THE ORIGIN REQUIREMENTS SPECIFICATION STANDARD

ORIGIN UK LIMITED

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1 Introduction

1.1 Purpose

This document is the Origin standard for Requirements Specifications. It defines the structure and content of a Requirements Specification when developed to Origin standards.

1.2 Scope

A Requirements Specification is the formal statement of the requirements and objectives of a system.

The standard does not set out to specify how the production of the Requirements Specification is to be conducted.

1.3 Audience

This document is intended for all members of Origin staff. It must not be shown or distributed to anyone outside Origin without written permission from senior management.

The standard is intended for all staff involved in the project inception phase of a project and in the creation or review of a Requirements Specification.

1.4 Related Documents

The reader should be familiar with:

ORIGIN GB.S0-14
The Origin Document Standard

ORIGIN GB.S3-4
The Origin Functional Specification Standard

1.5 References

ORIGIN GB. S0-14
The Origin Document Standard

IEE 1986
Guidelines for the Documentation of Software in Industrial Computer Systems

BS6719: 1986
British Standard Guide for Specifying User Requirements for a Computer Based System

2 The Requirements Specification

2.1 Purpose of a Requirements Specification

It is important to understand clearly the purpose of a Requirements Specification particularly in relation to its use in the analysis phase of a project.

Firstly, it needs to be recognised that we are not dealing exclusively with software; we are dealing with the Requirements Specification for a **system,** which may comprise hardware and software as well as manual, or non-computer related, processes.

A Requirements Specification is the output of the project inception phase of a project, and is designed to provide an adequate specification of the scope, requirements and objectives for a proposed system. It is important to clearly distinguish the purpose of a Requirements Specification from that of a Functional Specification, with which it is often confused. A Requirements Specification is produced during the project inception phase and specifies what facilities are required, and the business reasoning behind the requirements. The Functional Specification specifies what the system will do to meet these requirements.

2.2 The User's View

In the production of a Requirements Specification it is usually the **user's** view that is of paramount importance, hence the fact that the document is more usually referred to as a User Requirements Specification, or URS. **However, it is the client who funds the production of the specification and it is the client we must ultimately satisfy if we are to be involved in subsequent phases of the project**. The client may well be the user but more often they are different groups of people. For example a client may be manufacturer who wishes to produce a new product for the marketplace. Clearly the client is the manufacturer and the user the purchaser of the end product.

Clearly there is a potential source of conflict here; the user may require facilities which the client is unable, or unwilling, to provide, for example on the grounds of cost. Conversely, the client may insist on features which the user would quite happily do without, for example security and monitoring of user performance. The important thing is to correctly identify the users and to distinguish the users from the client.

2.3 Essential and Desirable Facilities

When discussing requirements care should be taken to distinguish between essential features and desirable features. Essential features are those which must be present and which are not negotiable. Desirable features are those which the client or user would like, but which can be sacrificed if they fall outside the user's criteria for, say, cost. If some features are more desirable than others then it may be necessary to consider assigning some form of weighting.

2.4 Origin's Role in the Requirements Specification

A Requirements Specification will usually be produced by a client. However, it may be produced by Origin acting on the client's behalf. Origin will also on occasion produce Requirements Specifications for its own in-house systems.

It is generally recommended that work on the specification phase of a project should not start without a Requirements Specification being in existence. There is often the temptation to skip the Requirements Specification and go direct to the Functional Specification. This should be avoided, since the Requirements Specification plays an important role in establishing the business reasoning and the scope.

