

R&D Project Management Manual

User Manual

National Rivers Authority

R&D Note 249



Project 375

R&D PROJECT MANAGEMENT MANUAL

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ENVIRONMENT AGENCY

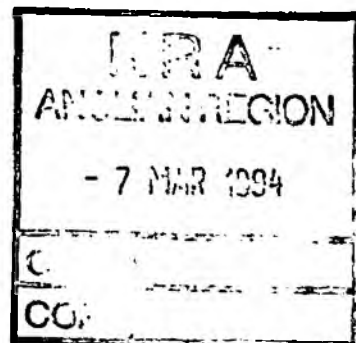


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Dissemination Status

Internal: Released to Regions
External: Restricted

Statement of Use

This Manual is for use by R&D Co-ordinators and Project Leaders within the NRA.

This document was produced in two phases. Phase 1 was undertaken by PA Consulting Limited. The Manual was then revised in house in the light of the NRA Project Management Procedures PIN by John Dalton, R&D Programme Officer, Head Office.

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SUMMARY GUIDE

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DOCUMENT CONTROL

Version Number	Issue Date	Comment
0.2	12/01/94	First draft issued for review
1.0	28/02/94	First issue of Manual

Summary Guide

SUMMARY GUIDE

This Summary Guide provides a checklist for staff involved in R&D project management. It highlights the steps involved in project development and the necessary approvals required. It does not attempt to provide all the details, but draws attention to the relevant sections of this Manual where further information can be found.

It is divided into two sections: the first summarises the steps in project development; and the second lists the documents which must be produced in the approval process.

Project Development

This section provides a summary checklist of the main steps involved in project development. The "Stage" column references the appropriate section of the Manual. The "Work" column gives the activity with comments in the "Notes" column. The "Responsible" column details the officer responsible for the given stage and should be used by all appropriate staff to focus on what is required. Finally the "Log" column can be used either as a tick list or for dates. The Region's R&D Co-ordinator is the primary Regional focus for information, advice and assistance on the use of this Manual.

Stage	Work	Notes	Responsible	Log
B1.1.3	Complete Summary Appraisal Form	Reviewed by Head of R&D.	Topic Leader	
B2.1.1 and B1.1.4	Complete PID: - involve IS; - external reviewer; - review PID; - complete Form A.	Drafting undertaken by PL if significant IS implications if over £100k by Topic Leader & Head of R&D under SoD	Project Leader	
B2.1.3	Procurement Process - Competitive Tender	Draft ToR Pre-tender selection Invitation to tender Evaluate tenders Approval of contractor PBA issued	R&D Co-ordinator	
B2.1.3	- Single Tender Action	Confirm STA conditions are met Complete Form C PBA issued	R&D Co-ordinator	
B2.3 and B3.1	Complete Contract	Agree contract conditions Send signed copies	R&D Co-ordinator	

B3.1	Monitor project - Financial monitoring - Technical progress - Quality monitoring - Change control	Produce reports as required, may be monthly Quality Review Panel Form G required ?	Project Leader	
B4.1.1	Complete ERSA - output produced - ERSA signed off - uptake accepted	May need an implementation plan Output accepted by customer including Regional PAB By EG/Board	Project Leader	
B4.1.2	Post-Project Appraisal	Recommended by PAB	PPA Team	

Approval

This section provides a summary checklist for checking that documents have been produced and approved before a project can start. The documents which are required depend on the category of project.

The approved Financial Form A allows expenditure to be incurred on a project. This enables work to be started and commence the process of procuring a contractor. The Project Budget Authorisation (PBA) gives the Region the authority to commit expenditure, by financial year, from the National R&D budget.

Documents	Category of project ⁴	
	"Small"	"Medium" or "Large"
Summary Appraisal Form plus Project Plan ("Small PID")	✓	N/A
Project Initiation Document	N/A	✓
Financial Form A ¹	✓	✓
Procured services approved ²	✓	✓
Project Budget Authorisation ³	✓	✓

Note:

¹ Refer to *Financial Memorandum and Scheme of Delegation* for levels of approval required.

² Refer to *Section B2.1.3* for details of the relevant forms i.e. Form B or C.

³ Refer to *Section B2.2.10* for explanation of PBA.

⁴ Refer to *Section A3.1* for description of category of project.

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Version Number	Issue Date	Comment
0.2	01/11/93	First draft issued for review
1.0	28/02/94	First issue of Manual

A1 GUIDE TO USE

The purpose of the Guide to Use is to introduce the Manual to explain its structure and content, and to indicate how it is intended to be used to help to manage R&D projects successfully for the NRA. The Guide to Use is structured in four sections:

- "Purpose of the Manual" explains what the Manual is intended to achieve and who it is aimed at in terms of readership.
- "Structure of the Manual" explains how the Manual is structured into parts and what each part is used for.
- "Use of the Manual" describes, for new and existing users, how the manual should be used and gives the terminology that is used and notes on cross referencing and other procedures that have to be complied with.
- "Updating the Manual" explains how the manual should be kept up to date and what document control procedures should be followed.

A1.1 Purpose of the Manual

This Manual is intended to provide guidance on the management of R&D projects. It describes the way in which R&D projects are organised and structured and has been written primarily for:

- Project Leaders
- Project support staff (Regional R&D Co-ordinators and R&D Section in Head Office)

It is also an essential source of reference for other NRA staff who are involved in the management of the R&D programme, particularly the Topic Leaders.

The Manual conforms with the NRA's overall project management framework which is defined in the parent Policy Implementation Note (PIN) - *Project Management Procedures PIN* dated August 1993 - and sets out the basic requirements for the structure, management and control of projects.

Compliance with PINs is mandatory. Where necessary, PINs are supported by guidance manuals which give practical advice and guidance. This Manual performs that function for R&D project management. It does not replace the *Project Management Procedures PIN*, but builds on various sections where specific procedures exist for R&D. In other places it adds explanatory detail. In either case the PIN is cross-referenced with the PIN section numbers being shown in bold italics e.g. *Project Management Procedures PIN - Section 4.6*.

This Manual also complies with Cabinet Office requirements for public sector R&D as set out in *R&D Assessment* (HMSO, 1989).

A1.2 Structure of the Manual

A1.2.1 Introduction

It is recognised that different NRA staff involved in R&D have differing levels of experience of managing R&D projects. This Manual has therefore been designed to provide both a briefing on R&D project management as well as detailed procedures and guidance for undertaking projects. Depending on the needs of the user, either the Manual can be read in full or the user can simply refer to the appropriate procedures or guidelines.

There are certain issues which are extremely complex e.g. commercial issues, which are not covered in any depth in this document. In such cases, reference is made to the R&D Section numbered paper or to other sources of guidance, such as the *Procurement Manual* or a particular NRA officer.

A1.2.2 Part A

Part A of the Manual explains the environment within which R&D projects are undertaken in the NRA and discusses the particular issues which apply to R&D. It outlines the organisation of the NRA, its functions, its Regions and its management framework. It places R&D within this context and establishes the major links that exists with, and the features that distinguish R&D from, other project activities in the NRA. The importance of "project outputs" and their proper uptake are also discussed. It is likely that a user would only need to refer to Part A occasionally for general guidance, once the basic principles and organisation are understood.

A1.2.3 Part B

Part B leads the user of the Manual, stage by stage, through a typical project and contains the "Management Procedures" which should be followed in each stage. Each procedure is divided into three sections:

1. **Introduction**, which describes what each stage is for, what is needed before the stage can start and what the stage will produce. As the principle is to plan the next stage in detail as part of a previous stage, the procedure comprises not only what work is carried out during the stage but also what needs to be considered when planning for the next stage.
2. **Process description**, which explains (with a flow chart), step by step what needs to be done in each stage of a project and by whom.

3. **Guidelines**, which contain guidance on the specific issues or documentation needed to be completed or produced during the stage and which are referred to in the process description.

A1.2.4 Index and Appendices

The **Index** allows the user to find the main references for a particular subject area.

Appendices at the back of the Manual contain further supporting information covering:

- terms of reference;
- project management forms;
- examples of completed forms;
- example file records;
- detailed guidance on standard R&D form of agreement;
- references R&D numbered papers; and
- glossary of terms.

A1.3 **Use of the Manual**

A1.3.1 New Users

New users should acquaint themselves with the R&D environment described in Part A and the terminology used in R&D management by reading the Glossary. Much of this is generic to NRA project management as a whole, other terminology derives from the Cabinet Office guidelines on R&D Assessment. This Glossary should be referred to whenever the user is unclear of the meaning of a word or phrase. Following this, the new user should then skim through Part B, reading the "introductions", following the process flow charts and referring to each guideline as required. There is a considerable amount to understand and it is not expected that a new user will retain all that is presented in each section. It is only necessary that sufficient understanding is obtained for the user to follow Section A1.3.2.

Regional R&D Co-ordinators have a dual role:

- in providing support to Project Leaders working on projects in their Region; and
- on the management of their Region's portfolio of R&D projects.

They will therefore need to familiarise themselves with the full Manual as they will need to be able to respond to any requests from the Project Leaders for advice and support. They should also not hesitate to seek advice from other more experienced R&D Co-ordinators or from the R&D Section in Head Office.

Note this manual does not seek to take the place of project management training. It is assumed that the users at least have a grounding in the techniques required and the concept of the NRA's Project Management framework.

A1.3.2 All Users

Once a broad understanding has been obtained then the user should concentrate on the task in hand. The Project Leader will usually have been appointed at the start of the **Detailed Planning and Project Authorisation Stage (Section B.2)**, if not before. They should read procedure **B1 - Identification**, to recap on how the project came to be identified, selected and who has been involved. This will support the initial project briefing which each Project Leader should obtain from the Topic Leader. They should then read the procedure for the stage which is about to be undertaken; this should be read in full detail, referring to other procedures when prompted. Finally they should read the next stage to remind themselves of its full scope: project management is concerned with looking ahead and always planning the next stage before the present stage is completed. If further clarification is needed then the Project Leader should not hesitate to ask the Regional R&D Co-ordinator.

The Manual has to cover all sizes and complexities of R&D projects, but the principles and procedures apply to all projects. However, if a procedure is not followed fully, then this should be a deliberate decision which is driven by the needs of the particular project and not a wish to cut corners because time is short. Notes are given in Part B to indicate where a procedure can be "collapsed" down to the basic minimum e.g. **Section B2.0 - Introduction**. In all cases the relevant PINs must be adhered to.

A1.3.3 Use of Standard Forms and Report Contents

The manual contains a number of standard forms and report contents. The reasons for using these are given below. Some are mandatory, others are optional and provided to help the user deal with particular circumstances.

Standard forms: many of the procedures require standard forms to be used, some of which are common for all NRA projects. For example, proposed changes to an approved project are recorded on a Change Report (see **Appendix B**). Other forms fulfil the same purpose of an equivalent form in the **Project Management Procedures PIN**. Forms are used so that:

- important information is given in a consistent and complete way;
- the information is easily recognisable by others;

- time can be saved by avoiding the need for writing memos; and
- so that standard information can be used as appendices to progress reports if needed.

Standard report contents: similarly, the Manual prescribes the headings used in various progress reports and similar "short term" documents which are produced as part of the project. These documents must be sufficient to match the needs of the particular project and often only a single sentence is needed to fill them in. The standard headings are used to ensure consistency and completeness and to aid reviewers. The latter may have to read a number of project reports and are assisted greatly if the documents are written in a recognisable order.

A1.3.4 Other NRA Procedures

Other procedural documents which will need to be referred to include:

For the NRA generally:

- NRA PIN Volume 14 *Project Management Procedures*;
- NRA PIN Volume 7 *Financial Memorandum and the Scheme of Delegation* (FM/SoD);
- NRA PIN Volume 9 *Procurement Manual*;
- NRA *Economic Appraisal Manual*; and
- local instructions.

For R&D in particular:

- *Guidance Note on the Production of R&D Outputs for the NRA*
- *R&D Note 180*

These are introduced in Part A and referred to at the relevant points in the procedures.

A1.3.5 Cross-references and Other Conventions

Extensive cross-referencing has been made to make the Manual easy to use. Each page contains the following information:

- **on the header:** the section reference and title; and
- **on the footer:** the name of this Manual, date, a page reference and version number.

Section/paragraph references comprise a letter indicating the Part of the Manual (A, B etc.) with a reference number, followed by up to two sections e.g. *B2.1.3*

In Procedure B1, the guideline on the numbering of submissions and proposals is referred to as "*Section B1.2.1.*"

Cross-references are given for internal references between sections of the Manual and for external references to other documents/publications. They are in bold italics within the text.

Page numbering comprises the section number plus a page number i.e.:

B1, followed by consecutive page numbers e.g. "B1/12".

In this way additional pages can be added in a section without upsetting the complete page numbering of the whole document.

If an individual page is photocopied, it will be possible to know which document it came from and the version.

A1.4 **Updating the Manual**

The Manual is a day-to-day working procedural document and as such has to reflect up-to-date practice. Changes to the Manual can occur for a variety of reasons:

- external procedures change (e.g. Scheme of Delegation);
- procedures within the Manual are enhanced or developed; and/or
- errors are found and need to be corrected.

It is essential that all users of the Manual are using the most up to date versions. This is achieved by means of "Document Control" as follows.

A1.4.1 Issue of Manuals

Each manual is individually numbered and is allocated by R&D Section to a named individual. If multiple copies are given to R&D Co-ordinators, they must maintain a log and inform the R&D Section of the individuals they have been given to. Thus, a register of all recipients is held by the R&D Section.

A1.4.2 Version Numbering of Procedures

Each procedure within the Manual has a document control section, similar to that used on PINs, which records the version number of the procedure, the date of issue and a comment giving the reason for issue. The current list of latest versions for each procedure is recorded on the contents sheet for each part of the Manual.

Version numbering is in two parts:

- a release number; and
- an amendment number.

For example, a procedure with version number 1.5 indicates that the procedure was issued as part of release 1 of the Manual and that there have been five subsequent amendments issued.

Once a considerable number of amendments have been issued and the Manual, in its current release status, has been used for some time, it will be convenient to scrap the previous release and issue a new release of the full Manual for example, Version 2.0 would replace Version 1.9.

Release "0" (e.g. 0.3) is always used to indicate drafts of sections which have been produced for review purposes.

A1.4.3 Comments on Existing Releases

The Manual is issued by the R&D Section through the Head of R&D, who is responsible for ensuring that document control is maintained. If users have any queries or comments on the manual then these should be directed, in the first instance, to the respective Regional R&D Co-ordinator. The Regional R&D Co-ordinators should then pass on the comments to the Head Office R&D Section.

A2 GENERAL BACKGROUND

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DOCUMENT CONTROL

Version Number	Issue Date	Comment
0.2	01/11/93	First draft issued for review
1.0	28/02/94	First issue of Manual

A2 GENERAL BACKGROUND

A2.0 Introduction

This chapter provides the framework within which R&D projects are managed. It outlines the organisation of the NRA, its functions, its Regions and its management framework. The significance of project outputs and their uptake is also discussed.

It is likely that a user would only need to refer to this part of the manual occasionally, for general guidance, once the basic principles and organisation are understood.

A2.1 Project Management in the NRA

A2.1.1 Corporate Structure

The NRA's statutory duties and responsibilities for its seven "core functions" (i.e. Water Quality, Water Resources, Flood Defence, etc. as given in *Figure A2.3 - Commission and Topic Structure*) are undertaken by operational staff in its eight Regions. The management structure is therefore a "matrix", with the Regional line management structure on the one hand and the core function structure on the other (See *Figure A2.1 - NRA Corporate Structure*).

Overall management responsibility is taken by the Executive Group (EG) which is chaired by the Chief Executive and reports to the NRA Board on matters of policy and resource allocation.

Each Region is managed by a Regional General Manager (RGM) assisted by a Regional Management Team (RMT). Operational activities are co-ordinated through the Operations Team (OT). All NRA staff are assigned to either Head Office or one of the Regions.

Each core function's activities are co-ordinated by a Head of Function assisted by a Function Committee (FC) which comprises the function managers from each of the eight Regions. Each FC reports either to the Director of Water Management or to the Chief Scientist on the EG concerning policy development and national developmental initiatives (which includes R&D).

The policy development and operational lines meet at the Executive Group.

A2.1.2 NRA Management Procedures

There are various mandatory management, financial and other policies and procedures in the NRA. Those which impact most directly on R&D projects are listed below. This manual does not reiterate what is contained in these, but refers the user to them as appropriate.

The Project Management Procedures PIN sets out the project management procedures

which must be applied to all projects undertaken by the NRA. The procedures provide a basic framework for project management.

The Financial Memorandum contains the rules on financial, staffing and related matters through which the Department of the Environment, as sponsoring department, administers control over the NRA.

The Scheme of Delegation gives the limits of responsibility which have been delegated to the various tiers of management in the NRA. It is approved by the NRA Board and should be read in conjunction with the Financial Memorandum. Advice and guidance on this should be sought from the Region's Scheme of Delegation (SoD) Co-ordinator.

The NRA Procurement Manual aims to ensure that goods and services are obtained in an efficient and effective way which provide value for money.

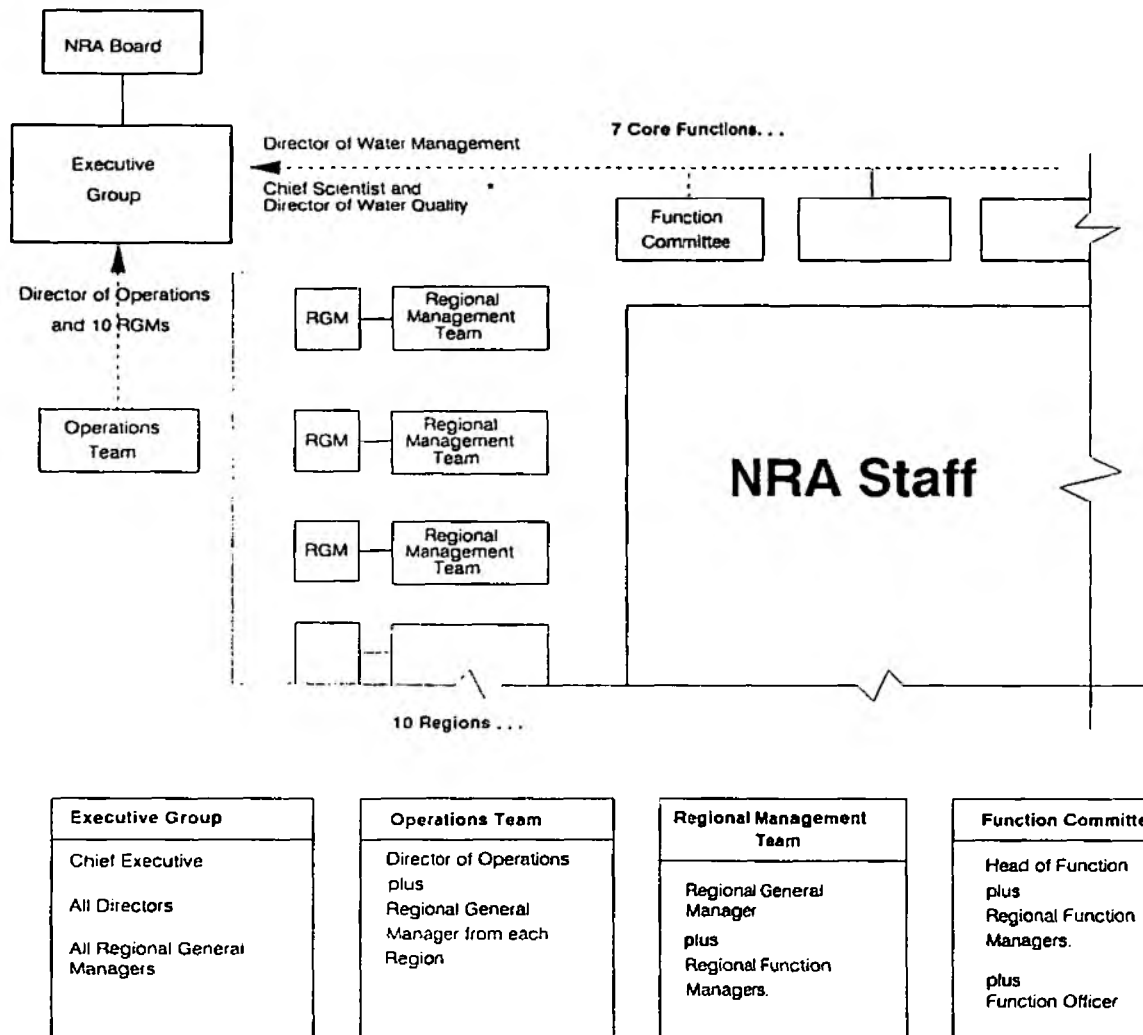
NRA Economic Appraisal Manual contains guidance on the economic and financial appraisal of projects to ensure that a consistent approach is used throughout the organisation in line with Treasury guidelines.

Regional instructions and guidelines. Whilst the NRA seeks to limit the proliferation of diverse procedures and practices for managing the business, it is recognised that particular differences may exist between Regions. Local instructions/guidelines are therefore permitted provided they follow the principles of overall NRA policy.

A2.1.3 Basis of R&D Programme

Having an effective R&D programme is an essential element in the business of an organization such as the NRA. The overall purpose of the programme is to make the organization more efficient and effective in its business operation, and innovative and proactive with regard to the issues it has to tackle. All of these are vital to the NRA, which will remain under pressure both to carry out more work with the resources available and to develop approaches to deal with new and often increasingly complex environmental issues.

The importance of the NRA using research to support its business tasks - outside, but related to, its day-to-day operational duties - was recognized in the NRA's formation. The Water Resources Act 1991 places a duty on the NRA to ".....make arrangements for the carrying out of research and related activities (whether by the Authority or others) in respect of matters to which the functions of the Authority relate". R&D objectives are thus set principally by the NRA's mainstream staff in its different core function business areas as the customers of research. The NRA is not therefore to be regarded as simply another research funding organization with a general remit to carry out environmental research.



* title abbreviated elsewhere to "Chief Scientist"

Figure A2.1 - NRA Corporate Structure (schematic)

Within the NRA's R&D programme, an R&D project can cover any initiative aimed at developing new or improved tools and procedures, or in filling gaps in knowledge which address a particular problem, need or opportunity relating to the effectiveness of the NRA's business operations. The element common to all is that of innovation or the acquisition of new knowledge or identification of best practice. In common with Government departments, the NRA uses a range of "primary purpose" indicators along with standard OECD "Frascati definitions" to classify its R&D projects in terms of justification and type (e.g. applied) of research.

The R&D programme is funded from Grant-in-aid (GIA), plus contribution from the Water Resources and Flood Defence accounts. The cost of R&D in any Commission is treated as an overhead on the core function(s) to which the project relates. Because the programme is undertaken on a national basis, R&D costs are charged through to each Region by Head Office on a pro-rata basis, taking into account that Region's proportion of the function's overall expenditure. Some R&D projects are collaboratively funded with external organisations (see *Section A2.2.6*).

A2.1.4 Organisation of R&D

Overall responsibility for ensuring that the NRA carries out its R&D duty in an effective manner rests with the Chief Scientist and Director of Water Quality (hereafter referred to as Chief Scientist for brevity). The management structure developed by the NRA has sought to achieve the active involvement of the R&D customer (i.e. the core function, or cross-function, sponsor) in both the identification and management of each Commission's programme in order to ensure that R&D objectives and outputs properly address the NRA's business needs (see *Figure A2.3 - Commission and Topic Structure*). The management structure therefore involves both the core functions and the R&D Section of the Chief Scientist's Directorate - each having defined responsibilities (see *Figure A2.2 - R&D Organisation for Programme and Project Management*).

The R&D is thus effectively integrated with core function activity. R&D staff provide a support service to ensure that R&D is carried out in an effective and co-ordinated manner. Identification of R&D objectives and implementation of R&D outputs begin and end with the customer, with the Chief Scientist having responsibilities for ensuring the effective quality control, planning, management and delivery of the R&D to meet those objectives. This relationship can be seen in *Figure A2.4 - R&D Project Cycle*, which indicates the key stages in the R&D project cycle.

Reporting to the Chief Scientist, the Head of R&D is responsible for promoting and co-ordinating R&D activities within the NRA and for the day-to-day management of the R&D support service. This is done with guidance from the R&D Committee which has both Regional and core function representation. Membership of the R&D Committee is shown in R&D numbered paper *R&D(94)2*. The R&D Committee normally meets twice a year - following the end/start of the fiscal year and at the half year stage.

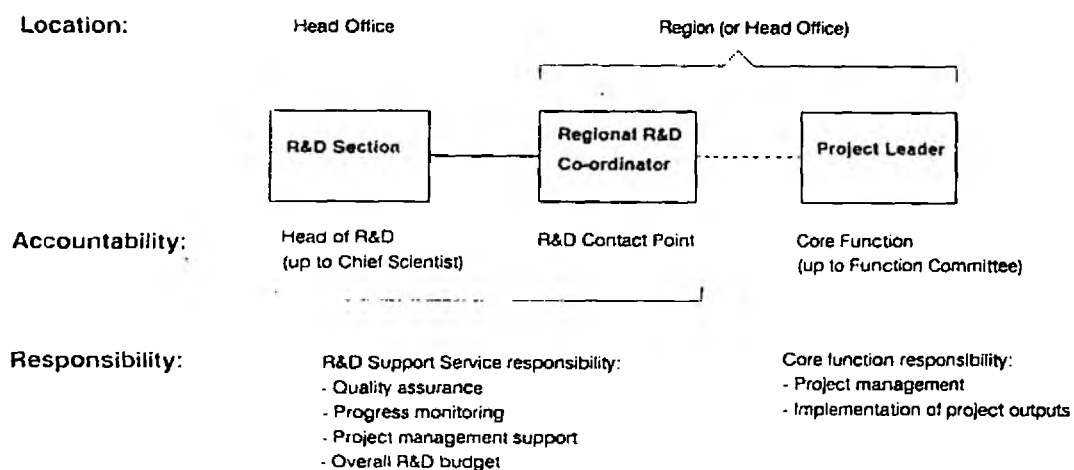


Figure A2.2 - R&D Organisation of Programme and Project Management

The following officers are represented on the Committee:

- Chief Scientist;
- Head of R&D;
- R&D representative from each core function ("R&D Commissioner");
- R&D representative from each Region ("R&D Contact Point"); and
- Head of Corporate Planning.

In order to place all R&D work within the context of a single national programme, it has been essential to provide a coherent overall framework for the development of the R&D programme and the management of R&D projects.

For the overall programme structure, R&D in areas of different core function responsibility has been arranged into **Commissions**, (i.e. it is work *commissioned* by the core function as "customer"), each Commission being in turn divided into **Topic Areas**, which in turn consist of **Projects** of related nature (see *Figure A2.3 - Commission and Topic Structure*). The Topic Areas reflect appropriate management divisions and/or business areas within the core function's business plan or function strategy, and provide a basis for technical co-ordination both between projects and with the core function. The seven Commissions (except the last) thus reflect the NRA's core function areas:

- A. Water Quality
- B. Water Resources
- C. Flood Defence
- D. Fisheries
- E. Recreation and Navigation
- F. Conservation
- G. Cross-functional

The Cross-functional Commission is being progressively developed to deal with issues for which an integrated approach must be adopted for two or more core function areas, and for the limited number of projects undertaken to improve the effectiveness of support services.

Commission/Project structure

In each of the core function Commissions, responsibility for identification and justification of R&D rests with the relevant FC, as indicated in *Figure A2.4 - R&D Project Cycle*. Each FC comprises the Head of Function plus Regional function managers, thus providing a balanced national perspective as the R&D "customer" for the function. The FC determines not simply the content of the Commission programme, but also the level of resources which the core function allocates to R&D.

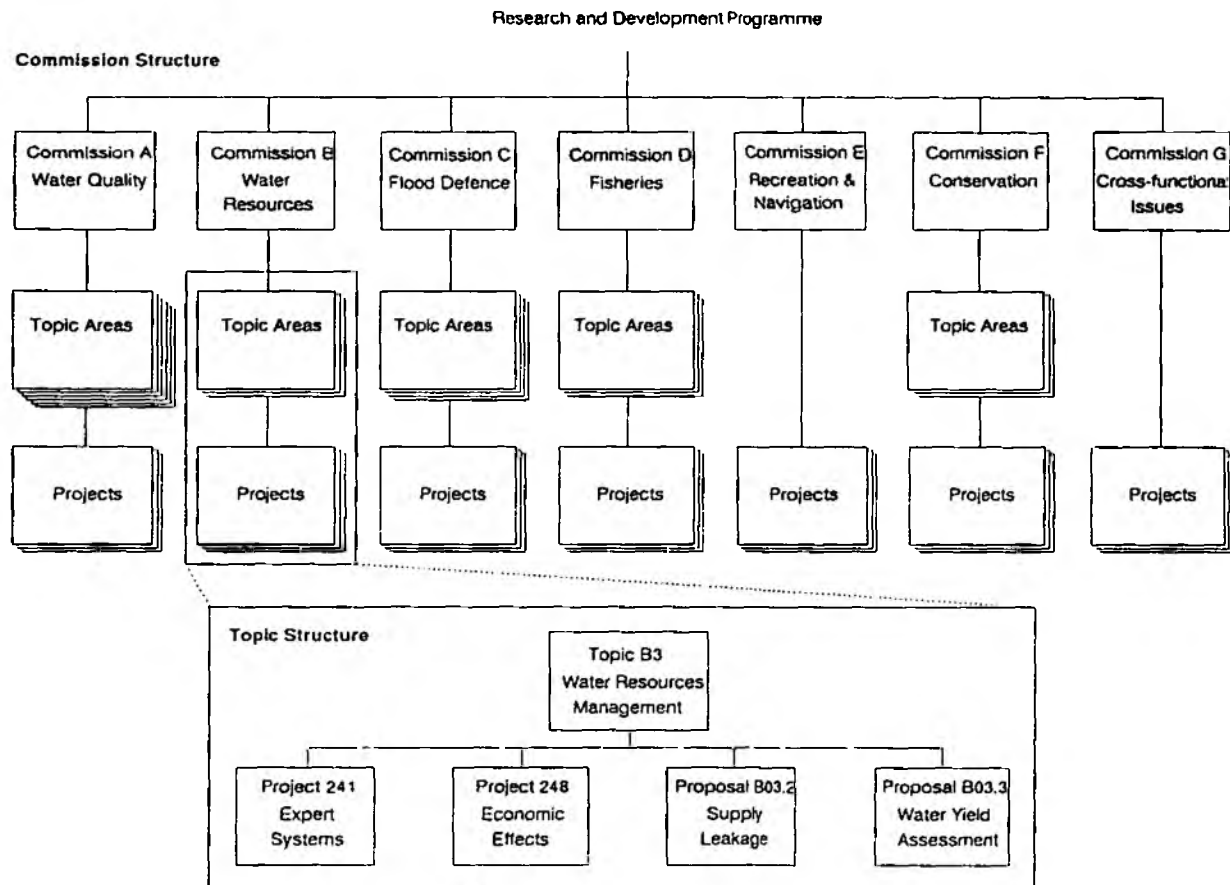


Figure A2.3 - Commission and Topic Structure

One member of each FC takes lead responsibility for R&D work at Commission level as "R&D Commissioner". Within each Commission, Topic Leaders are responsible for planning a portfolio of projects and through individual Project Leaders, delivery of the outputs on time to the function. The current list of Commissioners and Topic Leaders are given in the R&D numbered paper (*R&D(94)2*). Project Leaders are responsible for detailed planning and supervision of individual projects within a defined brief. It is expected that all Regions will contribute equitably to provision of staff resources for commission management - resourcing being co-ordinated at a function/region level through the FC and at national level through the corporate planning process. This significant level of involvement of operational staff in R&D is deliberately aimed at enabling the NRA to be innovative and proactive in the way it achieves its business objectives. Commissioners, and Topic and Project Leaders, are expected to be assisted in their duties by R&D Section staff in a programme planning or project management support role.

In the Cross-functional Commission, there are no Topic Leaders as such. Every project must have a Project Sponsor - usually a Director, or a chairman of a relevant NRA business group who occupies a recognised national position in that subject area. The Project Sponsor is responsible for appointing the Project Leader. The R&D Section will assist the Project Leader to set up links with relevant core functions.

Regional Structure

Within each Region, a Regional R&D Co-ordinator is responsible for providing management support to the Project Leaders and for co-ordinating management of the portfolio of projects allocated to his Region (the roles of the Project Leader and Regional R&D Co-ordinator with respect to projects are described in *Section A3.2*). Each Regional R&D Co-ordinator is accountable, in the line management sense, via a Regional R&D Contact Point, to his respective Regional Management Team. The Regional R&D Contact Point acts as a focal point, at a senior level, for R&D matters in the Region and represents the Region on the R&D Committee; ideally, they should be a member of the Regional Management Team.

Within the NRA's Regional structure, R&D Coordinators and R&D Contact Points are expected to be within the Region's Technical Management Services section, where its technical and scientific expertise will be concentrated. However Project Leaders may be drawn from any appropriate part of the NRA's organisation.

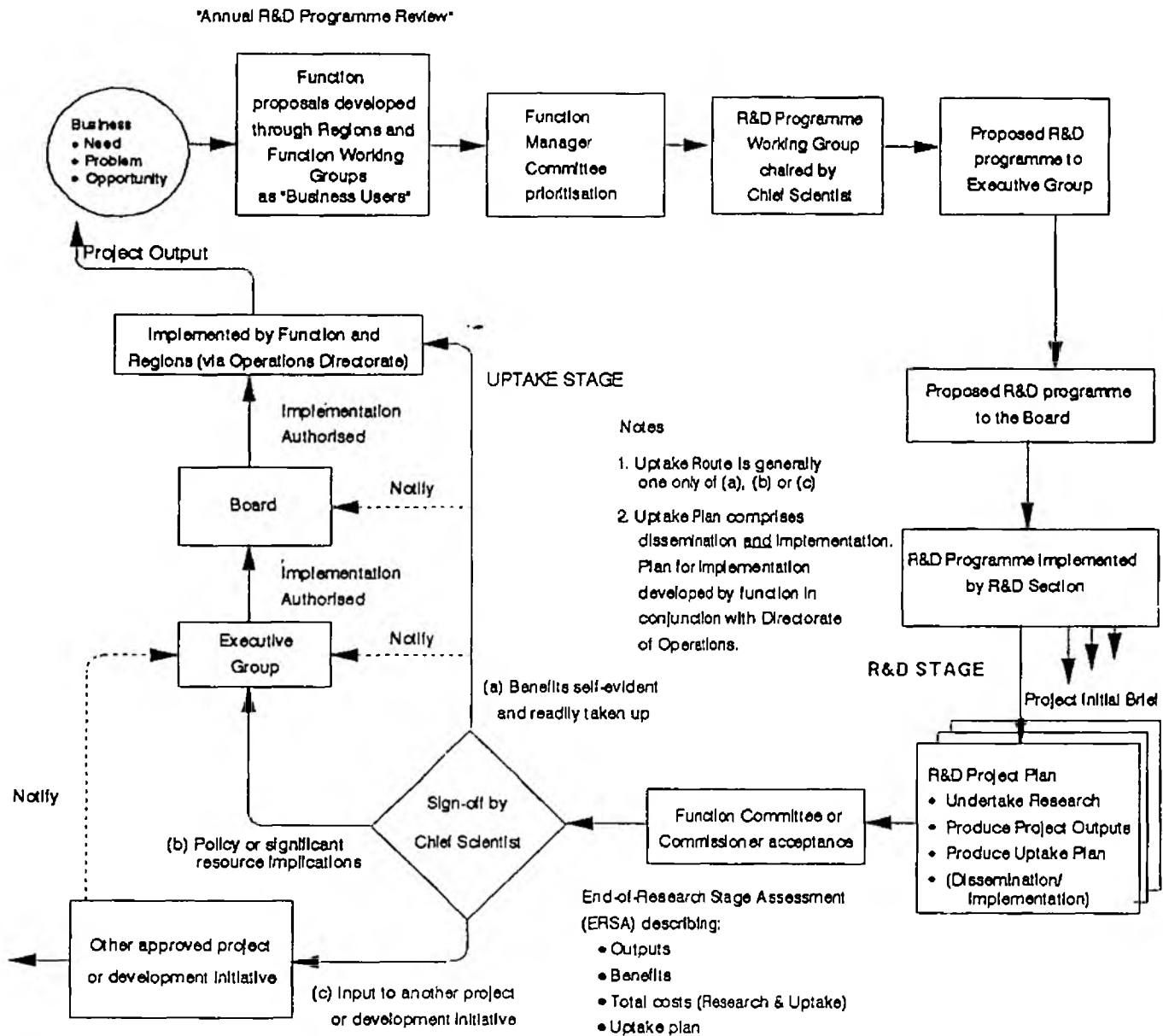


Figure 4 R&D Project Cycle (key authorisations/approval/actions/acceptance)

Figure A2.4 - R&D Project Cycle

A2.2 R&D within NRA

It is essential that R&D supports the business needs of the NRA and provides high quality outputs which give value for money. The framework for technical and financial management of the R&D Programme has been developed to support these principles. It is outlined below.

A2.2.1 Customership

The subdivision of the NRA's R&D Programme into Commissions, each of which relates to a core function, is described in *Section A2.1.4*. The FC are generally the "customers" for R&D. They, supported by function working groups if any, identify the key issues facing the function, build these into their Function Strategies/Business Plans, identify related R&D needs and make funds available for undertaking R&D. This concept of "customership" is crucial to the success of projects.

Customership is equally important in cross-functional projects. All those functions involved should feel a strong sense of ownership which should be realised by identifying a "sponsor" and setting up a Project Board at an early stage.

Whilst the customer for R&D is usually a FC (represented by the R&D Commissioner), there are projects which have such a significant impact on the NRA that the customer (i.e. sponsor) may be a member of the OT or EG. The "Customer Acceptance Level" is used to define the level in the NRA at which final acceptance of outputs is agreed. It is essential that this is also the level at which the PID is approved in the first place.

A2.2.2 Assessment Process

The NRA, through the Chief Scientist, must be sure that the R&D Programme is structured in an effective manner, and that R&D resources address the NRA's key business and offer value for money. "Assessment" is a term used to describe the processes of appraisal, monitoring and evaluation which ensures quality is built in to an R&D Programme. The Cabinet Office have developed the "ROAME" guidelines as a framework for the assessment of public sector R&D; the assessment of R&D in the NRA follows this principle. The "ROAME" guidelines are fully consistent with the principles of NRA project management, the initials stand for:

Rationale
Objectives
Appraisal
Monitoring
Evaluation

No project or programme should be funded unless it has an acceptable plan which addresses **why** it is needed (Rationale), **what** it is expected to achieve (Objectives) and **how** it is to be achieved (Appraisal). The remaining parts (M,E) address **how** and **when** monitoring and

evaluation will be done. In short, the assessment process ensures the right projects are done and that they are carried out in the right way.

Assessment in R&D takes place at three levels:

- Commission or "Business Strategy" level;
- Topic Area level; and
- Project level.

The processes are similar, but are more detailed, relating to specific needs, at project level. Each level needs to be justified, monitored whilst it is being carried out and evaluated once it is completed. At Commission and Topic Area levels the rationale, objectives and appraisal are addressed through the Function Strategy/Business Plan, and the Topic Investment Appraisal (TIA) respectively. These are reviewed annually as part of the corporate planning cycle. At project level, the PID (described in this Manual) define the rationale, objectives and appraisal, whilst monitoring and evaluation and carried out using the management and control procedures in this Manual.

Reference: R&D Assessment - A Guide for Customers and Managers of R&D; HMSO, 1989.

A2.2.3 External Liaison

The effectiveness of the NRA's R&D programme depends partly on the extent to which it links into other R&D programmes and to which collaboration takes place with other research-commissioning organisations. In particular, collaboration helps to avoid duplication of R&D and to achieve value for money. Collaboration in R&D can enable organisations having similar business interests to develop common approaches to these, and provide a better platform for the uptake of results. In some cases, collaboration in R&D may be the best way for the NRA as an organisation to get involved with a wider national or international forum. The R&D Section maintains specific contact with research arms of the following organisations and groups;

- DoE and MAFF;
- Welsh Office;
- Scottish and Northern Ireland regulatory bodies;
- Research Councils;
- Other Public Bodies;
- Water Industry;
- Commission of European Communities;
- Industry generally; and
- European Groups.

Further information can be obtained from the R&D Planning Officer, in the R&D Section, who has specific responsibility for maintaining these links.

The NRA also supports some basic and applied strategic research at Higher Education Institutes through post-doctoral NRA Research Fellowships in subject areas of particular interest to the NRA.

A2.2.4 Collaboration

The term "collaboration" is used to imply some form of shared commitment to undertake a project. This may be in terms of funding, providing resources or expertise. Collaboration is only undertaken on the basis that it is beneficial to the parties involved. Whatever the approach, the interests of the NRA must not be compromised. Practical issues such as timing of the availability of funds and differing priorities between organisations will influence whether collaboration takes the form of a joint venture (see "co-funding" and "contribution in kind" below) or is at a purely liaison level.

