

CHAPTER 1

RELIABILITY & MAINTAINABILITY PANELS AND WORKING GROUPS

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1. INTRODUCTION

1.1 Reliability and Maintainability R&M¹ Engineering have a major influence on the delivery of equipment capability. R&M however does not just happen it requires the development of an understanding of the Capability Requirement to enable risks associated with R&M to be mitigated through the generation of informed R&M programme options that are relevant and tailored to the needs of the project. The R&M options developed will include those for specifying the R&M User Requirements within the constraints of the project and to enable the process of articulating the R&M requirements to be started.

1.2 In a similar way to safety, R&M is the responsibility of many stakeholders and needs to be managed in a manner that enables these stakeholders to participate in the development and delivery of appropriate R&M qualities while limiting discussion and argument monopolising the time of less specific committees and non-stakeholders.

1.3 To achieve this, the R&M Panel (stakeholder group) was developed to enable interested stakeholders and subject matter experts to provide timely support, advice and guidance to a Project Team on all matters pertaining to R&M for the good of the project.

2. THE R&M PANEL

2.1 History

2.1.1 The concept of the R&M Panel was introduced in the early 1990's and was mandated in the Sponsors Purple Book prior the adoption of Smart Procurement in the late 1990's. Since then the 'Panel' system has been a corner stone of progressive assurance and the R&M Case and has featured prominently in successive Defence Standards since 1999.

2.1.2 Today while the principles and requirements are as sound as ever and remain unchanged, the emphasis has moved from the name of the committee, which at times has produced more discussion than the equipment it should be supporting; to the outputs, recognising that it's the ability of the Panel to support and add value to the project and not what the committee should or should not be titled. Previously such titles have included A, B and C; Pre-procurement, Procurement and Post-procurement; as well as a number of iterations of Concept, Project and In-service which are more commonly used today. Each of these have also been complimented by a single title 'Panel' none of which are wrong or preferred, the most important issues is the work undertaken and that interested parties communicate with each other and within the constraints of the project appropriately manage the requirements, risks, programmes and deliverables associated with R&M.

2.1.3 Defence Standard 00-40, Part 1 state;

'The Project Manager shall establish an R&M project committee or working group. This group should include representation from R&M stakeholders including specialist advisors, the equipment Sponsor, and, as required, project Integrated Logistic Support, contracts, QA, R&D advisors and the contractor's design and engineering staff.'

¹ R&M is a generic term which embraces the qualities of Availability, Reliability, Maintainability, Durability, RCM and Testability.

emphasising the need for all interested parties to be included while acknowledging the relative unimportance of any title.

2.2 Role

2.2.1 The role of the R&M Panel is to ensure that R&M, and in particular R&M issues, are appropriately discussed and resolved in a timely manner to enable specialist R&M support, advice and guidance to be provided to the Capability Sponsor, Project Manager and other project staff and committees. The R&M Panel in turn removes part of the project management overhead associated with R&M from other members of the Project Team while providing the specialism required to manage R&M successfully. Terms of Reference (ToR) for the R&M Panel are attached at Leaflets 1 – 3 inclusive embracing the key stages of the equipment life cycle.

2.2.2 At the discretion of the Chair of the R&M Panel, R&M Working Groups (R&M WG) may be formed to address specific R&M issues associated with the project, the ToR of which are attached at Leaflet 4.

3. STAKEHOLDERS

3.1 R&M stakeholders are those organisations and persons who own or can add value to the R&M qualities of the project. The Capability Sponsor, Project Manager and Project R&M Focal Point may seem obvious, because the development of R&M is expensive, time consuming and not without risk, finance and commercial staff, programme and risk managers all have their part to play, as do many others.

3.2 From a practical perspective within the Project Team it may be simpler to decide if there is anybody who may not have a part in the direct delivery of R&M. Some project staff such as trial directors may have little involvement with the R&M aspects of a project in the initial stages of the acquisition, yet considerable as the project reaches maturity. The attached ToR's are not exhaustive but provide sound reference to those who would successfully contribute to an R&M Panel and/or Working Group.

4. MEETINGS

4.1 While it would be counter-productive to bar any interested parties from an R&M Panel it is equally important to control the number of those attending to prevent the 'talking shop' developing and wasting the time of those who would be contributing more to the project gainfully employed elsewhere.