2.5 Documentation Style and Related Issues

In the production of the Requirements Specification there are several points to consider which will influence the style of the document, and its success as the input to the analysis phase of the project:

- Where possible, present an implementation independent approach.
- Where possible each stated requirement should be related to a single idea.
- Requirements should be measurable; it must be possible to determine whether or not a requirement has been met. For some aspects of the specification, for example performance and reliability, it will be necessary to include numeric and statistical data.
- Diagrams and lists should be used, where appropriate, as alternatives to prose.
- The document should be written to enable statements made in the Functional Specification to be cross-checked against requirements specified in the Requirements Specification. This may be done in a number of ways. For example one approach is to specify each requirement as a separately numbered subsection. This method is often used in MoD specifications but can result in documents which are difficult to read. Another approach is to provide a numbered list of the summarized requirements in an appendix, with references to the main body of the specification where appropriate.

2.6 Safety Aspects

When specifying requirements ensure that the system can be built, tested and used safely. If possible refer to any relevant standards, codes of practice or legislation.

3 Structure and Content of a Requirements Specification

A Requirements Specification will usually be written in some user subset of natural language, for example if the system is a medical one, medical terminology will be used, if it is a banking application, banking terminology will be used.

It is this need to express the requirements in user terms that can result in a specification being redundant in places, incomplete in other places and ambiguous through the use of natural language. As long as the Requirements Specification is not used as the baseline document for a project (this is instead the primary purpose of the Functional Specification) no serious problems should arise.

The structure and level of detail of a Requirements Specification will vary depending upon the type and size of the project. Listed below are the sections which may be present in a Requirements Specification. Where these are marked as optional they may be omitted if not applicable.

1 Introduction
2 Overview
3 Existing Systems and Procedures
4 Operations
5 Data Models (optional)
6 External Interfaces (optional)
7 Human Interfaces (optional)
8 Robustness and Reliability
9 Safety
10 Security (optional)
11 Sizing and Performance (optional)
12 Hardware Requirements (optional)
13 Software Requirements (optional)
14 Installation and Commissioning
15 Testing and Acceptance
16 Phasing (optional)
17 Training
Appendix A Glossary (optional)

It should be noted that optional sections should be omitted only if they do not apply, not because they are minimal or undefined.

If the specification is large and it is expected that senior management will read it, it may be advisable to separate the document into a number of parts.

Part 1 Management summary containing sections 1 and 2
Part 2 Requirements containing sections 3 to 13
Part 3 Development strategy containing sections 14 to 17

3.1 Introduction

The Introduction section is a standard Origin introduction [OTIB S0-14]. It should reference any documents and specifications on which the Requirements Specification is based. If much of the content was derived from discussions with the client's staff it may also be useful for future reference to acknowledge this.

A glossary may be included in the introduction if it is short, i.e. a few lines of text. If a large glossary is required this should be placed in an appendix or in a separate document.

3.2 Overview

The Overview section is used to provide an introduction to the system specified in the rest of the document and to place the system in the context of the organisation's operations. The style and presentation of this section will depend to a large extent on the type of system being specified. For example, is it an information system, a control system or an item of equipment?

Requirements Specifications are read by many different people and the Overview section may be used to provide a summary for those not needing to know the detail of the system. Thus the Overview section is mandatory and should cover all major aspects of the system. Ensuring the Overview section is complete will reduce the chance of misunderstanding with the client's senior management.

For systems which have mainly an IT content the Overview section should, in providing management with a summary of the proposed system:

- Provide an overview of the client's organisation.
- Provide an overall perspective of the system, its primary purpose and scope.
- Determine how the system relates to the user's organisation and its operation.
- Determine how the system relates to the future plans and strategies of the organisation.
- Determine how critical the system is to the organisation and its activities.
- Identify the major benefits the organisation will obtain from the implementation of the system. The benefits may be financial savings, new business opportunities, increased competitiveness and so on.
- What is the minimum expected life of the required system and/or what is its required pay-back period?
- Establish the criteria for evaluating proposed solutions, including adherence to standards.

