JSP 886
THE DEFENCE LOGISTICS SUPPORT CHAIN MANUAL

VOLUME 7
INTEGRATED LOGISTICS SUPPORT

PART 8.13
OBSOLESCENCE MANAGEMENT

MINISTRY OF DEFENCE

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1	8 Jul 09	Supersedes JSP 586 Volume 2
2	10 Nov 09	Chapter 1 – Policy: amended.
3	11 Jan 10	Minor changes.

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CHAPTER 1 – OBSOLESCENCE MANAGEMENT POLICY

CONTEXT

1. This part of the manual provides guidance for a support manager on the MOD Obsolescence Management (OM) policy and the Support Solution Envelope (SSE) Governing Policy (GP).

2. Obsolescence as defined in the International Standard IEC 62402:2007[1] is the 'transition from availability from the original manufacturer to unavailability' and OM is 'the co-ordinated activities to direct and control an organisation with regard to obsolescence'.

3. The objective of OM is to ensure that obsolescence is managed as an integral part of design, development, production and in-service support in order to minimise the financial and availability impact throughout the product life cycle.

POLICY

4. It is MOD policy that the procedures and processes within this document are applied to all MOD projects. In recognition of the diversity of platforms, equipment and other support strategies an element of tailoring of the best practice, techniques and methodologies, may be required.

5. TLS-OM is responsible for MOD OM policy. The overall aim of the policy shall be to set in place requirements for OM that will maintain the optimum balance of operational availability and cost of ownership by:

a. Minimising the unacceptable loss of operational capability that arises from expensive redesign, replacement and lengthy down times through unavailability of obsolete items.

b. Minimising unplanned expenditure by maximising the time and the mitigation options available by proactively planning for obsolescence.

c. Avoiding multiple independent efforts to resolve the same or similar obsolescence problems resulting in unnecessary cost.

PRECEDENCE AND AUTHORITY

6. The authority to carry out OM is promulgated from Defence Equipment and Support Standing Instruction 10 – Support Solution Development.

MANDATED REQUIREMENTS

7. Failure to manage the obsolescence risk of an equipment will impact life cycle costs, product performance, product availability, maintainability, safety and legislation. Consequently, it is a requirement that projects will implement a proactive OM strategy unless it is clearly not cost effective to do so.

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1. [1] BS EN 62402:2007 is the UK implementation of the standard. It is identical to the IEC 62402:2007.

ASSURANCE AND PROCESS

Ensurance and Assurance

8. The details for ensurance on the OM Governing Policy are provided on the Acquisition Operating Framework (AOF), within the Support Solutions Envelope (SSE), Governing Policy 2.3.

Ensurance: is internal validation carried out by the project team as an assessment of the development of the support solution.

9. OM is an element of the ILS process which is independently assured against Governing Policy 2.1. Guidance for Assurance can be found in JSP 886 Volume 1 Part 3 Support Solutions Envelope.

Assurance: Governing Policies are externally assessed by the Support Improvement Team, independently identifying risks to delivery and assisting in the provision of a coherent support solution.

Process

10. Project Teams (PT) shall develop and implement a proactive OM strategy in accordance with IEC 62402:2007, the main points of which are:

a. In the course of the design of an equipment, the choice of materials, products, technologies and interfaces shall be made in order to minimize the risk to the equipment of future obsolescence. Factors to be taken into account will include current market, regulations, technology roadmaps and appropriate component selection.

b. A risk assessment shall be carried out to determine the risk to the equipment from obsolescence. The recommended method of conducting the risk assessment is the use of the triplet of Probability, Impact and Cost as described by IEC 62402:2007. The result of this assessment will determine the category of risk (low, medium or high).

c. As a result of the risk assessment, either a reactive or proactive approach to the obsolescence risk shall be employed for each item.

(1) Reactive – This approach shall be employed where the result of the risk assessment is in the ‘low’ risk category. This option entails doing nothing until an obsolescence issue arises, where an appropriate and cost effective resolution to the problem is implemented.