Co-funding

Co-funding exists when two or more organisations jointly develop a project. It is usual for one organisation to take the lead and receive financial contributions from the other(s). The precise arrangements for such a partnership should be formally laid out in a "Memorandum of Understanding". Advice on this should be obtained from the R&D Section. The three most common approaches to co-funding are:

- one research-commissioning organisation acts as the lead funder and receives contributions from the others. The lead funder engages the research contractor and is responsible for supervising the project. A Steering Group, comprising all the funding bodies, can be set up either as an advisory group or as an executive;
- the future research contractor promotes the project and receives contributions, from interested parties, under similar agreements. The funders then exercise control over the project through a Steering Group. The powers of the Steering Group must be defined in advance; and
- the research contractor makes a significant contribution to the project in terms of a reduced contract price. This may happen when the contractor has some unique or novel technique/product and requires additional funding to develop it. Any such agreement must comply with the *Financial Memorandum*.

Contribution in kind

In this case, a project is developed jointly, as above, but one or more of the parties contribute by providing resources (use of facilities, labour etc.) rather than money.

Liaison

In this case the NRA develops its project(s) alongside those of other organisations with a view to a common use of the results. The projects interface but do not overlap, typically by having commonly agreed objectives and outputs. Such an arrangement may or may not have a Steering Group.

A2.2.5 Commercial Issues

In developing the PID and later in setting up the R&D Contract, the Project Leader must consider the possible commercial issues which relate to the production and use of the project outputs. For any project that has commercial issues, the R&D Coordinator must inform the Head of R&D as soon as this is known. It is also necessary to consider the future use of any other results or know-how which are produced under the project even though these may not be of immediate interest to the NRA end-user.

In general, the NRA undertakes R&D to make it more efficient in carrying out its own business. The *Financial Memorandum* does not provide for the NRA to promote commercial business opportunities per se. Therefore the following basic principles have been adopted and should be taken into account when any R&D project is being planned:

- the NRA does not enter into R&D for commercial purposes but, as far as can practically be foreseen, no other party should be allowed to profit unduly as a result of the NRA's investment in R&D;
- the NRA should not relinquish, without good reason, its due share of the exploitation rights for R&D results for which it has paid; and
- wherever appropriate, the project should be structured (or limited) so that the commercial sector takes up the development of products which have potential commercial value, or which will require continuing support. The potential for future profit by commercial parties should be used to minimise the NRA's net investment in R&D.

For example, it is generally appropriate for the NRA to develop the requirements specification for a particular piece of equipment and then call for potential suppliers to submit prototypes for evaluation, rather than to fund the development of the prototype. On the other hand, the market for some of the NRA's requirements may be so specialised that the NRA has no option but to invest in development. In such cases, some commercial involvement by the NRA might be necessary in order to recoup its investment.

In many cases, the commercial party's interest will hinge on its perception of the risks involved in development of a commercial product in relation to the future potential market and its future liabilities.

Always bear in mind that the NRA's publicised involvement with any commercially available product can provide a considerable commercial advantage to the producer and will, irrespective of the legal position, link the NRA with the future use of the product.

The Cabinet Office has recently sought to establish the right of any person or organisation involved in undertaking basic or applied research to retain the Intellectual Property Rights (IPR) to the results, but for the exploitation of those results to be the right of the person or organisations funding, or providing other inputs in kind to, the research. This is a broad principle and not a legal requirement. (See R&D numbered paper, Commercial Issues related to R&D Projects *R&D(93)16A* and Intellectual Property in the Public Sector Research Base, HMSO September 1992.)

A2.2.6 Annual Programme Review

As with all NRA activities, the R&D programme is subject to an annual review within the corporate planning cycle. Key steps in this review and identification process are indicated in *Figure A2.4 - R&D Project Cycle*. New projects to be started during the coming fiscal year are identified, and a provisional programme for each commission is agreed and prioritised, by the FC within Corporate Planning guidelines on priority development initiatives and available resources. The Flood Defence programme must also be confirmed by Regional Flood Defence Chairmen. The latter includes the NRA management resources available to undertake and implement new projects.

This annual review of each Commission's programme is "customer-driven". It is undertaken by the Commissioner and Topic Leaders, assisted and co-ordinated by R&D staff. The review takes the following aspects into account:

- existing Topic Area and objectives, and progress with the on-going programme;
- R&D issues related to key development initiatives within the function's business plan and strategy;
- operational problems, opportunities and needs identified by Regions;
- proposals from key external organisations; and
- programmes of related R&D undertaken by other bodies, in particular DoE and MAFF.

Where appropriate, discussions are held with significant external research-commissioning bodies. The principal consideration nevertheless remains the NRA's own business objectives. Any projects having a significant component related to Information Systems must be developed in liaison with the NRA's Information Systems Section.

The Commission programmes are then consolidated into a provisional national R&D Programme by the R&D Section and presented to the EG Priorities Sub Group and NRA Board for review alongside other NRA plans. The resource allocation, including an R&D budget, is confirmed and details of the national programme are finalised by the R&D Section (see *Section A2.1.4*). The confirmed programme of on-going projects and new starts is then published internally with an abridged version for public use.

A2.2.7 Uptake of R&D

The effective targeting of R&D outputs to achieve business objectives, together with the planning and management of the process of uptake of the R&D output by the end-user, are critical activities which contribute to the success of an R&D project. An approach has been developed to ensure that there is a logical progression through the project cycle from the R&D stage into uptake. The steps of uptake planning, End-of-R&D Stage Assessment (ERSA), sign-off by Chief Scientist, and uptake are explained in detail in *Chapter B4 - Project Closure*.

Planning of the R&D outputs and the activities needed to deliver these to the end-user is done in outline in the Summary Appraisal Form (see *Appendix B*). The detailed specifications for the project outputs and uptake plan are developed during the course of the *Detailed planning and authorisation stage (Chapter B2)*. The uptake plan will cover:

- (a) **dissemination** (delivery of the project outputs to the end-user), which the Chief Scientist ensures is undertaken, including appropriate external release; and
- (b) **implementation** (putting the project outputs into use by the end-user), for which the end-users - usually NRA core-function staff - are generally responsible.

Acceptance (or otherwise) of satisfactory completion of the R&D stage is achieved by sign-off of the ERSA by the R&D customer and any other person or group specified in the project plan. Finally the completed ERSA is independently reviewed by the Chief Scientist in confirming that the R&D stage has been satisfactorily completed (or otherwise) and that the R&D output may be taken forward to uptake.

Uptake of outputs from R&D projects can follow one of three defined routes (see *Figure A2.4 - R&D Project Cycle*):

- (a) outputs whose benefits are self-evident and readily taken up with minimum policy impact or resource input by the core function/Regions - for example, an improved analytical technique;
- (b) outputs which have policy implications or significant resource requirements for implementation - for example, an automatic system for quality monitoring; or
- (c) outputs which are taken up into other core function development initiatives or R&D projects - for example, data produced for developing Statutory Water Quality Objectives.

Uptake for category (b) requires the EG and Board to approve the implementation plan - in a similar way to other policy implementation. Approval will normally be sought through the annual corporate planning process. At other times, plans will be submitted by the Chief Scientist with the business case presented by the Director concerned. Clearly, implementation of category (b) outputs may need to be held back pending resource

availability. Uptake of category (a) and (c) outputs will simply be reported to the EG Priorities Sub-group and OT by the Chief Scientist on a routine basis. Notification for Regions to implement R&D outputs will be given by the Director of Operations.

A2.2.8 Operational Investigations

The NRA's R&D programme is undertaken to address national issues. A distinction is therefore maintained between the nationally-funded R&D work and "Operational Investigations" (OI), which are projects that address site-specific issues in one particular Region only and are therefore the responsibility of the Region concerned. OI projects can nevertheless have important secondary national benefits. An interface is therefore maintained between OI projects and the R&D Programme (and indeed with the NRA as a whole) to achieve optimum benefits from OI projects and to ensure that they are developed within the national context (this includes avoiding wasteful duplication in other Regions). In some cases this may result in a proposed OI being incorporated into, and developed within, the R&D Programme as an R&D project. A range of interfacing categories of OI has been developed:

Regional OI is undertaken by a Region and has limited or no national interest.

OI, reported nationally is identified as having sufficient national interest to warrant reporting nationally.

OI, external liaison is developed in conjunction with other on-going work being undertaken either by a national working group or another Region and some form of liaison is deemed beneficial. These are also reported nationally.

Part R&D/Part OI is developed with two parts of the project defined and funded separately, the R&D resources provided through the national R&D Programme.

A register of all OIs containing basic information is held by the Director of Operations. See also R&D numbered paper *R&D(92)25*.

Any output should be suited for its purpose, for example:

- a laboratory manual may be in A4 ring-bound form to allow easy updating, whilst a field guide may be pocket-sized and waterproof;
- a working group, as end-user, may only require the briefest and most specific of report to feed into another development activity they are undertaking.

To clarify intended use, all R&D outputs are presented for uptake with a short "Statement of Use". They are also given an internal and external dissemination status as follows:

Internal	-	Limited release
	-	Released via Function Committee
	-	Released to Regions
External	-	Restricted
	-	Released to Public Domain

It should be appreciated that the "customer" who has commissioned a project output may not necessarily be the end-user. For this reason the end-user should be represented on the Project Board, the Quality Review Panel or in some advisory role to the project. It is important to define, by name in the PID, who has responsibility for accepting the output; this is called the "Customer Acceptance Level". For major projects, with substantial resource or policy implications, this may be at EG level, but for smaller ones it may be at Topic level.

Project management of R&D is often directed towards identifying the most suitable output for the identified business need and then delivering it to the end-user in the most suitable format. No matter what special outputs are produced (e.g. video, computer software etc.) some supporting document will always be required. At the minimum, an R&D Digest will be required. The *Guidance Note on the Production of R&D Outputs for the National Rivers Authority (R&D Note 180)*, explains these in detail and how to select the most appropriate.

General dissemination of R&D

While specific dissemination activities such as workshops and seminars are addressed in the uptake plan for any R&D project, the R&D Section is responsible for maintaining awareness of the NRA's R&D Programme both internally and externally. The general approach concerning external dissemination of R&D information and results is that these shall be deemed confidential until such time as internal processing has been completed. The results shall then be released to the public domain. Completed R&D outputs may not be withheld from the public domain unless this is justified by virtue of their confidential or sensitive nature. The NRA will ensure that this policy complies with the EC Directive on Freedom of Access to Information on the Environment.

The NRA positively encourages the dissemination of information on R&D projects through papers and articles in the technical and scientific literature and through seminars and conferences both during and following the work (see *R&D(93)33*). Wherever possible the NRA's Project Leader should be involved as a named author. Permission to publish should be sought first, although it will not be unreasonably withheld. Because publication of papers on NRA R&D projects in the literature has not been as extensive as it might be, the NRA intends to make it a contractual requirement that, where appropriate, each research contractor will publish at least one paper on their particular project. This will also act as a controlled means of peer review.

NRA R&D publications (i.e. those documents released to the public domain) are distributed through an appointed agency. The costs of external dissemination should, as far as possible, be self-financing; however the price of each publication has to be assessed against desirable circulation. Any policy to develop income from R&D publications will be in line with the guidelines on commercial issues to be agreed with the DoE. The NRA makes its publications available to the UK water industry through the Foundation for Water Research.

The following aids to dissemination of R&D outputs are now produced:

- List of all R&D Outputs - updated annually;
- R&D Newsletter - produced quarterly, provides interest articles on R&D programme, lists new start projects and outputs in quarter;
- R&D Digest - single-page or purpose-made "flyer" to publicise each R&D output; and
- Annual R&D Review - formal annual report; reviewing the previous year's outputs; describing current year's R&D programme and development of strategic R&D.

In addition, Regions have been requested to ensure that a minimum standard of archive facility for R&D output documents is made available in each Region. A full set of R&D output documents is also held by the Head Office Information Centre.

A2.3.2 Quality of outputs

Having identified the most suitable form of output to address the business need, it is essential that the desired quality of the outputs is adequately specified and acceptable to the "customer".

All projects are a balance between cost, time and product objectives. In planning any project a realistic timescale and budget must be provided to achieve the specified product requirements. It is also essential that the deliverables from a project are defined in such a way that the quality criteria can be demonstrated to have been achieved.

The *Project Management Procedures PIN - Section 6* gives details of the quality assurance process that is required. This is further explained in *Section B2.2.8 Quality Plan and B3.1.3 Quality Monitoring* of this manual.

A2.3.3 Typical Project Lifecycle

A project, regardless of its size or objectives, may be divided into a number of distinct parts which represent stages through its life, from identification to completion. These stages are collectively called the "Project Lifecycle". It is a sound principle to consider the various stages in the lifecycle when planning a project. Neglecting this may result in important stages or packages of work not being recognised until part way through the project. A standard lifecycle for a typical R&D project is shown in *Figure A2.5 - Typical Project Lifecycle* and includes the following stages:

- identification, when the issue to be researched is formally "noted";
- summary appraisal, obtaining initial authorisation to include a project as part of the R&D programme;
- project authorisation, when the project is formally authorised;
- research contractor selection, when tenders are obtained for research work;
- undertake research, when the research or development work is done and the outputs are produced;
- uptake, when project outputs are disseminated and implemented;
- project closure, when the project is formally completed; and
- post project appraisal, when the actual benefits are compared to those planned.

Each stage ends with a control point, when plans for the next stage are approved and a decision is made on whether to proceed further with the project. *Table A2* lists the key project management documents which will be prepared during each stage; these are described more fully in Part B of this Manual.

Considerable benefits are gained by using lifecycle stages for project management; in particular:

- an emphasis is placed on control points for reviews, approvals and authorisations;
- the project concentrates on definable activities in the current stage;
- the project cannot continue until detailed plans for the next stage have been developed;
- the need for particular resources for each stage can be seen more easily; and
- the lifecycle is itself a check list of the complete scope of the project.

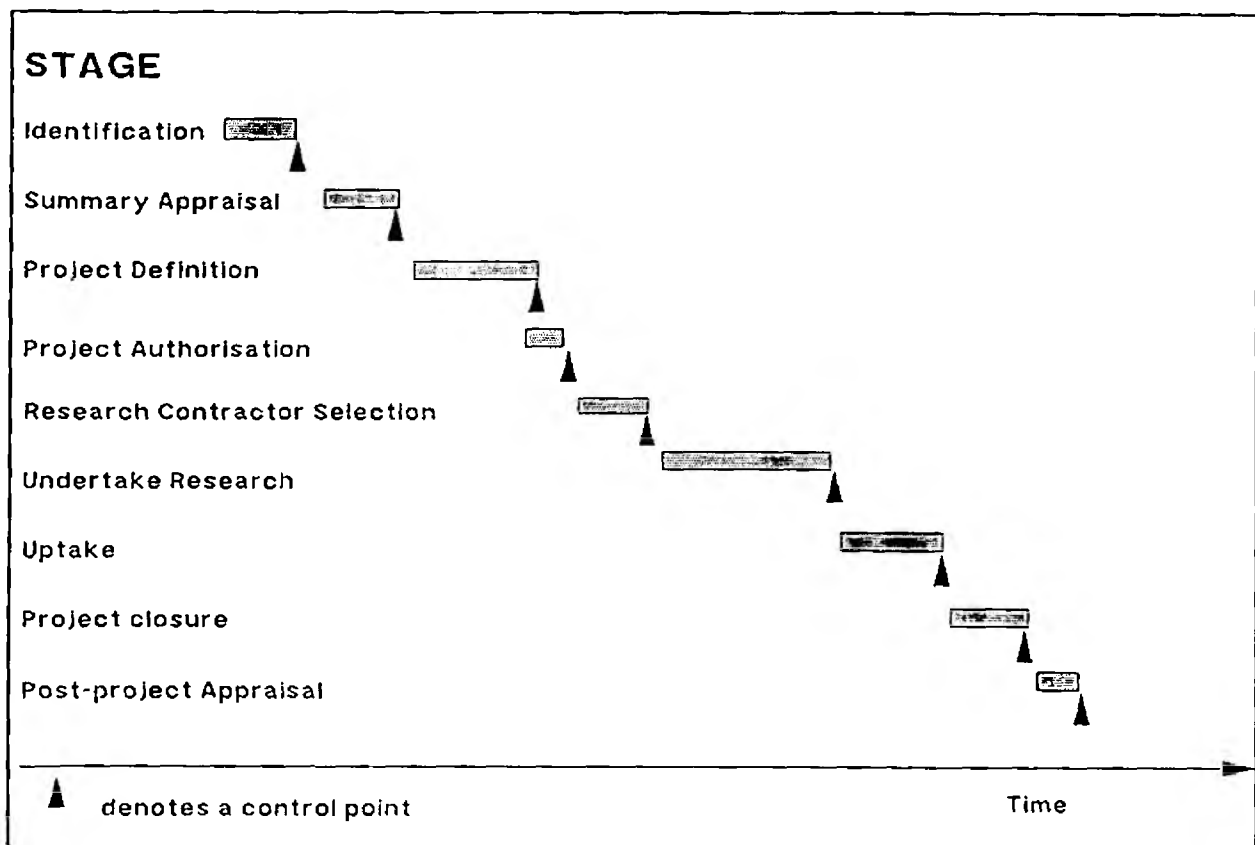


Figure A2.6 - Typical Project Lifecycle

Table A2 - Key Project Management Documents

Lifecycle Stage	Document	Responsibility:
Identification	Draft Summary Appraisal Form (PM1)	Proposer/Topic Leader
Summary Appraisal	Summary Appraisal Form (PM1)	Project/Topic Leader
Project Definition	Initial Appraisal document, if required	Project/Topic Leader
Project Authorisation	Project Initiation Document (PID)	Project Leader
	Project Budget Authorisation (PBA)	R&D Section
	Project Authorisation forms (finance)	Project Leader
Contractor selection	Tender documents	Regional R&D Co-ordinator
Undertake Research Stage(s)	Authority to commit expenditure forms (finance)	Project Leader
	Change request forms	Originator
	Progress reports - technical, financial and quality	Project Leader
		Package/contract managers
	Document Status and Use Note	Project Leader
	End of Contract Reports	Project Leader
Uptake Stage(s)	End of R&D Stage Assessment (ERSA)	Project Leader
	Authority to commit expenditure forms (finance)	Project Leader
	Change request forms	Originator
	Progress reports - technical, financial and quality	Project Leader
Project Closure		Package/contract managers
	End of Project Report	Project Leader
Post Project Appraisal	Post Project Appraisal Report	Review team leader

NOTE: the Regional R&D Co-ordinator has an advisory role to assist the Project Leader in the preparation of all the project management documents.

The basic project management principles given in the PIN apply to all projects. However, R&D projects have specific characteristics which are different to, say, construction or IS projects. R&D projects, particularly those associated with applied research (as distinct from development), are less easily defined and technical quality can be difficult to express and quantify. In many cases the exact output requirements which are needed to meet the project objectives cannot be fully defined at the outset; the process of R&D is a means by which the "product" is defined. This level of uncertainty does not prevent the project being scoped and objectives set. However, the principle of adopting a step-by-step approach is very important in R&D; the project should be divided into lifecycle stages. These should all be planned in outline from the start, and the detailed planning of each stage should be undertaken or confirmed during the preceding stage. During each stage, the Project Leader can therefore consider:

- is progress being made towards the objectives in the most direct manner?
- what should be done next and how best is this scoped?

In this way the project is steered, in a logical way, from control point to control point from concept to final outcome.

The lifecycle stages can also be broken down into smaller work packages each with its own scope, cost and timescale. The process of breaking the project into manageable packages is called "work breakdown". An example of this is in *Figure A2.7 - Undertake Research Stage options for the typical project*, case (b), where the "undertake research" stage could be divided into two work packages, one undertaken by NRA staff and the other undertaken by a contractor. The decision on whether to break the project into two research stages as opposed to using more work packages depends on whether the Project Leader feels that the change over from one stage to another represents a key control point.

Thus the Project Leader, in discussion with the Topic Leader and R&D Co-ordinator, may need to consider modifying the typical lifecycle models to suit an individual project. In particular, larger projects may have more than one research contract which could be carried out in more than one stage. In such cases, it is appropriate to have more "undertake research" stages than given in the typical model. Similar changes may be needed to reflect the diversity and complexity of related uptake activities. It may also be that some of the stages do not run in the sequence shown and may even overlap. It is a matter for the Project Leader to adopt a work breakdown which best suits the needs of the project.

In some cases, a separate project may need to be undertaken to define the objective of the research. For example, the Function Business Plan may identify the need for a "tool" for a particular use. In the first instance the R&D project may not be concerned with actually producing that "tool" but rather undertaking applied research to find out if the development of the "tool" is possible and what options are available. A subsequent project may actually develop the new "tool".

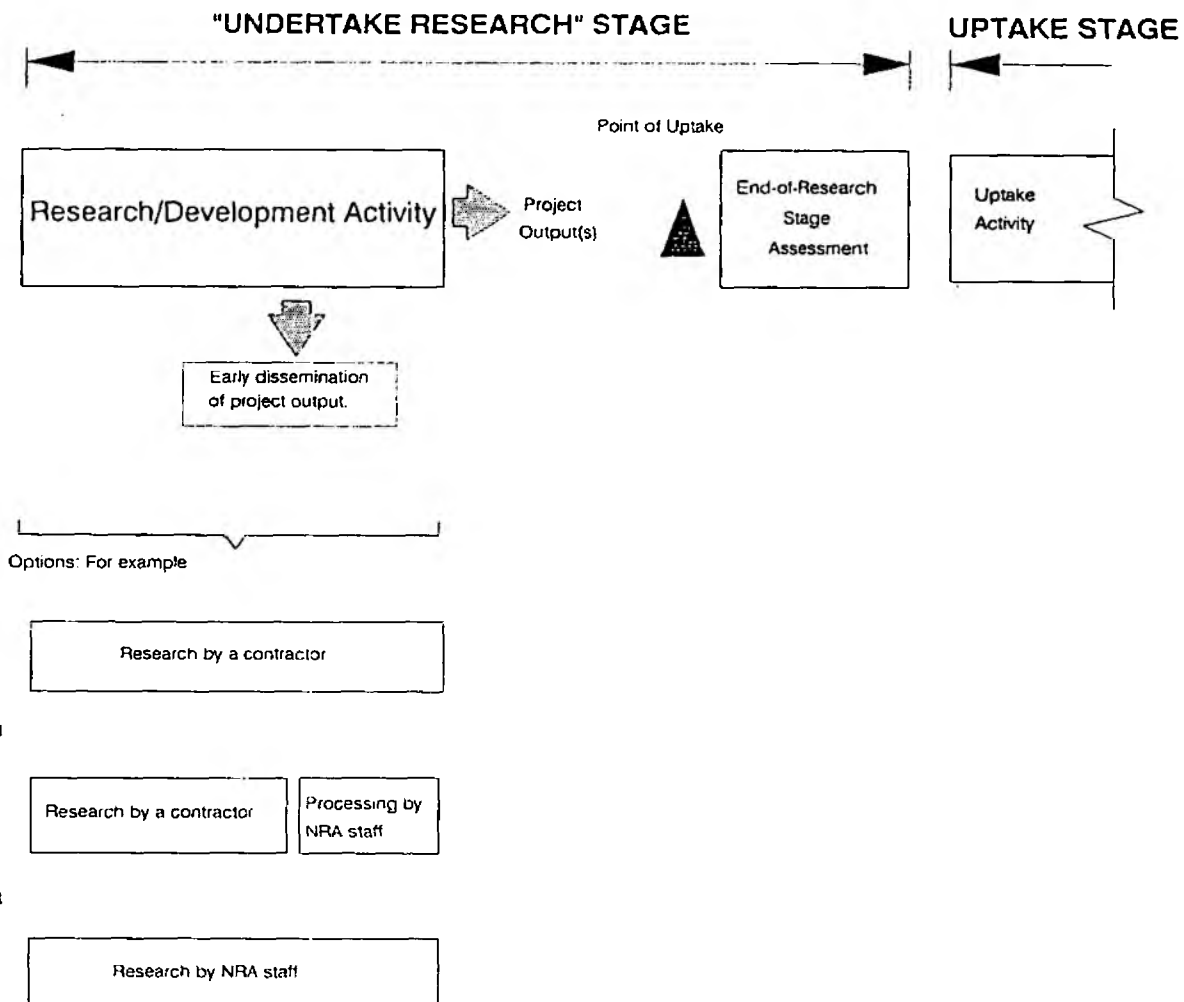


Figure A2.7 - "Undertake Research" Stage options for a typical project

A2.3.4 Roles within Project Organisation

This section summarises the roles of NRA staff in the organisation of R&D projects. Project organisation must encourage:

- single point responsibility for each work package;
- a clear definition of roles and responsibilities;
- clear lines of project authority for decisions and issue resolution; and
- a correct balance between project and other "normal" functional duties.

Further details of Project Management Organisation are given in *Chapter A3*. Full descriptions of the roles and responsibilities of each party given in the *Appendix A*.

The **Topic Leader** has a key role as he represents the customer's interest in the specific area concerned and will have been closely involved in developing the Summary Appraisal. A good relationship between the Topic Leader and Project Leader is essential and will enhance the likelihood of project success as it is through this contact that the Project Leader gains an understanding of the business and technical issues driving the project. As the role is demanding, the R&D Section has a management support budget for providing assistants or expert advisers as appropriate to Topic Leaders. The Topic Leader will have links to the end users or managers, such as existing functional working groups, with a vested interest in the outcome of a project, but who do not take an active role in either managing or undertaking the project.

The role of the **Project Leader** is to develop and manage the project throughout its life. Whilst not actually undertaking the research itself, the Project Leader is responsible to the customer for the project overall, in respect of both ensuring the contractor adheres to their contract, and that internal staff and external advisers are involved effectively. The Project Leader is supported by the **Regional R&D Co-ordinator** who assists in the setting up and management of the project including advising on contract matters, technical and managerial quality; financial authorisation processes and not least the interpretation of this manual! As Regional R&D Co-ordinators are either professionally qualified engineers or scientists, they can, by agreement, also be involved on some technical aspects of the project. A good working relationship between the Project Leader and Regional R&D Co-ordinator, with properly agreed and defined roles on each project, can keep a project running smoothly, with the minimum of disruption to their other duties outside the project. If it is agreed that the Regional R&D Co-ordinator undertakes some of the Project Leaders duties, this is perfectly acceptable, but the Project Leader still remains responsible for all aspects of their project.

The Regional R&D Co-ordinator also has management responsibilities for the full portfolio of projects which his Region is managing on the NRA's behalf. This is described in *Section A2.3.5* below.

More complex projects include the basic roles described above. However these may be supplemented by additional ones. For example, the project may need a larger team, be this

A2 - General Background

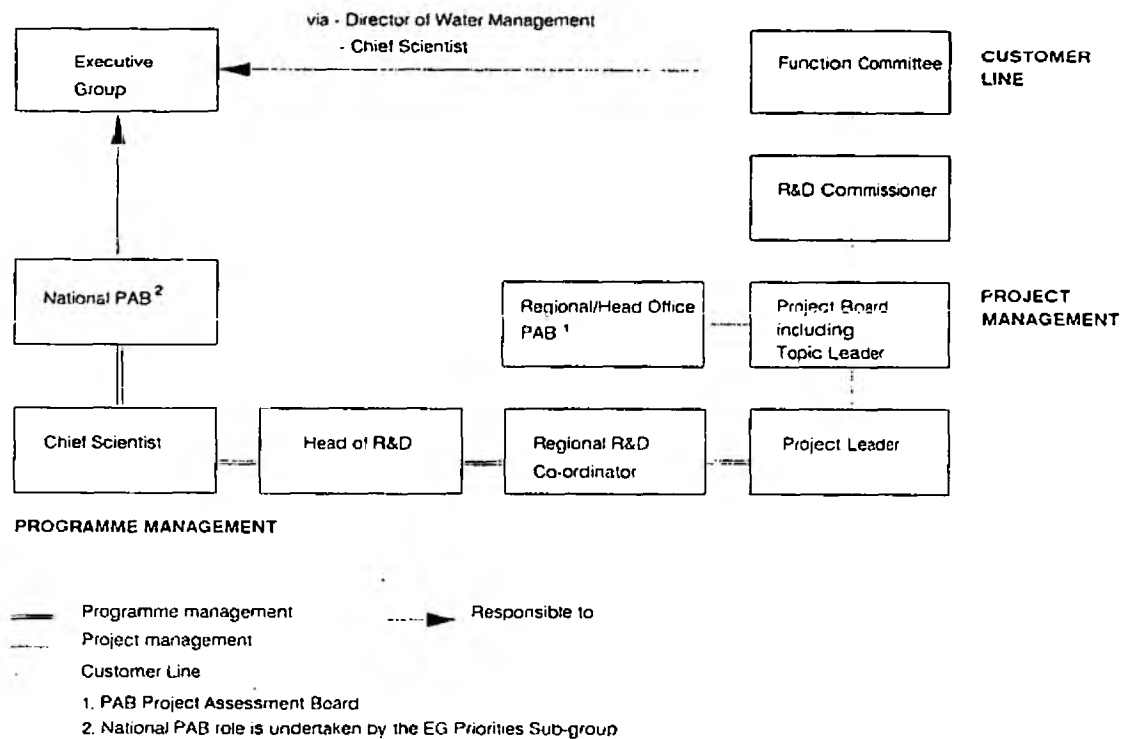


Figure A2.8 - Project and Programme Management

more contractors or more NRA staff. In such cases it is likely that the role of the customer will be greater. The project may be linked more strongly to an NRA functional working group whose opinions and needs have to be taken actively into account, and whilst they may not have any executive power over the project, they will review and sign off key project deliverables and hence help to ensure the utility of the outputs. Certain of these individuals will be part of the Quality Review Panel, and it is their role to ensure that the functional working group is satisfied with the outputs. Other end users may also be part of the Quality Review Panel. A functional working group is also a good source of advice and means by which stakeholders or sponsors can be involved. For cross-functional or collaborative projects, a named sponsor and/or a high level steering group will be introduced into the structure (which will be defined in the PID). The Project Assessment Board (PAB) will approve the membership of a Project Board (PB) which will also be written into the PID.

If a project, or group of projects, is particularly demanding, it may be appropriate for a full-time Project Leader to be appointed or for other project management support to be contracted in.

A2.3.5 Project and Programme Management

Figure A2.8 - Project and Programme Management shows how the line management of projects and the line management of the programme relate to one another. The key person involved in programme management is the Regional R&D Co-ordinator; they have to report, on a regular basis, on the overall status of all projects in the Region's portfolio. The Project Leader is responsible for ensuring the R&D Co-ordinator has correct, and up to date, information on their project. The information is then passed on to Head Office R&D Section using the R&D Information System (see *Section A2.4*) where it is consolidated with information from other Regions to cover the full NRA R&D Programme. Various reports are then prepared for R&D Commissioners, Topic Leaders and others as required. These reports are described in *Section B3*. The R&D Information System can be used by anyone in the NRA to see the latest position on any R&D project.

The R&D Committee which includes all R&D Commissioners and Regional R&D Contact Points has a central role which, by nature of its membership, brings together the project and programme management lines and the Regional and functional lines. All are ultimately responsible to the EG. The Terms of Reference of the R&D Committee are given in Appendix A.

Programme management

The Chief Scientist is responsible for ensuring that the NRA undertakes its R&D duty in an effective manner. Thus, while the core function as "Customer" has responsibility for identifying and managing its R&D and implementing its R&D outputs, the Chief Scientist has specific responsibilities for:

- maintaining quality control and value for money with R&D, for both the overall

- programme and individual projects;
- ensuring that a cohesive overall programme with effective cross-functional links is maintained, and that cross-functional issues are properly addressed;
- ensuring quality and delivery of R&D outputs; and
- maintaining effective links with external researchers and research-commissioning organisations.

Thus overall effectiveness of R&D depends on both the core function and Chief Scientist working together within the project management framework.

The Chief Scientist's management responsibilities are discharged through the R&D Section in the Science Directorate (comprising the Head of R&D, the R&D Planning Officer, the R&D Programme Officer and two assistants). The R&D Section liaises closely with the R&D Co-ordinator in each Region.

By providing the Project Leaders, each Region or Head Office takes responsibility for the technical and financial management of a portfolio of research projects. Programme management support for this is provided by the Regional R&D Co-ordinator.

A2.4 R&D Information System

The purpose of the R&D Information System is to enable progress on the R&D Programme to be monitored and to provide a readily accessible database covering both technical and financial aspects on all projects in the programme. At any one time, it is likely to contain information on about 200 active R&D projects.

The R&D Information System is used to produce various targeted reports, either in summary or in full detail, including monthly cost reports and six monthly progress reviews. The technical information is based on data in the PID and shows the project as currently authorised as well as information on outputs produced. Financial information comprises a record of actual expenditure to date and expected future expenditure. This is divided into expenditure for each financial year and is compared against the authorised budget (for total project costs) and the annual budget (for programme cash flow management). The R&D Information System only contains summary data and does not include full details of costs which are found on financial ledger systems and individual project management files and/or software. Reports can be aggregated by Topic Area, Region and Function so that various parties can monitor their own groups of projects.

Data input to the R&D Information System is managed on a Regional basis, with each Regional R&D Co-ordinator being responsible for maintaining the data on his respective Regional portfolio. Project Leaders are responsible for ensuring that the Regional R&D Co-ordinators receive correct and up-to-date progress data for input to the system. The only exception is that the R&D Co-ordinator keeps records for tracking actual costs, and liaises with the Regional Finance Department accordingly.

The consolidated national database is co-ordinated by the R&D Programme Officer in the R&D Section, Head Office. Information from the eight Regions and on projects managed in Head Office, is sent monthly to the R&D Section for consolidation in a single database. The consolidated database is then used for programme management purposes and is also redistributed to the Regional R&D Co-ordinators for information. This file transfer is done using the NRA X25 data network.

The R&D Programme Officer in the R&D Section is responsible for the support and ongoing development of the R&D Information System. Any queries concerning its use should be addressed there. Full details of the system are included in a comprehensive User Manual which includes:

- background and general information;
- detailed information on the facilities available; and
- examples of reports which can be generated.

Reference: R&D Information System User Manual.

A3 PROJECT MANAGEMENT ORGANISATION

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0.2	01/11/93	First draft issued for review
1.0	28/02/94	First issue of Manual

A3 PROJECT MANAGEMENT ORGANISATION

A3.0 Introduction

This chapter explains the organisation of project management. It builds on the *Project Management Procedures PIN - Section 2*. It explains the difference required in the organisation of the different size of project (small, medium and large) and details the roles and responsibilities of general project management and those specific to R&D projects.

A3.1 Management Structure for Projects

The management structure described in the *Project Management Procedures PIN - Section 2* provides the NRA with levels of control appropriate to the size, complexity and nature of the project. The PIN explains the role of three management bodies:

- the Project Assessment Board (PAB);
- the Project Board; and
- the Project Manager.

The Head Office and Regional Project Assessment Boards (PABs) have responsibility for control of a group of projects. The Project Board and the Project Manager have greater management responsibility, albeit generally only for single projects. See *Figure A3.1*.

All projects are categorised by size as small, medium or large, depending upon the type and total estimated cost given in Financial Form A (Project Authorisation). For R&D projects these are given as:

Small	up to £100,000
Medium	up to £250,000
Large	over £250,000

However, where a Topic Leader decides that a project is of high risk, it should be moved into the next category i.e. a financially Small project should be treated as a Medium project. (See *Project Management Procedures PIN - Section 4.4.12*)

The R&D Programme is presented by the Chief Scientist, as Director responsible for R&D, to Executive Group's Priorities Sub-Group and once it has been approved in principle by the EG, a Project Board (if appropriate) and Project Leader can then be appointed. The responsibility for the management and control of the project is then devolved to the Region/Head Office in which the Project Leader resides.

The Regional/Head Office PAB will perform the key roles during the life of the project as defined in the *Project Management Procedures PIN - Section 2* and in the relevant flow diagrams in Part B of this Manual.

Where an R&D project falls into the "Small" category, it is recognised that the PAB may delegate its roles to the R&D Contact Point, as the Manager responsible for R&D in the Region, and Topic Leader. Similarly, in these circumstances, it is unlikely that a Project Board will be necessary. The roles and responsibilities of the Project Board could be delegated to the R&D Contact Point and the Topic Leader. References in the remainder of this Manual to PAB and Project Board should also be taken to refer to R&D Contact Point and Topic Leader, where appropriate to "Small" projects.

R&D projects that are termed either "Medium" or "Large" will be overseen by the Regional/Head Office PAB. This body may establish a Project Board to which it may delegate many of the more time consuming tasks of the PAB. It is expected that this Board may well have members from other NRA Regions and may include the Topic Leader. The work of this group may be performed by correspondence with a reduced number of meetings.

Recommended members
to include

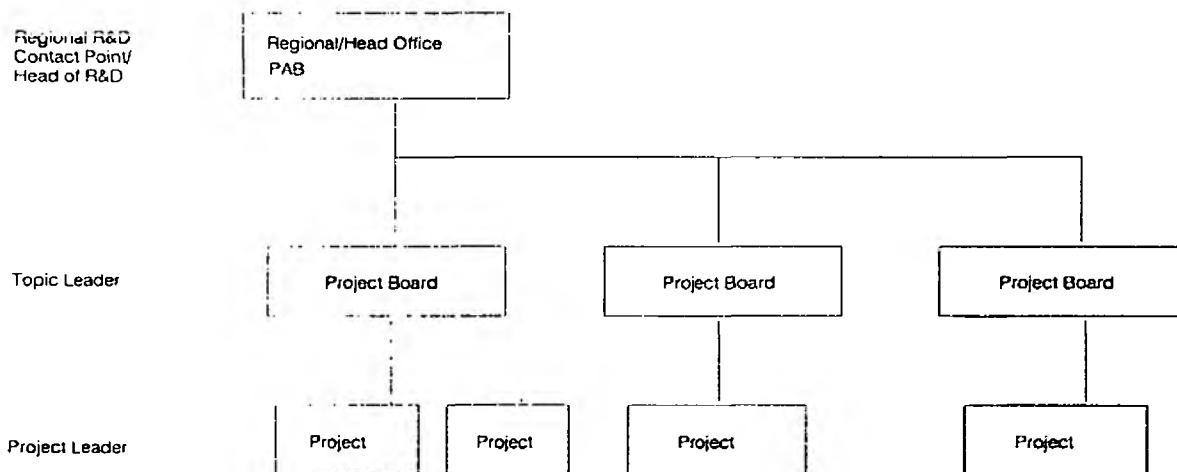


Figure A3.1 - Management structure for R&D projects

There may also be benefits in having an independent expert adviser assisting the Topic Leader with various activities. The R&D numbered paper *R&D(92)16* provides further information. For projects over £100k it is necessary for an independent external expert to review the PID and ensure there is no duplication of work with other commissioning bodies and that the project is structured in a realistic manner. They are also able to peer review the work and ensure the quality of the science is acceptable. There may be internal Technical Specialists who should also be consulted.

As the majority of R&D projects are contracted to outside research contractors, the responsibility for overseeing the day-to-day management of R&D projects is performed by the Project Leader. This term is used in preference to Project Manager, (as the latter is used for the Research Contractor's manager) but the roles described in the *Project Management Procedures PIN* are broadly the same.

A3.2 Roles and Responsibilities

A3.2.1 General Project Related Roles

Project Assessment Board (PAB)

The role of the Regional/Head Office PAB is given in *Project Management Procedures PIN - Section 2 and Appendix 1*. This Board has a number of key roles at each stage in the life of a project. These are:

- **Stage 1**, to approve the Summary Appraisal Form and the management structure for the project;
- **Stage 2**, to review the PID and Financial Form A and provide a recommendation for approval to the appropriate authority under the Scheme of Delegation;
- **Stage 3**, to review financial monitoring reports and approve Change Reports where applicable; and
- **Stage 4**, to approve the End of R&D Stage Assessment Form (ERSA), where required, and recommend projects for Post Project Appraisal.

In approving the management structure for R&D projects, the PAB must consider who are the most appropriate people to be involved.

Project Board

The role and responsibilities of the Project Board are similarly given in *Project Management Procedures PIN - Section 2 and Appendix 1*. This Board is established to assist the Project Leader and to control and monitor the project. Its composition will depend on the size and complexity of the project. Its activities will include:

- providing advice and support for the Project Leader;
- reviewing key appraisal documents and monitoring reports; and
- establishing and monitoring the work of the Quality Review Panel.

The membership of the Project Board may be altered at any time during the life of the project in order to accommodate changing circumstances, but it is essential that the Topic Leader is involved in some capacity as he has important responsibilities as detailed in *Section A3.2.2* below.

A3.2.2 Specific R&D Related Roles

Project Leader

Project Leaders are appointed for their ability to develop and supervise R&D projects. They are not necessarily expected to undertake any R&D work. Their responsibility is to develop the PID from the Summary Appraisal Form (where appropriate) handed over by the Topic Leader and, as "customer" representative, to supervise the Research Contractor (or internal research team) and take the R&D output through to implementation. Supervision implies sufficient contact with the Research Contractor to ensure that targets are achieved and problems are identified and resolved as early as possible. In order to achieve effective co-ordination between projects, in some cases it may be desirable for a Project Leader to manage a group of projects. In other cases, the necessary project management skills may not be available within the NRA, and the services of an experienced research manager may need to be contracted-in. Whatever the approach to project leadership, it must be appropriate in terms of both technical knowledge and management skills of the staff concerned.