For a product development we might consider:

- How the product fits in with the overall business strategy of the client
- How the product is placed in terms of competitor's equipment
- Benefits to users (for example performance, costs and functionality) over earlier versions of the product
- Product options and available configurations

Possible headings for subsections could be:

- A System Perspective
- An Operational Overview
- User Characteristics
- Expected Benefits
- Constraints
- Conformance to standards, e.g. BS5750, codes of practice or legislation
- Assumptions and Dependencies

Here, as in the remainder of the document, **care should be taken to ensure that no non-essential binding decisions are made regarding technical solutions**. It does of course sometimes happen that we inherit technical decisions early in the project lifecycle. In this case, we regard these given solutions as constraints.

3.3 Existing Systems and Procedures

It is very rare for an isolated system to be developed, that is one which is totally unrelated to any other system, past or present. It may be the case, particularly for Information Technology (IT) type projects, that the system being specified is a replacement for an existing, not necessarily computer-based, system.

This section provides an overview of existing systems which the proposed system is replacing and/or it will be required to interface with. The level of detail provided should be the minimum necessary to place the replacement system in its proper context. If the system being specified is a replacement for an existing system then this section should emphasize any weaknesses or shortcomings the new system is required to eliminate.

This section usually has an added purpose of introducing much of the user-specific jargon that will be necessary for a complete understanding of the user's requirements. It will not necessarily be the case that all users within the client organization will have the same understanding of key jargon words, therefore if in doubt define all essential terminology. Even if the client is sure of his or her terminology, we may not be. It's a good way of clarifying these terms before it's too late.

3.4 Operations

The Operations section describes the operations to be performed by the system. It describes:

- What the system does
- When it does it
- How the action is perceived by the outside world

In general, any **operation** that is not visible to the outside world cannot be considered part of the Requirements Specification. The system may nevertheless have attributes and capabilities which are not visible to the outside world but which are part of the Requirements Specification.

The Operations section should be structured as a number of subsections to ease reading. The following should be considered in structuring the section:

- The structure should be uniform, namely the functionality should be subdivided based on a single criterion.

- The subdivision should be on a functionality basis, not a physical basis.

- The subdivision should preferably be into divisions used by the client.

When describing a system it is important to describe all the operations that may be performed, this includes operations involved in:

- **System startup:** describe any environmental prerequisites, for example the status of external interfaces. The action of the system, should the prerequisites not be satisfied, must also be described.

- **System shutdown:** similar considerations must be given to system shutdown, describing the status of the system during and after shutdown.

- **Timed and scheduled operations:** operations that are performed at specified times and/or with specified frequencies. Are the operations automatically or manually initiated? What happens if they cannot be performed?

- **Rare or infrequent operations**: These are often overlooked in a Requirements Specification. Examples include diagnostic checks, periodic monitoring operations and conversions from earlier systems.

- **Installation and Configuration:** where an item of software is subject to configuration and installation by users, as might be the case with a word processor package for example, the installation program and its operation should be specified fully in the Requirements Specification. De-installation may also be required.

- **Behaviour under foreseeable failure conditions**

All specifications must contain descriptions of startup and shutdown even if the system is intended for continuous operation. Even these systems must start at some time and will need to be stopped, if only for decommissioning.

In describing the operations it is necessary to state the system's behaviour if the external interfaces provide erroneous or extraneous information.

In describing the operations it is necessary to make explicit any safety requirements so that the system operates safely. This may be particularly relevant to infrequent or unusual operations.

Operations may be described in a process or data-oriented manner, whichever is more applicable.

3.5 Data Models

The Data Models section is optional. The Data Models section is present in recognition of the importance of data models as a method of describing certain aspects of the requirements.

The data model will sometimes relate to a database. The term database being used in its loosest sense to describe a logically correlated collection of data which is significant to the system.

A formal model of the data will usually be derived during the Functional Specification phase of the project. The aim in the Requirements Specification should be:

- To identify all representations of data known to the user, such as data content of screens and printed reports, standard forms such as invoices, sales orders etc.
- For each separable data item, to identify how it originates, who uses it and how it is used.
- Determine volumes of data for each type and flow.