(2) Proactive – This approach shall be employed where the result of the risk assessment is either in the ‘medium’ or ‘high’ risk category. A suitable method, aligned to the severity of the risk, to reduce the impact of obsolescence shall be selected.

d. Different items within an equipment may be assessed with different categories of risk; therefore one system may consist of a combination of reactive and proactive approaches.

e. The risk assessment shall be re-evaluated at intervals no greater than 2 years. This is to ensure that the chosen approach (reactive or proactive) for each item to the obsolescence risk is still valid and no other factors have been introduced which may affect the original decision.

f. Metrics shall be used to measure the performance of the Obsolescence Management Plan (OMP). As a minimum, the 'Cost Avoidance' achieved by implementing a proactive OM strategy shall be calculated.

g. The methodology and outcome of the risk assessment, and the approach that has been selected for each item, will be articulated in an OMP. Further guidance on developing an OMP and detail of the other elements that constitute a proactive OM strategy can be found in Chapter 5.

Software

11. Software does not become 'obsolete' but can be affected by the rapid obsolescence of the hardware on which the software runs. The impact of changes in hardware to the software that is embedded in an equipment must be taken into account when mitigating and resolving obsolescence concerns.

12. JSP886 Volume 7 Part 4 Software Support outlines the MOD policy that shall be followed to ensure that software being introduced to service is supportable through life and in the most cost effective manner. Projects shall ensure compliance against this policy and not the guidance laid out in IEC 62402:2007 for Software Obsolescence.

KEY PRINCIPLES

13. Experience has shown that the impact of obsolescence within defence is significant. For this reason OM needs to be instigated as soon as possible to minimise costs and mitigate against risks.

ASSOCIATED STANDARDS AND GUIDANCE

14. OM in MOD shall be undertaken in accordance with IEC 62402:2007 Obsolescence Management – Application Guide.

15. PTs are responsible for ensuring that their contractors have the necessary knowledge and expertise to manage the obsolescence risk to their projects. Guidance on contracting Industry to implement a proactive OM strategy is available from TLS Obsolescence Management (TLS-OM) and can also be found in Chapters 2 to 7 of this document.

16. OM policy is guided by the Joint Obsolescence Management Working Group (JOMWG) which is responsible to the MOD / Industry Joint Through Life Support Steering Group (JTLSSG). The JTLSSG has been established to develop jointly agreed Through Life Support strategies and policies to the benefit of MOD and Industry and in support of the Defence Industrial Strategy.

17. Further information is available from TLS-OM and the OM topic within the Acquisition Operating Framework. TLS-OM is responsible for the maintenance, currency and relevance of this policy and is the MOD representative on the OMWG. Changes to either this policy or the standard quoted can be requested through TLS-OM team.

OWNERSHIP

The policy for OM is sponsored by DES JSC TLS-Pol-DHd.

Contact details
DES JSC TLS-POL-OM
Room 2.4.42
Kentigern House
65 Brown Street
Glasgow, G2 8EX
Tel: Civ: +44(0)141 224 2692
Mil: 94561 2692
E-mail:
Internal: DES JSC TLS-POL-OM
External: desjsctls-pol-om@mod.uk