4.2 Remember, the R&M Panel is a specialist committee or working group in support of the project and are answerable to the Capability Sponsor, Project and subsequently In-Service Equipment Managers as the equipment develops and matures. Therefore, often it is only necessary to invite key stakeholders (see attachments) and those with a direct input to specific R&M Panel meetings. As the project matures the role and specific outputs from the Panel will evolve. Consider, it is as important to allow the project's development to influence the business of the Panel as it is for the Panel to influence the R&M development of the project.

5. TERMS OF REFERENCE (ToR)

5.1 Outline Terms of Reference are attached at Leaflets 1 – 3 and Leaflet 4 for the R&M Panels and R&M Working Groups respectively.

5.2 These ToR's are for guidance and will need tailoring to suit your specific projects. The ToR's for your project should seldom exceed two sides of A4 paper as there are only three objectives to be satisfied in the management and risk mitigation of R&M, these are:

The Purchaser's R&M requirements shall be determined and demonstrated to be understood by the Purchaser and the Supplier;

A programme of activities shall be planned and implemented to satisfy the requirements; and

The Purchaser shall be provided with assurance that the R&M requirements have been satisfied.

Def Stan 00-40, Part 1 refers

6. TRAINING

6.1 There is no training specifically targeted for R&M stakeholders however there is considerable alternative training in a number of allied disciplines which would enable stakeholders to contribute the most from their particular expertise and hence add value to a project.

6.2 The R&M Focal Point as part of their accreditation would have completed computer and classroom based R&M training to the standard required for practitioner, such training is recommended and freely available to all. In addition familiarisation with any of the following would also provide a worthwhile contribution to the aspirations of an R&M Panel or Working Group:

- Principles of Acquisition;
- Project Management;
- Risk Management;
- Safety Management;
- Integrated Logistic Support;
- Commercial and Financial Awareness;
- Background in any Engineering or Manufacturing Discipline;
- Recent User or Manager of similar Equipment, and more.

6.3 In addition the TLS Reliability Team can provide general or specific mentoring where to do so would optimise the contribution of the stakeholders to the project.

LEAFLET E1/1

THE R&M PANEL DURING THE CONCEPT PHASE

It is advisable that the Capability Sponsor or his/her representative of the equipment or system establish and chair as early as practically possible an R&M Panel to formulate R&M requirements that are operationally justified and are likely to lead to optimising Operational Availability and Through Life Costs (TLC). The Project Team Leader, as a member of this Panel, ensures that the requirements are technically and economically feasible within declared cost and time constraints.

The R&M Concept Panel needs to include representation from:

- Capability Sponsor;
- Project Team Leader;
- Through Life Project Team (Project Manager) or In-service Equipment Support Manager;
- Project Team R&M Focal Point;
- Project Integrated Logistics Support (ILS) Manager.

and, if necessary, the Chair may call on representation from:

- Commercial and Financial Staff;
- Subject Matter Expertise;
- Industrial representation with special and appropriate knowledge.

The Terms of Reference of the Concept Panel may include but not be limited to:

To recommend an agreed R&M statement for the User Requirement which meets the operational and logistic needs, is technically achievable within reasonable or imposed limits of time and cost and, as far as can be determined at this early stage, will result in the optimum TLC.

To ensure, through the Capability Sponsor, that these requirements are given due weight in the supporting paper to the User Requirement Document.

To investigate and evaluate possible trade-offs to achieve optimum cost effectiveness.

To advise on warranties or other contractual terms which might be used to create incentives within industry to meet the R&M requirements.

To provide a forum for discussing, at an early stage, the need to demonstrate compliance with the R&M requirements, and if necessary, the preferred method.

To advise on the content, format and presentation of the Initial R&M Case.

If the User Requirement is being considered as a target, the R&M Concept Panel should advise on the R&M content of Assessment Stage and evaluate the results. It is therefore important that an initial meeting of this Panel is held as soon as possible after project inception.

LEAFLET E1/2

THE R&M PANEL DURING THE ACQUISITION PHASE

On endorsement of the User Requirement, the Project Manager becomes accountable for delivering the R&M requirements and an R&M Project Panel should be established under his/her chair.