Details of the role and responsibilities of Project Leaders are given in *Appendix A* of this Manual.

Topic Leader

Topic Leaders take a national responsibility for a specific subject area of the R&D Programme. They will generally be selected because of their knowledge and standing in their subject area. The Topic Leader will be linked into any NRA National Centre or core function business group dealing with the issues to which that Topic area relates. In some cases they will take advice from an independent external advisor in setting the research objectives and planning the projects. Topic Leaders are expected to liaise closely with colleagues in other Regions.

The responsibilities of Topic Leaders include briefing the Project Leaders and checking and signing off the PID. They must, as a member of the Project Board, be involved in the monitoring of deliverables from all projects in their Topic Areas. They are responsible for delivering the outputs for their Topic Areas to the customer.

Further details of the role and responsibilities of Topic Leaders are given in *Appendix A* of this Manual.

R&D Contact Point

The Regional R&D Contact Point (see R&D numbered paper *R&D(94)2* for current list) acts as a focus, at a senior level, for R&D matters in the Region and represents the Region on the R&D Committee. Ideally, they should be a member of the Regional Management Team and Regional PAB. The R&D Contact Point may also be the line manager of the R&D Co-ordinator.

The R&D Contact Point usually has signing powers under the *Scheme of Delegation PIN* as a Second Tier Manager to authorise Financial Forms A (Project Authorisation) and Gs (Project Supplementary Expenditure), up to £10,000. They must be consulted and sign all Financial Forms before these are passed on to the Regional General Manager (RGM) and/or Head Office.

They can also be delegated to take on the responsibility of the PAB and/or the Project Board.

Commissioner

The Commissioner is appointed by their Function Committee to oversee their Commission and any Cross-functional projects. They review the Topic Investment Appraisals and other reports prepared by Topic Leaders. They arrange for key R&D outputs to be reviewed by, or presented to, the Function Committee. They are able to sign off less significant R&D outputs on behalf of the Function Managers.

Further details are given in *Appendix A* of this Manual.

R&D Co-ordinator

Each Region has an R&D Co-ordinator (see *Appendix A*) (with the R&D Programme Officer fulfilling this role in Head Office), who assists in the setting up and management of a portfolio of projects, including advising on contract matters, technical, quality and financial authorisation processes (see *A2.3.4*). A good working relationship between the Project Leader and Regional R&D Co-ordinator, with agreed and defined roles on each project, can keep a project running smoothly, with the minimum of disruption to their other duties outside the project.

B1 IDENTIFICATION AND INITIAL APPROVAL OF R&D PROJECTS (STAGE 1)

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B1 IDENTIFICATION AND INITIAL APPROVAL OF R&D PROJECTS

B1.0 Introduction

This chapter explains the process by which potential projects are identified and how the R&D Programme is approved, through to obtaining initial approval for commencing work on a project. The first stage of this development process is undertaken by the Core Function as Customers - principally through the Commissioner and Topic Leaders - and by the R&D Planning Officer. The process is given here in general terms only.

R&D projects are undertaken to address some "need", "opportunity" or "problem" which effects the effectiveness of the NRA in carrying out its business. The potential for R&D to improve the effectiveness of some aspect of the NRA's business may be identified by almost any person or group in, or dealing with the NRA.

One of the activities at this stage is to carry out a broad screening of both functional issues and the existing R&D Programme to identify those issues which will potentially benefit from R&D.

Following the identification of a potential issue for R&D, a formal "submission" is made, which is considered for inclusion in the R&D Programme (see *Section B1.1.2*). An initial appraisal and/or approval for a "Small" project will then be required. Where an initial appraisal is required to define the project, the results will be used to prepare the Business Case (see *Section B2.2.4*).

The process of the proposal being screened and selected by the customer helps to develop ownership and commitment to it from an early stage. With strong competition for NRA resources, only R&D projects which either support priority developmental initiatives and continuing activities, or provide major operational benefits should be brought into the R&D programme.

The process has been divided up into four stages, the high level overview (which takes place June to October in the previous year), the inclusion of a proposal in the R&D Programme, the approval of the R&D Programme and approval for "Small" projects.

B1 - Identification and initial approval

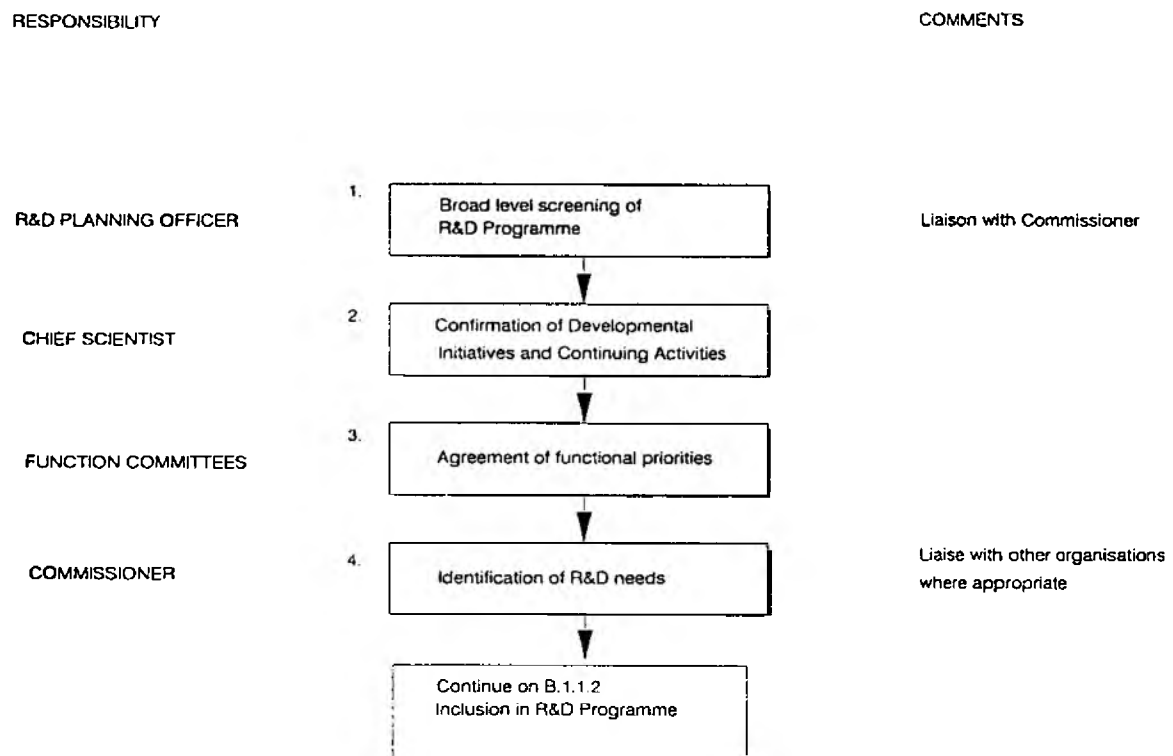


Figure B1.1.1 High Level Overview of Problems, Needs or Opportunities

B1.1 Process Description

This section explains the process by which projects are identified and developed through to obtaining initial approval to commence work. Further supporting information is given in the R&D numbered paper on *Planning and Development of Strategic R&D Projects (R&D(93)17)*.

B1.1.1 High Level Overview

The steps to be completed during this stage are described below and shown schematically in the associated flow chart on the facing page. The numbering below relates to the step numbers on the flow chart.

1. The R&D Planning Officer, in liaison with the Commissioners, will consider the present programme and any proposed change to function priorities. They will assess the balance of the projects in the programme and what is being delivered from each. Coherence and links with the developmental initiatives and continuing activities will also be checked.

The budget available for new starts will also be considered by looking at the level of commitments to on-going projects and the anticipated R&D budget for the following year.

2. The Chief Scientist and Director of Water Management have meetings with the Chief Executive (bilaterals) to confirm the priorities. This confirms the status of continuing activities and identifies any further developmental initiatives.
3. The Function Committees then agree on the function's business priorities within the developmental initiatives and continuing activities. They confirm a business programme of work and identify those areas where there are gaps in knowledge.
4. The high level issues develop from 3. above. There are discussions with other research commissioning organisations e.g. UK Water Operators and Natural Environment Research Council over collaboration on common R&D issues. The Commissioner can also set priorities for specific issues or those crossing several Topic areas.

B1 - Identification and initial approval

RESPONSIBILITY

COMMENTS

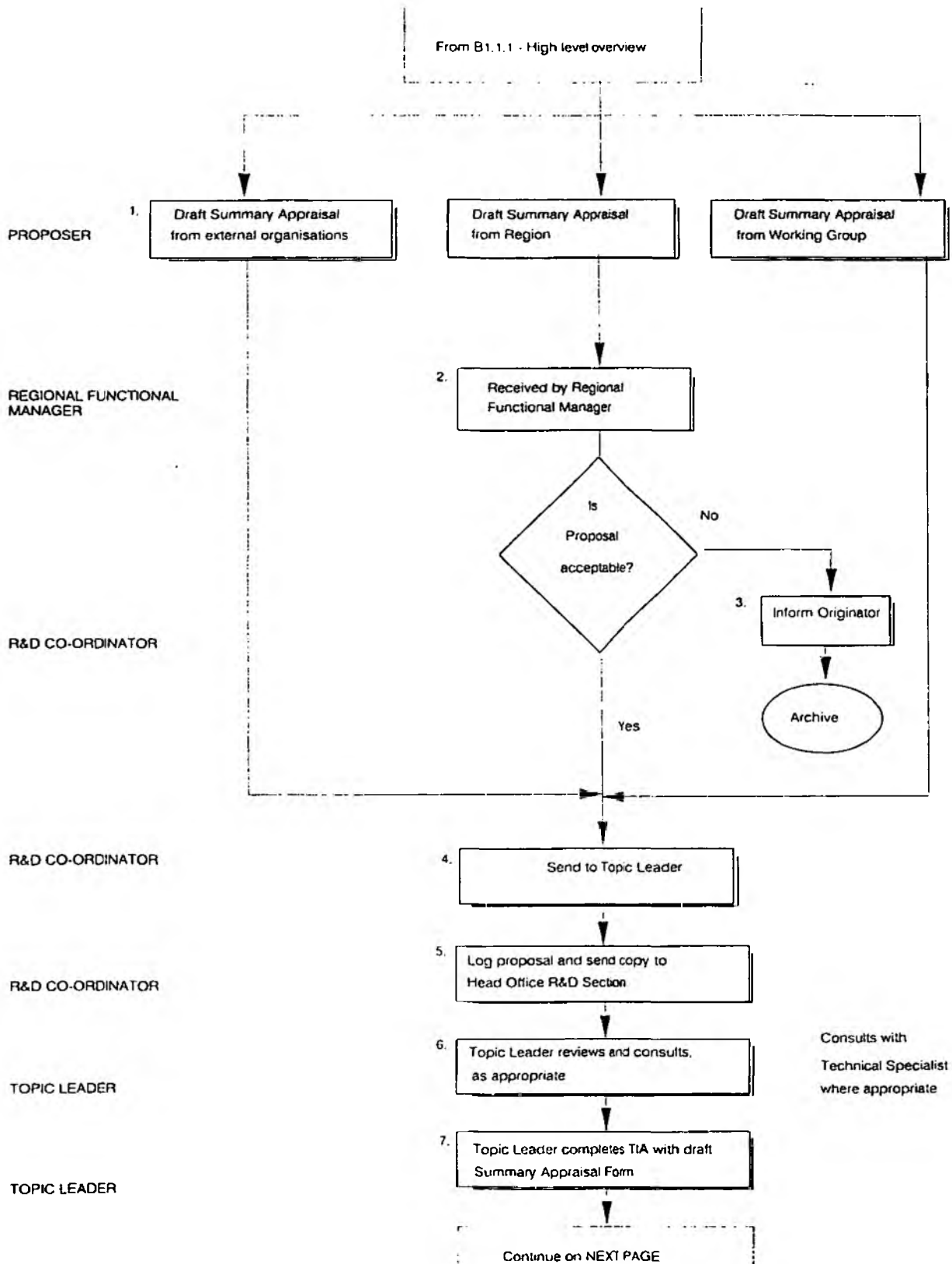


Figure B1.1.2 Inclusion in R&D Programme

B1.1.2 Inclusion in R&D Programme

The steps to be completed during this stage are described below and shown schematically in the associated flow chart on the facing page. The numbering below relates to the step numbers on the flow chart.

1. Proposals for R&D can be submitted by anybody with knowledge of the NRA's business. Research commissioning organisations and other bodies can submit outline proposals - finally as a draft Summary Appraisal (see *Appendix B*) - to the relevant Topic Leader. It is important to remember that there could be Intellectual Property Rights (IPR) associated with these submissions. (See *R&D(93)16A* - Commercial issues related to R&D projects).

Similarly any internal NRA working or business group should flag up any potential R&D issues to the relevant Topic Leader. It is important that these support the Business Plans of the working or business groups. The Topic Leader is responsible for keeping the relevant group informed as to the progress of their proposals.

The Regional Management Teams (RMTs) should encourage their operational staff to put forward any problems or opportunities which may warrant tactical research. The R&D Co-ordinator can advise the RMT on how to do this and co-ordinate the Regional receipt of these proposals.

2. The proposals produced in the Region must be sent to the relevant Regional Function Manager for consideration. The Regional Function Manager must then consider if the issue is something that may benefit the function nationally.
3. If the Regional Function Manager does not feel that the proposal is sufficiently important, then the R&D Co-ordinator must inform the proposer of this decision giving reasons (from the Regional Function Manager) as to why it was rejected. The Topic Leader then archives the proposal for consideration next year.
4. The supported proposal is then sent by the R&D Co-ordinator to the relevant Topic Leader. If the proposal is thought relevant to other Topic Leaders, it should also be circulated to them for comment. Where a proposal is thought to be cross-functional then the R&D Section should be consulted.
5. The R&D Co-ordinator logs all the proposals they have received and sends a copy of these to Head Office for information. This can be done in batches or as they are passed to the relevant Topic Leaders.
6. The Topic Leader then reviews the proposals consulting with relevant staff as required. Any Function or Topic Technical Specialists should be consulted at this stage.
7. Having all the proposals the Topic Leader is now able to put forward their proposals, if appropriate, and to complete the Topic Investment Appraisal (TIA), together with a draft Summary Appraisal Form supporting those proposed new start projects. Further guidance on completing Topic Investment Appraisals is given in *R&D(93)20*.

B1 - Identification and initial approval

8. Where the relevant Topic Leader has not included proposals in his TIA, then the R&D Co-ordinator must inform the proposer of this decision, giving reasons (from the Topic Leader) as to why it was rejected.
9. The Business Groups (where they exist) will then consider the TIA and assess the proposed projects against function priorities.
10. The draft Commission programme is then assessed by the Function Committees where the proposals are ranked in order of importance.
11. The Schedule of Ongoing and Proposed New Starts is then drafted from the prioritised list of proposals in the TIA.
12. The Schedule is then reviewed by the R&D Programme Working Group (see *Appendix A* for Terms of Reference). Cross-functional issues are discussed and an agreed programme results.
13. The proposed programme schedule from 11. above is then submitted to the National Project Assessment Board (PAB). This role will be performed by the Executive Group Priorities Sub-group.
14. A report on the proposed R&D Programme is then submitted to the Executive Group (EG) by the EG Priorities Sub-Group. As a result of this consultation process various modifications and amendments to the programme may be requested by the EG Priorities Sub-Group.
15. Following approval by EG, the R&D Programme will be circulated. It is then for the relevant R&D Co-ordinators to inform the proposers of the R&D projects of the outcome of their proposals.
16. The approved R&D Programme is submitted to the Board for information.

B1 - Identification and initial approval

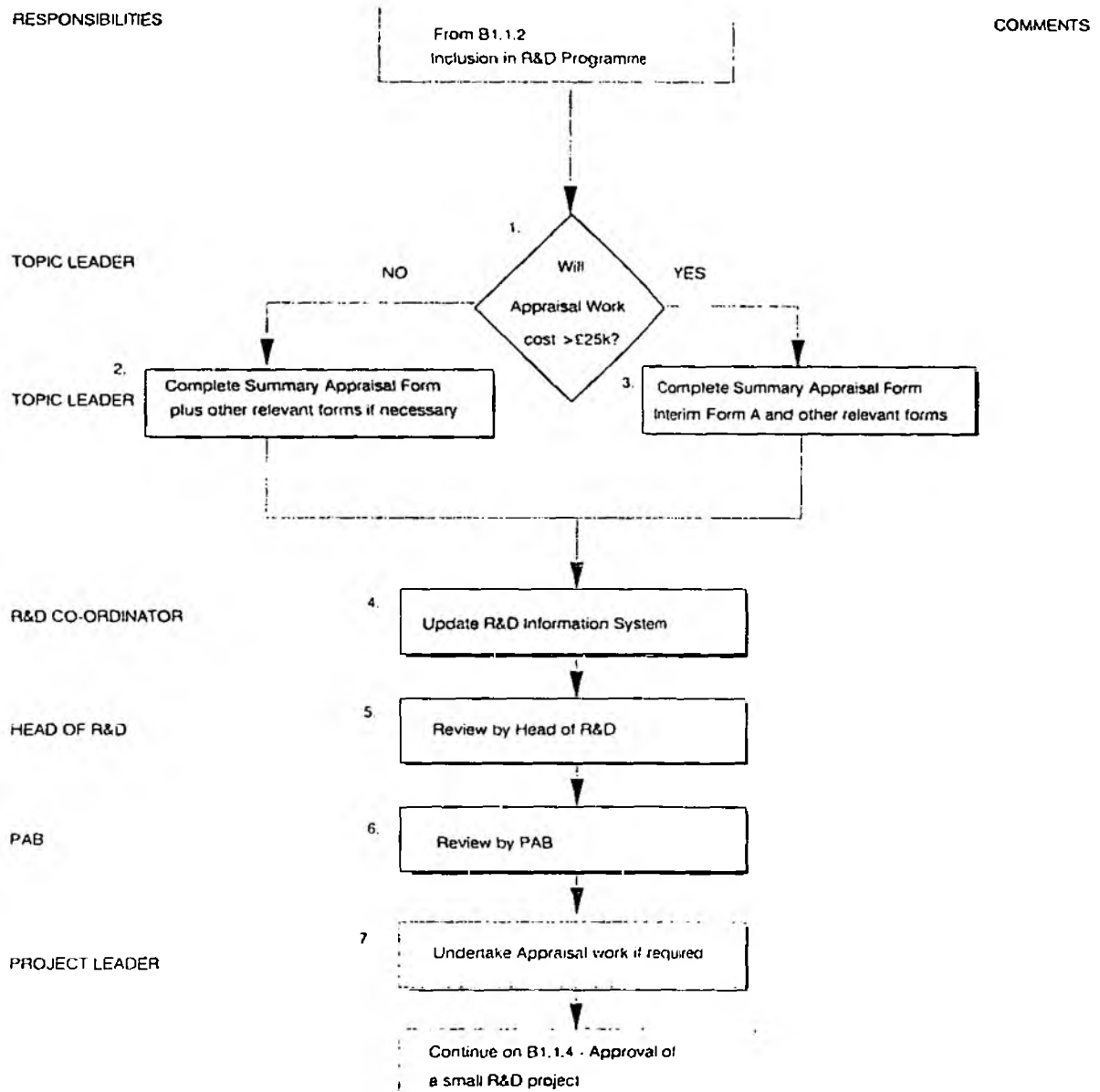


Figure B1.1.3 Approval of R&D Programme

B1.1.3 Approval of R&D Programme

The steps to be completed during this stage are described below and shown schematically in the associated flow chart on the facing page. The numbering below relates to the step numbers on the flow chart.

1. Once the R&D Programme has been approved; it may be necessary to undertake further scoping or feasibility studies to define the project or to clarify the options to be considered. Where this work costs less than £25k, a Financial Form A is not required.
2. The Summary Appraisal (see *Appendix B*) must be completed. This will be the responsibility of the Topic Leader who may delegate this to a Project Leader, if known at this point. If the definition study or scoping study is contracted out, note that the *NRA Procurement Manual* must be adhered to.
3. Where the appraisal work is expected to cost £25k or more, then a Financial Form A must be approved by the relevant authority as defined in the *Scheme of Delegation*.
4. The details of the Summary Appraisal must be entered onto the R&D Information System by the R&D Co-ordinator. This ensures that the R&D Section can monitor progress on all projects and that the information is widely available.
5. The Summary Appraisal must be sent to the Head of R&D for quality review and checking the overall approach. The R&D Co-ordinator will provide a copy of the Form for comment. The Head of R&D will complete the review by confirming the document is approved and that all issues have been addressed. He also confirms that this project has been approved by the EG and the Board when signing the Summary Appraisal.
6. The Summary Appraisal will be submitted to the relevant PAB for approval to incur expenditure on the detailed planning of the project.
7. Following approval by the PAB, it is possible to undertake the further planning of the project. This may include an initial appraisal to define the scope of the project.

RESPONSIBILITIES

COMMENTS

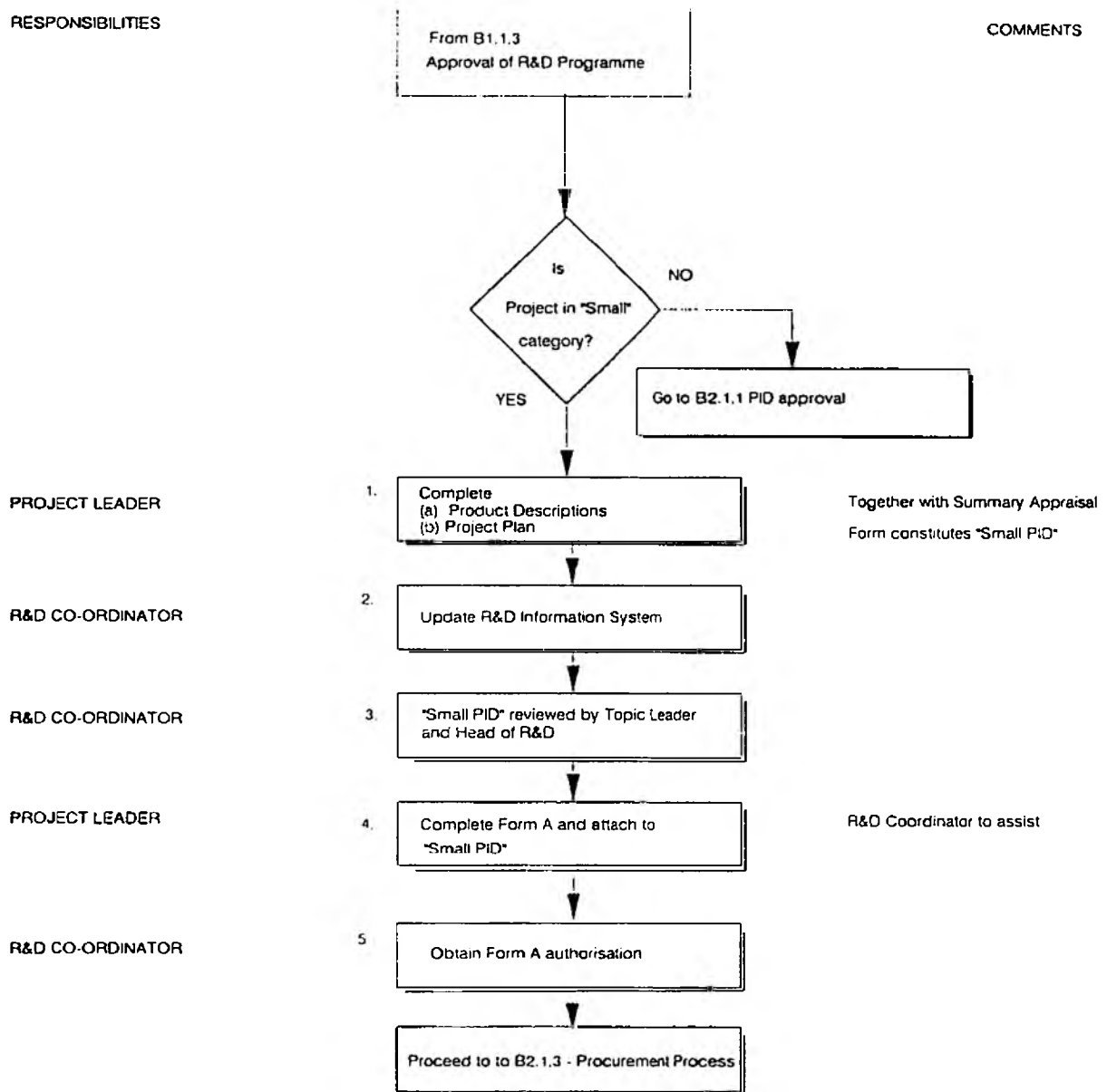


Figure B1.1.4 Approval of a "Small" R&D Project

B1.1.4 Approval of a "Small" R&D Project

The procedures for managing "Small Projects" are different from those for "Medium" or "Large Projects" in that Stage 1 - Approval of Programme and Stage 2 - Detailed Planning are combined. Therefore, the approval of a "Small" R&D Project has been included in this section. Reference should also be made to the section on "Small Projects" in the *NRA Project Management Manual*. An example of the additional information required to obtain approval is given in *Appendix C*.

The steps to be completed during this stage are described below and shown schematically in the associated flow chart on the facing page. The numbering below relates to the step numbers on the flow chart.

1. Once the project has been confirmed as being in the "Small" category, the Project Plan and the Product Descriptions should be developed. In general, the level of detail should relate to the size and complexity of the project and should provide sufficient detail for appropriate tender documents to be developed. Refer to Section *B2.2.1*. for further details. These two documents, together with the Summary Appraisal, constitute a "Small PID".
2. The R&D Co-ordinator must update the R&D Information System with these details.
3. The R&D Co-ordinator must then send the "Small PID", signed by the Project Leader, to the Topic Leader and then Head of R&D for review and approval.
4. The Project Leader is then responsible for signing the Financial Form A and attaching the updated, where necessary, "Small PID".
5. The document from 4. above is then sent to the PAB, (or R&D Contact Point or Project Leader's line manager (see *Section A3.2 - Roles and responsibilities*)) for approval prior to obtaining the authorisation under the *Scheme of Delegation*.

B1.2 Guidelines

B1.2.1 Numbering Convention

Submissions

The Regional R&D Co-ordinator, or R&D Programme Officer in Head Office, is responsible for allocating a submission number to all proposals received by or generated in their Region.

The number is in three parts:

- the year, e.g. "93" for 1993;
- the sequential number in the Regional R&D Co-ordinator's log, e.g. "012"; and
- the code for the NRA Region, e.g. "ST" for Severn Trent.

A typical submission number is thus: **93/012/ST**.

Proposed Projects

The Topic Leader allocates a proposal number to all proposed projects detailed in the TIA.

The proposal number is in three parts:

- a code for the identifying Topic Area, e.g. "A03";
- the year, e.g. "93" for 1993; and
- the sequential number in the Topic Leader's log, e.g. "03"

A typical proposal number is thus: **A03(93)03**.

After the review of the proposals a particular proposal may be reassigned to an alternative Topic Area. If this happens the proposal number is not changed.

B1.2.2 Topic Investment Appraisal

The Topic Investment Appraisal (TIA) justifies why a programme of work should be carried out. It provides the essential link between the Function Strategy and Business Plan or tactical issues and the proposed projects. Guidance on completing the TIA is provided in R&D numbered paper *R&D(93)20 - Topic Investment Appraisal*.

TIAs are revised once each year by the Topic Leader to provide a broad justification for undertaking the proposed programme of projects within each Topic Area.

B1.2.3 Summary Appraisal

The purpose of the Summary Appraisal (*Appendix B* has a copy of the standard form together with guidance notes on how to complete it) is to define and justify the need for and benefits of a project, and to consider options so that a decision can be made on whether the project appears sufficiently justified for a full appraisal to proceed. A draft Summary Appraisal can be prepared either by NRA staff or by external organisations. The total length of this will not generally exceed the two A4 pages, although in the first instance it is unlikely that the second page could be completed.

It should not be an onerous task to draft the Summary Appraisal. It is intended simply to give a brief and considered statement of what benefits the proposed project will deliver. The Regional R&D Co-ordinator will be able to advise on the level of detail which should be included.

If the submission is accepted and becomes a proposal in the TIA, the objectives, outputs, benefits, costs, timescales and other factors will be reviewed and worked up in more detail and with greater certainty in the subsequent stages of project appraisal. The content of the document is described below and a model example is included in the *Appendix C*. Supplementary sheets may be added to give greater detail to any part of the form. A Wordperfect proforma is available.

When drafting this form for a submission of a proposal to be considered, it is important that the following are completed:

1. Project Reference

This is the submission number discussed in *B1.2.1*, which is later changed to the proposal number if the proposed is accepted into the TIA.

2. Title

The title should be concise yet descriptive of the project objectives. It should not exceed 60 characters.

3. Proposed Total Cost

This will be a "best guess" at this stage.

4. Description of Problem, Need or Opportunity

Explain why the project has been identified, including which developmental initiative or continuing activity it supports.

5. Objectives

Define what the project objectives are and how they meet the issue noted in 4. above. Objectives should be described in a maximum of 30 words using a "to... to..." statement. i.e. to do something to achieve some changed position for the NRA in terms of its business needs.

6. Products

Give an outline of the output to be produced from the project.

7. Justification/Benefits/Consequences of Doing Nothing

Give reasons why the project should be undertaken at the time proposed. Include benefits which will accrue and explain the consequences of not undertaking the project.

8. Summary of Options Considered

Either a brief description of each option considered, including "do nothing". Best estimates of costs and benefits, where known, must be included. Costs and benefits must be discounted over time, using 6% at present, to give a NPV.

These provide the basic information necessary for the Function and R&D Section to assess whether the submission should be considered further. Further information can be given if so wished.

These proposals are used to support the TIAs and subsequently, where successful, to complete the draft Schedule of Ongoing Projects and Proposed New Starts (see *R&D(93)23* as an example), which is submitted to the R&D Programme Working Group. Once the R&D Programme has been approved by EG, further work will be required to complete filling in the Summary Appraisal Form.

B1.2.4 Urgent Proposals

It is possible that during the course of the financial year tactical (or strategic if corporate/function priorities change) projects are required to provide answers to specific problems. These will not have been developed following the procedures mentioned in *B1.1* above, as the R&D Programme Working Group only sits once per year.

Where the Function Committee decide that a piece of work is urgently required, which has not previously been approved, then the project has to be developed in accordance with the process described in *B1.1.2*. However, the draft Summary Appraisal Form must be completed by the Topic Leader and sent to the R&D Section for submission to the National PAB (EG Priorities Sub-group) for approval.

B1 - Identification and initial approval

Once the National PAB have approved the project for inclusion in the R&D Programme, the project will be further developed through the process set out in *B1.1.3*.

B1.2.5 National Centres

The NRA is establishing national centres in a number of areas. Such centres should be consulted by the Topic Leader when considering relevant proposed projects. A list of these centres and the technical specialists will appear as an R&D numbered paper in due course.

B2 DETAILED PLANNING AND PROJECT AUTHORISATION (STAGE 2)

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DOCUMENT CONTROL

Version Number	Issue Date	Comment
0.2	01/11/93	First draft issued for review
1.0	28/02/94	First issue of Manual

B2 - Detailed planning and project authorisation

B2 DETAILED PLANNING AND PROJECT AUTHORISATION

B2.0 Introduction

This chapter provides an explanation of the detailed planning and project authorisation process for "Medium" and "Large" projects. For such projects, the process commences with the PAB approving the Project Leader and Project Board and ends with the authorisation to commit expenditure on a project. This equates to Stage 2 of the project lifecycle as illustrated in the *Project Management Procedures PIN - Appendix 1*.

For "Small" projects, the Summary Appraisal (see *Section B1.1.5*) and a Financial Form A provide the necessary authorisation to procure R&D services. Thus, a conventional PID is not required for "Small" projects. For this category of projects the reader should skip to *Section B2.1.3 - Procurement Process*.

The next stage in the project cycle is *B3 - Project monitoring*. The way this is to be done must be considered when completing the PID.

B2 - Detailed planning and project authorisation

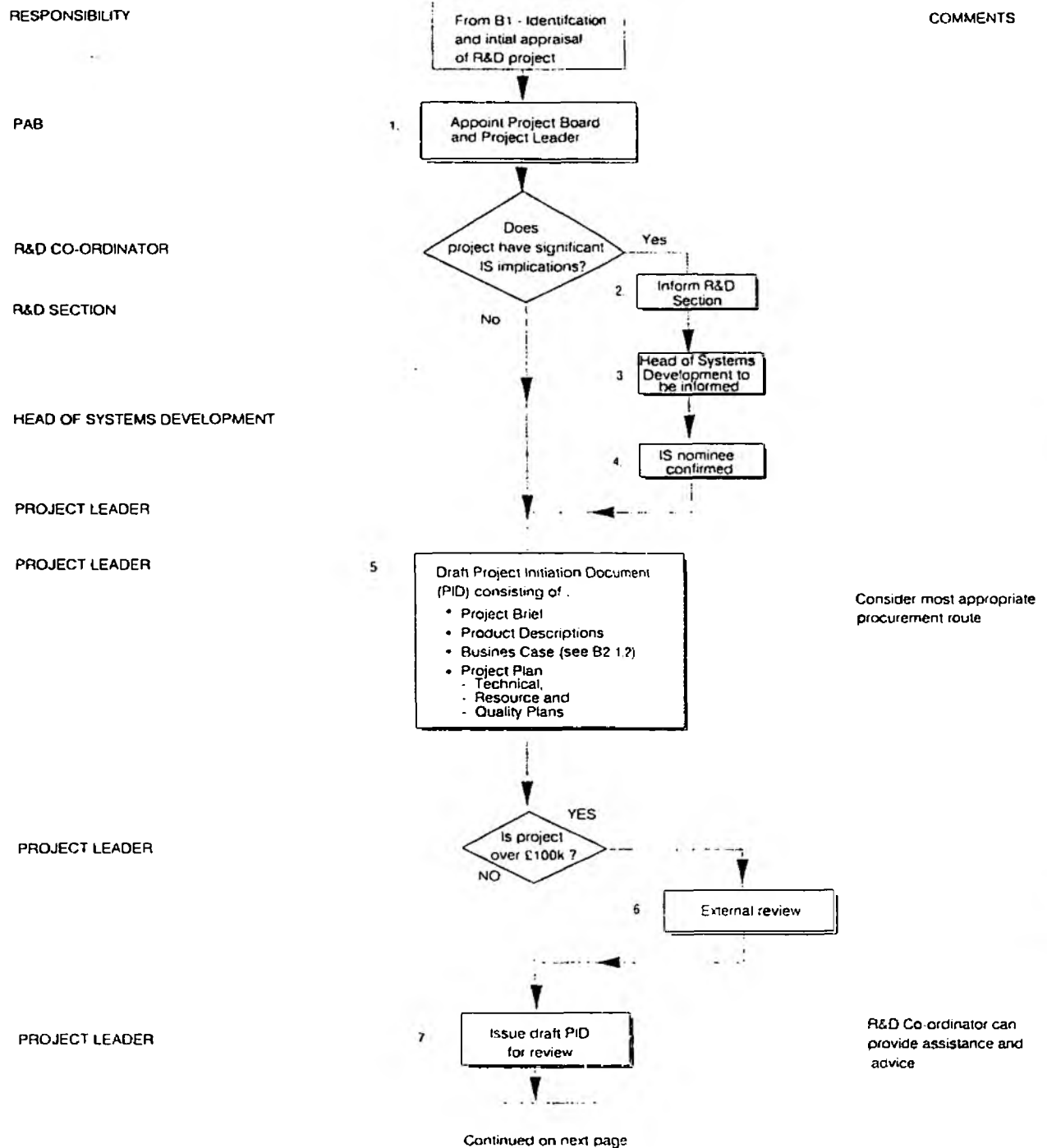


Figure B2.1.1 Project Initiation Document (PID) approval

B2.1 Process Description

B2.1.1 Project Initiation Document (PID)

This section expands on the *Project Management Procedures PIN - Section 4.2*. The steps to be completed during the preparation of the PID are described below and shown schematically in the associated flow chart. The numbering below relates to the step numbers on the flow chart.

1. The PAB will appoint/approve the Project Board and Project Leader. The Project Board will have the Topic Leader and an IS nominee for those projects with (or Head Office) from the Project Leader significant IS implications. These people may be located in a different Region (or Head Office) from the Project Leader.
2. The Regional R&D Co-ordinator must inform the R&D Section of those projects with significant IS implications and the proposed IS nominee, if known.
3. The R&D Section will inform the Head of Systems Development of the projects concerned and the IS nominee where known.
4. The Head of Systems Development will then either confirm the IS nominee or will recommend the use of someone else to the PAB.
5. The PID can then be drafted. This has four parts together with the Product Descriptions, which should be completed using the PM2 forms (see *Appendix B.*) The Business Case is further considered in *Section B2.1.2*. The Project Plan should also consider which is the most appropriate route for procuring the services to undertake the project.
6. For "Medium" and "Large" projects, the draft PID must be reviewed by an independent expert. This provides a check to ensure that the R&D does not duplicate work done elsewhere and that the most appropriate option has been taken. Further guidance on the selection of the independent experts can be found in R&D numbered paper - Independent Advisors for R&D Projects (*R&D(93)3*).
7. The Project Leader will then issue the draft PID for review. The R&D Co-ordinator will review the PID to ensure that it conforms to the R&D standards, (see *Example PID Appendix E*). The Topic Leader, IS nominee and other relevant parties should also informally review the PID. The Head of R&D will finally review the draft PID and, if satisfactory, approve it.

B2 - Detailed planning and project authorisation

RESPONSIBILITY

COMMENTS

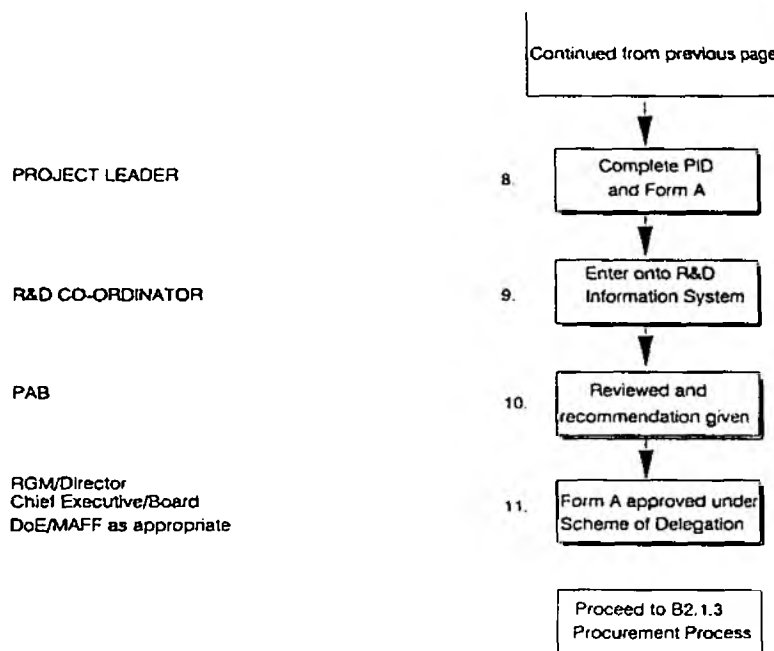


Figure B2.1.1 Project Initiation Document (PID) approval (continued)

8. The Project Leader will amend the draft PID taking into account any comments and changes requested and then complete the Financial Form A. It is essential that the figure for authorised total cost on the Financial Form A, including provision for inflation for projects over 2 years in duration, corresponds to the total figure for authorised total cost in the PID.
9. The R&D Co-ordinator will enter the PID onto the R&D Information System for the next exchange of data. This is performed monthly by the R&D Co-ordinator sending their Regional data files via the Wide Area Network (WAN), to Head Office. This will involve updating the information already contained on the Information System, to correspond with that on the Summary Appraisal.
10. The Project Leader will send the completed PID and Form A to the Regional PAB for review and any recommendations.
11. The Form A will then be approved by the appropriate authority as defined under the Scheme of Delegation. (See also *R&D Expenditure on National Projects (R&D(92)1A)*).