3.6 External Interfaces

The External Interfaces section is optional and may be omitted if the system does not interact with the outside world or other systems other than through the human interface (see Section 3.7).

The External Interfaces section is used to describe all interactions between the system whose requirements are being specified and other systems.

This section describes only the nature and detail of the interfaces, not the operations resulting from particular data crossing the interface which is described in the Operations section (see Section 3.4).

External interfaces may affect the design of the system and may therefore place constraints on the system. It is important therefore to investigate external interfaces carefully to determine those which must be defined explicitly and in full detail, and those which can be defined in more general terms. For example if a system is required to communicate with a number of existing systems which share a common networking technology it may be appropriate to constrain the system

being specified to use the same technology. If on the other hand the system being specified requires to communicate with these existing systems only on an infrequent basis, the use of a simple serial link or floppy disk might be a more suitable transfer mechanism.

The aim should be to restrict, where possible, the definition of each interface to a description of the data that passes across the interface, the high-level protocols involved, and the frequency of use.

The External Interfaces section may refer to other specifications, for example other standards, but when this is the case these must be qualified to indicate to what degree of completeness the other specifications are adhered to. For example, it is not enough to state 'CCITT X.25 (1980)' as this has many optional features and those supported must be listed.

Interfaces may be of differing forms, for example:

- Communications links supporting multiple levels of protocol; these may be specified in functional terms or in absolute terms if compatibility with existing or planned strategies is required.

- General purpose input/output, e.g. buttons, lamps, relay closures, electro-mechanical devices, may be specified in absolute terms if interfaces are to existing or known sub-systems.

- Sensors, usually specified in terms of their required performance, accuracy, sampling rate, etc.

- Buses, possibly specified in absolute terms if system is required to co-exist in a rack with existing sub-systems.

- Data shared with other systems, existing or planned, should be specified.

- Databases, files, etc. common to other systems, existing or planned, should be identified.

Additional general guidelines (not part of this standard) on the specification of requirements can be found in [IEE 1986] and [BS6719:1986].

3.7 Human Interfaces

The Human Interfaces section is optional but may be omitted only if the system does not interact with human beings at all.

The approach taken to the specification of the human interface will vary widely from project to project. For product development it is not unusual to include a draft user manual as part of the specification, complete with detailed screen layouts. For other developments it may be sufficient to include no more than an overview of the style of user interface to be implemented, the details being left to the Functional Specification phase.

The human interface is specified in a separate section because:

- the human interface is of significant importance
- clients often do not conceive it as an external interface in the same sense as other external interfaces
- unlike the other interfaces the level of detail may vary

The last of these points is true in as much as human beings are more flexible than other external systems. Thus the detail necessary is different, for example placing a field on a form in slightly different positions will not affect the user's ability to understand the data. However, moving a field in the structure of a packet used by a communications protocol will invalidate the packet.

In describing the human interfaces, special attention should be given to what categories of personnel will be expected to use the system, their existing levels of training, and their required level of training. Statements such as '.... the system must be user-friendly.' are worthless. Is the user a manual worker on the production line, a skilled technician, a university professor? What are the repercussions in misreading a display or entering the incorrect data?

Allied to the above considerations are those relating to the form of the human interface. Do the requirements of the system indicate a preference for a command-line interface, structured menus, or windows? How is the user to be assisted and guided through the system's operation: help screens, hypertext, menu structure and hierarchy, etc?

The human interface may take many forms, for example:

- screen and paper forms
- graphs
- printed reports
- buttons and LEDs
- keyboards (including limited and extended key sets)
- command syntaxes
- numeric displays
- meters
- user configuration files

The mechanisms used to describe them may vary but should be uniform throughout the specification. Care should be taken to ensure that all the interfaces with humans are identified and the information content of each described. In a Requirements Specification it is sufficient and necessary to define the nature of the various human interfaces and the data that passes across each interface. It is not necessary to define the display formats, panel layouts or instrumentation at this stage.