The R&M Project Panel needs to include representation from:

- Project Manager;
- Capability Sponsor;
- Project Team R&M Focal Point;
- Project Team members (specific responsibilities);
- Project Integrated Logistics Support (ILS) Manager (optional or representing Project Manager);

and, if deemed necessary, the Chair may call on representation from:

- Contractor(s);
- Commercial and Financial Staff;
- Subject Matter Expertise;

The Terms of Reference of the Project Panel may include but not be limited to:

To assist the Project Manager in developing and defining the R&M aspects of the Acquisition Strategy and Specification including the assessment criteria for the tender proposals and the method of demonstrating the achievement of R&M to acceptable statistical levels of confidence.

To assist the Project Manager in his/her responsibility for the compilation of the System Requirement Document, which translates the requirement into a form against which industry can tender.

To recommend amendment or adoption of formal R&M programmes, plans, trials and demonstrations prepared by the contractor.

To ensure that the relevant details from these programmes and plans are included as integral parts of the overall development cost plans.

To recommend verifiable milestones to monitor progress in R&M

To monitor R&M aspects of the results of development and user trials and of maintainability and testability assessments.

To agree an assessment of achieved R&M levels for acceptance purposes.

To ensure trade-offs studies between reliability, availability and life cycle costs are undertaken, with the aim of striking the optimum balance.

To provide advice to both Project Manager and Operational Requirements Sponsor on any proposed amendments to project timescales or targets subject to contract and cost factors. To bring to the attention of the Project Manager and Sponsor any conflict found to exist between the various R&M requirements and detailed performance requirements, or where significant shortfalls become apparent, and to discuss the in-service effects of any amendments.

To assess the results of In-service Reliability and Maintainability Demonstrations, where these are called for as part of the equipment acquisition strategy.

NOTE: Many projects retain the Panel as the forum to approve R&M milestones and compliance while employing an R&M Working Group reporting to the Panel for the day to day business of managing R&M.

LEAFLET E1/3

THE R&M PANEL DURING THE IN-SERVICE PHASE

On successful fulfilment of the contract and acceptance of the project into service an In-Service R&M Panel is established under the Chair of the appropriate Service's Equipment Support Manager or Through Life Project Team.

The In-Service R&M Panel includes representation from:

- Project Manager or In-Service Equipment Support Manager;
- Customer 2 Representative;
- Project Integrated Logistics Support (ILS) Manager;
- Project Team R&M Focal Point.

and, if deemed necessary, may call on representation from:

- Contractor(s);
- Commercial and Financial Staff;
- Subject Matter Expertise;
- TLS Reliability.

The Terms of Reference for the In-Service Panel may include but not be limited to:

To monitor the achieved R&M qualities in service through the outputs of data collection and usage systems where employed.

To advise, where appropriate, on invoking warranties or guarantees associated with failure to achieve the specified levels of R&M.

To contribute to the analysis of defects and incident reporting; and proposals for modifications and/or mid-life improvements to meet the specified levels of R&M.

LEAFLET E1/4

THE R&M WORKING GROUP

An R&M Working Group (R&M WG) can be established at any time during an equipments life cycle. They are usually formed to address one, occasionally a small number, of specific issues pertaining to R&M associated with that equipment or system. Unless otherwise directed an R&M WG will report to whoever formed it; usually this will be the Project R&M Panel, however occasionally this could be a Capability Working Group or an alternative project committee.

The R&M Working Group may have representation from:

- Project Team;
- Project Team R&M Focal Point;
- Customer 2 Representative;
- Project Integrated Logistics Support (ILS) Manager;

and, if deemed necessary, may call on representation from:

- Contractor(s);
- Subject Matter Expertise;
- Commercial and Financial Staff.

The Terms of Reference (ToR) for an R&M Working Group will usually be determined by an R&M Panel, however subject to the task at hand a Project Team or Capability Working Group may also choose to task an R&M Working Group when it would be prudent to do so.

However tasked, it is important that the ToR include but is not limited to:

- Aim of activity;
- Customer;
- Scope;
- References;
- Deliverables;
- Contacts where appropriate;
- Critical dates;
- Security classification(s);
- Report format.

It is important to recognise that some work may be classified, have commercial and contractual significance, be controversial, etc. diplomacy may achieve more satisfactory results than striving for a speedy conclusion.