B2 - Detailed planning and project authorisation

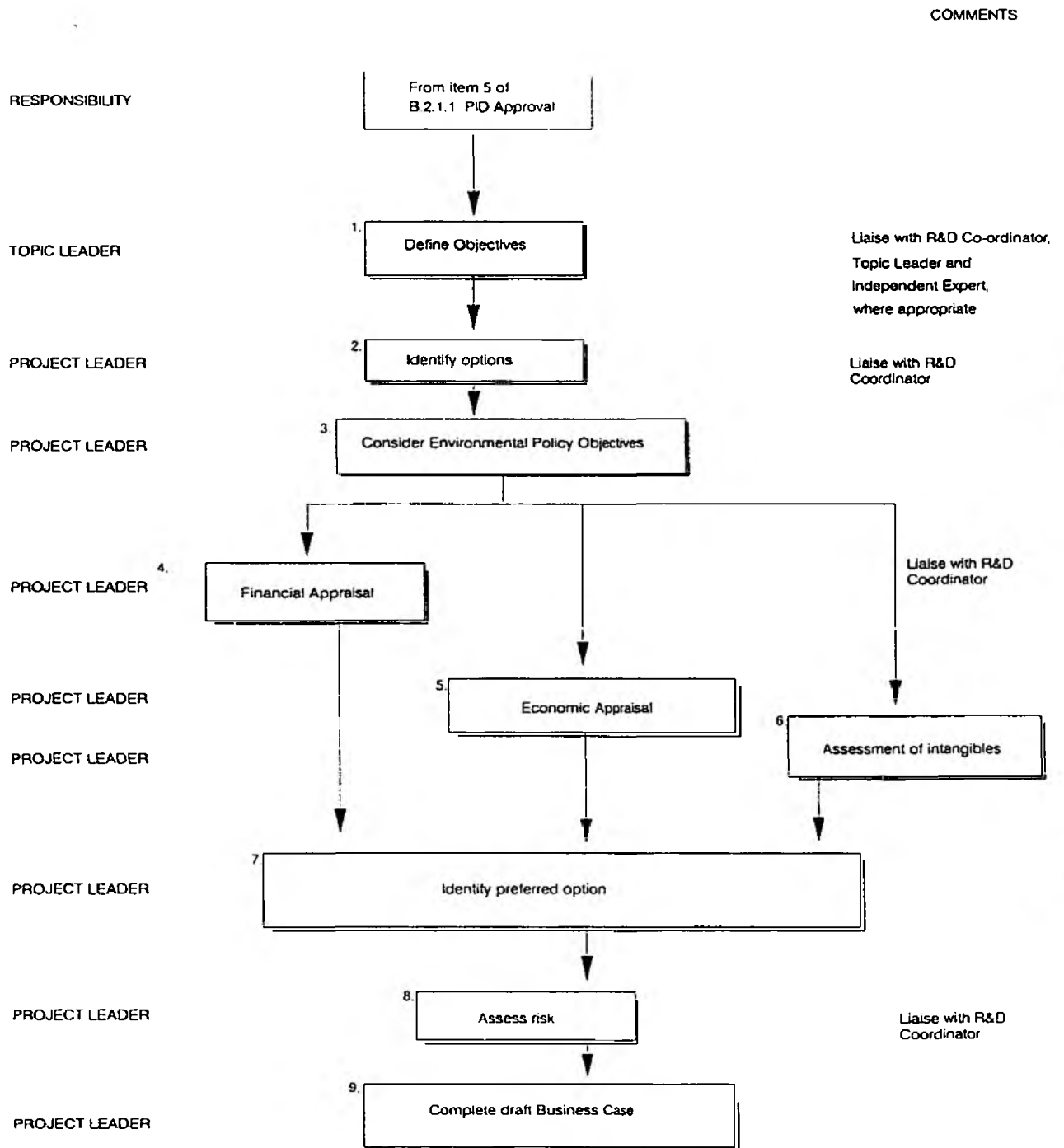


Figure B2.1.2 Business Case

B2.1.2 Business Case

This section builds on the *Project Management Procedures PIN - Section 4.4*. The steps to be completed during the preparation of the PID are described below and shown schematically in the associated flow chart. The numbering below relates to the step numbers on the flow chart.

1. The overall project objectives will have been defined in such a way as to clearly support a developmental initiative or continuing activity. (See *Project Management Procedures PIN - Section 4.4.4* and the *Example PID - Appendix E*.)
2. A wide range of options should be considered, always including a "do nothing" and preferably a "do minimum possible" statement. A Feasibility Study may have been undertaken which further developed options and/or an independent advisor may have been consulted.
3. The NRA has an Environmental Policy which must be complied with. The *Project Management Procedures PIN - Section 4.4.6* has a checklist against which the options should be considered.
4. The financial appraisal only considers cash flow of both expenditure and any tangible benefits. The results of this exercise should then be discounted to produce a discounted cash flow. (See *Project Management Procedures PIN - Section 4.4.7* for further details.)
5. The economic appraisal considers both private and social costs and benefits, including environmental and other intangible social effects. As above the results of this should be discounted. (See *Project Management Procedures PIN - Section 4.4.8* and *NRA Economic Appraisal Manual* for further details.)
6. The effects of other "costs" and benefits may not quantifiable. Where these are deemed to be relevant to the decision making process they should still be recorded. The *Project Management Procedures PIN - Section 4.4.9* provides a method of undertaking this.
7. Having undertaken the steps 3 to 6 above, the preferred option should be stated, explicitly giving the reasons.
8. The risks associated with the preferred option must be assessed and may also need to be assessed for other likely options.
9. The draft Business Case can now be completed ready for review.

B2.1.3 Procurement Process

Introduction

The procurement process aims to ensure that users obtain the goods and services required in an efficient and effective way, ensuring value for money. The NRA *Procurement Manual* provides a framework within which the organisation can undertake a range of procurement practices. The procurement process must not only be above reproach, but must be seen to be so - being fair to potential suppliers, meeting the needs of the NRA in the most cost effective way and at the same time ensuring that staff involved are free from any allegation of prejudice or malpractice.

The underlying policy is that procurement of R&D contracts should be on the basis of value for money i.e. quality (or fitness for purpose) and delivery against price. The services of Research Contractors should therefore be acquired by competitive tendering (see *Figure B2.1.3.A - Competitive Tender*) unless there are convincing reasons to the contrary. Competition avoids any suggestion of favouritism and the encouragement of monopoly. It can also help to promote efficiency and economy. Maximum advantage should be taken of the procurement and legal specialist services available within the NRA to ensure that best procurement practice is maintained and used to the benefit of the organisation. The NRA *Procurement Manual* provides further guidance on this process. In particular *Section 4.2 of the Procurement Manual* explains the minimum number of tenders who have to be invited and the *Appendix B and C - Section 5* outlines the related procedures. The Regional Procurement Officer and the Regional Tender Board can offer valuable advice on procurement issues.

The NRA is also covered by the EU Procurement Directives. Guidance explaining when the Directives must be applied has been circulated to R&D Co-ordinators and Regional Procurement Officers by the Head of R&D and Head of Procurement. In case of query, please consult first with Regional procurement and R&D staff and then with Head Office colleagues.

An R&D contract which is not awarded by competitive means is referred to as a "Single Tender Action" (STA), i.e. only one tenderer was considered. The NRA *Procurement Manual* places a strong presumption against Single Tender Actions. This leads to a separate flow diagram being produced for STA, see *Figure B2.1.3B - Single Tender Actions*.

However, on some occasions STA is the only option available e.g. in establishing a collaboratively funded project with other organisations, or where a UK National Centre is rightly used to undertake the R&D. In these circumstances a competitive tender would be inappropriate. Further guidance is given in R&D numbered paper R&D(93)34 - **Special Single Tender Action Situations Relating to R&D**. The arguments for a STA must be given in the Business Case and Project Plan.

B2 - Detailed planning and project authorisation

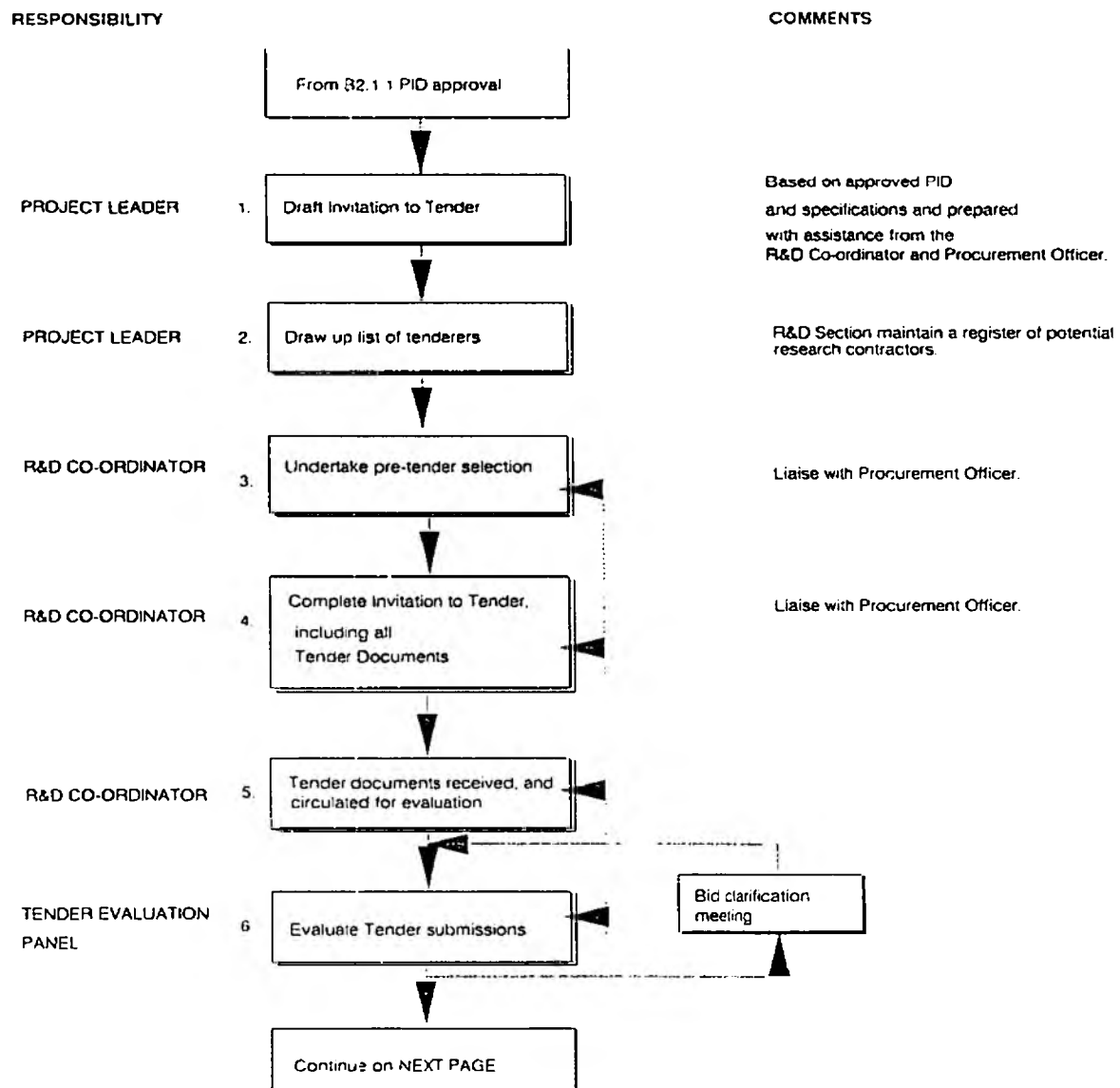


Figure B2.1.3.A - Competitive Tender

Competitive Tender

The steps to be completed for a competitive tender are described below and shown schematically in the associated flow chart. The numbering below relates to the step numbers on the flow chart.

1. The Project Leader, with assistance from the Regional R&D Co-ordinator, should draft the invitation to tender, including the specifications for the contract which covers the objectives, background, outline method, timescales and products built up from relevant sections of PID as appropriate, as described in *Section B2.2.4*. The criteria against which the tender documents are to be evaluated should be set down at this stage.
2. The Project Leader should, in consultation with the Topic Leader and Regional R&D Co-ordinator, confirm the list of potential tenderers.
3. From the list of potential tenderers, a short list may be arrived at by undertaking a pre-tender selection. This will establish those tenderers who have the necessary resources, knowledge and expertise to successfully undertake the project in the required timescale. A list of criteria are produced against which the contractors are asked to provide a brief statement, together with the wish to be considered. (See NRA *Procurement Manual* for further details.)
4. The Regional R&D Co-ordinator should prepare the invitation to tender on behalf of the Project Leader, based on the terms of reference and specifications from step 1 above. They will also include the Standard Conditions of Engagement and the executive summary from the *Guidance Note for Production of R&D Outputs (R&D Note 180)*. If necessary, the R&D Section can advise on the form and content of the tender documents. Once the documents are agreed they can be issued to the tenderers in accordance with the *Procurement Manual*.
5. The tenders will be opened by a Tender Panel, the time and date each was received being noted. Envelopes showing postmarks proving the dispatch date should be kept. These documents are then copied to members of a panel who will evaluate the submissions. This Tender Evaluation Panel should comprise as a minimum the Project Leader and the Regional R&D Co-ordinator; the Topic Leader may also be on the panel. It may also be appropriate to include others such as a person from a working group or steering group.
6. The Tender Evaluation Panel review the tenders taking into account the tender evaluation criteria, the technical competence, quality of team, timing as well as cost and number of man days being offered. They should conduct bid clarification meetings, if appropriate, and select a preferred tenderer.

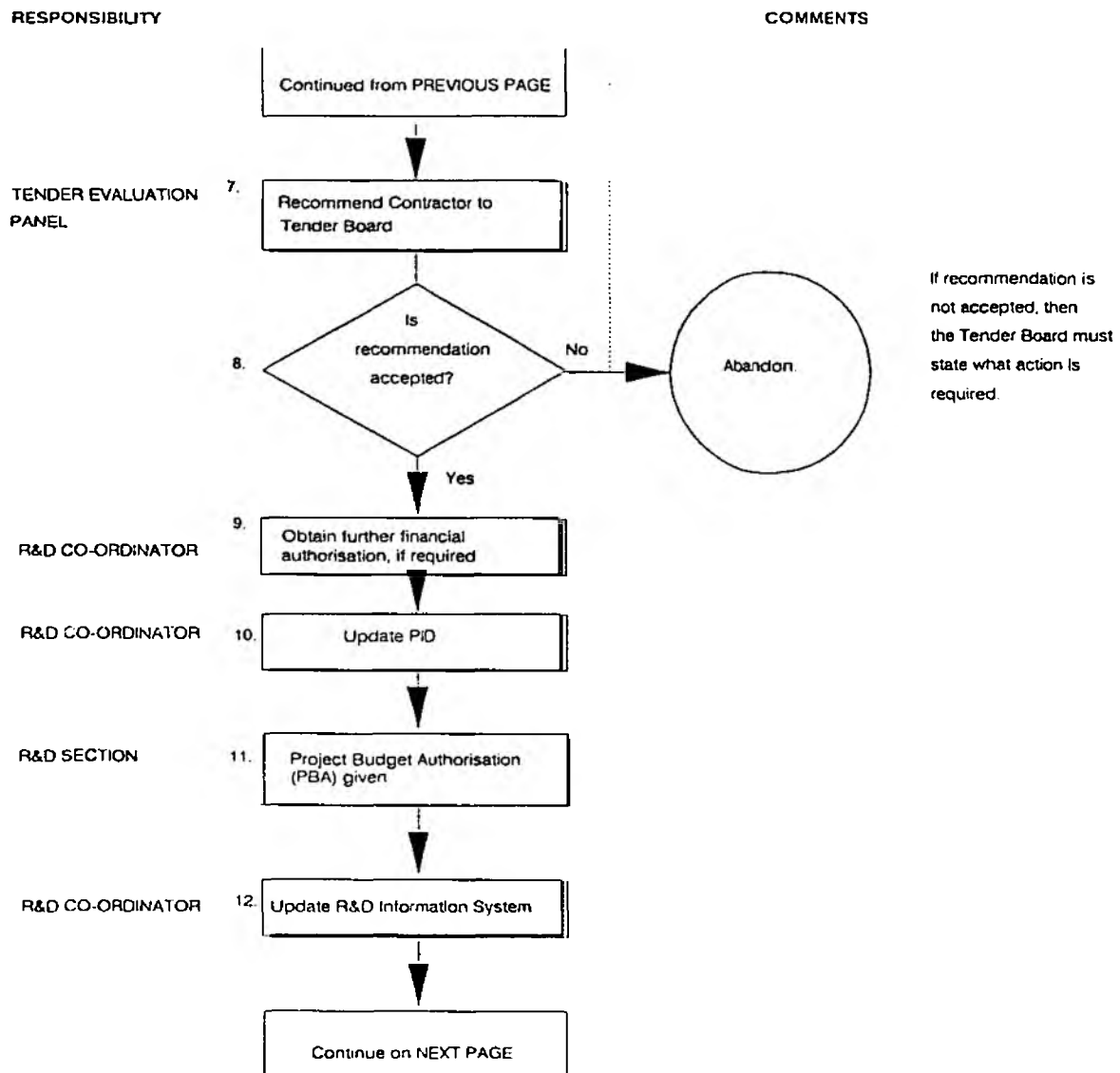


Figure B2.1.3.A - Competitive Tender

7. The Tender Evaluation Panel recommend a contractor to the Regional Tender Board (or its equivalent).
8. The recommendation may be:
 - rejected with instructions to abandon or choose an alternative; or
 - accepted with qualification; or
 - accepted without qualification.

If the former is recommended, the Tender Board will state what action is required.

9. If the preferred tender is not the lowest in cost, then a Financial Form B must be completed. If the accepted tender price is above that allowed for in the approved Form A, then a Project Supplementary Expenditure Form (Financial Form G) must also be completed and signed by the appropriate authority as in the *Scheme of Delegation*.
10. Once a contractor has been selected, the Project Leader should amend the PID to take account of the tendered costs, method and timescales. If these are significantly different from the estimates, the Project Leader and the Regional R&D Co-ordinator should decide if a full review of the PID is necessary. If there are any doubts, the Topic Leader and R&D Section should be consulted for advice. The contract can be drafted at this stage (see *B2.3 - Contract documentation*), but the award process is included in *B3.1 - Project monitoring*.
11. The amended PID together with the relevant financial forms must be sent to the R&D Section. The R&D Section will undertake the final quality control and budget check, the Head of R&D will sign off the PID and the Project Budget Authorisation (PBA) will be issued. This authorises the project to commence.
12. The R&D Co-ordinator must update the R&D Information System before the next monthly exchange of data.

B2 - Detailed planning and project authorisation

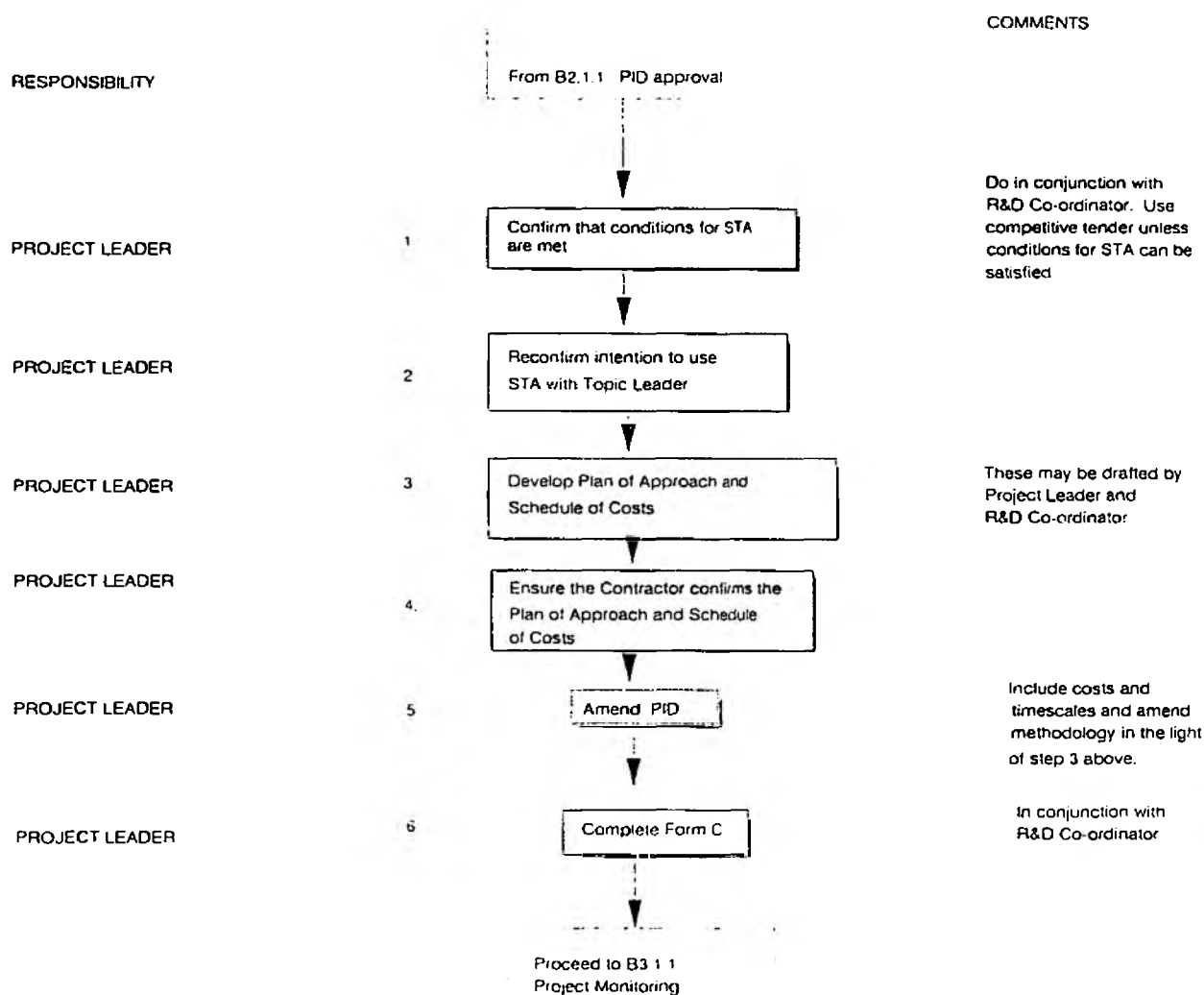


Figure B2.1.3.B - Single Tender Action

Single Tender Action

The steps to be completed if a single tender action is deemed appropriate are described below and shown schematically in the associated flow chart. The numbering below relates to the step numbers on the flow chart.

1. The Project Leader should, in consultation with the Regional R&D Co-ordinator, confirm that there is in fact only one suitable contractor who can be invited. This needs to be checked against the criteria given in the Scheme of Delegation. If more than one potential contractor exists and the conditions for STA (see *R&D(93)34*) cannot be satisfied, then the competitive tender route given in *Figure B2.1.3.A* must be used.
2. The Project Leader should reconfirm, to the Topic Leader, that the STA route as approved in the PID, is being followed. Details of the proposed contractor and the reasons for the choice of STA should be given and noted on the file.
3. The Project Leader, with assistance from the Regional R&D Co-ordinator, can then start to develop the Plan of Approach (see *Section B2.2.1 - Drafting the PID*) and Schedule of Costs (see *Procurement Manual - Section 4.3*) for the contract. These are developed as part of the PID and will eventually form part of the formal contract documents. It is essential that the Project Leader ensures that the Plan of Approach and Schedule of Costs match the PID and that interfaces to other activities in the project (but outside the R&D contract) are clearly stated.
4. The Project Leader, once satisfied with the Plan of Approach and Schedule of Costs, should ask the prospective contractor (not informing them that they are in a STA position) to complete the Schedule of Costs and provide an alternative Plan of Approach if appropriate. The proposed Research Contractor must demonstrate that charging rates and resources allocated to the work are reasonable and agreed, and this must be included in the PID.
5. Once the Plan of Approach and costs have been confirmed, the Project Leader should amend the PID to take them into account. If the amended PID is significantly different from the original, the Project Leader should consult with the Regional R&D Co-ordinator to decide if a full review of the revised PID is necessary.
6. The financial form to authorise a STA (Form C) must be completed by the Project Leader in conjunction with the Regional R&D Co-ordinator.

B2 - Detailed planning and project authorisation

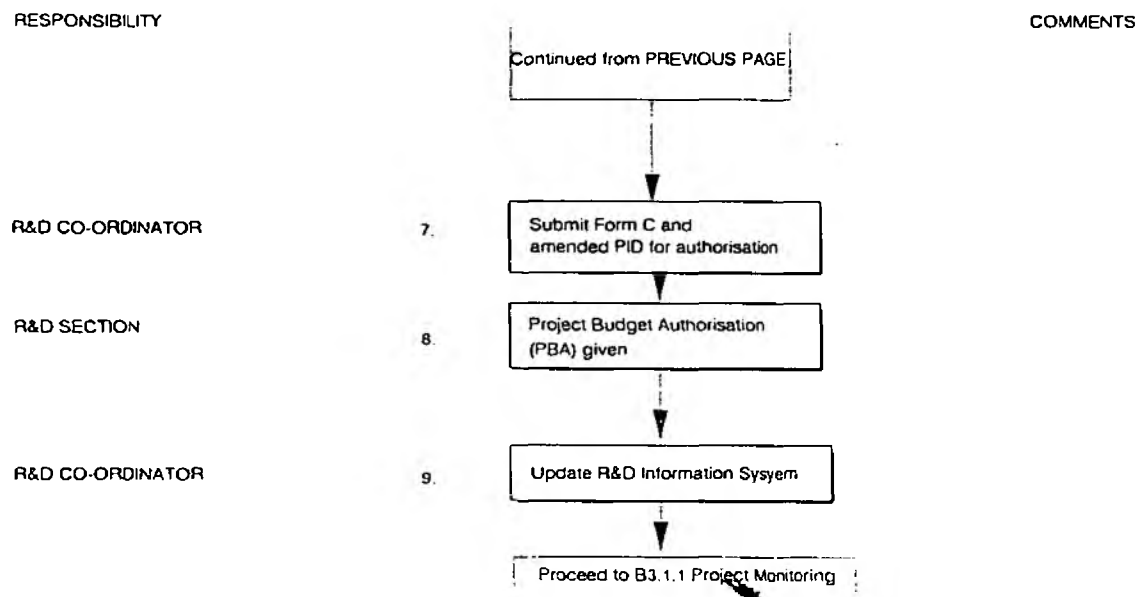


Figure B2.1.3.B - Single Tender Action

7. The completed Financial Form C and amended PID should be sent for authorisation by the appropriate level of NRA officer as detailed in the *Scheme of Delegation* and R&D numbered paper, *R&D Expenditure on National Projects (R&D(92)1A)*. The Head of R&D will be involved in this process.
8. Once authorisation of the Financial Form C has been given, the R&D Section will issue the PBA. This authorises the project to commence.
9. The R&D Co-ordinator must update the R&D Information System before the next monthly exchange of data.

B2.2 Guidelines

B2.2.1 Drafting the PID

The PID is a dynamic document that may, if necessary, be changed during the life of the project. The Project Leader is responsible for the preparation and update of the PID, in agreement with the *Project Board*. *The Project Management Procedures PIN - Section 4.2* provides further details.

Before starting to draft a PID, the Project Leader should ensure that he is familiar with:

- (a) the background to R&D in the NRA as given in *Chapter A2 - Introduction*, or summarised in the relevant sections of the latest Annual R&D Review;
- (b) the relevant Function Strategy, Business Plan (where they exist) and Topic Investment Appraisal, and has been briefed by the Topic Leader on the background to the project, together with receiving a copy of the approved Summary Appraisal Form for the R&D project; and
- (c) the approach to project development and appointment of Research Contractor (see *Section B2.1.3*). The Project Leader should have discussed this with their Regional R&D Co-ordinator and should be aware - in particular - of the stages in project development. The *Procurement Manual* PIN and the *Financial Memorandum and Scheme of Delegation* must also be followed. The Project Leader and the R&D Co-ordinator should agree who writes what in the PID. This will vary depending on their relative skills, knowledge, time availability, etc.

The four sections of the PID - Project Brief, Product Descriptions, Business Case and Project Plan - that must be completed are further explained below.

B2.2.2 Project Brief

The Project Brief, except for appendices, will be held in the R&D Information System. The following section numbers generally, except the front sheets, refer to memo fields presently held or planned in the R&D Information System:

1. Front Sheets (specific fields)

Standard front sheets will include:

- the project title (as given in the Summary Appraisal)
- the R&D Commission reference and title
- the Topic Area reference and title
- the proposal reference and (when issued) project number
- the R&D Frascati category

- the R&D primary purpose
- the names of the R&D Commissioner, Topic Leader and Project Leader.
- the details of the contractor
- the type of contract
- the contract dates.

For cross-functional projects, the names of the customer representative taking on the role of Topic Leader and R&D Commissioner as sponsor should be given.

2. Objectives

"Overall objective" explains what the project objective is and the business need which is being addressed. It should be the same as given in the Summary Appraisal unless changes have been agreed with the Topic Leader, R&D Commissioner and Project Board.

"Specific objectives" are defined to provide finite, usually interim, objectives which the project team will need to meet. These will frequently reflect the packages of work into which the project is divided into and key targets against which progress can be monitored. They will also reference each permanent output that will be produced.

3. Problem, need or opportunity (new memo field)

The problem, need or opportunity must be identified as in the Summary Appraisal. This will give the reasons why the project has been identified and will include the developmental initiative or continuing activity which the project supports.

B2.2.3 Product Descriptions

4. Deliverables (previously Outputs)

The Product Descriptions must be prepared and presented on PM2 forms (see *Appendix B*). Each permanent output produced from the project must have a form completed. This provides a brief outline of the output planned to be produced. These will need to be attached as an appendix to the PID.

Additional details should be completed on the R&D Information System which will give details on both short-term documents and permanent R&D outputs. The types and Designation of outputs and Customer Acceptance Level are described in the Guidance Note on Production of R&D Outputs (*R&D Note 180*) and must also be added.

It should be noted that Project Outputs can be specified at interim stages of a project - e.g. a Report following a Literature Review.

B2.2.4 Business Case

Section B2.1.2 outlines the process producing the Business Case. The following gives further details of what is required.

5. Background

The "**background**" to the project should be as short as practical. It must state which developmental initiative or continuing activity the project supports, and indicate why the NRA needs to undertake R&D (e.g. to improve its operational effectiveness in some area) thus elaborating on the primary purpose. Cross-references to Topic Appraisals or other relevant projects should be made if appropriate. Similarly any policy implications should be highlighted. The proposed/actual procurement route (competitive tender or single tender action) should be given with supporting reasons (see *Section B2.1.3*).

There must also be an explanation of the possible "**options**" considered in deciding on the approach of R&D project, in particular the reasons for rejecting options for not "doing nothing" or doing the minimum possible. All the options considered must be consistent with the objectives or strategy of the NRA and must accord with the NRA's Environmental Policy. Refer to *Section 4.4.6 Project Management PIN*. (Note this links in with statements on Finance Form A). The level of detail should relate to the size of project.

It is necessary to identify the costs, benefits and risks of undertaking each of the various options (*Sections 4.4.7 - 4.4.12 Project Management PIN*). In R&D projects it is often difficult to quantify the benefits, but it will still be necessary to record the benefits associated with each option. Further details of ranking these "intangibles" are given in the *Economic Appraisal Manual*. (Note that a full economic appraisal may become a project in its own right.) On completion of this assessment, the preferred option must be stated. Where a discounted cash flow has been produced, this should be shown in an appendix.

"**Context**" explains the context of the project in relation to the overall R&D Programme and to research undertaken by others. Attention should be drawn to relevant external practice and other research programmes (in UK and overseas, especially CEC) with which the project team must liaise. If technical or financial collaboration has been arranged with external bodies, this should be mentioned.

6. Benefits

This section defines the benefits that will be realised upon successful implementation of the project. It answers the question "what will the project outputs do for the NRA?". Benefits may be categorised as:

- **tangible:** e.g. savings, cost avoidance or revenue enhancement;
- **intangible:** i.e. unquantifiable benefits such as meeting new statutory requirements.

It is important to check whether the intangible benefits can in fact be translated at least in part to tangible benefits. Further guidance is provided in the *Economic Appraisal Manual*. It is also necessary to state how the benefits will be monitored and hence how the success of the project will be measured. Unless this is done, the NRA will have no objective method of evaluating project success. (In parallel with the *Economic Appraisal Manual* there are also a list of Regional experts (Finance Directorate, Head Office, has the list) who can help with providing advice and guidance.)

7. Assumptions, Constraints and Risk

"Assumptions" made in drafting this PID should be listed, including those which relate to cost, timescale, benefits and performance of contractor. Also state those assumptions on which project success may depend, for example data being ready from another project or input from NRA function staff.

"Constraints" are limitations on the scope or execution of the contract and should be listed. These may exclude specific avenues of research, time necessary for data collection, liaison with certain groups reliance on other project outputs, date by when results need to be known etc.

"Risks" are any potential threat or occurrence which may prevent the project from achieving its objectives. A risk assessment must be carried out for the preferred option identifying both the probability of identified events occurring and the impact the event would have on the project. Each risk identified should be listed and each identified as either high, medium or low. High and medium risks should each have a contingency plan outlined which says how the risk will be managed if it actually occurs. Note that projects containing high risks will not normally be undertaken by the NRA and therefore, if encountered, specific statements on how the risk is to be managed must be included. When assessing risk should be taken into account. (See *Project Management Procedures PIN - Section 4.4.12*). If a project is medium or high risk, then it must be considered in the next category i.e. "Small" regarded as a "Medium" project.

B2.2.5 Project Plan

Every R&D project, whether "Small", "Medium" or "Large" will produce a Project Plan. The level of detail will obviously change according to the category. There are three parts to the Project Plan i.e. Technical, Resource and Quality. This section builds on *Project Management Procedures PIN - Section 4.5*.

B2.2.6 Technical Plan

The Technical Plan details the activities and stages in the project, the outputs produced and their estimated time for production. Some R&D projects are complex and the management and control of a project is facilitated by its division into manageable packages as well as into lifecycle stages. For most R&D projects, which comprise work done under a single contract, the contract itself is one of the "work packages". Another package would be the work that the NRA has to do itself in order to complete a particular research stage. Each package is undertaken by a research contractor, or group of NRA staff, and has a specific output. A "contract" should not be confused with a "project"; the former need only be one part of the whole project. Each package of work must have a single person responsible for its management; this person may be the contractor's contract manager, the Project Leader or any other named member of the project team.

Phases of projects

In *Chapter A3*, the nature of the development of R&D projects was described and, in particular, the need which often arises to limit how far work may proceed before a formal reappraisal is conducted. For some projects, it is inappropriate to seek authorisation for the full project or even the full extent of the R&D, but only for work to a specified milestone. The period between successive formal reappraisal points is called a "phase" and may include one or more project stages.

The Technical Plan must clarify how the phases and stages of work fit together. Each phase must produce an output which is stated in the objectives.

8. **Approach (previously Method)**

In this section, the Project Leader should state how the project is to be carried out. They will need to decide the stages through which the project will pass, the key control points, the order in which major work items will be done and the type of resources needed. This will cover, not only undertaking the R&D, but also dissemination and implementation.

Overall approach summarises the overall plan and organisation of the project, particularly any packages of work into which the project is divided, the reporting link to the end-user, and how progress will be monitored.

Undertake R&D summarises the main R&D activities in the programme of work in sufficient detail to indicate the steps (e.g. literature review) in which the work will proceed. (The Project Leader will subsequently report progress in his regular Monitoring report against these activities (see *Chapter B3 - Project monitoring*)). Some activities should be selected to link in with Specific Objectives (Item 2) in order to provide interim Targets (see Item 9). This provides the means for the monitoring framework to test the achievement of objectives. Ensure that each

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Package of work (listed in Budget Plan, Section 11 Costs) is described. Note that final packages are frequently internal NRA activities.

Uptake covers:

- (a) Dissemination by appropriate NRA officers through any workshops or seminars funded through the R&D budget; and
- (b) Implementation by the Function for end-users.

This section needs to indicate the broad philosophy of how the Outputs are to be taken up. (See also *Section A2.3.1 - Outputs* for background information.) Implementation activities maybe minimal if the project output simply feeds into another project. In such cases, the project into which the R&D will feed should be stated. In other cases, full implementation may potentially be a long activity, and only a limited implementation phase might be included in the project. In all cases, the activities to be undertaken in implementation must be outlined and the scale of cost indicated. This outline plan is progressively developed during the project as the "Implementation Plan" in discussion with both end-users and customer for the R&D.

The three routes for uptake are explained in more detail in *Figure B.4.2 - Uptake of R&D* and in *Section B4.2.2*.

9. Targets and Timescales

This section explains when various significant points in the project are to be achieved, particularly the dates for key deliverables. Key targets by which the effectiveness and success of the work can be assessed (as distinct from simply progress in activities listed in Item 8), as well as for the completion of activities or delivery of outputs should be given. Wherever possible interim targets should also be specified so that progress can be assessed. If the project is divided into multiple stages or contracts then the start and end dates of these should be given. A Gantt chart relating to the approach and method in Item 8 must be included as an appendix.

A software tool, Microsoft Project, is to be used by all R&D Co-ordinators to produce these Gantt charts. All significant tasks identified under this Item must be shown in the chart. The bars will be regularly updated to show how progress on these tasks is progressing. The Microsoft Project software will also be able to hold manpower information in order to show when inputs are required and easily highlight if problems exist.

B2.2.7 Resource Plan

The Resource Plan details the costs and manpower estimates required for each activity to complete each output successfully. The project organisation and staffing responsibilities are detailed in Item 10. More than one R&D contract may be needed in order to meet the project objectives. Each contract may be supervised directly by the Project Leader, or it may be delegated to another NRA staff member who reports (in the project line) to the Project Leader. In effect, the project is broken up into manageable "sub-projects". The Project Leader retains overall responsibility for the project, but may allocate subsidiary packages to others.

This process of dividing the project into manageable pieces is influenced by:

- the project organisation and lifecycle stage
- the need for control points and phasing of the work
- the scope of work packages and the contractor concerned
- the time availability of NRA staff on the project to apply to the project related work.

10. Organisation (new memo field)

Project Organisation explains the responsibilities and reporting relationships of the principal parties, including Function Working Groups. This section should list the names and the roles of the people involved in the project, as approved by the PAB (see *Section B2.1.1 - PID*). It should also document the working or steering groups (if any) associated with the project with the names of the members of the group. For more complex projects, an organisation chart should be given in the Appendix. It is assumed that the roles and responsibilities are as given in this manual; only changes from the standard need be explained. If the project is being done in collaboration with others, then the roles, responsibilities and relationships should be defined here.

Project Monitoring explains the responsibilities and reporting lines for monitoring progress. R&D Project Leaders will report to a Project Board comprising staff including the Topic Leader. The Topic Leader should be a member of a relevant NRA Working Group or in some cases a member of an external Steering Group, representing the end-users of the research.

All "Medium" and "Large" projects can have an external independent expert as part of the Project Board. Those with significant IS impacts will have an IS nominee.

11. Costs

Costs (including manpower resources) explain **how much** the project will cost and where the budget comes from. It is accepted that not all costs shown can be readily monitored at present. Details are set out in schedules covering:

- **Outline Cost Plan**, which gives an overview of the project on a stage by stage basis.
- **Stage Cost Schedule**, which gives the cost breakdown of significant work packages as each is started and PID is updated. Optional for small packages, but needed for budget variations.
- **Budget Plan**, which gives the cost and required cash flow by financial year for each activity. This is mandatory for projects having several work packages or needing significant function staff resources.
- **NRA Staff Resource Plan**, which indicates the Function and R&D staff resources required to manage and undertake the project.
- **Funding Plan**, which shows the sources of funding.

The "Authorised Total", in the outline cost plan, covers the full project costs, including project management costs. This total figure links in with that on the Financial Form A. It includes costs borne by the Function's budget and by external agencies. (Note that budget not controlled by the NRA should not be included in the Financial Form A, but will be recorded in the PID.) The Authorised Total cannot be changed following PID approval except by formal reappraisal and approval of the changed project.

The NRA Staff Resources plan should show best estimates of staff inputs. Project Management by Function Staff should cover only the Project Leader and Topic Leader. Project Leaders are normally expected to spend between 5 and 10% of their time (average 8%) on project management per project, and Topic Leader 10% of their time on Topic activities. The Regional R&D Co-ordinator input to support the Project Leader will depend on their degree of technical involvement and the complexity of the project.

Uptake costs are approximate estimates only to identify their nature and scale. These may be relatively low for projects having uptake routes (a) or (c) (see *Section B4.2.2 - Uptake*). Uptake costs and timing will always be re-appraised during and at End of R&D Stage.

Tolerances for reporting change must be set in this section (see *Section B3.1.4 - Change control*).

B2.2.8 Quality Plan

This details the quality strategy, the quality acceptance criteria and the resources required for the quality reviews and relative timings of the reviews in relation to the outputs identified in the Technical Plan. The *Project Management Procedures PIN - Section 6.2* has further details.

12. **Quality Plan (new memo field)**

This memo field on the R&D Information System will be used to detail the Quality Plan. It will state which outputs are to be subject to Quality Review, the general acceptance criteria against which the outputs are to be reviewed, the procedures to be used - i.e. formal or postal (see *Project Management Procedures PIN - Section 6.5-6.6*) and any tests which may be required. Where the acceptance criteria are highly complex, it is only necessary to give a general description of the type of test here.