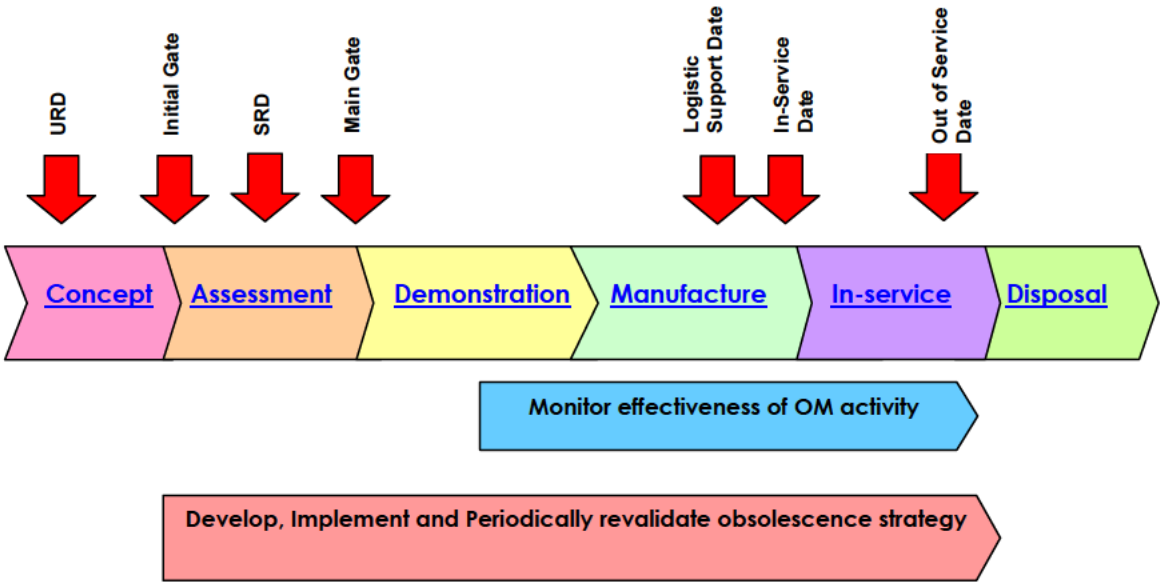
Document Editor
DES JSC TLS-POL-PC5
E-mail:
Internal: DES JSC TLS-POL-PC5
External: DESJSCTLS-POL-PC5@mod.uk
Tel Civ: +44(0) 1225 882891
Tel Mil: 9355 82891

CHAPTER 2 – OBSOLESCENCE MANAGEMENT IN THE CADMID CYCLE

INTRODUCTION

1. This chapter assists a PT to identify the key OM requirements at the various milestones of the CADMID cycle.

Figure 1: Obsolescence Management in the CADMID Cycle



USER REQUIREMENTS DOCUMENT (URD)

2. The PT shall include the requirement to manage Obsolescence in the URD. The following Requirement and corresponding Measure of Effectiveness (MoE) is recommended but may be tailored to suit individual projects.

Requirement: An OM strategy will be required to mitigate the risk of obsolescence through life.

MoE: Obsolescence has no impact to availability or capability.

INITIAL GATE

3. The PT shall provide at Initial Gate, evidence of the requirements documented in the SSE Compliance Tool.

Refer to Chapter 3 for guidance on how to contract for OM.

SYSTEM REQUIREMENTS DOCUMENT (SRD)

4. The PT shall include the requirement to manage Obsolescence in the SRD. The following Requirement and corresponding Measure of Performance (MoP) is recommended but may be tailored to suit individual projects.

Requirement: The solution will include an OM strategy that complies with JSP886 Volume 7, Part 8.13 OM.

MoP: Obsolescence Management Plan (OMP) is compliant with IEC 62402:2007.

MAIN GATE

5. The PT shall provide at Main Gate, evidence of the requirements documented in the SSE Compliance Tool.

Refer to Chapter 5 for guidance on how to develop an OMP

LOGISTIC SUPPORT DATE REVIEW

6. The PT shall provide at the Logistic Support Date Review, evidence of the requirements documented in the SSE Compliance Tool.

IN-SERVICE DATE REVIEW

7. The PT shall provide at the In-Service Date Review, evidence of the requirements documented in the SSE Compliance Tool.

CHAPTER 3 - CONTRACTING FOR OBSOLESCENCE MANAGEMENT

INTRODUCTION

1. One of the most important areas to consider when implementing an OM strategy for a project is to ensure that the contractual conditions are well defined and important decisions are made at the outset.

2. The correct contractual conditions must be in place to ensure that the financial and availability risk to your project, as a result of Obsolescence, is being managed through life, and in the most cost effective method.