Finally it may be appropriate to consider prototyping some part or all of the human interface. This would necessitate structuring subsequent project phases to take this into account.

3.8 Robustness and Reliability

The Robustness and Reliability section details the reaction of the system to abnormal events, faults and failures. The Robustness and Reliability section is important because many systems need to be not only correct (given correct data produce the correct results) but also reliable (given bad data recognise and report the fact).

There are various aspects to robustness and reliability including:

- Detection of fault conditions and erroneous information
- Ability to reject erroneous information
- Reporting of faults and receipt of erroneous information
- Redundancy
- Hot, warm or cold standby
- Loss of data in the event of a failure
- Maintaining data integrity and consistency across failures
- Restart and recovery
- Mean Time to Repair (MTR)
- Mean Time Between Failures (MTBF)
- Diagnostic Support

If the reaction of the system to erroneous data is given in detail in the Operations section a reference to it should be included in this section.

This section should also contain a statement on required availability and usage of the system. For example, 'system is to be operational 24 hours / day, 365 days / year'.

3.9 Safety

The Safety section is compulsory. If the system being specified has absolutely no safety requirements then this section may just include a statement to the effect that "the ... system poses no possible risks to life or property and has no requirements relating to safety". This disclaimer should not be made lightly. If the Safety section is not a disclaimer it describes those aspects of the system relevant to safety. Safety requirements may vary widely dependent on the system but may include one or more of the following:

- Fail-safe behaviour - which aspects of the system must be designed so as to fail in a safe way.
- Robustness in high-stress situations - are any parts of the system likely to be critical in a crisis (such as a reactor cooling fault or a signalling fault) and if so the need for extra verification and testing of these parts of the system should be identified.
- Clarity of presentation of information in high-stress situations - are any parts of the system likely to be critical in a crisis (such as a reactor cooling fault or a signalling fault) and if so the need for extra care and checking of the user interfaces to the parts should be identified.
- Areas where software must not be used - are there any areas where mechanical backup is mandatory ?

In addition, reference may be made to the Robustness and Reliability section and the Security section where relevant.

3.10 Security

The Security section is optional, and if present describes those aspects of security relevant to the system. Security requirements will vary widely dependent on the system, but will usually consider one or more of the following:

- Physical security - the protection of buildings and equipment, communication channels, etc. by physical means (e.g. locked doors)
- Personnel security - the protection of a system by limiting access to certain individuals, and the mechanisms used to ensure those individuals are not a threat
- Integrity - preventing unauthorized amendments or deletions
- Existing legal requirements - e.g. Data Protection Act
- Communications security
- Encryption
- Protection against software piracy
- Licensing scenario - means to ensure appropriate access to the product, such as floating licences, licence servers, demonstration modes

The Security section is more significant for government projects although concerns about security are growing in some areas of commerce and industry.

3.11 Sizing and Performance

The Sizing and Performance section is optional, although most systems will have some requirements pertaining to sizing and performance. There are, depending on the type of system being specified, many different aspects to sizing and performance:

- Record and database sizing; for example a company information system may be required to keep 10,000 staff records for five years.
- Acceptable response times under normal operations; for example the ability to access a staff record within 5 seconds 95% of the time and within 10 seconds 100% of the time.
- Transaction volumes; for each operation, for example read staff record, an average transaction rate and arrival pattern may be given.
- Online versus offline storage capacities.
- Sampling rates; e.g. a temperature sensor must be sampled every 5 seconds throughout the day, and the sampled values stored for subsequent analysis.
- Estimated growth in data and transactions during the stated life of the system.
- Operational deadlines which have to be met during operation of the system.

In the Requirements Specification, the sizing and performance information will usually be considered a first approximation, subject to further refinement, possibly using formal methods, in the specification phase. For example, estimates of data volumes will require refinement in the specification phase to take into account overheads dependent on, for example, the data model and communications protocols used.

3.12 Hardware Requirements

This section is optional and may be omitted if the requirements relate to software only.