A Quality Review Panel (QRP) will be assembled from staff who either have an interest or a particular technical expertise in the outputs under review including the independent Topic Advisor where relevant. The Project Board will provide the Chairman of this Panel and can decide who are the further members of this Panel. These details are to be entered into this memo field. The role of this Panel is to review the outputs for "fitness of purpose" and consistency to the Product descriptions, further details are given in *Appendix A*.

The establishment of the QPR should be undertaken as early as possible - they may be required to review the PID! The roles should be agreed, even if names have not been agreed by the time the PID is complete and submitted for approval.

The way in which the QPR operates should also be stated. It may not be necessary to hold a specific meeting, but rather to undertake the review by correspondence. The output will be sent to Panel members who will be given a specified time in which to respond. In this case, the Chairman must ensure all action points have been signed off. If a review by correspondence is to take place, then this must also be documented.

B2.2.9 Choice of Potential Research Contractors

Register of potential contractors

R&D Section and the Regional R&D Co-ordinators can advise on the choice of potential research contractors. The R&D Section maintains a register of those which have registered

bona fide R&D interests with the NRA. A record of performance on each contract is also kept; this is derived from the End-of-R&D Stage Assessment (ERSA) forms (see *Section B4.2.1*).

Selection of tenderers

Detailed advice on selecting tenderers is given in the *NRA Procurement Manual*. The Regional Procurement Officer is able to offer further information and advice. Tenderers should be selected on the basis of their ability and/or facilities to undertake the work outlined in the specification. They must be able to demonstrate normal project management skills - i.e. being able to work to specification, to time and to normal budgetary control. However, most importantly for research contracts, they must have staff available with appropriate experience and intellect to tackle the research issues concerned.

Selection as a tenderer is taken to imply that the NRA deem the organisation suitable to undertake the contract concerned. Particular care must be taken to ensure that the selection criteria reflect the criteria on which the technical quality of the tenders will be judged. (see *Section Tender Evaluation and Clarification* page B2/32).

The *NRA Procurement Manual - Section 3.2.4*, recommends that a pre-tender discussion takes place. This is particularly useful when the scope and specifications of the work need to take account of the views and capability of potential researchers, as such a discussion will enable the NRA to improve the specifications for the work concerned. The location of potential contractors and the budget of the project may affect the decision to hold such a meeting. In all events, the pre-tender selection process should ensure that the potential contractors are:

- (a) willing to undertake the work;
- (b) skilled in research project management; and
- (c) able to satisfy basic technical criteria relating to the specifications.

Depending on the complexity and cost of the proposed work the Project Leader should use the appropriate means of obtaining this information.

Use of in-house work force and NRA as a "contractor"

The particular blend of skills necessary to successfully undertake the work may be found in an in-house work force. They must be treated in the same way as any other potential research contractor. This happens when either the NRA has unique experience of the issues concerned, or it is beneficial for the NRA to gain experience by actually undertaking, as opposed to managing, the research. Allocating staff from their routine duties to a project may be disruptive to operational activity. Employing temporary replacement staff on a contract basis is acceptable in the NRA and can be used to provide a stand-in for mainstream staff member(s). However care needs to be taken to ensure that the latter do not feel their routine job is threatened if it is taken over by another person. Staff who are concerned about

their security will not perform well on a project. The Regional Personnel Department should be able to provide further assistance if needed. Arrangements for charging staff to the R&D project budget must be made with the relevant Regional Finance and Personnel Departments.

B2.2.10 Tender process

Invitation to Tender

The Invitation to Tender (see *NRA Procurement Manual - Section 4.3*) will be sent out by the Regional Procurement Officer. It will consist of:

- (a) covering letter;
- (b) work specifications;
- (c) requirement of tenderers to include names of staff to be used with staff CVs, etc;
- (d) blank schedule of costs;
- (e) relevant summaries from *R&D Note 180*;
- (f) Standard Conditions of Engagement for Research Contracts;
- (g) various items including response card, labels, etc; and
- (h) requirement for proof of financial viability and adequate insurance.

Examples of (a) and (d) can be found in the *NRA Procurement Manual - Section 4.3*. The specifications are discussed below in *B2.2.9 - Choice of potential research contractors*.

Specifications

This section provides guidance on drafting a specification for an R&D contract. It explains the points which need to be addressed in the specification, where their origin lies in the PID and other planning activities, and how the specification is incorporated into the Agreement between the Research Contractor and the NRA.

The specification outlining the proposed work is drawn up by the Project Leader, with assistance by the R&D Co-ordinator who will be familiar with generic aspects. Subject-specific aspects can be produced through a project definition (or scoping) study, and - as with the PID - specialist advice may need to be obtained to develop the "Objectives" and "Approach" which are specified.

Note that general information on specification is given in the *Procurement Manual*. This explains how the specification should be drafted so as to be unambiguous, comprehensive and - as far as uniqueness will allow - unbiased. In particular, the degree of time which should be expended on writing the specification should be broadly commensurate with the value and strategic nature of the project output.

The specification should be explicit in giving details of the work required in terms of objectives, key activities and outputs. In general, emphasis should be on the characteristics

of the output ("function and performance" - e.g. its quality requirements) rather than every detail of how the research should be done ("materials and workmanship" - as, for example, the specification for building a house). If the specification is too prescriptive, it may discourage tenderers from coming forward with their own ideas and making the best contribution to achieving the objectives. However, the specification should not be so vague that tenderers have to rely on their own interpretations of the NRA's requirements.

Guideline price should not be given, but rather an indication of the scale or size of the work. For example, a literature review might specify that "a report of about words' length is required, covering key references in and subject areas, and taking between and man-days' effort from an experienced practitioner". In particular, a specification should provide sufficient on issues with cost or resource implications to enable tenderers to submit meaningful tenders.

Clearly, the coverage of the specification (e.g. detailed technical requirements) will vary depending on the type of output. Details for specification of R&D document outputs are given in the *Guidance Note on the Production of R&D Outputs (R&D Note 180)*.

The specification should cover the following:

Background Use information from "**Background**" in Business Case. Add any helpful data for setting the project in the wider NRA and (inter)national context, referring to any relevant documents and other source material (e.g. Function Strategy).

Objectives Use objectives from Project Brief in the PID (for phase concerned if necessary)

Programme of Work This section should build on the "**Approach**" given in the Technical Plan as appropriate to indicate how the objectives are to be achieved. It is important to describe each activity and task in sufficient detail for tenderers to understand the technical scope of the work. For most R&D, it is appropriate to give a broad framework of activities. Tenderers can also be given the opportunity to suggest alternative approaches, having first costed the NRA's requirements, and to indicate other issues which they consider relevant. Where appropriate, questions and pointers for response should be included to establish the scientific quality of tenders.

Details in the Programme of Work should cover persons and organisations to be consulted; and relevant survey methodology, including approximate sample size; method of compiling and presenting the work. The quality requirements, or acceptance criteria, for checking any deliverable should be stated (see *Section B2.2.1 - PID*) The Programme of Work **must** include details of the form (e.g. style) and any technical requirements (including quality standards) of the outputs.

Deliverables are described (at the end of the Programme of Work under a subheading) as in the list of deliverables in the Product Descriptions section of the PID.

Contract Management describes how the contract will be managed, including any steering group arrangements. This should be based on the Resource Plan in the PID.

Estimated Resources describes the range of man-days within which tenders are expected to be provided. Any other significant resource requirements - e.g. equipment - must be indicated. This also should be based on the Resource Plan in the PID.

The calibre of staff needed should be indicated (e.g. graduate environmental scientist with minimum years experience in) and tenderers asked to provide CVs for staff in key positions (see Invitation to Tender above). These categories of staff can be linked into the future Schedule of Costs to be attached to the Agreement.

Targets and Timescales This section should build on the Timescales and Key Targets in the Technical Plan in the PID. A **Gantt chart** should be provided. Only sufficient detail as is deemed necessary for tender purposes should be provided.

Tender Evaluation and Clarification

When the specifications are being prepared, it is important that the criteria against which all the tender documents are to be evaluated are also considered. These criteria can be set out in a table format and each member of the Tender Evaluation Panel can then independently score each submission before the Panel meets. This provides the framework for the Tender Evaluation Panel meeting.

The criteria may be given a weighting. This can be discussed and agreed by the Panel. This evaluation of quality and price provides a logical process by which the preferred tender can be arrived at. It enables the Panel to decide where best value for money can be obtained and will form the basis of the report to the Regional Tender Board.

Where information in the tender submission is not clear, or felt to be inaccurate, then it is permissible to clarify the bid. The important point to remember is that competition must not be distorted. Further advice can be obtained from your Regional Procurement Officer.

Approval

This section provides a summary checklist to ensure the necessary documents have been produced and approved before a project can start. It depends in which category a project falls as to which documents are required.

The documents required to be completed and approved are described below in a table format.

Documents	Category of project	
	"Small"	"Medium" or "Large"
Summary Appraisal plus Project Plan ("Small PID")	✓	N/A
Project Initiation Document	N/A	✓
Financial Form A ¹	✓	✓
Procured services approved ²	✓	✓
Project Budget Authorisation	✓	✓

Note:

¹ Refer to *Financial Memorandum and Scheme of Delegation* for levels of approval required.

² Refer to *Section B2.1.3* for details of the relevant forms i.e. Form B or C.

Project Budget Authorisation (PBA)

The PBA enables the R&D Section to monitor and control R&D expenditure on all projects. It provides a statement that there is the budget available, not that the other Project Management and Scheme of Delegation approvals have been given.

The PBA number (and consequent Project Number) will reflect a record on the R&D Information System. Where a further phase of a project has a separate PID, then a new PBA number will be given. If the further phase is produced by simply modifying an existing PID then a revised PBA will be issued with the same number, but showing the further budget provision.

B2.3 Contract documentation

This Section provides details of the present (April 1990) standard R&D contract documentation. It explains the basis on which it has been produced, the content and format (see *Appendix G* for copy) and provides examples of clauses that can be altered in certain circumstances. This section will be revised in the light of future revision of the NRA Conditions of Engagement for R&D and further work on commercial issues in the near future. References to the existing clauses have been left in.

B2.3.1 Basis of the Standard Conditions for R&D

The basis on which the Standard Conditions of Engagement for R&D were drafted are given below in order to aid understanding and interpretation.

- there must be equity between parties to a contract; courts will not uphold manifestly unfair contracts; the Contractor has a right to be treated fairly and provision is made for:
 - the requirement for the NRA to adhere to timetables for decision making
 - some flexibility on annual spend
 - some virement between cost categories
- a single, named, point of formal contact is given for both the Contractor and the NRA
- the Contractor is obligated to use named staff; if changes have to be made, the NRA has the right to approve replacements
- unless agreed otherwise, the results of the Contract belong to the NRA exclusively and it has sole discretion on whether to publish the results externally
- costs will generally be on a time plus expenses basis up to a ceiling. This ceiling figure can only be varied under the conditions laid down in the Contract. The costs are presented in a schedule which allows the calculation of variations to be done on a reasonable basis
- liquidated damages have not been provided as they need to bear some relation to an actual loss which the NRA would suffer. It is considered that for R&D contracts this may be difficult to establish
- there is no "maintenance period" for outputs of the R&D contract
- there is no arbitration clause see *B2.3.3 - Relating to Additional Clauses*
- the NRA has the right to terminate the Contract.

B2.3.2 Standard Contract Documentation

The standard R&D contract documentation is described in brief below. More detail on the Standard-Conditions of Engagement and Schedules is given in the *Appendix G*. A typical contract comprises the:

- Preamble (optional)
- Memorandum of Agreement
- Standard Conditions of Engagement of a Research Contract
- Schedules 1 to 9 as appropriate

Preamble

This is an optional section in the contract documents and is not part of the legally enforceable contract. In some cases, it could be helpful to use this to provide background information which would not otherwise appear in Schedule 2.

Memorandum of Agreement for Research Contracts

This is an essential legal document signed by both parties to the contract and refers to the Standard Conditions of Engagement and Schedules which also comprise part of the contract.

The Memorandum highlights key features of the Contract which are laid out as a proforma, as follows:

- project reference number
- NRA contract reference number
- project title
- names of contacting parties
- start and completion date of contract
- name of NRA's Nominated Officer
- name of Contractor's Nominated Officer
- contract cash flow
- retention
- maximum total liability
- list of schedules
- signatures

Ideally the NRA's Nominated Officer should be the Project Leader. However, in some cases this person may not have the delegated authority to act for the NRA. In this case, it is simpler from the NRA's viewpoint to name a Nominated Officer who has the authority to sign the Contract and for this person to delegate the day-to-day running of the project to the Project Leader. This should be recorded in the Project Initiation Document. The Contractor's Nominated Officer ideally also should be directly involved in the execution of the contract and be the single point of formal communication between the parties.

A standard list of schedules is included and given below. These retain their reference numbering even if one is not used on a particular contract.

Standard Conditions of Engagement

The Standard Conditions of Engagement are included in the Appendix together with notes on interpretation and use. The basis of the conditions is described in *Section B2.3.1*.

Schedules

The additional information to be provided by purpose-written schedules is as follows. This is described more fully in the Appendix:

1. **Supplementary conditions** (mandatory) is for inclusion of additional clauses or amendments to the Standard Conditions. In the event of a conflict between the two, the Schedule 1 conditions shall rule. See *B2.3.3* below for an outline of what this contains.
2. **Terms of Reference (to be renamed Specification)** (mandatory) of the Contract should be a complete specification of the work the contractor is to undertake.
3. **Organisation Chart** (recommended) is for the contractor to show how his team is organised, including sub-contractors if any. For a simple project this may not be necessary and the team and their roles can be included in Schedule 4. This relates to Item 10 of the PID.
4. **Staff Resources** (mandatory) is for the contractor to list the team and its qualifications. It may be supplemented by CVs and is likely to influence the choice of contractor.
5. **Plan of Approach** (mandatory) for tendered contracts, the contractor will develop this in response to the specification. For an STA, a similar approach is adopted, although the contractor may provide a preferred alternative Plan. It should include both a statement and programme (bar chart). It relates to "work specification" in the ITT and Item 8 of the PID, but is worked up, by the tenderer in far more detail.
6. **Activity Schedule** (optional) tabulates, in the form of a Gantt chart, the activities to be undertaken, the resources needed, duration and work content; it provides in a visual format that which is in Schedule 5. This relates to Item 9 of the PID and is prepared, by the tenderer, based on his Plan of Approach.
7. **Capital Equipment** (optional) relates to procurement of any capital items within the Contract.

8. **Project Budget (to be renamed Contract Cash Flow)** (mandatory) is a Schedule which shows the contractor's expected invoicing profile including, total spend (see Schedule 9) and spend in each NRA fiscal year with retention shown specifically. The instruction to tender should state whether the Contractor should provide estimates of spend by month or by quarter. This relates to section 6 of the Project Plan.
9. **Schedule of Costs** (mandatory) is presented under set categories defined in the tender instructions. This Schedule also indicates whether certain expenses are "at cost" or covered by an all-in daily rate. This relates to Item 11 of the PID.

B2.3.3 Non-standard Contract Schedules

Schedule 1 - Supplementary Conditions

Schedule 1 is used to vary the Standard Conditions of Engagement. The following lists some of the items which frequently appear in this Schedule. More examples are given in the *Appendix G*.

Relating to existing clauses:

- cl 1.1 Contract Year: state the NRA's fiscal year unless circumstances dictate otherwise.
- cl 2.7 Progress and Interim Reports: define here unless already in Schedule 2.
- cl 2.8 Final Reports: define here unless already in Schedule 2.
- cl 2.11 Computer Software: if the 12 months stated is not suitable, state a different period.
- cl 2.13 Invoicing: the contract allows for monthly or quarterly invoicing. In order to reduce administration, it may be agreed that the quarterly invoices are full submissions and the two previous monthly ones are estimates. In this case ensure the quarterly ones match the NRA's quarterly financial reporting needs. State if the monthly invoices are only interim in nature and subject to correction until final account.
- cl 3.4 Project Review Meetings: state if required more frequently than the six months given. Also amend 14 days notice for ad hoc meetings if necessary.
- cl 3.5.2 Completion of Work: amend this clause to reflect the relative responsibilities for testing, acceptance and installation of computer software.
- cl 3.7.3 Inflation: the basis for inflation for the prices in Schedule 9 should be stated (or if none, state none.)

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- cl 3.9.2 Retention: any changes to the standard 10% off each invoice should be stated.
- cl 3.9.5 Annual Expenditure: any change to the 10% tolerance on annual spend shall be stated.
- cl 3.10.1 Virement: any change to the 20% tolerance for each cost category shall be stated here.
- cl 4.1.1 Termination: if 28 days is inappropriate then an alternative can be given.
- cl 4.8 VAT: amend the clause to account for exempt supply or other special cases.

Relating to additional clauses:

Settlement of Disputes: no clause exists but, if necessary one may be inserted. Without one, it is implied that disputes would be settled in a court of law, rather than by arbitration.

Maintenance Period: can be appropriate for contracts involving supply of bespoke or special equipment. This should not affect the NRA's statutory rights.

Postponement: there is no clause; for multi-stage contracts it may be worth considering this to cover gaps between stages. Head Office R&D Section should be consulted if this is considered important.

Foreign Currency: if part of the contract requires foreign currency it should be made clear how the contractor is to be paid (exchange rate, etc.).

Special Circumstances

If the contract involves any special or extraordinary circumstances, then advice should be sought, in the first instance from R&D Section; the NRA has specialist legal and procurement services which can be called upon to give advice.

Contracts involving capital equipment

In certain cases, the contract may involve the delivery of items of bespoke capital equipment. In these cases, it may be worth considering a 6 to 12 month "maintenance period" starting from when the work is complete. The Contract is then complete at the end of the maintenance period. The objective of this period is to allow the NRA to use the capital equipment for a given period and, if faults are found, the Contractor is obliged to rectify them at no cost. In the event of any problems, the NRA would not release the full retention money until the faults have been rectified. Day-to-day maintenance of the equipment would rest with the NRA as it has accepted delivery. The maintenance period should not be used to modify the equipment; if modifications are needed they can be arranged by using a mutually agreed variation and the contractor being paid accordingly.

Contracts with commercially exploitable outputs

If a contract contains an output which is potentially commercially exploitable then the contract needs to include clauses to cover the particular circumstances which may apply. General guidance is given in *Section A2.2.5 - Commercial issues* and more specifically in the related R&D numbered paper *R&D(93)16A*.

Contracts involving computer software

All projects in the NRA involving a significant IS element must be reviewed via Head Office R&D Section by the Information Systems Department to check their compatibility with overall NRA IS policy.

Contracts involving computer software as part of the outputs must be considered carefully as the following issues, among others, need to be considered:

- who will keep the source code after the contract is complete?
- what are the arrangements for subsequent modification?
- who will "support" the software and deal with users queries?
- what happens to the source code if the contractor goes into liquidation?

Any matters concerning intellectual property rights and other Commercial Issues should be dealt with in line with the preceding section. It may be that alternative forms of contract are more appropriate. The Procurement Department and R&D Section should be consulted.

Use of contracts put forward by others

The NRA's policy is to use its own Conditions of Engagement, except where the NRA is a minor funder in a collaborative project, on all occasions and R&D Section should be consulted if contractors propose alternatives.

Legal advice on contract matters

All Regional R&D Co-ordinators should ensure that their Regional Solicitor or departmental legal officer are familiar with the Standard Conditions of Engagement. Detailed queries should be routed through the R&D Section which can then draw on the advice of the professionals who drafted the conditions and the Legal Services Department. Any proposal giving rise to commercial issues (see above) should be discussed with the Legal Service Department in Head Office.

B3 PROJECT MONITORING (STAGE 3)

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DOCUMENT CONTROL

Version Number	Issue Date	Comment
0.2	01/11/93	First draft issued for review
1.0	28/02/94	First issue of Manual

B3 - Project monitoring

B3 PROJECT MONITORING

B3.0 Introduction

This chapter explains how R&D projects should be monitored, what reports have to be produced and who has to review and approve any changes to the original plan. It builds upon *Project Management Procedures PIN, Section 7 and 8*. The chapter starts with the briefing of the Contractor and finishes with the production of the final product.

The first section (*B3.1*) describes the processes involved. It explains the procedures for technical, quality and financial monitoring and ends with the description of the change control processes.

The second section (*B3.2*) gives guidance on various matters concerned with monitoring projects. The third section (*B3.3*) explains the sort of project files that are required when running a project.

RESPONSIBILITY

COMMENTS

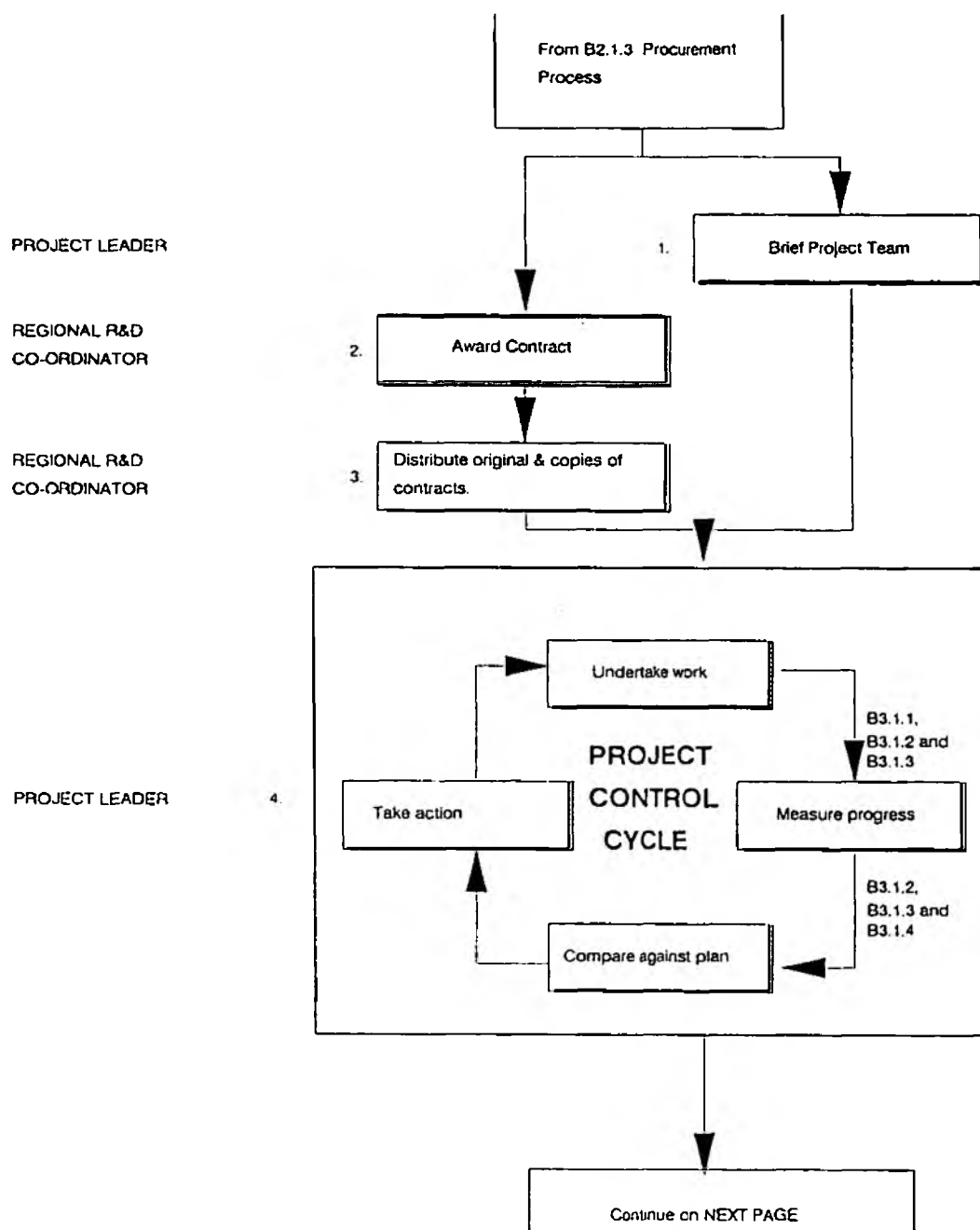


Figure B3.1 Project Monitoring

B3.1 Process Description

The steps to be completed for the Project Monitoring stage are described below and shown schematically in the associated flow chart (*Figure B3.1 Project Monitoring*).

1. Once the project has been authorised and the PBA issued, the Project Leader should notify the team as given in the PID. It is recommended that a briefing meeting is held which includes the Topic Leader and other key members of the team to check the understanding of the PID and to confirm working relationships. This meeting should also involve the Regional R&D Co-ordinator, research contractor (see *Section B3.2.4*) and, if there are significant in-house inputs, NRA staff who would be responsible for co-ordinating these.
2. The Regional R&D Co-ordinator should arrange for the formal award of any R&D Contracts (whether external or internal). Two copies of the contract need to be signed, one for the research contractor and the other for the NRA (signatory in accordance with the *Scheme of Delegation*). Letters of Intent may be used in accordance with the NRA *Procurement Manual*.
3. The Regional R&D Co-ordinator should send:
 - a signed copy of the Contract to the Contractor;
 - a signed copy of the Contract to the formal records store within the Region (follow Regional procedures); and
 - a working copy of the Contract to the Project Leader.

The Regional R&D Co-ordinator must also keep a working copy for their own use.

4. The research work can now start. All the principles of project management described in the *Project Management Procedures PIN* apply. Particular attention should be given to ensuring that all staff involved in the project know and understand what their role is, when they are to contribute to the project and what benefits they may receive; it is only through people that anything at all will be achieved. The guidelines following this section provide more information on supervision (*B3.2.1*) and managing the contractor (*B3.2.2*). The cyclical nature of each stage is represented in the flow chart by the Project Control Cycle:
 - work is carried out;
 - progress is measured;
 - progress is compared against the plan; and
 - corrective action is taken if needed.

The full range of project controls are applied wherever appropriate as described in *Project Management Procedures PIN - Section 7.4 and Section B3.1.4* of this chapter. Guidelines are given in *Sections B3.2.1 to B3.2.4*.

B3 - Project monitoring

RESPONSIBILITY

COMMENTS

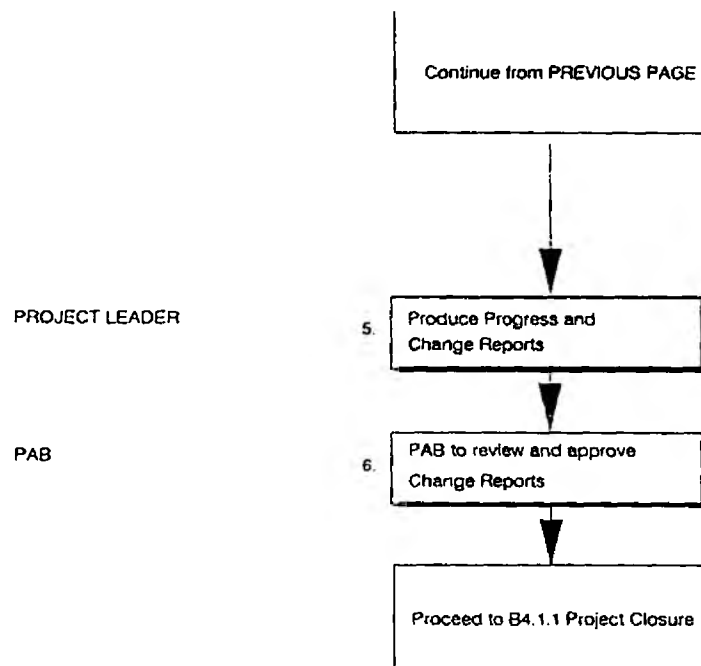


Figure B3.1 Project Monitoring

5. It is the responsibility of the Project Leader via the contractor, to produce Progress Reports to enable the Project Board to monitor progress. The content will be in the format specified *R&D Note 180*. These will be produced quarterly or as determined by the Project Board. The R&D Co-ordinator will enter progress details onto the R&D Information System every 6 months.

Where significant changes are required to be made to the approved PID, then a Change Report is required (see *Section B3.1.4*). This ensures that any major adjustments to the PID are approved.

6. The Project Leader completes the Change Report Form (PM5, see *Appendix B*) which is sent to PAB for approval.

B3.1.1 Technical Progress Monitoring

Technical progress must be monitored regularly to ensure that the Project Plan is being followed. It is important that products are produced on time, to cost, to specification and that the planned method of working is being followed. The monitoring of financial information is covered in *Section B3.1.2* and that of quality in *Section B3.1.3*.

The contract is the legal document which states the agreement that is reached between the NRA and the research contractor (see *Project Management Procedures PIN - Section 7.3*). It is the responsibility of the Project Leader to ensure that the contract is being adhered to and that, if any change is required, it follows the process described in *Section B3.1.4*. By closely monitoring progress against the contract, the Project Leader will ensure that the NRA is obtaining value for money and that the products will be delivered to time, cost and quality.

The technical information will be an important element of the R&D Progress Report (see *R&D Note 180*).

These will need to consider the intermediate targets and milestones and to check that work is being undertaken as planned. The objectives should still be addressed and it is required to ensure the Plan of Approach is still being followed.

B3 - Project monitoring

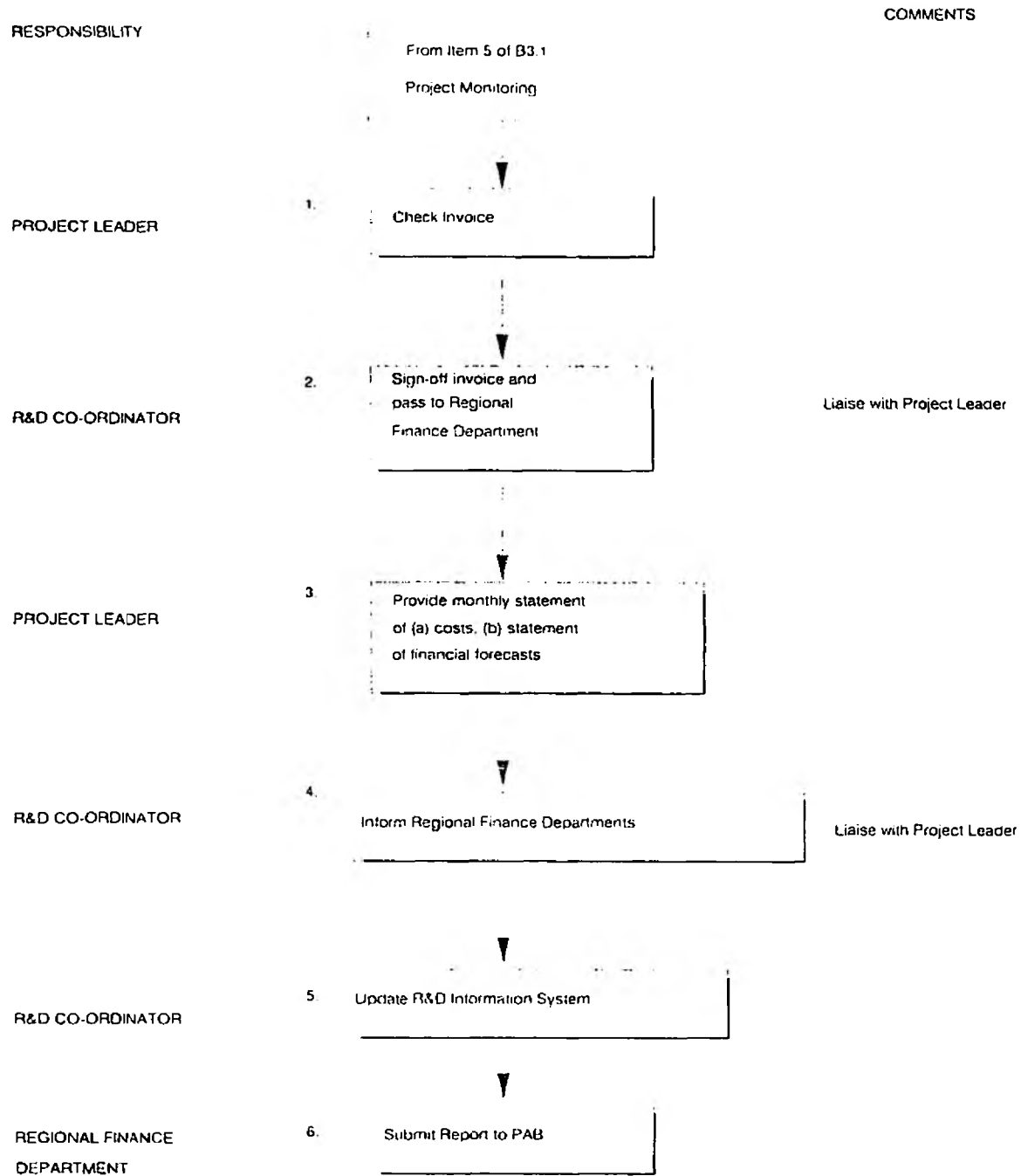


Figure B3.1.2 Monthly Financial Monitoring

B3.1.2 Financial Monitoring

The *Project Management Procedures PIN - Section 8* details the requirements for financial monitoring. These enable a high-level monitoring of the R&D programme to be undertaken and inform the PAB of project progress. It is necessary to establish the points at which monitoring must commence and end for individual projects. These are detailed in *Project Management Procedures PIN - Section 8.3*.

The steps to be completed for Financial Monitoring are described below and shown schematically in the associated flow chart (see *Figure B3.1.2 Monthly Financial Monitoring*).

1. The Project Leader must check the accuracy and validity of all invoices.
2. Once the invoice has been checked, it must be signed off by the appropriate person under the *Scheme of Delegation (SoD)*. It must then be passed through to the Regional Finance Department for payment. It is essential that the R&D Co-ordinator and the Project Leader liaise through out this process.
3. The R&D Coordinator must ensure that the Project Leader provides monthly statements of the costs, both of accrued and forecast outturns for the project.
4. The Regional Finance Department must be informed of this information by the R&D Co-ordinator acting in liaison with the Project Leader.
5. The R&D Co-ordinator must update the R&D Information System with this information before the monthly transfer of data electronically to Head Office.
6. The Regional Finance Department will submit a report to the PAB in accordance with the requirements of *Project Management Procedures PIN - Section 8.5*.

RESPONSIBILITIES

COMMENTS

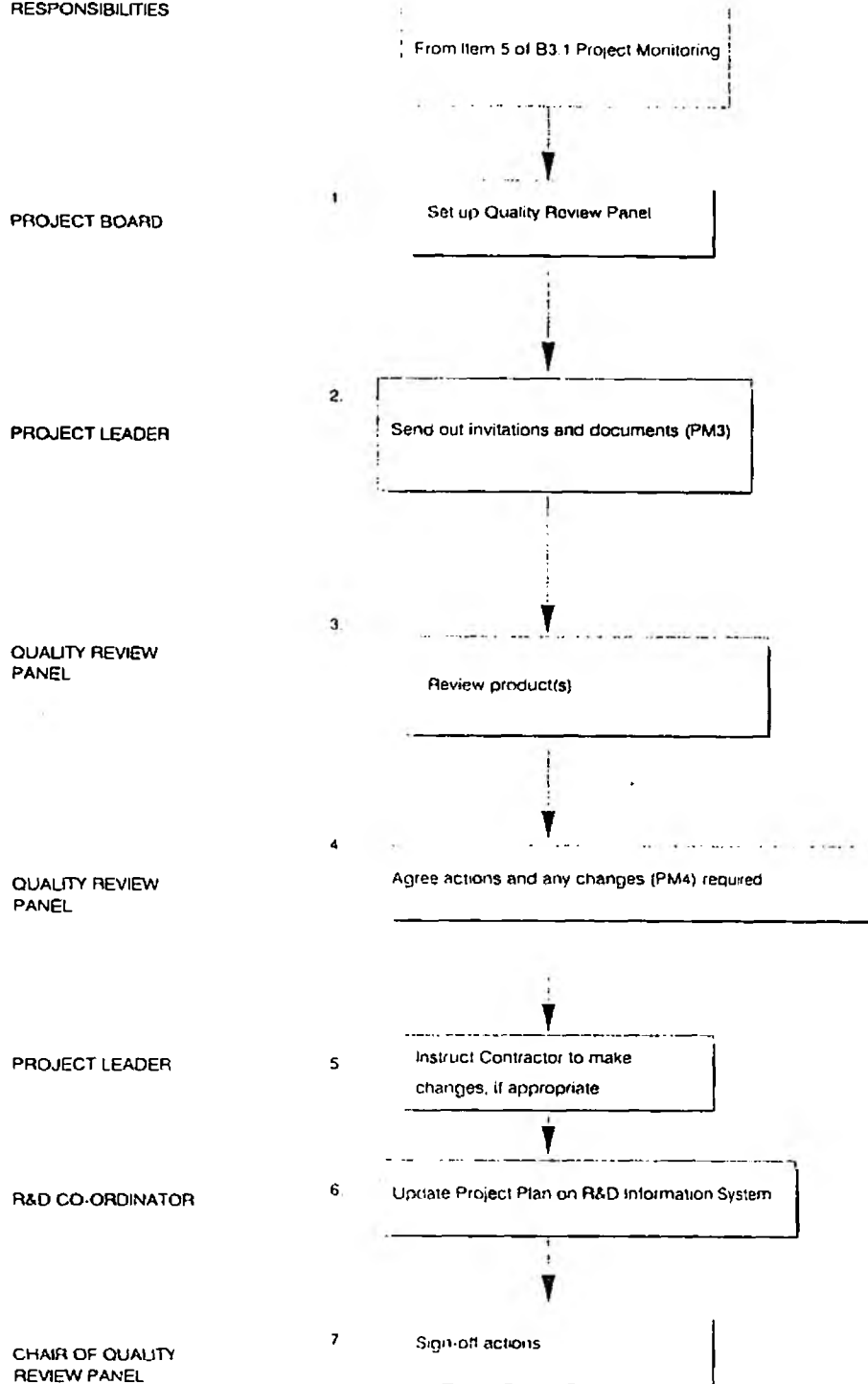


Figure B3.1.3 Quality Monitoring

B3.1.3 Quality Monitoring

This section builds upon the *Project Management Procedures PIN - Section 6*. The Quality Plan, which is part of the Project Plan (see *Section B2.2.8*) details the quality strategy, the quality acceptance criteria and the resources needed for the quality reviews and relative timing of the quality reviews in relation to the products identified in the Technical Plan (see *Section B2.2.6*). Quality reviews, timed to coincide with the completion of individual products, compare actual project progress against the approved plan.

The steps to be completed for Quality Monitoring are described below and shown schematically in the associated flow chart (see *Figure B3.1.3 Quality Monitoring*).

1. The Quality Review Panel has to be established. For "Small" projects the R&D Contact Point or other relevant functional representative may perform this role. For "Medium" and "Large" projects, the Project Board must set up the Panel. (See *Project Management Procedures PIN - Section 6.4*).
2. It is the responsibility of the Project Leader to send out the invitations and associated documents to be reviewed. The form PM3 (see *Appendix B*) should be used for this purpose.
3. The review may take place at a meeting or by correspondence. In either case, each product must be reviewed from the point of view of "fitness for purpose".
4. All the agreed actions and changes that are required must be recorded on the Quality Review Action List form (PM4, see *Appendix B*). These may need to be accompanied by additional notes, diagrams, marked up text, etc.
5. The Project Leader may then have to liaise with the Contractor to ensure that the changes or amendments required by the Quality Review Panel are actioned. It is the responsibility of the Project Leader, with the R&D Co-ordinator, to ensure the quality of the output conforms to the required standards in both content and format.
6. The R&D Co-ordinator, in liaison with the Project Leader, must update the Project Plan on the R&D Information System following any review.
7. Once all the action points have been completed, the Chair of the Quality Review Panel will sign off the PM4 form.