CONTRACTING FOR OBSOLESCENCE MANAGEMENT

3. There are two main elements that need to be addressed when contracting for OM, these are:

   a. Contracting to manage the obsolescence risk to a project.

   b. Contracting for the mitigation of obsolescence concerns and resolution of obsolescence issues.

4. Both of the above elements have been clearly explained in the Commercial Policy Statement (CPS) for OM. This CPS is within the Commercial Toolkit on the AOF.

COMMERCIAL POLICY STATEMENT

5. The CPS has been developed to assist PT's, and their commercial officers, in considering the decisions that need to be made when engaging with Industry to manage the risk from obsolescence to a project. Once these decisions have been made to suit the selected support solution, suggested contractual wording is available.

6. The CPS can be found here.

CHAPTER 4 – OBSOLESCENCE MANAGEMENT STRATEGY

INTRODUCTION

1. This chapter defines the main activities and responsibilities for an PT and Contractor in developing and implementing a proactive OM strategy.

2. Obsolescence will affect hardware, software, and support equipment. It impacts upon all stages of the life of equipment. It is inevitable, may be expensive and cannot be ignored, but forethought and careful planning can reduce its impact and cost. PTs shall ensure that OM becomes an integral part of its consultation with industry during all phases of the CADMID Cycle in order to maximise availability and optimise costs throughout the product life.

3. In addressing the through life costs of obsolescence, it has been seen that at some point in the equipment life cycle, anticipating and dealing with the problem will be considerably cheaper than waiting until later in the life cycle when a major redesign may be required which threatens programme availability. Through actively managing obsolescence, an upfront 'cost avoidance' policy may be required.

4. It is accepted, however, that no strategy can be fully proactive and there will always be an element of reactivity as a result of sudden changes in the threat, new capability requirements and the technology sector market forces.

RESPONSIBILITY

5. PTs shall allocate, or delegate, responsibility for dealing with obsolescence so that the necessary planning, analysis, mitigation and resolution can be made available to support the equipment or system throughout its life cycle. All these activities and responsibilities will be articulated in an OMP; see Chapter 5 for full details of the structure and elements within the OMP. The OMP for a system or equipment shall be detailed in the Through Life Management Plan (TLMP).

OM ACTIVITIES / RESPONSIBILITIES FOR THE PT

6. Regardless of the relationship with the contractor and the nature of the support contract, the responsibility for OM rests with the PT. To varying degrees, much of the OM activity may be being conducted by the contractor, however the risk is ultimately the MOD's therefore the PT must be closely involved in the process by ensuring sufficient checks and controls are in place to have the confidence in the contractor's capability to manage the risk of obsolescence to the project. Performing the following major activities will ensure the PT maintain the role of an Intelligent Customer.

Define Project Requirements for OM

7. During the Concept and Assessment phases of the project the PT shall:

   a. Seek advice and guidance from SME

   b. Define Contractual Requirements for OM, refer to Chapter 3

c. Determine Obsolescence Risk Model (who owns the risk for obsolescence); refer to Chapter 3 Contracting to Resolve the Obsolescence Concerns and Issues that Arise.

d. Appoint a PT representative who will be responsible for OM.

e. Review and agree contractor's OMP, request assurance from the SME.

f. Ensure obsolescence is managed as an integral part of the design.

g. Obtain Component List when available. To identify the minimum data required for component monitoring refer to Chapter 5 Component List.

h. Load component list to the Component Availability Monitoring Tool. For further details on the benefits, refer to Chapter 5 Component Availability Monitoring Tool.

Monitor the implementation of the OMP

8. During the Demonstration, Manufacturing and In-Service phases of the project the PT shall:

a. Review obsolescence status briefs (Contractor notifies the PT of future obsolescence concerns and current obsolescence issues).

b. Investigate the status of the obsolescence concerns and issues on the Component Monitoring Tool.

c. Ensure that the most cost effective mitigation of obsolescence concerns and resolution of obsolescence issues are being adopted by the Contractor; refer to Chapter 5 Resolution Process.

d. Liaise with the contractor on the implementation of the mitigation of obsolescence concerns and resolution of obsolescence issues. The PT shall ensure that the timing of the implementation is aligned with Future Capability Upgrades.

e. Monitor the performance of the OMP by measuring Cost Avoidance, refer to Chapter 7.

f. Ensure the Contractor revalidates the risk assessment at least every two years.

g. Ensure all decisions are recorded in the OMP.