The Hardware Requirements section should identify all hardware components, proprietary or custom, that will be required. Care should be taken to avoid making decisions on whether a particular function will be implemented in hardware or software. Thus this section should include only items of hardware where it is perfectly clear that the functions they provide or support can be provided only in hardware. Items so identified may be considered to be constraints.

For identified items of hardware some information on the required characteristics will have to be quoted. This could include for example:

- Accuracy and performance
- Minimum and maximum operating temperatures
- Minimum and maximum levels of humidity
- Operation under stated levels of pollution, e.g. smoke, dust and chemical fumes
- Power supply requirements, including voltage levels, stability, noise immunity, etc.
- Special constraints, for example operation of system at high altitudes
- Interfaces to existing systems
- Levels of MTR and MTBF
- Safety requirements
- Applicable standards

For more specific information, particularly for industrial systems, see [IEE 1986].

This section should also allow for a non-specific statement on hardware requirements such as 'where possible Brand XYZ hardware should be used'.

3.13 Software Requirements

The Software Requirements section is optional and may be used to specify any existing software and software packages that are to be used. These may be:

- Software packages
- Operating systems that are mandatory requirements or are preferred for compatibility
- Specific libraries, for example application-specific libraries
- Software from existing systems
- Specific development tools, e.g. compilers which have been adopted as standard

All statements in the Software Requirements section must be complete, giving for each piece of software:

- Name
- Supplier
- Version

This section should also allow for a non-specific statement on software requirements such as 'where possible Brand XYZ software should be used'.

As with hardware, the specification of specific software items places constraints on the system and should be avoided if possible.

3.14 Installation and Commissioning

The Installation and Commissioning section is optional. The section is used to state any special requirements for installation, commissioning and initial use of the system. The section may have both a hardware and a software content.

Considerations will include for example:

- Access to site, e.g. widths of corridors and doorways
- Cabling, including considerations of raised flooring, trunking, use of own or customer's contractors
- Location and availability of services; electricity, water, etc.
- Interruption to normal operations
- Establishment of database, including source of data, period over which it is captured and any verification requirements
- Parallel running
- Installation and commissioning outside of 'normal' hours
- Training

3.15 Testing and Acceptance

This section should identify all requirements for system simulation, demonstration and acceptance testing. Topics that may be covered include:

- Maximising pre-delivery testing as a means of reducing serious problems arising during final acceptance on site
- Testing for conformance to recognized standards
- Testing to meet the connection requirements of national telecommunications suppliers
- Any special conditions and requirements relating to on-site testing. Such conditions could relate to security, special site services, installation, power supplies, etc.
- Criteria for commencing acceptance tests

Acceptance testing requires special considerations to determine the evidence which will satisfy the client that the system will meet his or her requirements. Such evidence might involve:

- testing with typical (in terms of characteristics and loading) examples of the user's work
- testing with abnormal loads
- testing with extreme examples of the user's work
- testing under extremes of environmental conditions, e.g. temperature, humidity, dirt, etc.
- meeting safety requirements under all circumstances
- meeting secrecy and privacy requirements
- meeting response times
- meeting standards
- operation under failure conditions
- recovery from failure

For a system with safety considerations it must be possible to perform acceptance and other tests safely.

3.16 Phasing

The Phasing section is optional, and if present is used to describe any phasing in the implementation. It should be noted that this information is liable to change, particularly during the specification phase.

The Phasing section should state:

- What phases there will be
- What facilities are to be provided in each phase
- What interim processing and data requirements will exist
- The strategy for moving between phases

and will be subdivided with a section for each phase.

3.17 Training

Include any requirements relating to training of any or all of the following:

- Management
- Technical personnel
- Users
- Maintenance personnel

3.18 Glossary

The glossary of terms may be included in the Introduction section if it is small, say less than ten definitions. If it is too large it should form an appendix. The glossary should contain a brief description of all technical terms and abbreviations.

