeks, review with Subproject Managers all outstanding issues
and their associated action plans.

Project Manager

Report on the status of outstanding high priority issues should be reported
to senior management on a regular basis.

Project Issue Form

Date Raised:		Raised By:	Number:
Summary			

Action Mgr:	Priority:	Target Date:

Description and Possible Action:
Attach further sheets if necessary

Next Review Date:	

Issue Action Log				
Status Date	**Action and Status**	**Resp**	**Target Date**	**Actual Date**
			Check if action log continued	

Figure 4. Project issue form

Project Issue Log

No.	Summary	Prio-rity	Date Raised	Next Review Date	Resol-ved
	End of Log				

Figure 5. Project issue log

Project Issue Form

Date Raised:	3 jan 1994	Raised By:	GDE	Number:	07

Summary
Summary: Design of recovery of lines to Warwick and London following disaster

Action Mgr:	GDE	Priority:	H	Target Date:	15 feb 1994

Description and Possible Action:
There are two options of supporting non-strategically connected devices to Warwick and London following disaster at Barnwood: 1. Reroute physically to Warwick and allow SNA connectivity back to Barnwood.   2. Modify connectivity at London to surviving center and provide connectivity through to Warwick   A technical decision is required to allow design to be completed.   *Attach further sheets if necessary*

Next Review Date:	

Issue Action Log				
Status Date	Action and Status	Resp	Target Date	Actual Date

3 Jan	GDE to convene relevant technicians and resolve under CJR chairmanship	GDE	8 Jan	9 Jan
9 Jan	Mtg held, actions noted and added to Tech. Review mtg.	PCD	18 Jan	16 Jan
6 Feb	Decisions included in design. GDE/PAH to discuss further	GDE	28 Feb	27 Feb
27 Feb	Option 2 above taken			
	*** ISSUE CLOSED ***			
		Check if action log continued		

Figure 6. Completed project issueform

Project Issue Log

No.	Summary	Prio-rity	Date Raised	Next Review Date	Resol-ved
01	Disaster recovery support to non-business sites	M	6Nov94	CLOSED	25 Nov
02	Disaster recovery for non-ESA systems supported by Warwick	H	6Nov94	CLOSED	25 Nov
03	Placement of third tape system	H	4Sep94	CLOSED	4 Sep
04	Interfaces to critical services are they also critical	H	25Nov94	CLOSED	4 Feb
05	Project communications with development department	M	13Dec94	CLOSED	4 Feb
06	Recovery of non-strategically connected devices to Warwick	M	27Jan94	CLOSED	27 Feb
07	Outage program to support system environment changes	H	20Mar94		
08	Outage program to support environmental support changes	H	20Mar94		
09	Migration of applications from'H' system to 'P' system	M	20Mar94	CLOSED	
10	Forward recovery of service DB restore	M	11Mar94		
	Date of this log: 20th March 1994				
End of Log					

Figure 7. Completed project issue log

4.7   Issue Management Checklist

The following should be in place for an Issue and Problem Management System to be successful:

1. Definitions for:
   - Issue
   - Concern (possibly)
   - Issue escalation

2. Procedures for:
   - Issue handling at project level
   - Issue escalation above Project Manager

3. Forms for:
   - Issue log at project level
   - Issue detail forms at project level
   - Continuation forms of above (if single sheet not enough)

4. People to handle issues:
   - Active sponsor
   - Project Manager
   - Project Office manager (or function in small project) for chasingactions
   - Action Manager (active Subproject Managers)

5. Review meetings:
   - Issues as an agenda item in Progress Review Meetings
   - Issues as an agenda item in Technical Review Meetings

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5   Error and Fault Management

Note: The Procedures for Techniques are contained in the Project Control Book Guide.

Subtopics

5.1   What Are Errors and Faults?

Errors and faults are similar because both reflect a state of something that is wrong that requires putting right.

In an ideal world errors and faults would not occur, but unfortunately they do so, therefore, need to be dealt with. They can be handled by a similar (or possibly the same) process. The main distinction between them, as defined, is that an error is the result of a human mistake and a fault is a state of something that requires fixing.

An error is:
- A mistake that has been created by a person
- Ideally corrected by the person who caused it
- Corrected as quickly as possible in the project cycle as delays cost the project time and money

A fault is:
- Something that is not functioning properly
- Ideally fixed by the person with the relevant skills
- Corrected as quickly as possible in the project cycle as delays cost the project time and money.