OM ACTIVITIES / RESPONSIBILITIES FOR THE CONTRACTOR

9. The Contractor will ensure the OM strategy is properly resourced to ensure that obsolescence has no detrimental impact to the availability or capability of the project. Performing the following major activities will ensure the organisation is able to fulfil their contractual obligations.

Develop OM strategy

10. When developing a proactive OM strategy the Contractor shall:

a. Assign an Obsolescence Manager.

b. Negotiate / Agree Obsolescence Risk Model (who owns the risk for obsolescence) with the PT, refer to Chapter 3 Contracting to Resolve the Obsolescence Concerns and Issues that Arise.

c. Develop OM strategy; articulate this in an OMP, developed in accordance with Chapter 5.

d. Develop the processes and procedures required to implement the OM strategy throughout the organisation.

e. Implement the proactive approaches which reduce the risk of obsolescence during the design phase.

f. Select the tools and technologies required to implement the OM strategy.

g. If OM activities are being cascaded to the Suppliers define contract requirements.

h. Obtain Component Lists from Suppliers; refer to Chapter 5 Component Lists.

i. Formalise communications to ensure information is passed throughout the supply chain and stakeholders.

Implement OMP

11. When implementing a proactive OM strategy the Contractor shall:

a. Conduct a Risk Assessment based on Probability – Impact – Cost; refer to Chapter 5, Risk Assessment.

b. If the risk is 'Med' or 'High, adopt Proactive Approach.

(1) Identify and assess the most appropriate Proactive Approach to mitigate the obsolescence concerns, refer to Chapter 5 Proactive Approach.

(2) Implement the most appropriate mitigation action.

(3) Update the OMP to reflect the decisions made.

(4) Record any future Obsolescence Concerns in the PT status briefs.

c. Conduct Component Monitoring for 'High' risk components.

d. If the risk is 'Low' adopt a Chapter 5 Reactive Approach.

e. Revalidate the risk assessment at least every two years.

f. When an Obsolescence Issue arises:

(1) Identify and Assess available Resolutions, refer to Chapter 5 Resolution Process.

(2) Implement the most cost effective Resolution.

(3) Liaise with the PT on the implementation of the adopted Resolution and ensure that the timing of the implementation is aligned with Future Capability Upgrades.

(4) Update the OMP to reflect the decisions made.

(5) Record any Obsolescence issues in the PT status briefs.

g. Calculate Cost Avoidance, refer to Chapter 7.

h. Recommend an Obsolescence Impact Assessment is conducted, refer to Chapter 6.

i. Update the OMP to reflect any lessons learned.

CHAPTER 5 – OBSOLESCENCE MANAGEMENT PLAN

REQUIRED ELEMENTS OF AN OBSOLESCENCE MANAGEMENT PLAN

1. All the OM activities and responsibilities documented in Chapter 4 will be articulated in an OMP. Detailed explanations on how to perform the activities within the elements of the OMP are described within the following paragraphs. A template for drafting an OMP can be downloaded from the Acquisition Operating Framework, populating this with specific project data will ensure compliance with SSE GP 2.3.

DOCUMENT DETAILS

2. These details are necessary for Configuration Management purposes and shall include:

a. Name of Document.

b. Document reference number.

c. Document version number.

d. Date of document.

e. Author of document.

f. Owner of document.

g. Record of referenced documents.

h. Table of contents

PROJECT DETAILS

3. This shall be a short description of the project that the plan refers to and the nature of the intended support solution.

a. Name of project.

b. Description of project (brief overview of project covered by OMP).

c. Description of Support Solution (information that will aid the assessment of the OMP in relation to the overarching Support Solution (nature of support contract etc)).