Appendix A Checklist

1 INTRODUCTION

1.1 Purpose

System is correctly and unambiguously identified by name, with supporting references to initial inception documents.

1.2 Scope

Scope limited to requirements for named system.

1.3 Audience

Include a readership statement

1.4 References

Feasibility study
Other project inception documents
Existing systems and procedures
Standards

2 OVERVIEW

Organizational overview
Overview of existing system
Business reasoning
Benefits

3 EXISTING SYSTEMS AND PROCEDURES

Description of current systems
Other systems and/or procedures system is required to interface with
Weaknesses of existing system

4 OPERATIONS

Describe WHAT actions the system performs.
Describe WHEN it performs them.
Describe what causes the action to be performed.
Describe the effect of the action on external interfaces.
Describe all normal operations.
Describe system startup.
Describe system shutdown.
Describe the system reaction to faults.

Describe installation and configuration.
Use terminology understandable to the intended users.
Make safety requirements explicit
Aim for an unambiguous statement with no redundancy, whilst accepting that the ideal is rarely achieved.
Use lists as they are easier to read and easier to check than prose.
Use diagrams wherever possible.
Do not prejudice the work to be carried out in the specification phase by making implementation decisions unless absolutely necessary when such decisions become constraints.

5 DATA MODELS

Have all user-visible entities, and their representations been identified?
Has the source, destination and disposition of each item of data been identified?
Is it clear how the various items of data are to be accessed and processed?
Are volumes of data documented?

6 EXTERNAL INTERFACES

Define all known external interfaces (others may be introduced during the Specification phase as part of the solution).

Define only what the interface is, not the actions caused by data passing across it.

If an existing standard is used then it must be referenced. Include version or revision information as appropriate and state options assumed.

7 HUMAN INTERFACES

Define all interfaces with humans including:

- screen
- printed reports
- LEDs
- audible alarms
- keyboard, mouse, joystick, tracker ball, etc.
- alphanumeric displays
- configuration files

Consider user input and output requirements.
Consider ergonomic issues, e.g. ambient lighting, backlit displays, use of colour in displays, panel layouts, etc.

8 ROBUSTNESS AND RELIABILITY

State policy to detection of abnormal events.
State policy to detection of software errors by the system.

State availability and usage requirements.

9 SAFETY

State areas where the system must fail-safe.
State areas where extra verification is required.
State areas where extra clarity of user information is required.
State areas where software must not be used

10 SECURITY

State all access security mechanisms.
State action upon breach of security.
State relationships between system security, physical security and personnel security.
State licensing mechanisms.

11 SIZING AND PERFORMANCE

State sizing in terms of:

- expected average sizings
- maximum sizings
- growth rates

State performance in terms of:

- minimum acceptable performance
- expected performance
- affect of growth on performance

12 HARDWARE REQUIREMENTS

Any specific requirements for packaged hardware should be stated with complete configuration where it is a constraint.
Any requirements for bespoke hardware to be identified.

13 SOFTWARE REQUIREMENTS

All packaged software that MUST be used is to be identified.

14 INSTALLATION AND COMMISSIONING

Have all site access restrictions been stated (both for people and equipment)?
Has the availability of services been identified?
Have the requirements relating to non-interruption of services during installation, commissioning and parallel running been identified?
Identify source of all initial system data.

15 TESTING AND ACCEPTANCE

Identify general approach to testing.
Identify any standards that have to be met and/or type approval procedures.
Identify where testing may require use of existing systems and equipment.
Identify, where possible, requirements for hire or loan of specialized test equipment.
Make safety testing and safe testing a requirement.

16 PHASING

Required only if phasing is a requirement or a constraint.

17 TRAINING

Management training
Training of technical personnel
User training
Training of maintenance personnel

APPENDIX A GLOSSARY

Glossary of all terms
Glossary of all diagrammatic techniques (key to diagrams)
Consider a separate project glossary document for large projects.