5.2   What is Error and Fault Management?

Basically, error and fault management is the logging of their occurrence and the date when corrected or fixed. As they are similar, there is no reason why they cannot be logged and controlled by the same process.

5.3   Why Do You Need Error and Fault Management

Errors and faults are a state of something that is wrong which requires action to restore them to a state of being right.

A good measurement of a Quality Control Process is the number of errors or faults that occur during any given phase of a project, and a second measurement is the time taken to correct or fix them.

It is a well-known fact that errors and faults are costly to a project, as they require resource, time and money to detect and fix them. It is also a fact that the longer they remain undetected in a project cycle, the more costly they are to fix.

An example may be that an error in specification of a requirement in an early phase of the project may take an analyst five minutes to proofread and correct. If this error is carried through programming, unit testing, and even systems testing, and is not detected until the system is in production, this same error can cause a system to be brought down with all the horrendous high costs that the business may suffer.

The cost difference in the timing of the detection of this error can be several thousand to one. That is why a project requires an effective error and fault management system.

Judgement is required as to what level errors and faults need to be logged on a project. The best criteria for them to be logged is when they have been detected by a person other than the one who caused it, whether within or without the project team.

5.4   Who Resolves Errors and Faults

You are responsible for the overall management of errors and faults and their resolution, because their control directly affects the health of the project. The log of errors and faults detected on the project should be maintained by either the project team or the Project Office, depending on the size and organization of the project. If appropriate, you may delegate to an appropriate Subproject Manager.

Errors should be corrected by those who make them, as this is the only way that "lessons are learnt". However, the occurrence of and the expertise to fix a fault may lie outside the project team, for example, in hardware or vendor software used by the project. In this instance, you may have to escalate the identified fault to a project issue, to ensure that the fault is eliminated.

5.5   When Do You Implement Error and Fault Management?

You need to set up an error and fault management log in the initial stages of the project. The log should remain in place throughout the life of the project. You should try to Identify and correct errors and faults as early as possible during the project cycle, because this is by far the most cost effective Quality Control process.

5.6 How Are Errors and Faults Managed?

It should be the aim of the project team to avoid errors and faults; they unfortunately occur and a process is required to handle them.

Errors and faults can be handled by the same process as they both require identifying and rectifying.

The main element of control of the process is to maintain an error and fault log. If the project is large and the organization is structured to handle them, more than one log can be maintained, say, at individual project team level. In the case of smaller projects, the log should be maintained by the Project Office, or at least centrally.

The log should then comprise:

Error/Fault Id Number:	An auditable unique reference
Subject:	A brief description of the error/fault and who is responsible for correcting/fixing it
Raised by:	Who found the error/fault
Date Raised:	When the error/fault was found
Person Responsible:	The person responsible for getting the error corrected or fault fixed
Date Corrected:	When the error/fault was corrected.

The log provides you, and the Subproject Manager, with a lot of statistical data that provides a good basis for project quality control. The data provides:

- The types of errors and faults occurring
- At what stage of the project they are being detected
- Which area of the project is creating errors
- How many errors and faults are occurring
- How quickly they are being fixed

Comparison on a regular basis will then detect whether error avoidance and correction is improving or not and, therefore, providing a valuable quality control management process.

It is strongly advisable that you or the Subproject Manager review the logs on a weekly basis, and even more frequently in critical periods such as system tests. At least once a month, you should review the overall position, as this will give you a good indication of quality measurements on the project.

If an error, and particularly a fault, needs resolution outside the project team and is not being actioned quickly enough, you should translate and cross-reference the item to the issue log and manage as appropriate. See "Issue Management" in topic 4.0.

5.7   Error and Fault Management Checklist

The following should be in place for an error and fault management system to be successful:

1. Definitions for:
   - Error
   - Fault

2. Processes for:
   - Error and fault logging and handling at project level
   - Error and fault logging and handling at subproject or team level as appropriate
   - Error/fault escalation to issue, when required

3. Forms for:
   - Error logs at project/subproject level
   - Fault logs at project/subproject level
   - Above combined, if preferred

4. People to handle errors and faults:
   - Project Managers
   - Subproject Managers
   - Project Office
   - Those responsible for correction

5. Review meeting:
   - Weekly at project/subproject level for status
   - Monthly at project level for Quality trend

6. Data and statistics
   - Number of errors and faults in a predetermined phase or time period
   - Error and fault correction turnaround time
   - Accumulate project date for Quality Measurement requirements

Index

Readers Comments

MITP
Exception Management Guide
Version C5.0

Publication No. MICG1EXC

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