SCOPE OF PLAN

4. This shall detail the scope of the project that the OMP covers (in entirety or partial) and will include:

a. Full identification of the equipment and services that the plan applies to (this shall also include details of any part of the project that the plan doesn't apply to and the reasons for the exclusion(s)).

b. Period the plan covers (particularly relevant if the contract does not run up to the OSD – this must be specified).

OBSOLESCENCE MANAGEMENT ORGANISATION

5. The plan should be properly resourced to ensure that the activities detailed by the plan can be undertaken and managed. The plan shall include detail of the organisation and individuals that will be/are responsible for the conduct of the activities listed by the plan.

6. A wiring diagram can be useful in demonstrating the relationship between the positions identified as can the inclusion of the relevant 'Terms of Reference' (TORs) if appropriate.

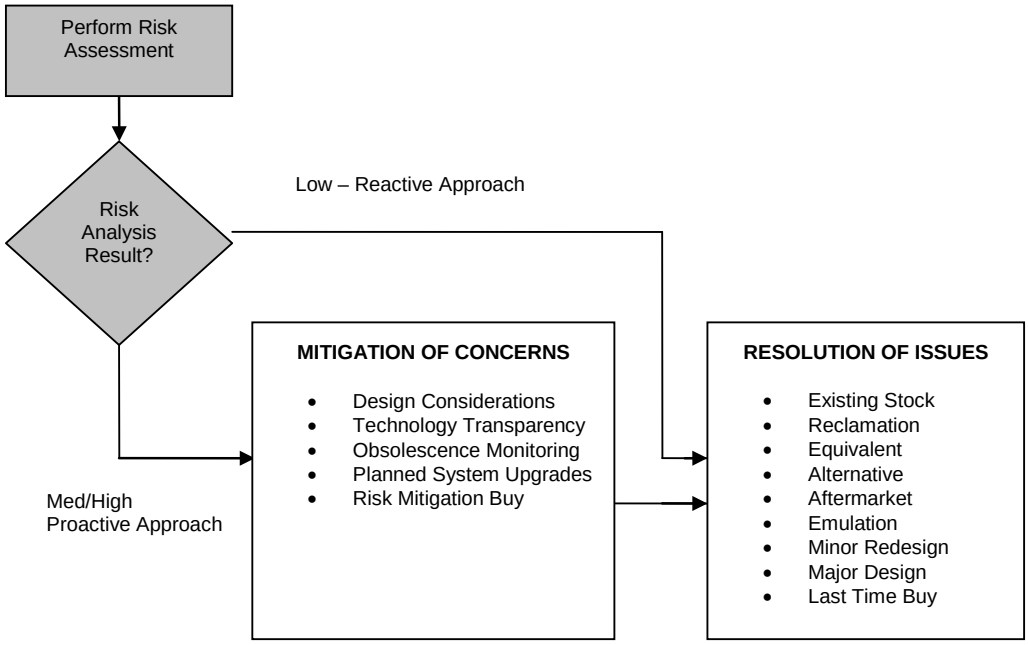
a. Detail of project's OM management structure (this shall include the industry partners details if relevant).

b. Details of Accountabilities and responsibilities.

c. Means and frequency of OM communications and meetings.

RISK ASSESSMENT

Figure 2: Reactive versus proactive approach



7. The recommended means of conducting the risk assessment is the use of the triplet of Probability, Impact and Cost as described by IEC 62402:2007. The first step shall be to break down the system or equipment into manageable portions. The level of detail to go down to is at the discretion of the Obsolescence Manager, but most obsolescence issues are being experienced at the component level in an equipment, therefore a list of components used within each equipment will be required, to manage and understand the obsolescence risk to the project. The aim of this is two-fold:

a. Concentrate effort on the areas that are most likely to create the biggest issues.

b. Do not waste effort where there are currently no known issues, or non-critical items.