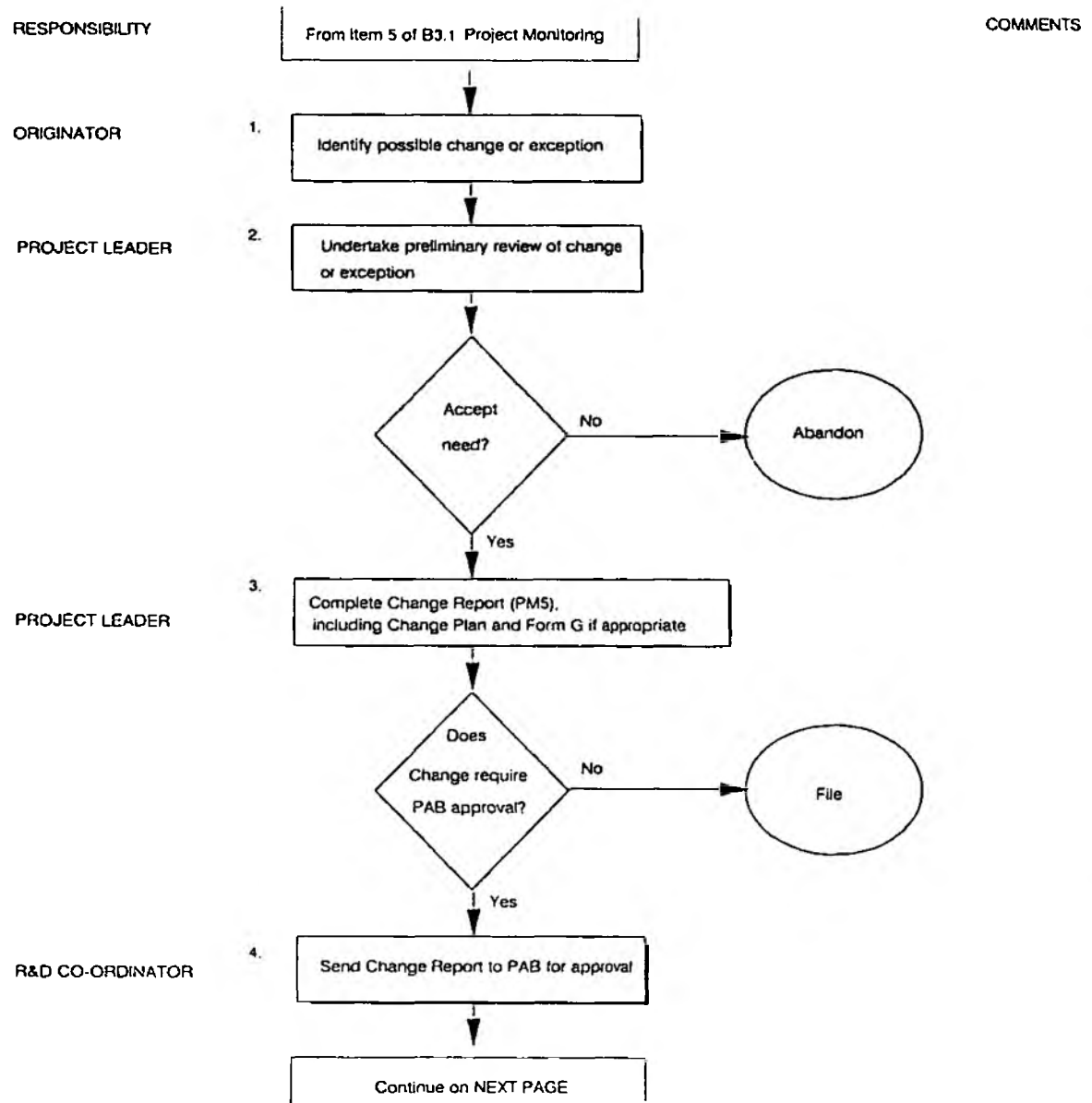


Figure B3.1.4 Change Control

B3.1.4 Change Control

The purpose of change control is to ensure that changes to the project which will affect expected benefits, specifications, cost and timescales are not allowed to be implemented until their effects have been assessed. This section builds on the *Project Management Procedures PIN - Section 7.4*.

The steps to be completed for Change Control are described below and shown schematically in the associated flow chart (see *Figure B3.1.4 Change Control*).

1. Any potential change or exception (see *Project Management Procedures PIN - Section 7.4.1*) must be identified.
2. The Project Leader should review the potential change and decide if it is worth further consideration. They should consult with other members of staff, i.e. Topic Leader and R&D Co-ordinator.
3. Once it has been decided to accept the change, then a Change Report Form (see *Appendix B - PM5*), including a Change Plan must be completed (see *Project Management Procedures PIN - Section 7.4.2 and 7.4.3*). If there is a requirement for a Project Supplementary Expenditure, then a Financial Form G must be produced in accordance with the *FM/SoD PIN*. The R&D Co-ordinator must ensure that the Form is correctly completed, justifying why the Project Supplementary Expenditure is required. (Note that if further specific objectives are being added that were not originally envisaged, then this is equivalent to a further phase and should be treated as such i.e. a Financial Form A). See also R&D numbered paper - R&D Expenditure on National Projects (*R&D(92)1A*) - Appendix 1 paragraphs 10-14.
4. If the cumulative change exceeds the tolerances set in the original Project Plan, the Change Report should be forwarded to the PAB after being approved by the Project Board. The PAB must review the Report and give approval to the Change Plan. If the PAB is not meeting in the near future and the requirement for change is urgent, then the Project Board should approve the Change Plan and the PAB should be informed at the next meeting.

RESPONSIBILITY

COMMENTS

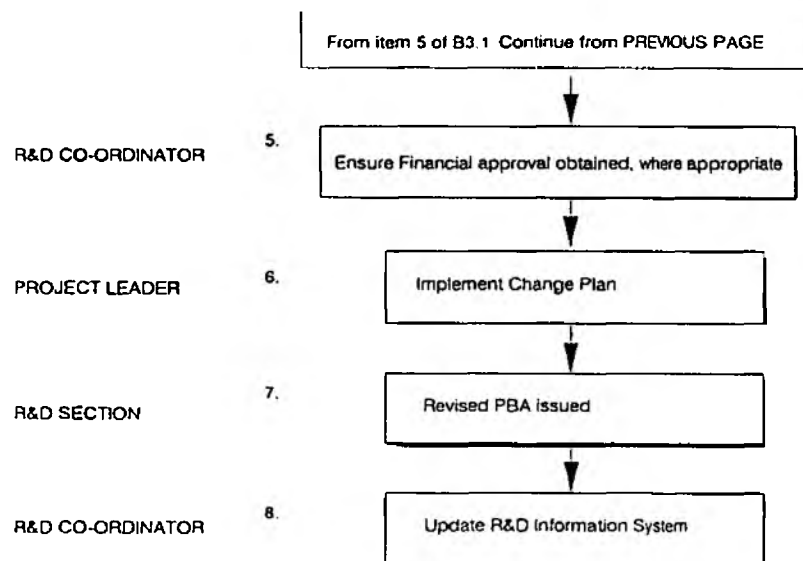


Figure B3.1.4 Change Control

5. Where there has been a need for a Financial Form G to be produced, the R&D Co-ordinator must ensure that this has been approved by the appropriate body as identified in the *FM/SoD PIN* and *R&D(92)1A*.
6. The Project Leader can now implement the changes detailed in the Change Plan.
7. For projects where the costs have risen by 5% of the contract or £2500, whichever is the least, there is no requirement to issue a PBA. For any Project Supplementary Expenditure over this amount, a revised PBA will be issued.
8. Once the necessary approvals have been obtained, the R&D Co-ordinator must update the Regional R&D Information System.

B3.2 Guidelines

B3.2.1 Supervision

Project supervision, which is fundamental to good project control, seeks to ensure that the objectives of the project/contract are achieved in accordance with the PID and Contracts i.e. to specification, on time and within the authorised budget. If all the planning has been done thoroughly, the likelihood of the project being undertaken successfully is enhanced considerably. However, projects do not run themselves, no matter how well planned, and it is necessary to monitor, on a regular basis, progress towards the objectives. Whilst supervision should not be concerned with logging past events or apportioning blame, it is prudent for the Project Leader (and others involved in a project) to keep a diary of events concerning the project and to record all contacts with contractors or other in-house NRA groups. Such records may be informal diary entries, notes to files, minutes/notes of meetings or formal letters.

The Project Leader will need to develop a sufficiently close working relationship with the contractor's manager for the latter to feel able to discuss openly and informally any significant issues which may impinge on the success of the contract/project. The Project Leader is not expected to be the contractor's manager's academic equal nor have the same breadth/depth of knowledge. The Project Leader should always seek to put across a practical NRA viewpoint and should not hesitate to call for assistance (e.g. from the Topic Leader, Regional R&D Co-ordinator, or an independent expert adviser) if needed.

The roles and responsibilities of all parties involved in undertaking the research will be defined in the PID. If the project is undertaken in collaboration with other funders then the respective management/supervisory roles should have also been defined. In the case of a contract, the contractor's manager is the single point of responsibility for that "work package". For any work done by the NRA itself, there should also be a named individual responsible for delivering each defined package of work.

When the research is done by an external contractor, supervision is done within the framework of the formal Contract between the NRA and the Research Contractor. The Project Leader must be familiar with the Contract and its place in the Project Plan, (*Sections B3.2.2 Managing the Contractor, B3.2.3 Formal actions to be taken under the Contract and B3.2.4 Financial Management of Contracts* offer further guidance.)

Monitoring and reporting progress is a key activity in the supervision of projects. The control principles discussed in the *Project Management Procedures PIN Section 7 and 8* should be applied to ensure that the project remains within its "area of viability" and that the balance between product, time and cost is maintained in such a way that the expected benefits can be delivered. There are two types of formal reporting to be considered:

For the management of Projects

- regular reporting from the contractor/in-house team to the Project Leader;
- regular reporting from the Project Leader to the Project Board including the Topic Leader/customer and then to the Head Office/Regional PAB; and
- monthly reporting of costs to the Regional Financial Department.

For the Management of the overall R&D Programme (via the R&D Information System)

- monthly reporting of project costs and forecasts to R&D Section; and
- 6 monthly project progress reviews to R&D Section.

The frequency of progress reporting and the distribution list for each report should be stated in the PID. In addition to written reports, there should be progress meetings. Again the timing, attendance and reason for these will be stated in the PID. It is important that all such meetings are minuted.

The content for progress reports is covered in Guidance Note for Reporting (*R&D Note 180*). With R&D, it is essential that progress reports are used in a proactive manner to identify at the earliest opportunity any issues which may affect the quality of products, timescale or cost.

B3.2.2 Managing the Contractor

The Contract is only effective when both parties have signed it.

The relationship between the Project Leader and the contractor's manager is the key to the success of the project. A good relationship will also enable contractual matters to be dealt with openly and frankly. Conversely, a poor relationship can lead to intractability when dealing with contractual issues and this may in turn result in the failure of the project. The Project Leader should always seek to achieve a positive outcome to contractual problems. However, remember that if the contractor is failing to perform satisfactorily either to time or in quality of workmanship, the NRA has the power to terminate the contract.

The Project Leader should appreciate that the responsibility for managing the contractor's resources rests with the contractor and he should not interfere with the running of the contract in such a way as to give rise to complaint. Similarly, the contractor should not have reason to claim for extra costs or time as result of what he sees as "interference" from the NRA. Clause 2.5 of the Standard Conditions of Engagement gives the NRA the right to give "reasonable" direction, but this must fall within the terms of the Contract as a whole. A contractor would be within his rights to reject "unreasonable" direction.

The responsibilities of the contractor's manager should include:

- planning and resourcing the research contract;
- organisation and communication within his research team;
- direction and motivation of the research team;
- monitoring and control of the research team; and
- reporting to the NRA, as specified in the Contract.

The responsibilities of the Project Leader in regard to a research contract include:

- day-to-day supervision (see *B3.2.1* above);
- review of draft and final research outputs (see *B3.1.3*);
- monitoring the likely benefits (see *B3.1.1*);
- formal variations to the contract (see *B.1.4*);
- formal reviews and progress meetings (see *B3.1.3*);
- formal actions to be taken under the contract (see *B3.1.4 and B3.2.3*);
- financial monitoring and control (see *B3.1.2*); and
- administering completion of the contract (see *B3.2.5*).

The aim is always to ensure that the specified products are produced within the authorised budget in the required timescale. Changes will need to be managed to ensure that a correct balance is always maintained.

B3.2.3 Formal Actions to be taken under the Contract

The present Standard Conditions of Engagement for Research Contracts (April 1990) provide the NRA with a number of administrative powers which can be used during the course of the work. The main ones are listed below, together with present contract clause references. They include the power to:

- vary the work content, timescale and budget (cl 2.1.4, 4.2 & 4.9);
- approve changes to contractor's staff (cl 2.2);
- check the contractor fulfils his statutory obligations as an employer (cl 2.2.4);
- give reasonable direction to the work (cl 2.5);
- request progress reports (cl 2.7);
- have access to the work and all documents produced in connection with it (cl 2.4.1);
- require the Contractor to assist a committee e.g. Steering Group, reviewing the work (cl 2.4.2);
- agree the content/form of interviews/surveys before they are conducted (cl 2.6);
- call ad hoc meetings if necessary (cl 3.4.2); and
- terminate the contract (cl 4.1).

Similarly the contractor has a number of obligations under the contract. These include:

- exercising reasonable skill, care and diligence (cl 2.1.1);

- notifying the NRA of any factors which could expedite the work (cl 2.1.4);
- notifying the NRA of any factors which could hinder the work (cl 4.3);
- maintaining confidentiality (cl 2.3);
- obtaining prior approval for publications relating to the work (cl 2.9);
- notifying and assigning patent rights (cl 2.10);
- allowing access to accounts information (cl 2.12);
- not communicating to the press (cl 4.14);
- maintaining appropriate public and employee insurance (cl 4.5); and
- not assigning or sub-contracting the work (cl 4.6 & 4.7).

The NRA also has obligations including:

- supplying relevant data and allowing access to premises/sites (cl 3.1);
- responding in a reasonable time to requests (cl 3.3); and
- paying invoices within the stated time (cl 3.9).

The above only highlights some of the relevant clauses in the contract. There is no substitute for the Project Leader having a good understanding of the entire contract, however, in the first instance, the Regional R&D Co-ordinator should be able to provide suitable advice as needed.

B3.2.4 Financial Management of Contract

Cost is one of the most visible and quantifiable performance measures in a project or contract, therefore careful monitoring is vital. It should be remembered that the Regional Finance Department and PAB should also provide advice/guidance on what is needed. (See *Project Management Procedures PIN - Section 8, Financial Monitoring.*)

It is essential to come to an agreement with the contractor at the start of a contract about the requirements for financial control. Although many of these will be prescribed in the contract, it is good practice to ensure that requirements are fully understood before interpretations are affected by disputes etc. This could be at the briefing meeting in (step 1 of B3.1). This briefing will include:

- **confirming budget restrictions (by fiscal year and cost category)**
Make sure the contractor understands that the cost should not only be kept within the contract sum, but also the cash flow should be kept within plus or minus 10% of the sums given for each financial year in Schedule 8 of the contract. In addition, the cost for each category given in Schedule 9 should not be exceeded by more than 20%. (Schedule 1 should state if these percentages have been amended for the specific contract in question.)
- **defining financial reporting formats and timing**
The contractor's requirements for progress reporting are in Schedule 2 of the contract. Make sure that the contractor is clear on how the cost figures should be

calculated (i.e. are they values of invoices rendered, cash received, excluding VAT etc.) and that these match the onward reporting of the project to the Regional Finance Department Project Board, PAB and R&D Section.

- **defining invoicing requirements**
Agree the form that the invoice should take, ensuring that it includes the necessary supporting documentation and is certified by the contractor in accordance with clause 2.13. Also make sure that the format meets the needs of the NRA with respect to authorising the payment to the contractor. Some contracts may be invoiced on a "time charged" basis (up to a ceiling) and others may be based on staged payments related to defined targets given in the contract; in either case payment is usually related to achievement.
- **agreeing special dates for invoices for quarter/year ends (if appropriate)**
There are special needs for reporting all the projects in the R&D Programme (monthly and 6 monthly). Ask the contractor to provide invoices in time for inclusion in these. The NRA will usually have special requirements for invoicing at year end.
- **setting up payment method (cheque, direct transfer etc)**
Confirm with the contractor how the payments should be made, obtaining bank account and other details if appropriate.

Other terms relating to financial aspects of contracts are given below and in the glossary (*Appendix I*).

Project Supplementary Expenditures are formal changes to the contract and are covered in *B3.1.4 - Change Control*. Remember that additional work must not be undertaken without prior budgetary agreement by all the relevant parties. Once approved, a letter should be sent by the Project Leader to the research contractor formally revising the relevant sections of the Contract.

Retention money is a percentage (10% unless agreed otherwise) of the invoice value of this contract which is retained by the NRA. It is released to the contractor as part of the final account. The objective is to provide the NRA with a small degree of financial protection in the event of non-performance. However, despite the contractual right to hold retention monies, there are occasions when the NRA might release some of the retention prior to final account. This is discretionary and would always need to be sanctioned by the Regional R&D Co-ordinator and the Regional Finance Manager. The early release of some retention would occur following a good performance by the Contractor and submission of draft final outputs and would be influenced by:

- NRA's wish to include costs in a particular financial year; and
- the retention money being disproportionately large compared to the outstanding work.

B3.2.5 Completion of contract

Clauses 3.5 and 3.10 of the Standard Conditions of Engagement link payment of the final account to the completion. Once the Contractor has fulfilled all the requirements, including NRA acceptance of the research project outputs, the Contract can be deemed to be complete and the final account can be settled. However, many of the obligations of the contractor still apply beyond completion (e.g. publications, patents, confidentiality, etc.).

For some contracts, there may also be an obligation to correct errors (e.g. cl 2.11.3). Whilst there is no maintenance period in the standard contract, it is appropriate for some contracts involving capital items to include this. In this case, the completion of the contract would still be after the final account has been settled, which may be 6 to 12 months after the work has been completed.

B3.2.7 R&D Information System

It is essential that the monthly financial updates and monthly output updates (giving details of progress or interim reports that have been produced) together with the 6 monthly progress reviews are entered onto the R&D Information System. This enables any NRA officer to be able to review the progress on any project in any Region, via the consolidated R&D Information System.

The financial information is used to enable the R&D Section to monitor and keep control over the whole R&D Programme of all projects and liaise with the Finance Directorate. Whereas the output information enables the R&D Section to monitor progress in producing deliverables. The Regional R&D Co-ordinator has the responsibility of ensuring these reports are entered onto the System. (See *Appendix A*.) The R&D Information System User Manual gives details of which specific fields have to be updated.

B3.3 Project Files

The *Project Management Procedures PIN - Section 5* details the need for keeping and maintaining project files and describes what is required. A consistent filing system for project documentation will ensure effective control and facilitate Post Project Appraisal, where appropriate. It will also aid management of the project and facilitate review by Project Board and PAB.

The *Project Management Procedures PIN* suggests that the Project Leader should hold and maintain the files, but the R&D Co-ordinator requires various data sets to send to Head Office. It is recommended that the initial planning and approval documents (Summary Appraisal Form, PID, Form A, etc.) are held by the R&D Co-ordinator as well as the PAB sign-off form and a copy of the signed Contract.

There are five categories of documents to be held during the life of a project. These are:

- (a) approval documents i.e. Summary Appraisal Form, PID, PBA, etc.
- (b) financial documents i.e. monthly reports, forecast statements, etc.
- (c) technical documents i.e. progress reports, etc.
- (d) output documents i.e. draft outputs, Quality Review Panel comments, etc., and
- (e) other paperwork relating to the project i.e. minutes of meetings, etc.

It is necessary that everyone involved in the project is clear on where the relevant paperwork resides. The following is suggested although these recommendations can be altered as long as both the Project Leader and R&D Co-ordinator agree and both clearly understand who is responsible for holding and maintaining the records.

The monitoring of progress, (including all progress reports), minutes of meetings and any correspondence can be held by the Project Leader, but if there are any changes to the plan the Change Reports and Form Gs should be held by the R&D Co-ordinator. Similarly the final output should be held by the Project Leader with the End-of-R&D Stage Assessment forms (ERSA) and final output being held by the R&D Co-ordinator.

It is assumed that large projects will normally be broken down into discrete stages, each of which may have a separate stage file. This will depend on the project.

B4 PROJECT CLOSURE (STAGE 4)

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0.2	01/11/93	First draft issued for review
1.0	28/02/94	First issue of Manual

B4 PROJECT CLOSURE

B4.0 Introduction

This chapter explains how R&D projects are to be closed. It builds on the *Project Management Manual PIN - Section 9*. The aim of these procedures is to ensure that the R&D Stage of the project is properly completed and that uptake is properly initiated. The chapter starts with confirmation that the final output has been produced and ends with post-project appraisal, where appropriate.

The first section describes the processes involved, whilst the second section gives more detailed guidance on various issues.

Project closure is an essential part of project management as it officially recognises that a project has been completed. It produces the final financial record and will ensure maximum benefit is derived to the NRA from the R&D programme.

The means by which the outputs from a project are disseminated and implemented are reviewed throughout the life of a project. The Project Closure process confirms how the final outputs are to be used by the "customer" and it also provides the formal hand-over from the R&D Section to the core function.

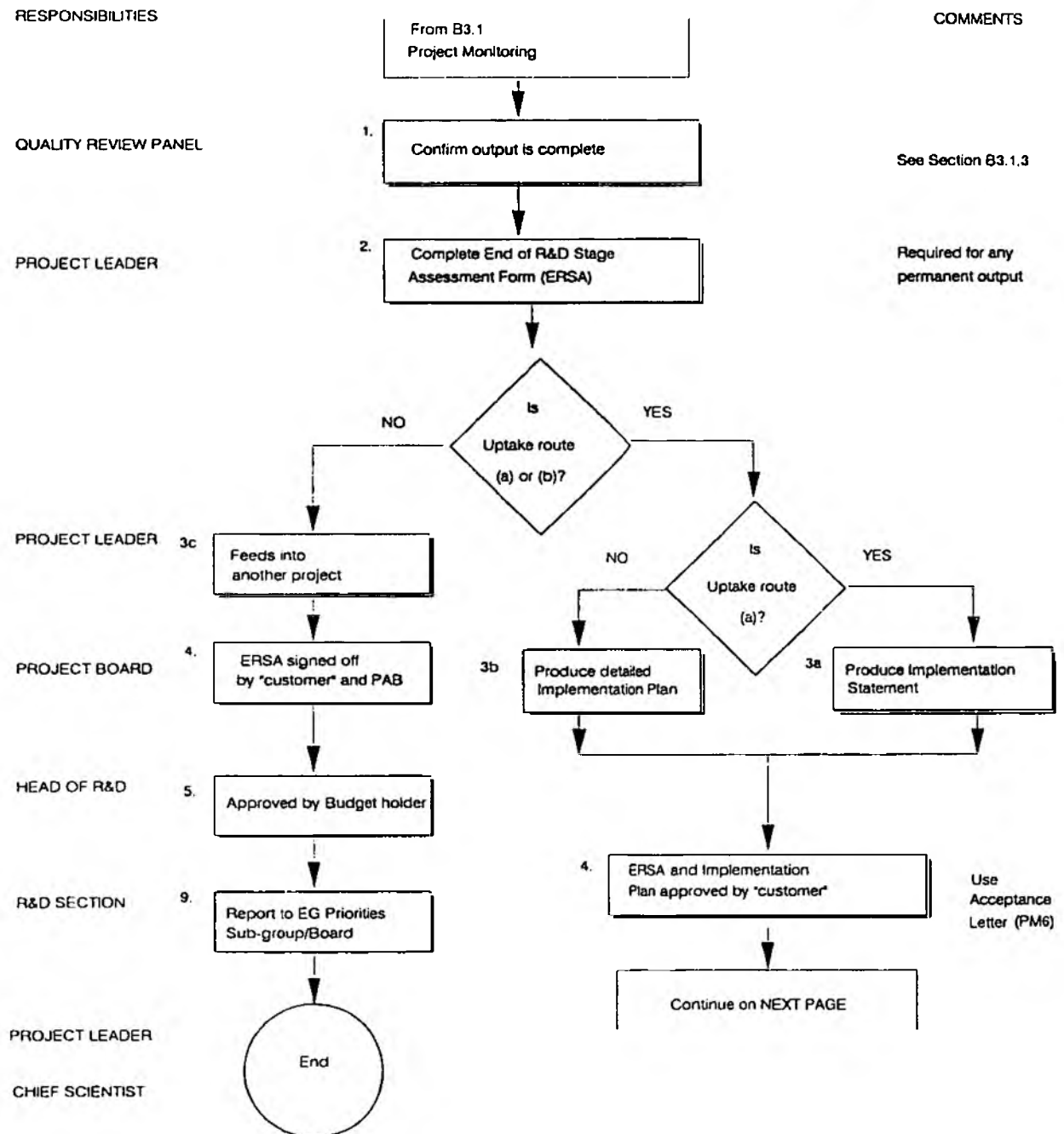


Figure B4.1.1 - End of R&D Stage Assessment (ERSA)

B4.1 Process Description

B4.1.1 End-of-R&D Stage Assessment (ERSA)

The steps to be completed in the End of R&D Stage Assessment (ERSA) stage are described below and shown schematically in the associated flow diagram (*B4.1.1 - End of R&D Stage Assessment*).

1. The first step is to ensure that the product has been confirmed as complete. *Section B3.1.3 - Quality Monitoring* provides guidance in this area.
2. When any permanent output has been produced the Project Leader must complete an ERSA form. (*Appendix B* has a copy.) This will be attached to the completed, marked up output, (or typeset copy for R&D Reports), the R&D Digest and the appropriate uptake statement, as given in 3. below.
3. The uptake route will have been identified and reviewed throughout the life of the project in the PID. The Technical Plan will have details of how implementation is to be carried out. The explanation of the different routes is given in *B4.2. Uptake of R&D*.
 - (a) Where the uptake route is given as (a) - outputs easily taken up - then the Project Leader will provide a brief Implementation Statement.
 - (b) Where the uptake route is given as (b) - output with policy or resource implications - then the Project Leader will provide a detailed Implementation Plan.
 - (c) Where the uptake route is given as (c) - output feeding into other projects - then the Project Leader will provide a "Statement of Use" including which project this R&D project feeds into.

The Implementation Plan, Implementation Statement or the Statement of Use will give the position of people in the NRA who should receive copies of the final output. This must include 1 copy for the Operations Directorate and two copies for the R&D Section.

4. The completed output, ERSA and Implementation Plan or Statement will be sent by the Project Leader to the user representative (as identified in the PID). The Acceptance Letter (*Appendix B - PM6*) ensures that the "customer" accepts the final product. The function in signing the ERSA accepts the policy decision or budget required to implement the result of the R&D. The ERSA is also signed and fulfils the function of Project Evaluation Report described in the *NRA Project Management Procedures PIN*.

B4 - Project Closure

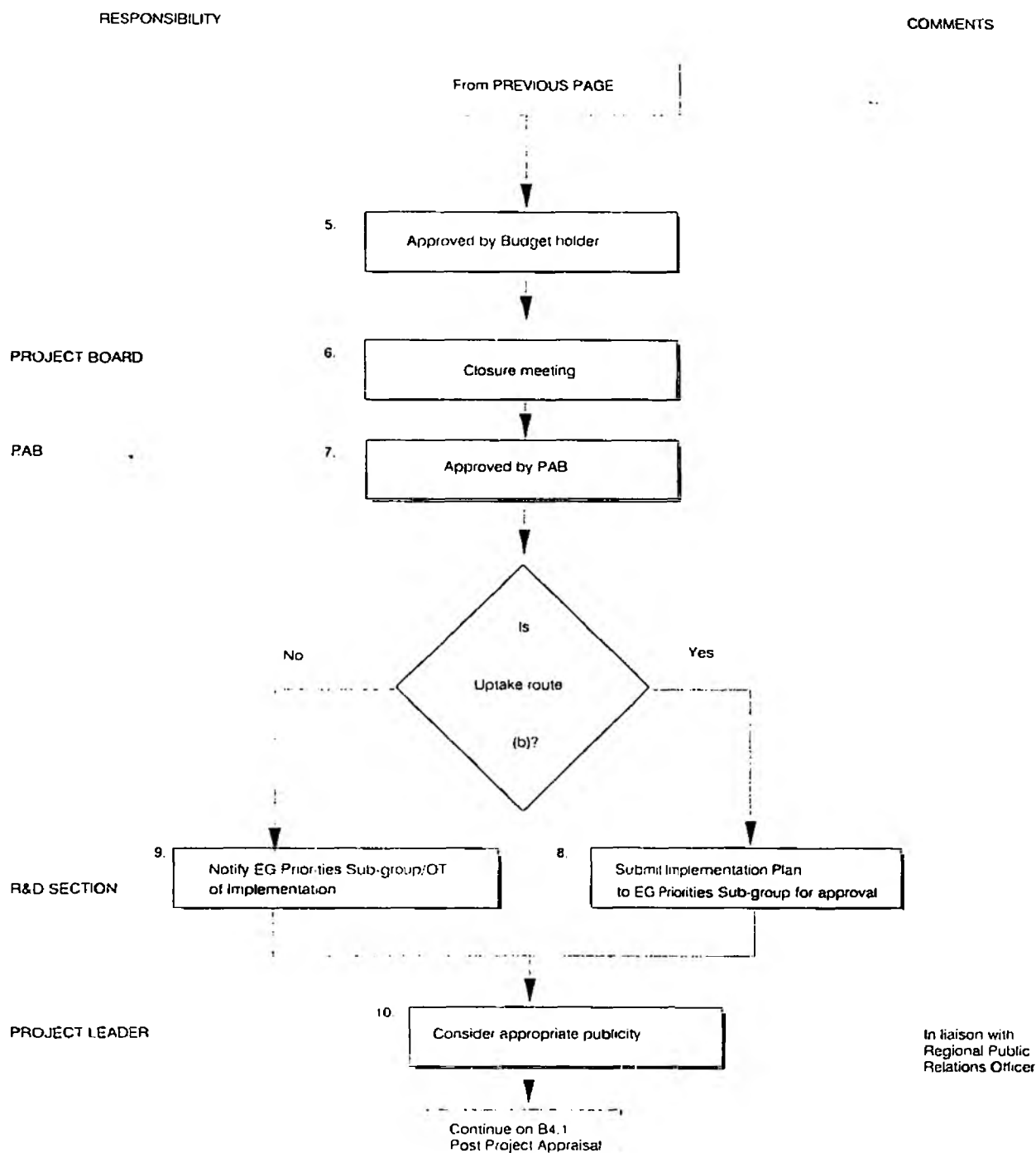


Figure B4.1.1 - End of R&D Stage Assessment (ERSA)

5. The Chief Scientist, as the national Budget holder, will sign-off the ERSA prior to any further approval required by the EG Priorities Sub-group for implementation. For those projects with uptake route (c), the Head of R&D will approve the ERSA, as delegated by the Chief Scientist.
6. At a Project Closure meeting the Project Board will ensure that all the files are complete, that the acceptance letters are signed and will recommend the project for sign-off by the PAB.
7. The Project Leader will send the minutes from 6. above to the PAB with the ERSA and Acceptance Letters. The PAB will review these and formally sign-off the project as completed. (See *R&D Note 180* for approach to distribution.) The final outputs can then be sent to the appropriate people as named in the uptake statement (see Item 3 of *B4.1.1*).
8. Where the project has an uptake route of (b), the Implementation Plan will be sent to the EG Priorities Sub-group for approval and then on to the board, if appropriate.
9. All projects that have completed will be notified to EG Priorities Sub-group/OT in a quarterly information report. This report will differentiate between the various types of uptake routes and for OT, the report will have copies of the ERSA, R&D Digest and the Implementation Plan/Statement, where appropriate, attached for information. This report provides the formal hand-over from R&D to the function via the Operations Directorate. Where the project has an uptake route of (b) then implementation must await approval from EG Priorities Sub-group or Board as required in the *Scheme of Delegation*.
10. The Project Leader must consider how the results of the R&D can be publicised. Articles can be written for "Water Guardians" or press releases produced. The Project Leader must discuss this with the Regional Public Relations Officer and the R&D Co-ordinator, ensuring that the Heads of Corporate Communication and Media and External Affairs, and the R&D Section are informed. Where an article is published it is important that it is clearly understood that the work was undertaken under the NRA's R&D Programme.

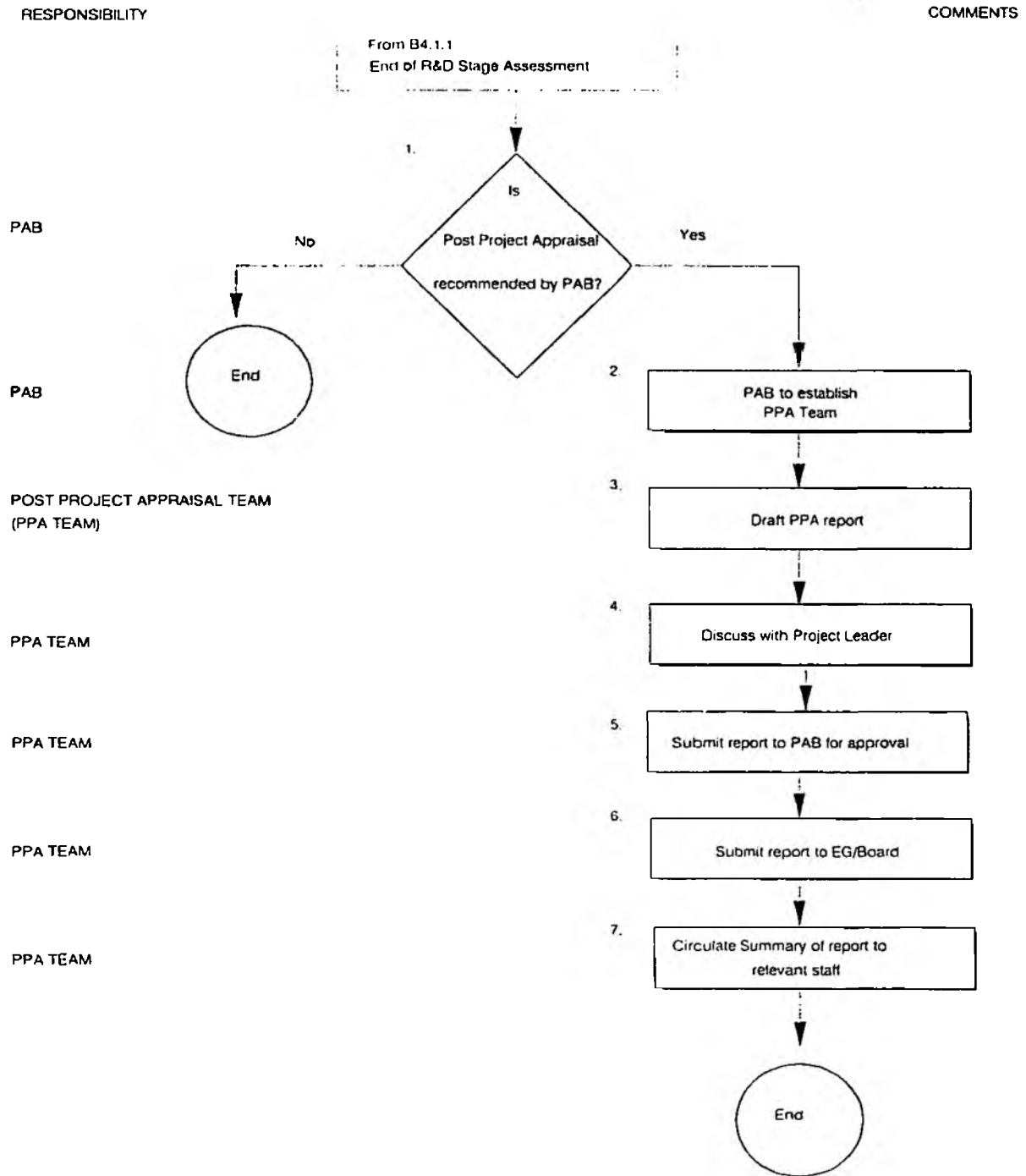


Figure B4.1.2 - Post-Project Appraisal

B4.1.2 Post-Project Appraisal (PPA)

The steps to be completed in the Post-Project Appraisal (PPA) stage are described below and shown schematically in the associated flow diagram (*B4.1.2 - Post-Project Appraisal*).

1. A recommendation to undertake a PPA will be made by the PAB to the RGM and Chief Scientist. Care must be exercised that the number of projects selected is not excessive. The *Project Management Procedures PIN* suggests that 10% of all projects are given a PPA.
2. The PAB will establish a PPA Team, who will be led by a person independent from the original project. This person will have the responsibility for the preparation of the PPA Report.
3. The PPA Team will draft a report which will review all documentation, compare actual performance against the original Project Plan and may include visits to appropriate sites to see the outputs in use.
4. The draft report will be discussed with the Project Leader to ensure that it is factually correct.
5. The Report will be submitted to the PAB with recommendations, where appropriate, for approval.
6. Once the Report is approved by the PAB, it is submitted to Executive Group/Board for information.
7. A summary of the Report is then circulated to relevant members of the NRA identifying the benefits, pitfalls and lessons learnt. In this way the recommendations of the PPA can be implemented.

B4.2 Guidelines

B4.2.1 End-of-R&D Stage Assessment

At the completion of the R&D stage of the project, an ERSA is produced which presents the project outputs, investment to date, and uptake plan - in particular the anticipated benefits and resource requirements for uptake. The Implementation Plan will identify the activities and resource requirements needed for implementation, and will justify these against the benefits which will be achieved - thus updating the PID. Acceptance (or otherwise) of satisfactory completion of the R&D stage is achieved by sign-off of the ERSA by the R&D customer and any other person or group specified in the PID. The completed ERSA is independently reviewed by the Chief Scientist in confirming that the R&D stage has been satisfactorily completed (or otherwise) and that the R&D output may be taken forward to uptake.

There is further guidance in R&D numbered paper - Interim measures for completion of R&D project outputs and research stage (*R&D(92)28*) and in the (*R&D Note 180*).

It is essential that the financial information given on the ERSA agrees with that in the R&D Information System. It is the responsibility of the R&D Co-ordinator to check this.

Where an uptake route of (b) has been given, it is necessary to check with the R&D Section that this is appropriate. Also the timing of Implementation Plans need to tie up with the Corporate Plan process.

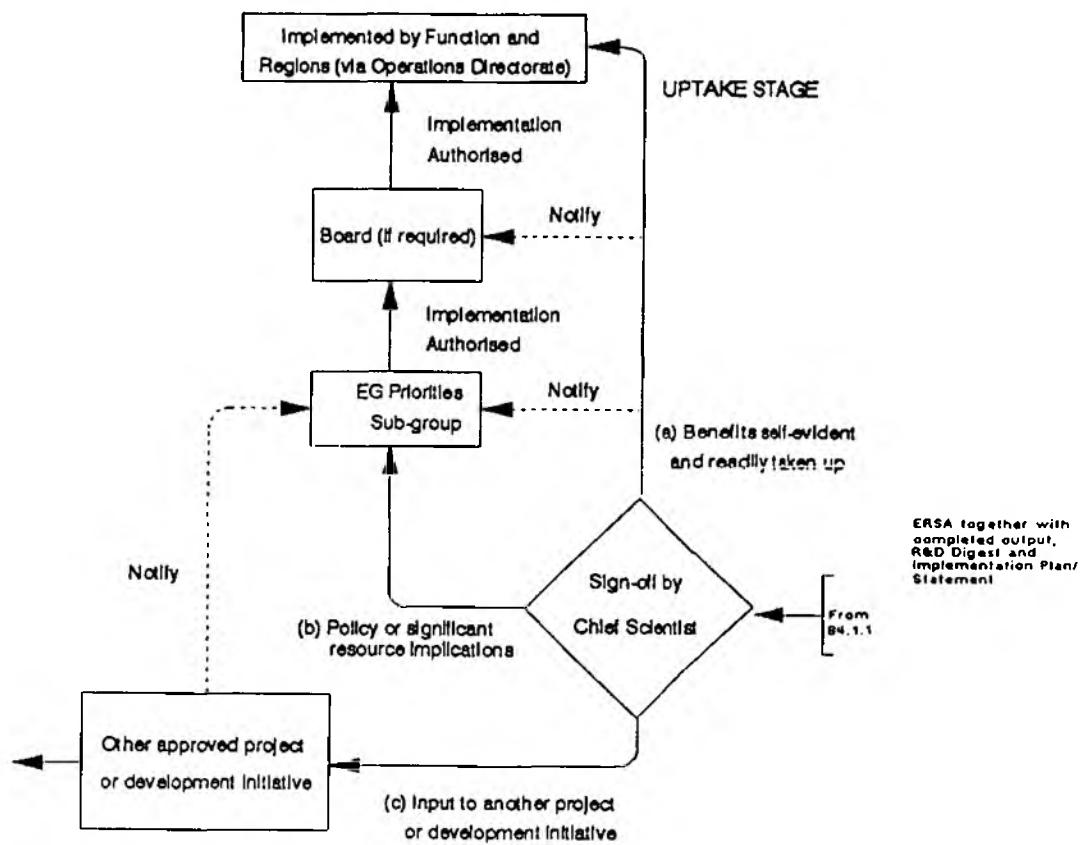


Figure B4.2 - Uptake of R&D

B4.2.2 Uptake

Planning of the R&D outputs and the activities needed to deliver these to the end-user is done in outline at the detailed project planning stage (see *B2.2.1 - PID*). The detailed specifications for the project outputs and uptake plan are developed during the course (see also *R&D Note 180*) of the R&D stage. The uptake plan will cover:

- (a) **dissemination** (delivery of the project outputs to the end-user), which the Chief Scientist ensures is undertaken including appropriate external release; and
- (b) **implementation** (putting the project outputs into use by the end-user), for which the end-users - usually NRA core-function staff - are generally responsible.

Uptake of outputs from R&D projects can follow one of three defined routes (see *Figure B4.2*):

- (a) outputs whose benefits are self-evident and readily taken up with minimum resource input by the core function/Regions - for example, an improved analytical technique;
- (b) outputs which have policy implications or significant resource requirements for implementation - for example, Cyclops portable water quality monitoring equipment; or
- (c) outputs which are taken up into other core function development initiatives or R&D projects - for example, data produced for developing Statutory Water Quality Objectives.

Uptake for category (b) requires the EG Priorities Sub-group and Board (where appropriate) to approve the implementation plan - in a similar way to other policy implementation. Depending on the issues concerned, different bodies may be involved in agreeing the way forward. If implementation relates to policy the relevant Function Committee may be involved. The EG Priorities Sub-group can approve the budget or approval may be sought through the annual corporate planning process. At other times, plans will be submitted by the Chief Scientist with the business case presented by the Director concerned. Clearly, implementation of category (b) outputs may need to be held back pending resource availability. Uptake of category (a) and (c) outputs will simply be reported to the EG Priorities Sub-group and OT by the Chief Scientist on a quarterly basis. Notification for Regions to implement R&D outputs will be given by the Director of Operations.

As explained in *B4.1.1* the R&D Section will produce quarterly reports for the EG Priorities Sub-group and OT. The report to OT will enclose copies of the ERSA, the R&D Digest and the Implementation Plan/Statement where appropriate.

Dissemination

The effective targeting of R&D outputs to achieve business objectives, together with the planning and management of the process of uptake of the project output by the end-user, are critical activities which contribute to the success of any R&D project.

In order to assist this process all project outputs have assigned a dissemination status. Permanent outputs are usually Released to Regions and Public Domain unless there are good reasons otherwise. This is given below:

Internal	-	Limited release
	-	Released via Function Committee
	-	Released to Regions
External	-	Restricted
	-	Released to Public Domain

It is important to identify the appropriate tools to aid dissemination e.g. workshops, training, roadshows, etc. If a workshop or training is recommended it is necessary to inform the R&D Section to ensure all relevant personnel are invited. Where a project is particularly complex, dissemination and implementation may be part of a further phase.

In every output there must be a "Statement of Use" which describes how the report is to be used and for those with uptake route (c) a list of staff who will receive the output (see *R&D Note 180* for further details). This will give a clear understanding to all who read the report what its status is and how it is to be used.

The Project Leader is responsible for producing the R&D Digest, which provides a brief summary of the results of the project. This is distributed to functional staff in order that they are aware of the results of the project and can ask for further details if necessary.

It is possible that external publicity may be required. Articles may appear in external journals or internal publications like the R&D Newsletter, and Water Guardians.

Implementation

When reviewing the Implementation Plan it will be necessary to cost out NRA staff time to implement the results of the work. If resources are required it is important to stress what statutory duty or policy it enables the NRA to achieve in order to be more effective. Even if resources are not required, it is important to indicate the developmental initiative or continuing activity which the work supports.

There may be formal instructions required to implement the results of the R&D. These will be given by the Director concerned.

B4.2.3 Post-Project Appraisal (PPA)

The *Project Management Procedures PIN - Section 9.6* explains that the aims of PPA are to learn lessons from the experiences gained at all stages of the project and to check that the outputs are operating as specified and have been implemented properly, where appropriate.

Its purpose is not to allocate blame, but to identify good practice which may be incorporated into future projects and those aspects which should be avoided. It requires a critical look at the project objectives including costs, timings and environmental impact, and how they are being achieved.

The appraisal should seek to answer the following question:

- have the key objectives of the project been achieved?
- were the expected costs and benefits, greater, fewer or different in nature from those predicted, or were certain inputs missed at the planning and appraisal stage? Did a predicted cost or benefit not occur?
- were the appropriate procedures complied with?
- was the project completed within budget, and to the programmed timetable?
- how well were the project requirements specified, and how well was the project managed?
- how well was the project targeted; the quality of research and its cost effectiveness? and
- what was the success of the project's uptake and was value for money achieved?

Any project may be selected by the PAB for a PPA. However, the decision to undertake PPA will be made by the RGM and Chief Scientist. The timing of the PPA must also be considered carefully by the PAB before they recommend a project. It may be necessary to carry out two appraisals on the same project, the first to be undertaken soon after completion of the project and the second after the deliverables have been in use for a period of time.

It is also planned to undertake and co-ordinate a number of programme area reviews (see *R&D (93)22A - Proposed approach to programme area reviewers*). This is to assess the quality, utility and future targeting of areas of the R&D programme.

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Index to be completed and inserted here.

APPENDICES

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DOCUMENT CONTROL

Version Number	Issue Date	Comment
0.2	01/11/93	First draft issued for review
1.0	28/02/94	First issue of Manual

APPENDIX A - TERMS OF REFERENCE

Role of Regional R&D Co-ordinator - reports to Regional R&D Contact Point

1. Assist in identifying the R&D opportunities and needs in the Region
2. Assist Regional staff involved in the annual review of the R&D programme
3. Maintain a database (R&D Information System) on all R&D projects managed within the Region
4. Monitor and report on R&D budget expenditure in the Region in conjunction with Regional Finance Department
5. Provide advice and assistance to staff (particularly project leaders) on the management of R&D projects in the Region
6. Ensure the proper assessment (appraisal, monitoring, end-of-research assessment etc.) by Project Leaders of R&D projects in the Region, and the satisfactory production of key R&D deliverables (e.g. Project Outputs) - Quality support role
7. Provide technical assistance to project leader as agreed in the Project Plan
8. Assist in the dissemination of R&D projects outputs and other R&D information in the Region
9. Maintain Regional links with external organisations having interest in the NRA's R&D programme
10. Undertake such other duties as may be required by the Regional R&D Contact Point (generally not more than 10% of time for full-time co-ordinators)
11. Provide advice on the completion of financial and other project management forms

Note: Regional R&D Co-ordinators shall acquire a working knowledge of mainstream staff activities, and be given the opportunity to develop a career discipline which will support their career development within the NRA but outside R&D management.

Role of Project Leader - reports to Topic Leader

1. Prepare the project appraisal, including developing project plan and setting up contacts with other Regions
2. Manage the R&D project within the authorised budget, in particular to ensure the deliverables are produced on time and to the agreed standard
3. Prepare plans for, and supervise, the work packages within the project, including both contractors and internal NRA resources
4. Ensure all project deliverables are signed off
5. Ensure formal project reviews are carried out at key points in the project
6. Liaise with the Topic Leader and Regional R&D Co-ordinator, in particular in reviewing and reporting progress
7. Liaise with the customer and stakeholders in the project regarding use of resources, progress and resolution of project issues
8. Assist the Topic Leader and customer to deliver the benefits from the project to the business area
9. Signs off all financial authorisations and project management forms.

Role of Topic Leader - reports to R&D Commissioner

1. Maintain a focus within the NRA for technical expertise in the topic area, including maintaining links with relevant external organisations and internal groups
2. Develop the R&D strategy for the topic area in relation to the NRA's business objectives, including preparing and reviewing annually the topic investment appraisal and related R&D projects
3. Prepare initial brief for approved new project starts and identify Project Leaders (or other appropriate means of project management) to achieve planned start dates
4. Monitor deliverables from projects within the topic area, and liaise with Project Leaders and Commissioner to maintain effective knowledge of progress
5. Review of sign-off designated project deliverables, including project plan, project outputs and, if appropriate, plans for uptake
6. Advise Project Leaders within the topic area on any technical or function-related problems arising on their projects
7. Assist in delivering the benefits of R&D projects in the topic area to the business area

Responsibilities of R&D Commissioner - reports to Function Committees

1. Maintain a focus for R&D activities within the NRA function and keep function managers advised on the matters related to their R&D commission
2. Identify an appropriate structure within which R&D is undertaken within the function
3. Identify the strategy R&D objectives for the function, and co-ordinate the annual review of its R&D commission
4. Review the Topic Investment Appraisals and monitoring reports prepared by Topic Leaders, in conjunction with the Head of R&D, to ensure the effectiveness of the programme
5. Review and sign-off designated project deliverables on behalf of function committee, including project outputs and the plans for their uptake
6. Deliver the benefits of R&D projects to the business area
7. Assist in the preparation of the Commission programme review in the NRA's Annual R&D Review

Roles of the R&D Contact Point

1. Maintain a focus for R&D activities within the Region, in particular to ensure that the role and purpose of the Authority's R&D programme are understood
2. Ensure that the Region takes part in the identification of national R&D issues and promotes its interests in the R&D programme
3. Monitor, and advise the Regional Management Team on, progress in undertaking R&D projects devolved to the Region
4. Ensure that procedures are established for dissemination of R&D outputs within the Region
5. Ensure that a satisfactory interface is achieved between the national projects and on-going activities, and Regional Operational Investigations
6. Ideally, line-manage the Regional R&D Coordinator

Terms of Reference of R&D Committee

1. To act as a Steering Group for developing and maintaining the Authority's overall R&D programme, within the context of its function-led Commission programmes.
2. To advise on the management framework within which the R&D programme, and its component projects, is assessed and managed.
3. To assist in achieving the optimum balance of functional and regional interests in the programme.
4. To monitor the uptake and expenditure of R&D budgets by regions and functions.
5. To monitor the quality of R&D outputs and provide feedback on the dissemination and implementation of R&D projects.
6. To advise on the links between R&D and operational investigations and to put forward regionally-perceived issues for R&D.

The R&D Committee provides a forum for discussion and decision-making on significant issues involving either the R&D programme as a whole, or specifically R&D management issues. As such it includes Functional and Regional representation.

The R&D Committee will normally meet twice a year - at the start of the fiscal year and at the half year stage.

Roles and responsibilities of the Project Assessment Board (PAB)

The PAB is responsible for controlling and monitoring all projects undertaken within a Region and at Head Office, including National projects. It therefore provides key management support to the Regional Management Team and National Directors respectively. The PAB membership should consist of representatives of various functions to give a strategic overview of all projects to ensure the objectives of the Corporate Plan are achieved. (See NRA *Project Management Procedures - Appendix I*).

Each PAB must consist of between three and six members, including a chairman who must be a senior manager, and should be multi-disciplinary wherever possible. Members will be appointed by the Regional Management Team or National Directors. For projects crossing Regional boundaries, the PAB will be appointed by the relevant Regional Management Teams, jointly, in consultation with the Director of Operations.

The PAB should normally meet monthly, although more frequent meetings may be deemed necessary. The dates of the meetings should be decided by the PAB itself, based on its workload.

The PAB has a number of key roles (although the small project PAB delegations, whereby the roles of the PAB can be performed by the Budget Manager, i.e. Head of R&D or usually Regional R&D Contact Point should be noted):

- to approve the Summary Appraisal Form which enables initial expenditure on medium and large projects. For small projects, the Summary Appraisal Form must be approved by the PAB prior to submission with the Form A for authorisation under the Scheme of Delegation;
- to set up the management structure for the project, including deciding on the composition of the Project Board and the identity of the Project Leader;
- for medium and large projects, to review the PID and Form A and provide a recommendation on approval to the appropriate authority under the SOD;
- to review financial monitoring reports
- approve Change Reports (including Change Plans), where applicable;
- to approve the ERSA, thereby effectively formally closing the project; and
- recommend projects for Post-Project Appraisal and set up the Post-Project Appraisal Team (see below).

One of the main roles of the PAB is to set up the management structure for each new project undertaken by the Region or Head Office. This will involve:

- for medium and large projects, deciding on the chairmanship and remaining membership of the Project Board for each project; and
- for small projects, assessing whether the roles of the Project Board and the PAB itself should be delegated to individual managers.

The PAB sets up the Project Board in order to delegate many of the time-consuming monitoring and control procedures which it does not wish to perform itself. As such, the Project Board is ultimately responsible for the successful completion of the project and delivery of products.

The composition of the Project Board will depend on the size and nature of the project. Wherever possible, there should be individuals including the Topic Leader, who can represent the interests of the users as well as those of the technical and financial aspects of the project.

The PAB may decide to appoint a chairman of the Project Board before making any further decisions on the project management structure. The chairman can either propose or become closely involved in decisions on the appointment of key individuals to run the project (ie. the remaining Project Board members and the Project Manager). It is recommended that the Project Board should consist of the chairman and at least two other members.

The PAB may adjust the membership of the Project Board at any time during the life of the project in order to accommodate changing circumstances.

For **small projects**, the roles of the PAB may be delegated by the PAB to the relevant Budget Manager.

If the roles are delegated, the PAB must obtain a statement from the Budget Manager once the project is complete which states that the project management procedures have been followed for that project.

Therefore, for small projects the following concessions are available:

- the Summary Appraisal Form and attachments will be reviewed and approved by the Budget Manager;
- the Change Reports will be approved by the Budget Manager;
- the Budget Manager will formally sign-off the project as complete.

Appendix A - Terms of reference

However, the PAB will receive the Summary Completion Statements which will report all completed projects.

Roles and responsibilities of the Project Board (PB)

The composition of the Project Board is one of the responsibilities of the PAB (see above).

The primary role of the Project Board is to control and monitor the work of the Project Leader on behalf of the PAB, ensuring that the project is conducted in accordance with the *NRA Project Management Procedures PIN* and any other relevant guidelines. In addition, it is required to assist the Project Leader in providing overall guidance and direction.

Specifically, the Project Board has the following roles:

- appointing the Project Leader;
- to review the PID, including all enclosed key documents, and recommend approval to the PAB;
- set up the Quality Review Panel, or perform the role itself, as appropriate. For medium and large projects, the Panel must include one member of the Project Board;
- to review the Progress Report at each meeting;
- to agree each Change Report (including the enclosed Change Plan) prior to submission to the PAB;
- review and sign-off each Acceptance Letter; and
- attend the closure meeting at which the ERSA must be reviewed, and recommend the project for sign-off by the PAB.

The Project Board therefore monitors the work of the Project Leader at "control points", leaving the Project Leader free to plan and organise between these points.

For **small projects**, particularly those where the PAB has delegated its role to a Budget Manager, a Project Board is unlikely to be appropriate. If so, the PAB (or Budget Manager, where appropriate) has two options:

- delegate the role of the Project Board to the Budget Manager and the Topic Leader - if this is the case, the Budget Manager will be responsible for directly controlling, monitoring and assisting the work of the Project Leader, and the project management structure will consist of only these two individuals; or
- delegate the role of the Project Board to the Topic Leader and a Line Manager, who in the project management structure would be junior to the Budget Manager, but senior to the Project Leader.

Roles of the Quality Review Panel (QRP)

The Quality Review Panel is set up by the Project Board to oversee the quality assurance procedures. The Quality Review Panel should be assembled from persons who have either an interest or a particular technical expertise in the product or types of products under review. For large projects, it should be chaired by a member of the Project Board; the Project Board will also select at least two other panel members - product users should be represented. The Project Leader should act as the secretary to the Panel. The Project Board may decide to change the composition of the Panel at any time.

For **medium** projects, the Project Board may decide to perform the role of the Panel itself. For **small** projects without a Project Board, the Budget Manager will be responsible for setting up the Quality Review Panel and nominating a chairman, although the Budget Manager may decide to perform the role of the Panel if appropriate.

The Panel may perform a Formal or a Postal Quality Review, the former being a full meeting of the Panel and the latter being a review of paperwork by each Panel member individually. The Project Leader, in conjunction with the chairman of the Quality Review Panel, is responsible for arranging the date of the review. Terms of reference for the review should be circulated on the Quality Review Invitation, form PM3 (see *Appendix B*). Invitations should be sent out to members of the Panel before the scheduled review date, giving ample time for a thorough preview of the documentation.

The Panel must review the Quality Review Invitations (enclosing Product Descriptions and documents enabling review). All agreed actions decided during the review must be recorded on a Quality Review Action List which must be signed-off by the Panel chairman once all action points are cleared by the Project Leader.

Roles of the Post-Project Appraisal Team ("PPA Team")

The PPA Team is set up by the PAB to conduct Post-Project Appraisals on appropriate projects. The PPA Team must be led by an appropriately experienced individual who must be independent from the original project.

Membership of the team should include representatives from other departments/functions, and, wherever possible, team members should not have been members of any original project body (such as the PAB, Project Board, or Quality Review Panel). However, the original Project Leader can be co-opted if required.

The responsibilities of the PPA Team are as follows:

- review all project documentation;
- where appropriate, visit the site accompanied by the original Project Leader and other functional representatives, and physically verify the products;
- prepare and discuss the draft report with the original Project Leader for factual accuracy;
- submit the report with recommendations (where appropriate) and conclusions to the PAB for approval;
- submit the approved report to the EG/NRA Board; and
- circulate a summary of the report within the NRA identifying benefits, pitfalls and lessons learned.

APPENDIX B - PROJECT MANAGEMENT FORMS

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Appendix B - Project Management Forms

SUMMARY APPRAISAL FORM**PM1**

Project Reference:
Function:
Region/H.O. Dept.:

Prepared by:
Date:

1. Title of Project

Proposed Total Cost	£	Start Year	199 /199

2. Description of Problem, Need or Opportunity

--

3. Objectives

--

4. Products

--

5. Justification/Benefits/Consequences of Doing Nothing

--

6. Summary of Options Considered : Estimated Costs and Benefits - (Preferred Options First)

	Option Description	Costs			Benefits		Net NPV (£k)
		Cap.	Rev.	Total	Value	NPV	
		(£k)	(£k)	(£k)	(£k)	(£k)	
1							
2							
3							
4							
5							
6							

7. Preferred Option (giving reasons where it is not the lowest cost option)

--

8. Key Target Dates

	Planning/SoD Approval	Running Project
Start		
End		
Other Key Dates [e.g. completion of stage/products]		

9. Planned Expenditure

	199 /199 Year 1 £'000	199 /199 Year 2 £'000	Beyond 199 /199 £'000	Total £'000
Planning				
Running the Project: NRA Costs Contractors Implementation				
TOTAL				
Capital				
Revenue				

10. Risks, Constraints, Dependencies

--

11. Proposed Responsibilities

Project Manager	
Project Board Membership	

PAB/Budget Manager Approval		Date	
-----------------------------	--	------	--

SUMMARY APPRAISAL FORM

PM1

GUIDANCE NOTES TO COMPLETION AND SUBMISSION

Purpose

The Summary Appraisal Form sets out the need for the project, its objectives and a consideration of the options. The Form is submitted to the PAB in order to obtain approval for inclusion on a proposed programme. For small projects, the Form will be the main planning document, and will accompany the Form A when obtaining SoD authorisation.

General

Presentation

- The Form should be completed using clear English with full sentences.
- Where additional space is required, attach extra pages and refer to these in the relevant box.
- A Wordperfect proforma is available, although the Form may be completed by hand.

Person Responsible

- The Budget Manager or his/her delegate should prepare the Form. The Budget Manager's name must appear in the "prepared by" box.

Timing

- The Form should be prepared in order to include the project on an approved programme. For small projects, the Form provides full authorisation to undertake the project, if accompanied by a Form A for SoD approval.

Submission

- In the case of medium and large projects, the Budget Manager must forward the Form to the PAB Secretary.
- In the case of small projects, the Budget Manager approves the Form and attaches it to the Form A for forwarding to the SoD authority.

Small Projects

- Where the Form is being prepared for a small project, Product Descriptions and an outline Project Plan must be attached.

Detailed Guidance on Completion

Proposed Total Cost

- Enter the latest estimate of cost of preferred option. This amount should be the total proposed expenditure, which shall be used to categorise the project as small/ medium/large.

Start Year

- Enter the first financial year in which it is proposed that the project should be included in an approved programme.

APPENDIX C - EXAMPLE SUMMARY APPRAISAL FORM

Example of a completed Summary Appraisal Form is included here.

SUMMARY APPRAISAL FORM**PM1**

Project Reference: G01(94)06
 Function: R&D
 Region/H.O. Dept.: Head Office

Prepared by: John Dalton
 Date: 14/01/94

1. Title of Project

Functional Analysis of European Wetland Ecosystems - Phase 2

Proposed Total Cost	£42,000	Start Year	1994 /1995
---------------------	---------	------------	------------

2. Description of Problem, Need or Opportunity

Wetlands are both dependant upon, and directly influence, processes within river catchments. It is essential that the NRA develops a sound and multi-disciplinary understanding of wetland processes to aid catchment management planning. This knowledge is required for better decision-making with respect to the NRA's flood defence, water resources, water quality, planning activities and conservation responsibilities. This project supports the Developmental Initiatives on EC Directives.

3. Objectives

To participate in relevant wetlands management research undertaken on behalf of EU (DGXII) to direct EU policy in this area and to define future wetland R&D requirements for both EU and NRA.

To produce an assessment tool to improve decision making on planning applications and NRA operational activities.

4. Products

An "expert system" in the form of a computer model.

A user manual for the computer system.

5. Justification/Benefits/Consequences of Doing Nothing

The NRA would not benefit from the large multi-disciplinary package of work funded by the EU and would not be in a position to directly contribute to the forthcoming EU Directive on wetland conservation. The NRA has been identified as a prime user of the system within the UK and is therefore in a strong position to influence development of outputs of direct relevance to the Authority, but within the context of a European scale project. If the NRA does not contribute to this it would be likely to find that a system is developed which the Authority cannot use and would require funds to develop a system that would be appropriate.

6. Summary of Options Considered : Estimated Costs and Benefits - (Preferred Options First)

Option Description	Costs			Benefits		Net NPV (£k)
	Cap.	Rev.	Total	Value	NPV	
	(£k)	(£k)	NPV (£k)	(£k)	(£k)	
1 NRA contributes to EU project		42	40.8	0		40.8
2 NRA undertakes project alone		590	568	0		568
3 Do nothing		0	0	0		0
4						
5						

2. Description of Problem/Need/Opportunity

- Enter the reasons why the project has been identified. This must include the National Aim or Objective to which the project contributes. It may also be necessary to explain why the expenditure represents a project and to list any links with other projects.

3. Objectives

- Enter the overall purpose of the project, or the proposed solution to the problem, need or opportunity. This will not require description of individual products (see below).

4. Products

- Give outlines of the outputs of the project, which may include documents, data, assets etc.

5. Justification/ Benefits/Consequences of Doing Nothing

- Enter the reasons why the project should be undertaken at the time proposed, including the benefits which will accrue and the perceived overall benefit over doing nothing (and/or delaying the expenditure).

6. Summary of Options

- Enter a brief description of each considered option to identify the option, including "do nothing" and, optionally, "do minimum". The "do nothing" option must be considered.
- Enter best current estimates of costs (split between capital and revenue) and benefits in both absolute and NPV terms. For medium and large projects, estimates will be soft because detailed planning will not yet have been undertaken. For small projects, estimates should be those appearing on the Form A.
- Enter the net NPV for each option.

7. Preferred Option

- Enter the name of the preferred option. No further justification is required where this option is that with the lowest cost.
- More than one option may be identified at this stage for medium and large projects, where detailed planning and appraisal is yet to be undertaken.

8. Key Target Dates

- Enter approximate timings as indicated, and any other estimates if available.

9. Planned Expenditure

- For the preferred option, set out the expected costs broken down between type and financial year.

10. Risks, Constraints and Dependencies

- Give a brief outline of the risks associated with the preferred option, including any factors which may impose constraints on the costs, benefits or timings of the project and individual products. Include any significant uncertainties and dependencies.

11. Proposed Responsibilities

- Provide recommendations for the identity of the Project Manager and Project Board Chairman and other members. Alternatives may be given.

PRODUCT DESCRIPTION**PM2**

Project Reference:
Function:
Region/H.O. Dept:

Prepared by:
Date:

1. Project Title**2. Product Title****Product Code****3. Person Responsible for Product Development****4. Purpose/Objective of Product****5. Product Outline****6. Presentation Format****7. Information Sources/Tools****8. Quality Criteria****9. Quality Review Method**

PRODUCT DESCRIPTION

PM2

GUIDANCE NOTES ON COMPLETION AND SUBMISSION

Purpose

The Product Description sets out the details of what is to be delivered by the project. One Form is to be prepared for each product.

General

Presentation

- The Form should be completed using clear English with full sentences.
- Where additional space is required, attach extra pages and refer to these in the relevant box.
- A Wordperfect proforma is available, although the Form may be completed by hand.

Timing and Submission

- For medium and large projects, a Form must be prepared during preparation of the PID and should be attached to that document.
- For small projects, the Form should be attached to the Summary Appraisal Form.

Detailed Guidance on Completion

3. Person Responsible

- For medium and large projects, the Project Manager or his/her delegate should prepare the Form.
- For small projects, the Budget Manager or his/her delegate should prepare the Form.

4. Purpose/Objective of Product

- Set out what the product is to achieve within the broader objectives of the project.

5. Product Outline

- Describe the product specification - for example, if the product is a document, set out its proposed structure. If it is a technical item, give an overview of the specification and refer to the location of detailed plans/drawings.

6. Presentation Format

- Give a description of the intended final form of the product.

7. Information Sources/Tools

- List the various documentation, data, research or other reference material that will be used in preparing the product.

8. Quality Criteria

- Set out the main standards that the product must achieve and the measures that the quality of the product will be judged by.

9. Quality Review Method

- Enter the proposed method for Quality Review, ie formal or postal.

QUALITY REVIEW INVITATION

PM3

Project Reference:
Function:
Region/H.O. Dept

Prepared by:
Date:

Project Title

Stage (if applicable)

You are invited to attend a Quality Review of the following Product(s):

Product Code(s)

Product Name(s)

Venue (if postal enter "POSTAL")		Date Time Duration	/ /
Chairman		Project Manager	
Reviewers			

Product Description(s) attached

--

Product(s) attached (where applicable)

--

QUALITY REVIEW INVITATION

PM3

GUIDANCE NOTES ON COMPLETION AND SUBMISSION**Purpose**

The Quality Review Invitation sets out the terms of reference for each Quality Review.

General**Presentation**

- The Form should be completed using clear English with full sentences.
- Where additional space is required, attach extra pages and refer to these in the relevant box.
- A Wordperfect proforma is available, although the Form may be completed by hand.

Person Responsible

- The Project Manager.

Timing

- The Form must be sent out with attachments to allow members of the Quality Review Panel time to review the product.

Submission

- A copy of the Form must be sent to each QRP member prior to every review.

Detailed Guidance on Completion

Each product to be reviewed must be identified, and details of the type of review to be carried out must be completed.

Formal Review

- Enter the venue, date, time and approximate duration in the boxes.

Postal Review

- Enter "POSTAL" in the Venue box, and enter the date by which a response is required in the Date box.

For both types of review, list the names of the Panel Chairman, the Project Manager and the remaining Panel members. In the case of Postal reviews, responses must be sent to the Project Manager.

Reference must be made to:-

- Product Descriptions relating to the products under review, which must be attached; and
- Products, which must be attached where possible, or a report describing the latest specification of the product(s).

Appendix B - Project Management Forms

QUALITY REVIEW ACTION LIST

PM4

Project Reference:
Function:
Region/H.O. Dept:

Prepared by:
Date:

Project Title

Stage (if applicable)

Product Code

Product Name

Date

Action No.

Description

Action
By

Target
Date

Checked
By

Quality Review Panel Chairman Sign Off

Date

QUALITY REVIEW ACTION LIST

PM4

GUIDANCE NOTES ON COMPLETION AND SUBMISSION**Purpose**

The Quality Review Action List is used to record actions and changes to products that are agreed during the Quality Review.

General**Presentation**

- The Form should be completed using clear English with full sentences.
- Where additional space is required, attach extra pages and refer to these in the relevant box.
- A Wordperfect proforma is available, although the Form may be completed by hand.

Person Responsible

- The Project Manager should complete the Form, as Secretary to the Quality Review Panel. The Panel Chairman must sign-off the Form once complete.

Timing/Submission

- A Form should be prepared following each Quality Review, and should be updated as each action point is dealt with. The Project Manager should submit the Form to the Chairman once all action points are complete.

Action Points

- For each action point, the Project Manager must set out the outline task, identify who is responsible for completing the task in the "Action By" column, and the target date for completion.
- Once complete, the Project Manager, or other specified reviewer, should check that the task has been properly performed in relation to the description, and should initial the Form in the "Checked By" column.

CHANGE REPORT

PM5

Project Reference:
Function:
Region/H.O. Dept:

Prepared by:
Date:

Project Title

Stage (if applicable)

Product(s) affected by the Change/Exception

Product Code(s)

Product Name(s)

Details of Change or Exception

Effect on Project

Proposed Change Plan (attach separate sheets if necessary)

Action By

Action By
Date

Comment

Project Manager

Date

Budget Manager/PAB Authorisation

Date

CHANGE REPORT

PM5

GUIDANCE NOTES ON COMPLETION AND SUBMISSION**Purpose**

The Change Report sets out the details of a Change or Exception, including its cause, effect and solution.

General**Presentation**

- The Form should be completed using clear English with full sentences.
- Where additional space is required, attach extra pages and refer to these in the relevant box.
- A Wordperfect proforma is available, although the Form may be completed by hand.

Person Responsible

- The Project Manager must prepare the Form.

Timing and Submission

- A Form must be prepared whenever a Change or Exception is identified which requires authorisation (ie has exceeded planned tolerances).
- The completed Form must be passed to the PAB (or Budget Manager, where the roles of the PAB have been delegated) who must authorise the Form prior to execution of the Change Plan.
- If there is a need to obtain authorisation urgently, the Project Board or Line Manager (as appropriate) can give interim approval which must be confirmed at the next meeting of the PAB.

Detailed Guidance on Completion**Details of the Change/Exception**

- Full details of the Change/Exception, including reasons why it has occurred.

Effect on Project

- Set out the main effects that the Change/Exception will have on the project, including a full statement of the costs and benefits associated with the Change/Exception.

Proposed Change Plan

- Attach details of the course of action that is recommended to correct or effect the Change/Exception. This should be split, where possible, into Technical, Resource and Quality Plans.
- Approximate timings and responsibilities for executing the Change Plan should be entered in the "Action By" boxes.

ACCEPTANCE LETTER

PM6

Project Reference:
Function:
Region/H.O. Dept:

Prepared by:
Date:

Project title

PART A (to be completed by the Project Manager)

User

Project Manager

Issued to User on

To be returned to Project Manager by

Product Name

Product Code

Product Description, Quality Plan, Product Documents and other relevant papers are to be attached

Part B (to be completed by the User)

I have reviewed the above product on behalf of:

		(Department, Function, etc)
<input type="checkbox"/>	The product is accepted	
<input type="checkbox"/>	The product is accepted subject to inclusion of the comments noted below	
<input type="checkbox"/>	The product is rejected for the reasons noted below	

Comments

--

Signature

Department

Date

--

--

/ /

ACCEPTANCE LETTER

PM6

GUIDANCE NOTES ON COMPLETION AND SUBMISSION

Purpose

The Acceptance Letter provides evidence that the product user is prepared to accept the delivered product, which will have been implemented in accordance with the agreed Implementation Plan.

General

Presentation

- The Form should be completed using clear English with full sentences.
- Where additional space is required, attach extra pages and refer to these in the relevant box.
- A Wordperfect proforma is available, although the Form may be completed by hand.

Person Responsible

- Part A must be prepared by the Project Manager, and Part B by the user representative.

Timing

- The Form should be sent to the user when the Project Manager is satisfied that product implementation is complete. The Project Manager should state the date by which the completed Form should be returned.

Submission

- The completed Form should be retained by the Project Manager and referred to during the Closure Meeting, and attached to the Project Evaluation Report, if appropriate.

Detailed Guidance on Completion

The Project Manager should complete the details required in Part A. The user representative should respond by completing and signing Part B. Any comments entered in Part B must be actioned by the Project Manager - if the product has been rejected, the Project Manager should issue a new Acceptance Letter once the user's comments have been actioned.

END OF R&D STAGE ASSESSMENT FORM

1. Project and Staff Details

Project Title				
Project Number		Commission		Topic Area
Project Leader			Region	

2. R&D Undertaken by:

List names of research organisations/in house group doing the R&D

Name	Performance (good/average/poor)

3. Objectives

The overall objective for the research:

--

4. Sign off

This ERSA has been:

prepared by	
seen by	
seen by	
accepted by	

as Project Leader/...../.....
Topic Leader/...../.....
Commissioner/...../.....
as Customer on/...../.....

5. Uptake Statements

The proposals for (a) dissemination and (b) implementation, including uptake route, for this stage are:

Uptake route:

6. Approval to Proceed to Uptake Stage

The Research stage has been completed and the project may proceed to the Uptake Stage. Comments follow:

--

Approved by _____

Dr C J Swinnerton, Director

Date _____

Appendix B - Project Management Forms

7. Project costs (£k)

Cost plan

Item	Approved PIA	Final Revised	Actual	Planned			Forecast Total
				R&D budget	Function	Others	
R&D stage							
Uptake stage							
- Dissemination							
- Implementation							
Total							

Do actual and planned costs include NRA in-house staff resources? ☐

State approximate NRA staff resource requirements for dissemination and implementation separately by year.

8. Timescales

Stage	Start	Finish
Planned project (as PIA)		
Research stage		
Uptake stage, planned		
- Dissemination		
- Implementation		

9. Project Outputs

Ref No	Title	Dissemination		Acceptance Level
		Internal	External	

Attachments:

Uptake plan ☐

Draft R&D Digest
for each output
Draft Final Report ☐

R&D management and future
evaluation issues ☐

END OF R&D STAGE ASSESSMENT**R&D Management and Future Evaluation Issues****1. Management Issues**

- a) Did the R&D stage achieve the objectives and outputs as specified?
- b) Was the R&D effectively managed by the research contractor?
- c) Are there any other management issues/lessons that need to be recorded?

	Yes		No
	Yes		No
	Yes		No

2. Research Issues (to be followed up by future Programme Area Review)

- a) Has the R&D stage built effectively on the available base of present knowledge?
- b) Could the same results have been achieved by an approach other than R&D?

	Yes		No
	Yes		No

e.g. brainstorm/conference/external expert

- c) What was the quality of the R&D technically?

	Excellent		Average		Poor
--	-----------	--	---------	--	------

3. Benefits and Value for Money (to be followed up by Post-project Evaluation)

- a) Is the NRA likely to achieve value for money from the R&D project when its completed?
- b) Will the output bring the anticipated benefits to the NRA?
- c) Set out any criteria that could be used to assess the benefits

	Yes		No
	Yes		No

(a)

(b)

(c)

4. Additional Information

Use this section to provide any explanatory information for the answers provided above.

Guidance Notes

These notes are designed to provide further information regarding the questions on management issues; research issues and benefits and value for money.

End of R&D Stage Assessment

1. Management Issues

- a) This is a measure of how successful the R&D stage was in achieving the objectives and outputs originally set out in the project investment appraisal. If, for any reason, the stage did not live up to the original expectations, a brief explanation should be provided in Section 4.
- b) An assessment of the performance of the research contractor is useful as it provides a good indication of the relative strengths/weaknesses of the range of research contractors with which the NRA interacts. Any comments regarding such performance may be added in Section 4.
- c) If there are any additional points, regarding the overall management (either by the NRA or the research contractor) of the project, that need to be recorded they should be included here. Issues such as feedback from NRA staff, communications with research contractor, support from R&D staff, briefing from core function staff are examples of items which could be considered.

2. Research Issues

- a) The successful completion of an R&D stage will, in many cases, depend upon the extent to which the existing base of knowledge within the scientific community was used and built upon. An indication of the degree to which the research contractor used and took forward the current science rather than duplicating existing knowledge is required. Clarifying remarks may be added in Section 4.
- b) In some instances, R&D may not be the only mechanism by which an output could be produced. Examples exist of where a "brainstorming" session by technical experts has achieved the desired end result. If this is the case for the R&D stage being assessed it should be recorded with details in Section 4.
- c) An overall assessment of the quality of the R&D in both scientific and technical terms is essential if the NRA is to be confident in utilising the output. Outputs that are scientifically excellent but unusable; or scientifically poor but easily taken up by the end-user are not particularly beneficial. If there are any issues regarding the technical basis of the output they should be set out in Section 4.

3. Benefits and Value for Money

- a) This R&D stage may be just part of the overall R&D project. It is essential that an assessment of whether the NRA is likely to achieve value for money from the whole R&D project is made. This will enable any adjustments to be made to further R&D stages or any subsequent uptake.
- b) At the outset of the project an estimation of the potential benefits was included in the project plan. An indication of whether the output will achieve the benefits is needed and any explanation can be included in Section 4.
- c) After the project has completed and the output(s) taken up, a post-project evaluation may be undertaken. This is designed to assess the project and how successful it was in achieving its original requirements. Any criteria by which the performance of the project may be assessed should be included here. For example the number of samples analysed to a new limit of detection and the increase in flood defence assets surveyed may be examples of criteria.

Appendix C - Example Summary Appraisal Form

7. Preferred Option (giving reasons where it is not the lowest cost option)

The preferred option is for the NRA to contribute to the EU project. This will minimise the risk of the NRA having to possibly develop an integrated tool for improved decision making and will enable the NRA to influence EU policy in this area.

8. Key Target Dates

	Planning/SoD Approval	Running Project
Start	19/01/94	12/07/94
End	01/04/94	31/03/96
Other Key Dates [e.g. completion of stage/products]	The start date for the project will be linked to the next meeting of the NRA's Wetland Liaison Group meeting at which a report will be given on the model from Phase 1.	

9. Planned Expenditure

	1994/1995 Year 1 £'000	1995 /1996 Year 2 £'000	Beyond 199 /199 £'000	Total £'000
Planning				
Running the Project:				
NRA Costs	1	1		2
Contractors	20	20		40
Implementation				
TOTAL	21	21		42
Capital				
Revenue	21	21		42

10. Risks, Constraints, Dependencies

Phase 2 of this project has been approved by the EU, therefore there is no risk associated with funding. The lead contractor will be the same as for Phase 1. Work will only start on Phase 2 after a satisfactory report is given to the next meeting of the Wetland Liaison Group, in July 1994. This will again reduce risk. Progress will be closely monitored on a six monthly basis by the NRA's Wetland Liaison Group.

11. Proposed Responsibilities

Project Manager	Dr Mark Everard, Water Quality Planner, Head Office
Project Board Membership	NRA Wetland Liaison Group: Paul Raven, Terry Newman, Richard Horrocks, Lyn Jenkins

PAB/Budget Manager Approval		Date	
-----------------------------	--	------	--

APPENDIX D - EXAMPLE OF OTHER FORMS

Example of a completed ERSA can be found here.

END OF R&D STAGE ASSESSMENT REPORT**1. Project and Staff Details**

Project Title	DO and Ammonia in Tidal Waters Related to SWQOs - Project Definition Study		
Project Number	323	Commission	A
		Topic Area	A4
Project Leader	Gareth Llewellyn		Region
			Head Office

2. R&D Undertaken by:

List names of research organisations/in house group doing the R&D

Name	Performance (good/average/poor)
WRc plc	Average

3. Objectives

The overall objective for the research:

To identify a programme of research required to enable the NRA to implement the ammonia and dissolved oxygen components of the water quality classification scheme for estuaries.

4. Sign off

This ERSA has been:

prepared by

seen by

seen by

accepted by

as Project Leader

Topic Leader

Commissioner

as Customer on

5. Uptake Statements

The proposals for (a) dissemination and (b) implementation, including uptake route, for this stage are:

This project definition study was undertaken to provide the basis from which sensible standards for ammonia and DO in estuaries could be developed. The dissemination should be to the SWQO Business Group and the 1995 water quality survey group. No specific dissemination activities will be required. The proposals set out in the output will be taken up by the Business Group and will feed into a further R&D project to develop the standards.

Uptake route: C

6. Approval to Proceed to Uptake Stage

The Research stage has been completed and the project may proceed to the Uptake Stage. Comments follow:

Approved by

Dr C J Swinnerton, Director Water Management

Date

Appendix D - Example of other forms

7. Project costs (£k)

Cost plan

Item	Approved PIA	Final Revised	Actual	Planned			Forecast Total
				R&D budget	Function	Others	
R&D stage	22,741	-	23,541				
Uptake stage							
- Dissemination	-			-	-	-	
- Implementation	-			-	-	-	
Total	22,741		23,541				

Do actual and planned costs include NRA in-house staff resources?

State approximate NRA staff resource requirements for dissemination and implementation separately by year.

Dissemination: Presentation by project leader to business Group 1 man day 1992/93.
Implementation through further R&D project approximately 70 m/d (93/94) 60 m/d (94/95)

8. Timescales

Stage	Start	Finish
Planned project (as PIA)		
Research stage	6/91	4/92
Uptake stage, planned		
- Dissemination	4/92	6/92
- Implementation	3/93	12/94

9. Project Outputs

Ref No	Title	Dissemination status		Acceptance Level
		Internal	External	
323/3/HO	Dissolved Oxygen and Ammonia in Tidal Waters Related to WQOs - Project Definition Study	Limited	Restricted	Topic Leader

Attachments:

Uptake plan ☐

:Draft R&D Digest for each output
Draft Final Report

:R&D management and future
contribution issues ☐

END OF R&D STAGE ASSESSMENT**R&D Management and Future Evaluation Issues****1. Management Issues**

- a) Did the R&D stage achieve the objectives and outputs as specified?
- b) Was the R&D effectively managed by the research contractor?
- c) Are there any other management issues/lessons that need to be recorded?

<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No
<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No

2. Research Issues (to be followed up by future Programme Area Review)

- a) Has the R&D stage built effectively on the available base of present knowledge?
- b) Could the same results have been achieved by an approach other than R&D?

<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No
<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No

e.g. brainstorm/conference/external expert

- c) What was the quality of the R&D technically?

3. Benefits and Value for Money (to be followed up by Post-project Evaluation)

- a) Is the NRA likely to achieve value for money from the R&D project when its completed?
- b) Will the output bring the anticipated benefits to the NRA?

<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No
<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No

- c) Set out any criteria that could be used to assess the benefits

(a)	Effectiveness of maintaining equipment developed to measure DO and NM4
(b)	Use of the standards as part of the GQA for estuaries
(c)	The targeting of R&D resources to appropriate costed options

4. Additional Information

Use this section to provide any explanatory information for the answers provided above.

1b. Finally achieving the required objectives the research contractor failed on numerous occasions to provide the cost breakdown for the options as required.

1c. The delay in approval for the SWQO scheme has resulted in a delayed take up of the output. It may have been beneficial to have left the output as a draft pending DoE's response to the scheme as a whole.

2b. A brainstorming session was used to identify all the potential options. The only aspect which may not have been covered by this approach would be the costing of the options.

APPENDIX E - EXAMPLE R&D PROJECT INITIATION DOCUMENT (PID)

The following is an example of R&D PID, this provides the management information necessary for justifying the investment of NRA resources. It provides the layout and format for this document with an example of the text.

The R&D PID is set out under standard headings so that it can be held on the R&D Information System (computer database) and so it conforms to the *NRA Project Management Procedures PIN*. The amount of detail included in any PID should be appropriate to the cost and level of complexity of the project. It is a dynamic document which should be revised and updated throughout the life of the project, especially as each package or phase is updated. This will normally involve changing/adding to Sections 5, 7, 11, 12, 14 and 15, but other Sections should be amended if necessary.

This example is for a "Medium" project which has two phases, but is relatively straight forward, except that within the research stage there is R&D and function budgets. It is important that judgement and advice (contact your Regional R&D Co-ordinator) are used to tailor the detail to the size and complexity of the project in question.

Version No.	Issue Date	Comment
0.2	12/12/93	First Draft for general review

R&D PROJECT INITIATION DOCUMENT

1. Title: Evaluation of the benefits of low flow alleviation

R&D Commission: B - Water Resources

Topic: B03 - Water Resources Management

Proposal No: B03(89)05 Project No: 0184

R&D Classification: Applied Strategic

Primary purpose: Operational Effectiveness/Efficiency

2. Project Leader: Michael Howard

Post title: Head of Water Resources

Region: Head Office

Address: Rivers House, Waterside Drive
Western Way,
Bristol

Postcode: BS1 4UD

Telephone: 0272 624400

Fax: 0272 624409

3. Research Contractor: Flood Hazard Research Centre

Address: University of the Midlands
Queensway,
Birmingham

Postcode: BR3 4SF

Telephone: 021 362 5359

Fax: 021 362 5403

Contract signatory: Mrs Mary Lockit

Project manager: Dr Miriam House

4. Contract Details

Type: Competitive Tender

Start Date: 04/89 Status: As Contract

End Date: 03/91 Status: As Contract

5. Objectives

Overall Objectives:

To develop a methodology and undertake surveys on two specified low flow rivers to obtain data for a cost benefit analysis in order for the NRA to justify to DoE the costs of alleviating low flows.

Specific objectives:

Phase 1

- (a) To design pilot questionnaires suitable for assessing the "willingness to pay" for use values on the specified rivers.
- (b) To undertake pilot surveys to test the questionnaires.
- (c) To review and revise the questionnaire design.
- (d) To consider the relevance of market price benefits on the two specified low flow rivers.
- (e) To produce a Phase 1 report in the form of an R&D Note, including details of questionnaire design and results of pilot survey.

Phase 2

- (a) To devise and agree details of the proposed survey area and sample size.
- (b) To undertake the survey in accordance with the agreed methodology and questionnaire.
- (c) To analyse the questionnaire returns and provide a valuation of the benefits.
- (d) To determine and estimate, if relevant, the market price benefits for the specified rivers.
- (e) To produce a report in the form of an R&D Note, detailing the work performed.

6. Problem

Since the formation of the NRA in September 1989, considerable attention has been given both internally and externally to the problem of unacceptably low flows in some of our rivers. These are problems caused by excessive authorised abstractions rather than due to drought.

Most of the abstractions were authorised under the Water Resources Act 1963 which gave existing abstractors the right to a licence regardless of any environmental implications.

As a first step in tackling these problems the NRA drew up a priority list of 40 locations perceived as suffering from excessive abstraction. Within this list a "top 20" list was drawn up representing those locations which would receive the most urgent attention. In most cases the cause of the low flows have been groundwater abstractions which have resulted in groundwater seepage to the surface being reduced or halted in some instances.

This project has resulted from discussions with DoE, who have indicated their reluctance to approve low flow schemes unless the benefits have been quantified. This project breaks new ground and it is crucial that the methodology is seen as robust and authoritative.

This project supports the Developmental Initiative - Water Resources Development Strategy.

Product descriptions

7. Deliverables

See Appendix 1 for the completed Product Description Forms (PM2).

7.1 Deliverables

Type	Status		No of copies	Date of completion	Produced by

	Int	Ext			

A. Short-term					
Progress Report					
(monthly)	R	R	7	01/07/89	Contractor
Interim Report	R	R	7	10/12/89	Contractor
Draft R&D Note A	R	R	7	31/01/90	Contractor
Draft R&D Note B	R	R	7	31/01/91	Contractor
B. Research					
Project Record	R	R	7	28/02/91	Contractor
R&D Note A	RR	PD	50	28/02/91	Contractor
R&D Note B	RR	PD	50	28/02/91	Contractor
R&D Digest	RR	PD	100	28/02/91	Project Leader

7.2 Project Outputs

Item	Designation	Acceptance Level	Uptake Route
Project Record	O	Project Board	(b)
R&D Note	O	Project Board	(b)
R&D Digest	-	Commissioner	

Business Case

8. Background

In formulating its original list of 40 rivers the NRA considered a variety of information describing quantitative and qualitative aspects of the water environment relating to each case of reduced flows. The list represented a best estimate of the most severe cases in England and Wales.

There are a number of methods which can be employed to add more water to a low flow location. Perhaps the most direct approach is to reduce or totally revoke the licences causing the problem. The NRA has powers under the Water Resources Act 1991 to vary or revoke licences. Where this approach is applied to a licence which is being used, then the NRA is liable to compensate the licence holder. If an agreement on compensation cannot be agreed by the NRA and the licence holder then it is determined by the Lands Tribunal. However, to date it has not been necessary to refer such matters to this Tribunal.

There are a number of technical measures which can be used to augment flows. In some instances river bed lining is a possibility but this form of solution is not without its environmental problems.

Another technical solution can be the introduction of a new source of water from elsewhere. Sometimes it is technically possible to pump water from the same groundwater source that is also being drawn upon by the abstraction causing the problem. This form of solution may appear to be a nonsense but by judicious design of the augmentation scheme a net gain in surfacewater flow can be achieved in summertime, and the groundwater allowed to recover in winter.

In the past consideration has been given to recycling of water within the river system whereby water from higher flowing downstream reaches could be pumped and piped upstream to augment flows. To date no application of this method is under consideration.

A further technical solution is to relocate the offending abstractions within the same water resource. For example it can be possible to alleviate low flows by moving groundwater abstraction locations further downstream within the catchment, thus allowing upstream recovery. Although downstream flows could reduce because of the relocation the impact of this reduction is minimised due to higher natural downstream flows.

Although the NRA has powers under existing legislation to resolve the problem, by revoking the licences, this is not necessarily the most cost-effective solution. In practice it is likely that a combination of revocation/variation and engineering measures will be the preferred option.

Options:

A previous project (Project 401 (Topic B3)) on this subject, explored different options for undertaking a robust methodology. R&D Note 486 produced the estimated costs and benefits associated with the various different options. It was decided by the Project Board to hold a seminar to discuss the preferred approach to the next phase. This internal seminar was attended by:

Professor Kerry Turner, Clive Swinnerton, Michael Howard, Meg Postle, Simon Taylor, Jerry Sherriff and John Dalton to discuss the various options.

Options that were discussed included Contingent Valuation methodology, Hedonic Pricing method, Travel Cost method and a scoring method based on minimum ecologically acceptable flows. All of these options comply with the NRA's Environmental Policy. However, in considering these it was felt that the risk associated with options other than the Contingent Valuation method would not be acceptable to DoE and as a result the other methods were not costed in detail.

This project represents the preferred approach which was endorsed by those at the meeting, especially Kerry Turner (NRA Board Member) and Meg Postle the NRA's economist.

"Do nothing"

If this project is not undertaken, it will not be possible for the NRA to provide adequate justification to the DoE of expenditure to alleviate the problems of low flows due to excessive abstraction.

Note: Options identified must be costed, and the benefits and risks considered. If a previous project considers options, only a reference is required, not the whole reworking of the previous project.

Context:

This project supports the Developmental Initiative - Water Resources Development Strategy, which is a "must do" activity, and has been approved in principle by the National PAB. Jim Davies, Economist DoE, as an independent expert, endorses this approach.

A considerable amount of work has been undertaken on Environmental Impact Assessment in both Europe and North America, which has given rise to statements of the effects of a variety of capital works on the environment.

The DoE has produced a guide to "Policy Appraisal and the Environment" to enable Ministers to consider the effect on the environment of various policy matters, but this does not attempt to assign specific monetary values.

The British Waterways Board and the Forestry Commission have undertaken some work to assess the value of canals and forests. Some Sea Defence schemes have attempted an assessment of amenity benefits of beaches. Other studies have been aimed at valuing recreational activities in river corridors.

The NRA has also undertaken relevant research: Project 253 - Economic value of changes to the water environment; Project 237 - Review of inherited low flow conditions, which is relevant to this project, but do not deal specifically with monetary values and Project 401 - Evaluating costs and benefits of low flow alleviation which considered different options for obtaining economic benefits.

9. Benefits

Although the NRA has powers under existing legislation to resolve the problem, by revoking the licences, this is not necessarily the most cost-effective solution. In practice it is likely that a combination of revocation/variation and engineering measures will be the preferred option.

The present approach used in selecting solutions is to choose the minimum cost option. However examination of cost-effectiveness does not give insight into whether the problems worth solving by the preferred option. The cost of solving some of the problems may run into several million pounds and this project is aimed at evaluating benefits so that project costs can be justified. It is likely that this will provide tangible benefits by increasing the cost effectiveness of the organisation. It will provide potential cost savings for the NRA if the low flow scheme proposed does not have a positive benefit/cost ratio.

10. Assumptions, constraints and risks

Assumptions

It is assumed that the Contractor will have the necessary experience to successfully undertake this work. It is expected that data collection will be relevant and valuable and that data will be obtained in a timely manner. The costs given in the R&D Note 486 were based on 1992 prices which are still assumed to be valid.

Constraints

Any on-site survey should be completed by October to obtain sufficient numbers of people to give a representative sample. It is assumed that the weather in any one year will still provide a robust "willingness to pay" for subsequent years.

Risks

The risks are minimised by adopting a phased approach, pre-tender selection will minimise the risk of employing an inadequate contractor. There is a risk that the results will not be acceptable to DoE, but this is minimised by ensuring that the most able contractor is selected. The overall risk is estimated to be low.

Project Plan

Technical Plan

11. Approach

Overall approach

This project has been divided into two phases, which builds on the work successfully completed as Project 401.

Questionnaire design and survey to be undertaken on a pilot basis by the Research Contractor, supervised by the Project Leader. These will be reviewed by the Project Board and there will be direct involvement with a member of the NRA. Phase 2 will be commenced after successful completion of Phase 1.

Policy makers are represented on the Project Board to ensure that the end-users receive the methodology that they are able to understand and use.

The Research Contractor will be chosen on the basis of (a) appreciation and knowledge of the Contingent Valuation methodology, (b) experience of environmental economics, and (c) experience of questionnaire design and organising survey work.

Undertake R&D

External R&D contract to:

Phase 1

- (a) Design pilot questionnaires
- (b) Undertake pilot surveys
- (c) Review and revise questionnaire design after results of pilot survey
- (d) Produce Phase 1 report with questionnaire design, results of pilot survey work and statement of market price benefits for the two specified rivers

Phase 2

- (a) Agree sample size and area for the specified rivers
- (b) Produce statement of market price benefits
- (c) Undertake survey
- (d) Analyse questionnaires
- (e) Produce Project Record and R&D Note detailing the work undertaken and the results

Uptake

Dissemination

Project Record for Phase 2 will be distributed to Water Resources Managers and Finance Directorate, together with R&D Digest. Dissemination to DoE through representative on Project Board. The R&D Note will be externally available to Public Domain.

Implementation

On successful completion of the project the function will organise a seminar and training session to explain and ensure that the methodology is used by the relevant staff when preparing a case for alleviation of low flows.

Customer Acceptance Level: Commissioner

12. Targets and timescales

Phase 1	Month
(a) Questionnaire design	3
(b) Pilot study completed	6
(d) Phase 1 report	9

Phase 2

(a)	Agree sample size and area	10
(c)	Undertake survey	12
(e)	Draft Project Record and R&D Note	22
(f)	Finalise R&D Outputs	24

See Appendix 2 for a Gantt chart which diagrammatically shows this.

Resource Plan

13. Organisation

Project Organisation

The Project Board will consist of:

Chair of Project Board,	Clive Swinnerton, Director of Water Management;
Senior End User,	Jerry Sherriff, Head of Water Resources;
Technical User,	Meg Postle, NRA Economist;
Independent Advisor,	Jim Davies, DoE Economist;
Topic Leader,	Joan Bloggs, Regional Water Resources Manager;
Project Leader,	Michael Howard; and
R&D Co-ordinator,	John Dalton.

For this project the Project Board, excluding the Director, will also perform the function of the Quality Review Panel.

The Project Board will review the Phase 1 report and give approval for Phase 2.

Project Monitoring

Project will be monitored by Project Leader and R&D Co-ordinator through regular meetings with the Research Contractor. Reports will be made monthly, in writing, to the Project Board.

14. Costs

Outline Cost Plan

Project Stage	NRA Management		NRA In- house	External Contractors	Total
	Function	R&D			
Project Appraisal	1200	1000	-	-	2200
Undertake Phase 1	2000	1000	3300	19500	25800
Research Phase 2	4000	2000	4800	72500	83300
Uptake	Estimates, see below				16000
Authorised Total					127300

Uptake costs will mainly comprise NRA function staff costs, estimated as 200m-days principally for dissemination workshop and subsequent implementation. Latter costs are significant since operational staff in each region will need to implement new techniques.

Stage Cost Schedule

Stage: Undertake R&D Work Package: R&D Contract, Phase 1

Item	Cost	Notes
Staff	7500	30 m-days
Travel & Subsistence	1000	
Capital items	-	
Consumables	2000	
Subcontract	6000	Market-survey plc
Deliverables	1200	
Other Costs	1800	Develop program
Total for Phase 1	19500	

Budget Plan(£)

Item	Assumed Start	Financial Year		Total
		89/90	90/91	
<u>Project Appraisal and Undertake R&D costs</u>				
1. <u>Work Undertaken through R&D budget</u>				
(a) Contractors				
- R&D contract, Phase 1	04/89	19500	-	19500
- R&D Contract, Phase 2	01/90	19000	53500	72500
- Dissemination workshop		-	1000	1000
(b) NRA In-house costs		3300	4800	8100
(c) Project Management (R&D Co-ordinator)		2000	2000	4000
Total R&D budget		43800	61300	105100
2. <u>Work undertaken through core function budget</u>				
- Project management (Project/Topic Leader)		3200	4000	7200
Total Function budget		3200	4000	7200
Total Project Appraisal and Undertake R&D cost		47000	65300	112300
Uptake costs to core function - provisionally 1991/92				15000*
Authorised Total				127300

* Uptake need not necessarily be done in 1991/92 and could be held over.

NRA Staff Resource Plan (m-days)

Item	Financial Year			Total
	89/90	90/91	91/92	
1. Function staff				
- NRA Project Management	20	20	-	52
- Undertaking Research	25	11	-	36
- Uptake	-	-	200*	200
Total Function staff	45	31	212	288**

** Comprises 280 days Regional staff and 8 days Head Office Staff

2. R&D Co-ordinator	13	15	8	36
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Funding Plan for R&D Programme Budget

ORIGINAL BUDGET ALLOCATION (£k)

From: -----	NRA Project Budget		-----	External bodies
To:	Contractor	NRA(Internal)	Total	Contractor
Pre 1989	0.0	0.0	0.0	0.0
1989/90	38.5	3.3	41.8	0.0
1990/91	53.5	4.8	58.3	0.0
1991/92	0.0	0.0	0.0	0.0
1992/93	0.0	0.0	0.0	0.0
1993/94	0.0	0.0	0.0	0.0
1994/95	0.0	0.0	0.0	0.0
1995/96	0.0	0.0	0.0	0.0
Total (k)	92.0	8.1	100.1	0.0

FUNDING SOURCES FOR NRA PROJECT BUDGET (%)

Financial year:	1989/90	1990/1	1991/2	1992/3	1993/4
Grant In Aid	0	0	0	0	0
Water Resources	100	100	0	0	0
Charges For Discharge	0	0	0	0	0
Flood Defence	0	0	0	0	0
Total %	0	0	0	0	0

15. Quality Plan

The Quality Review Panel will review:

Draft R&D Note on the Phase 1 report; and the
Draft Project Record and R&D Note from Phase 2.

The R&D Note for Phase 1 will be formally reviewed, with the Head of Water Resources being the Chair of the Quality Review Panel. This output must show that a robust methodology is likely to be achieved from Phase 2.

The review of the outputs from Phase 2 will be undertaken by a postal review, with the above documents being sent to the members of the Quality Review Panel (see Section 13. Project Organisation). The Panel will have 4 weeks in which to review these documents and return comments.

The criteria which will ensure that the outputs are acceptable are that the outputs are easy to read, provide a robust, workable methodology, that is understandable to the practitioners.

16. Overall Appraisal

The project is fully justifiable as supporting the Developmental Initiative - Water Resources Development Strategy. The potential benefits far outweigh the expected costs of this project.

Project Leader: _____ Date: _____

Topic Leader: _____ Date: _____

Appendix E - Example of PID

Appendix 1 - Product Descriptions

Appendix 2 - Gantt Chart

APPENDIX F - EXAMPLE OF FILE RECORDS

Example of a filing system with documents referenced and who is recommended to hold them.

APPENDIX G - STANDARD CONTRACT

This is an example of a the R&D Standard Contract (April 1990) with guidance note. Also, there is an example of a Memorandum of Understanding.

Version No.	Issue Date	Comment
0.2	12/12/93	First Draft for general review
1.0	28/02/94	First issue of Manual

The following is an example of Schedule 1 - Supplementary Conditions, which has been approved by the NRA legal department which has been used with NERC contracts. Other examples can be produced of clauses that have been agreed to be altered.

SCHEDULE 1 - SUPPLEMENTARY CONDITIONS

Cl 1.1 Contract Year

The term "Contract Year" is taken as the fiscal year from 1st April to 31st March in the following year.

Cl 2.7.1 Progress Reports

The contractor shall provide 5 copies of a 2-3 page progress report on _____ containing the following information:

- a) The technical progress of the Work for the appropriate reporting period.
- b) Interim results or conclusions of interest to the Authority.
- c) The cost of the Work during the reported period in relation to each category of expenditure.
- d) An estimate of the total costs of the Work at the date of submission of the report, under each category of expenditure.
- e) An estimate of the costs of the Work for the next reporting period.
- f) The programme to be followed in the next reporting period.
- g) A review of factors likely to affect the satisfactory completion of the Work in accordance with timescales and budget.

The progress report will be sent within two weeks of the end of the reporting period. Information on points c, d and e will be provided in outline only.

The financial statement (one copy - unbound) giving detailed information on points c, d and e will be sent within six weeks of the end of the reporting period.

The Authority reserves the right to arrange project review meetings following receipt of reports. In addition the Authority reserves the right to call meetings

at other times as set out in clause 3.4.2. The costs of these additional meetings will be borne by the NRA.

CI 2.7/2.8 Interim and Final Reports

- 1) Interim Report by _____ (____ copies).
- 2) Draft Project Record by _____ (____ copies).
- 3) Draft R&D Report by _____ (____ copies).
- 4) Project Record by _____ (____ copies)
- 5) R&D Report by _____ (____ copies).

All report format specified in NRA Guidance Note on R&D reporting, *R&D Note 180*.

CI 2.9.2 Publication of Results by Contractor

Delete: in toto

Insert: Neither party to this contract shall publish any information or the results of this contract without the written agreement of the other party, which agreement shall not be unreasonably withheld.

CI 2.9.3 Use of Work or Results for thesis or degree

Delete: in toto

Insert: Neither party to this contract shall use or permit any other person to use the work or the results arising from the contract for any thesis or degree without the written agreement of the other party, which agreement shall not be unreasonably withheld.

CI 2.9.5 Acknowledgement of Authority funding in any publication

Delete: in toto

Insert: Any publication shall contain an acknowledgement that the work was carried out under contract ie. funded by the Authority and is published with the agreement of the Authority.

CI 2.9.7 Supply of Publications

Delete: in toto

Insert: The contractor shall within ten days of receipt of copies of the publication, supply the Authority free of charge with five copies of any publication or such number as stated in the schedule.

CI 2.10.2 Patent Rights

Delete: in toto

Insert: The results and any patent rights arising from this contract shall be jointly owned by the Authority and the Contractor.

CI 2.10.3

Delete: in toto

Insert: Arrangements for registering any patent rights and for the commercial exploitation of any invention or design including the distribution of royalties or similar income shall be on Terms and conditions to be jointly agreed between the Authority and the Contractor.

Computer Software

CI 2.11.1

Delete: in toto

Insert: Neither the Authority nor the Contractor shall licence software produced under this contract to any third party or incorporate the same into other software owned by either party in identical substantially identical form, without prior written agreement between the Authority and the Contractor. That agreement shall not be unreasonably withheld by either party.

CI 2.11.2

Delete: in toto

Insert: Neither the Authority nor the Contractor shall disclose the programmes or associated documentation or any part thereof to any third party without prior written agreement between the Authority and the Contractor. That agreement shall not be unreasonably withheld by either party.

Add Cl 2.11.4

The contractor shall provide software in an IBM PC compatible format unless otherwise agreed with the NRA. Choice of software packages shall follow consultation with NRA IS staff.

Accounts

Cl 2.12.2 **Delete:** in toto

Cl 2.12.3 **Delete:** in toto

Insert: The Contractor shall maintain separate records of all projects specific expenditure and charges and make such records available to the NRA at a mutually agreeable location off the contractor's premises".

Cl 2.13 Invoicing

Cl 2.13.1 Invoicing for work shall be quarterly, in arrears in accordance with existing arrangements between the contractor and NRA.

Cl 2.13.3 Each invoice should be submitted within 6 weeks of the end of the period covered by the invoice.

Cl 3.6.5 Capital items

This clause shall not apply.

Cl 3.7.3 Adjustment for inflation

1992/93 rates have been used throughout the contract. The rates for future financial years will be based on the latest underlying percentage change for the Retail Price Index (RPI) over the previous 12 months, as published by her Majesty's Government in January of each year.

Cl 3.9.2 Payment of invoices

Delete: in toto

Insert: Each invoice shall be paid in full until the aggregate sum paid reaches 90% of the total contract sum. The final 10% shall be paid when the Authority certifies the contract to be completed to its satisfaction.

Cl 4.1 Termination by the Authority

Cl 4.1.4 **Add:** "Such expenditure shall include the redundancy costs of any staff specifically employed for the contract (for example limited period appointees)."

Cl 4.1.5 **Delete:** "..... less any sum payable to the Authority for damages for breach of Contract".

Add: "The Authority retains the right to recover any losses sustained through a breach of Contract".

Cl 4.8 Value Added Tax

Delete: in toto

Insert: "Value Added Tax at the applicable rate, if appropriate, will be payable by the Authority".

Cl 4.14 Publicity about work

Add: "Such agreement shall not be unreasonably withheld".

Ownership and rights to results

Delete: in toto - 4.15.1, 4.15.2, 4.15.3 and 4.15.5

Insert: 4.15.1

All rights in the results of the contract, including any copyright or right to apply for patent or any other form of intellectual property rights ("the proprietary rights") shall vest jointly in the Contractor and the Authority. The Contractor shall promptly inform the Authority of any result capable of being patented as a proprietary right which may arise in consequence of the Contract. Arrangements for registering any patent rights and for the commercial exploitation of any invention or design including the distribution of royalties or similar income shall be on terms and conditions to be jointly agreed between the Authority and the Contractor.

APPENDIX H - REFERENCED R&D NUMBERED PAPERS AND OTHER NRA DOCUMENTS

List of referenced R&D numbered papers and other papers

R&D numbered paper	Title
R&D(92)1A ¹	R&D expenditure on National projects
R&D(92)16	Note on appointment of management support for Topic Leaders
R&D(92)25	Note on Operational Investigations
R&D(92)28	Interim measures for completion of R&D outputs and research stage
R&D(93)3	Independent advisors for R&D projects
R&D(93)7	Schedule of Commission, Topic Areas and Topic Leaders, R&D contact Points and R&D Co-ordinators
R&D(93)16A	Commercial issues related to R&D projects
R&D(93)17	Planning and development of strategic R&D projects
R&D(93)20	Topic Investment Appraisal
R&D(93)22A	Proposed approach to programme area reviews
R&D(93)23	Draft Schedule of on-going projects and proposed new starts
R&D(93)33	Scientific Papers on NRA Research and Development
R&D(93)34	Special Single Tender Action situations relating to R&D

Note:

¹ This paper is likely to be reviewed in the near future and reference in the text will need to refer to the latest paper when available.

List of other NRA refereed documents

R&D Note 180	Guidance Note on the Production of R&D Output for the NRA
NRA Volume 7	Policy Guidance Note on the application of the Financial Memorandum and Scheme of Delegation
NRA Volume 9	Procurement Manual
NRA Volume 14	Project Management Procedures
NRA	Economic Appraisal Manual

APPENDIX I - GLOSSARY

GLOSSARY OF TERMS

Cross-references

Cross references to terms in the glossary will be shown in *Italics*. Cross references to key sections in the text of Parts A or B will be shown in square brackets thus [].

Sources

The glossary has been developed from the language in use in the NRA R&D environment (see list in *Appendix H* and, where appropriate, from other glossaries. Where a term has a definitive source this is noted, although definitions are not necessarily verbatim, but are strongly influenced by the source wording. It is expected that R&D Coordinator should have copies of these documents for reference.

Reference	Source
A	Cabinet Office: R&D Assessment. A Guide for Customers and Managers of Research and Development. (HMSO 1989).
B	Policy Appraisal and the Environment (HMSO 1991).
C	HM Treasury "Green Book". Economic Appraisal in Central Government - A Technical Guide for Government Departments (HM Treasury 1991).

Version No.	Issue Date	Comment
0.2	12/12/93	First Draft for general review
1.0	28/02/94	First issue of Manual

Activity	Task or job to be done within a specified time frame, usually requiring resources and incurring cost.
Annual R&D Programme Review	Annual review of the R&D programme to confirm on-going projects and decide which new project are started in the next financial year.
Appraisal	Defining of objectives, examining options and anticipated outputs and weighing up costs and benefits in order to decide whether to undertake (or continue with) a project or group of projects (see Investment Appraisal). (Source C).
Approval	Formal acceptance (usually on technical/management criteria) of a deliverable which does not imply any exercise of powers under the Scheme of Delegation (see Authorisation).
Assessment	Term used to describe the processes of appraisal, monitoring and evaluation (Source A).
As of Date	Date on a cost schedule or progress report for which the report is valid (see Submission Date).
Authorisation	Formal sanction to take a course of action under the powers given in the Scheme of Delegation. Authorisation generally refers to the sanction to spend NRA funds (see Approval).
Benefits	Value or utility of the outputs of R&D. The benefits of a policy will generally also be the final objectives of a policy, but there could be beneficial side effects. Benefits may be stated gross (as defined above) or net of costs and adverse side effects. (Source A).
Budget Manager	Head of R&D and usually Regional R&D Contact Point, who are responsible for the budget of the portfolio of R&D projects in Head Office and the Regions. May take on responsibility for roles of PAB in small projects.
Business Need	Part of the overall business strategy of the NRA. The outputs of a project should specifically fulfil a business need.
Change Control	Formal process through which changes (to cost, schedule, outputs, benefits etc) to the Project Plan and Project Initiation Document are introduced and evaluated prior to their adoption/rejection.

Collaboration	<p>Term used to describe some form of shared commitment with another organisation to a project either:</p> <ul style="list-style-type: none"> • co-funding • contribution in kind • liaison.
Commission	<p>Portfolio of R&D projects undertaken by any NRA core function. These have been arranged into seven commissions:</p> <ul style="list-style-type: none"> - A Water Quality - B Water Resources - C Flood Defence - D Fisheries - E Recreation & Navigation - F Conservation - G Cross-functional issues. <p>R&D issues are co-ordinated at the Function Committee (customer) level in each commission by a nominated member of the Committee who is termed the R&D Commissioner. Commissions are further sub-divided into Topic Areas.</p>
Competitive Tender (CT)	<p>Tender where three or more organisations are asked to bid in competition with each other. Assessment of the tenders will be on both cost and technical grounds.</p>
Completion	<p>The formal end point of a contract (see also Project Closure).</p>
Constraint	<p>Defined restriction or limitation imposed that is likely to influence the scale, pace, direction or undertaking of a project or an activity within a project.</p>
Contingency Plan	<p>Predefined measures to minimise or negate the adverse effects of a, risk or threat, should it occur.</p>
Contract	<p>Legally binding agreement between the NRA and another organisation which is carrying out work on its behalf. The usual contract for R&D is the NRA's "Standard Conditions of Engagement for Research Contracts".</p>

Appendix I - Glossary

Cost Plan	Document detailing all items of cost associated with the project, in the same work breakdown as the schedule plan. Developed at Project Initiation Document stage and updated after each subsequent stage to reflect improved accuracy as more information becomes available.
Customer	Person or group who have commissioned the R&D Project. This is usually a Function Committee but, for collaborative or cross-functional projects, may include another party.
Customer Acceptance Level	Level in the NRA hierarchy at which final acceptance of project outputs is signed off prior to the End-of-Research Stage Assessment.
Definition Study	Study undertaken, usually at the Project Initiation Document Stage, to appraise and evaluate a number of possible project options and to recommend a particular course of action.
Deliverable	The R&D Project will produce various "products" according to the Project Plan. They comprise, not only the Project and Research Outputs but also the information required for management and assessment. In total these represent the deliverables, of which the Project Plan itself is one (Source A).
Dependency	Relationship between project activities where the start of one activity is contingent upon the completion of another.
Detailed Plan	Developed throughout the project from the outline plan, breaking down the forthcoming stage into manageable activities that are the responsibility of named individuals.
Discounted Cash Flow (DCF)	Mathematical technique applied to financial and economic appraisals which enables the comparison of costs and benefits occurring at different times by calculating a present value for each.
Dissemination	Delivery of project outputs to the end-user (see Uptake).
Document Status and use Note (DSN)	Form on which the dissemination status and statement of use for an output is recorded.
Driver	Rationale for undertaking an R&D project.
Economy	Extent to which the input of resources, and hence, cost is minimised.

Effectiveness	Extent to which objectives are achieved. An effective R&D Project is one which achieves all its objectives and delivers all expected benefits. It is a measure of value for money. Effectiveness is different from efficiency. (Source A).
Efficiency	Term used to describe how well a project was conducted compared to its plan. It also includes how well the project management systems worked.
End-user	Person(s) or group who use the outputs from the R&D Project. This may be NRA operational staff, an NRA Working Group or could be external bodies.
End-of-Research Stage Assessment (ERSA)	Assessment at the end of the Undertake Research Stage which: <ul style="list-style-type: none"> • reviews the efficiency of cost effectiveness of the project to date • provides a detail plan of the Uptake Stage • is the key control/decision document on when/if uptake should start.
Executive Group (EG)	Team of Directors and Regional General Managers of the NRA who are responsible to the NRA Board for the management of the NRA.
External Cost	Costs that relate to payments made to an external contractor or supplier as distinct from being incurred through NRA staff.
Financial Memorandum (FM)	Rules on financial, staffing and other matters through which the Department of the Environment administers control over the NRA. Compliance with this document is mandatory.
Format	Layout and appearance of an output.
Frascati Definitions	See R&D Classification.
Function Committee	Committee, comprising the Head of Function, the Regional Function Managers and Function Officer which is responsible for identifying key issues relating to the function, developing function strategy and business plans and generally setting guidelines for operational staff.
Implementation	Putting the project outputs into use by the end-user (see Uptake).

Internal Cost	Cost of activities carried out by the NRA itself (see External Cost).
Investment Appraisal	Term for appraisals which take into account all economic costs and benefits. It includes an appropriate level of cost/benefit analysis and cost effectiveness analysis. (Source C).
Lifecycle	See Project Lifecycle
Matrix Management	Method of effectively managing individuals from different Functions or Regions. Matrix Management in projects involves people holding several roles simultaneously and results in their being responsible to more than one manager.
Milestone	Planned indicator which highlights a specific point of achievement in the project. Milestones are usually considered as targets and are useful for monitoring overall progress. (They are presented in schedule plans as activities with zero duration). (Source A).
NRA Board	Body, appointed by government, which is responsible for the overall performance of the NRA.
Nominated Officer	Person who is responsible for the NRA's obligations under contract.
Operational Investigation (OI)	Project undertaken through a Regional budget which provides new information needed to help resolve an operational issue in a particular Region. An OI is not a part of the R&D Programme.
Operations Team (OT)	Team, led by the Director of Operations, and comprising the Regional General Managers, which is responsible for co-ordinating the NRA's operational activities and implementing new policy.
Outline Plan	Initial plan developed in the early stages of a project and which will evolve as the project progresses.
Output	See Project Output.
Output specification	Detailed specification of outputs.
Permanent Document	Document produced as a project output which will not be superseded by any further outputs from the same project.

Phase	Term describing the part of the project for which authorisation has been obtained. It is necessary to have a reappraisal before proceeding further. A phase may comprise of one or more stages.
Point of Uptake	Target towards the end of the Undertake Research Stage at which all the outputs have been accepted by the customer. It is followed by a decision on when to start uptake at the End-of-Research Stage Assessment.
Post Project Appraisal Stage	Lifecycle stage of a project when a post-implementation review of a project is carried out to assess the degree to which the expected benefits have been achieved. It measures the "effectiveness" of a project.
Primary purpose	Generic reason for carrying out R&D in the NRA. There are four primary purposes: <ul style="list-style-type: none"> • "statutory duty" - to improve its ability to carry out statutory duties • "policy development" - to improve its efficiency or effectiveness in carrying out its business • "operational effectiveness/efficiency" - to support its Policy development • "underpinning knowledge" - to increase its general knowledge and understanding.
Processing activity	Work done by a team, other than the Research Contractor, on developing outputs from research contracts to form the project outputs.
Programme	Collection or portfolio of projects. The R&D Programme comprises all R&D projects being undertaken or planned to be undertaken.
Progress Report	Standard report summarising key events, costs, changes to the plan, milestones achieved, slippage, future events, risks, and issues.
Project	See R&D Project.
Project Authorisation Stage	Lifecycle stage of a project during which the Project Initiation Document is carried out, the project authorised and the Project Budget Authorisation issued.

Project Budget Authorisation	Document issued following Project Authorisation (PBA) which confirms the funds which are available to undertake the project.
Project Closure Stage	Lifecycle stage of a project designed to ensure that all deliverables have been accepted and all costs correctly allocated. At this point the project is considered complete.
Project Initiation Document (PID)	Document setting out the economic justification of a project in terms of economic costs and benefits.
Project Leader	NRA officer appointed to assume day to day responsibility for management of the project throughout its life.
Project Lifecycle	Sequence of defined stages over the full duration of a project comprising Identification, Summary Appraisal, Research Contractor Selection, Project Initiation Document, Project Authorisation, Undertake Research, Uptake and Project Closure.
Project Output	Product of an R&D Project. This may comprise documents, software, equipment or videos. Research Output is also used to describe the research product which a contractor delivers to the NRA and which may require further work to form a project output.
Project Plan	Key project management document, produced as part of the Project Initiation Document Stage. The plan contains details on technical, resource and quality plans.
Proposer	Person who proposes a potential project by completing a submission for an R&D project.
R&D Classification	<p>Definition of types of R&D according to the degree to which a project is focused on a particular end-application, based on the Frascati Manual:</p> <ul style="list-style-type: none"> • basic research • applied research with strategic aims • applied research with specific aims • development.
R&D Commissioner	Person on a Function Committee who represents the committee as customer for the R&D Project (see Commission).
R&D Committee	Committee with Core Functional and Regional representation which advises the Head of R&D on the management of the R&D Programme.

R&D Contact Point	Person in each Region who is the focal point for all R&D matters and who is generally a member of the Regional Management Team.
R&D Information System	Computer based information system used as a tool to monitor various aspects of the R&D Programme, especially Project Initiation Documents, project expenditure and outputs. It consolidates all Regional information into a single national database.
R&D Programme	Programme of R&D projects being undertaken or planned to be undertaken. The R&D Programme is managed on a Regional basis and is reviewed annually.
R&D Programme Working Group	Reference group of core functional interests which helps finalise the R&D Programme following the annual review.
R&D Project	Project undertaken by the NRA to address a national opportunity, problem or need through R&D.
R&D Section	Head Office group, led by the Head of R&D, which is responsible to the Chief Scientist for co-ordinating the management of R&D.
Regional General Manager (RGM)	Person responsible to the Chief Executive for all activities within an NRA Region.
Regional Management Team (RMT)	Team of Regional heads of department who, with the responsible for the management of all activities within an NRA Region.
Regional R&D Co-ordinator	Key person in each Region who is the first line of support and advice to Project Leaders. Is also responsible for reporting on the Region's portfolio of R&D Projects to R&D Section.
Release Status	Category defining the extent to which deliverables may be communicated a) within (Internal) and b) outside (External) the NRA.
Research Contractor Selection Stage	Lifecycle stage of a project in which tenders are sought and a research contractor is selected.

Appendix I - Glossary

Retention	Percentage (usually 10%) of invoice value retained by the NRA and released to the Contractor with the final account on completion of the Contract.
Research Output	Product from a Contract or work package which requires further processing to produce a Project Output.
Resources	People, equipment, or facilities required to undertake a project.
Risk	Recognised potential occurrences or threats that would jeopardise the success of the project.
Schedule	Activities of a project arranged sequentially in a time framework.
Scheme of Delegation (SoD)	Document, approved by the DOE, defining the powers and duties which are delegated to the various tiers of management in the NRA.
Scheme of Delegation Co-ordinator	Person, in each Region, from whom advice and guidance regarding the SoD and the Financial Memorandum may be sought.
Short-term document	Document, produced as a deliverable from the project but which has a limited designated life e.g. an Interim Report.
Single Tender Action (STA)	Tender where only one contractor is invited to bid (see also Sole Source).
Sign Off	Formal process to agree that deliverables meet, and are fit for the purpose required. It is also used to record comment of deliverables before acceptance.
Sole Source Tender	Special case of STA where there is only one potential contractor who can meet the terms of reference and tender selection criteria.
Stage	Structured step in a project, with specific objectives and a defined review at the end. The stages together form the framework of the project lifecycle.
Stakeholder	Person or group who has a vested interest in a project but who does not take an active part in its management or undertaking.

Steering Group	Group established to monitor a project and to advise the Project Leader in the resolution of issues and providing guidance. The group may be purely advisory or may have an executive function.
Submission	Completed form proposing to the NRA an issue which might be addressed by an R&D Project and which describes the benefits resulting.
Submission Date	Date when a cost, schedule or progress report has to be submitted. This is a finite time after the "as of date" as it takes time to compile a report.
Success	A successful project is one which delivers the planned benefits and meets all agreed cost, schedule and quality targets.
Summary Appraisal Stage	First lifecycle stage of a project during which the need, opportunity or problem is identified and accepted/ rejected for further consideration.
Target	Quantified objective within a defined timescale. Usually shown as a milestone on schedule plans.
Tender Documents	Set of documents which are sent to prospective contractors on which they bid to undertake work for the NRA.
Topic Area	Sub-division of Commission which focuses on a defined area of interest.
Topic Investment Appraisal (TIA)	Investment appraisal, reviewed annually, covering the group of projects in a Topic Area including the schedule of on-going projects and proposed new starts.
Topic Leader	Person responsible for developing and achieving the objectives for a particular Topic Area. He/she maintains an overview of, and acts as a national focal point within the NRA for R&D in the Topic Area. This person also has a key role in identifying and directing R&D Projects.
Undertake Research Stage	Lifecycle stage(s) of a project in which research and development work is carried out and the outputs are completed. The work itself may be done by a contractor and/or NRA staff.
Uptake Stage	Lifecycle stage of a project when the outputs are disseminated and implemented.

Uptake Route

Three possible routes for Uptake which apply to:

- a) Projects with self evident benefits
- b) Projects with major resource/policy implications
- c) Projects which feed into another project or development activity.

Variations

Formal changes to Contracts.

Work Breakdown

Hierarchical structure comprising sequences of activities needed to complete a project, each level of the structure being more detailed than the next higher level. Each grouping of activities is called a work package.

Work Package

Generic term to describe a grouping of activities in a project. For example a 'Stage'.