8. To conduct the risk assessment the Obsolescence Manager shall consider the probability, impact and cost. Examples of the considerations to be taken into account are, but are not limited to, the following:

a. What would be the impact of product being unavailable due to lack of spares?

b. What would be the impact of performance degradation due to alternative components?

c. What would be the impact on product due to material obsolescence?

d. What would be the likely cost of premature replacement?

e. What would be the likely cost of other measures to circumvent obsolescence?

f. What is the probability of obsolescence occurring due to advances in technology?

g. What is the probability of obsolescence occurring due to the introduction of new legislation?

h. What would be the consequences of the loss of the relevant knowledge and skill base sets?

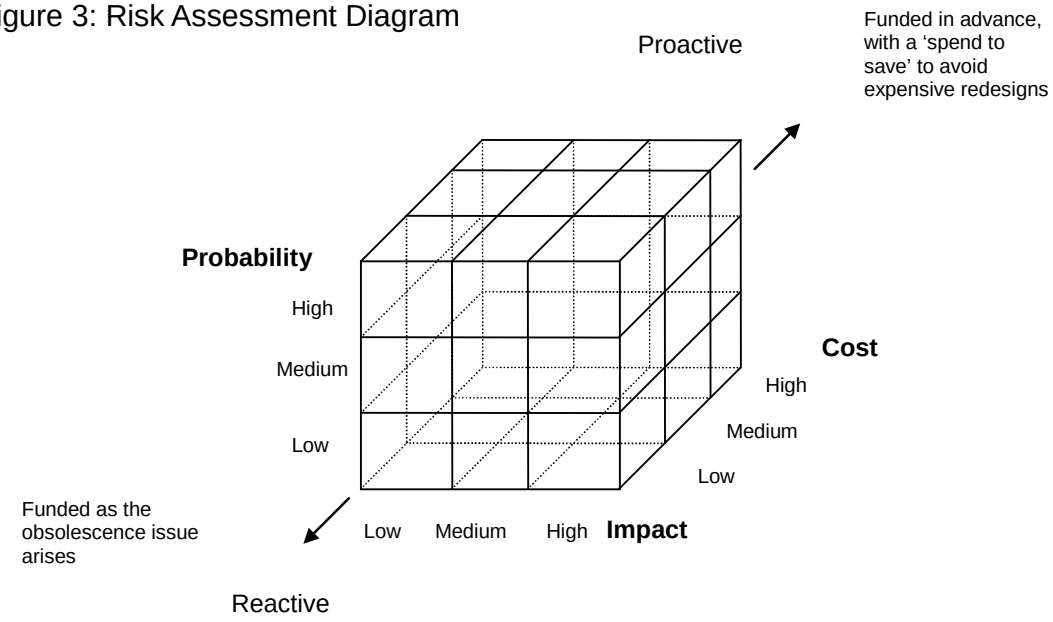
i. What would be the impact of lack of documentation?

j. What would be the impact of loss of access to intellectual property rights (IPR)?

k. What would be the impact to the product due to changes in environmental legislation?

9. The Obsolescence Manager shall conduct a risk assessment to attain a possible 'score' for the item under assessment and plot it against Figure 3; where the triplet of Probability, Impact and Cost form the three axes of the diagram and the level of classification is low, medium and high. The diagram provides a simple method to plot where the risks are likely to fall and from this the Obsolescence Manager is able to derive the appropriate approach (i.e. reactive or proactive) to adopt. It should be noted that the approaches for a number of items within an equipment or Line Replacement Unit (LRU) could be a mix of reactive or proactive. Dependent on the evolving support situation, the item or equipment may move between a proactive or reactive approach.

Figure 3: Risk Assessment Diagram



OBSOLESCENCE MANAGEMENT APPROACH

10. Once these activities have been performed for the equipment under consideration, then the appropriate approach shall be considered. IEC 62402:2007 indicates that there are two approaches to select from (reactive and proactive). There are a number of Prime Contractors who suggest that there are additional approaches available however these are merely different levels of pro-activity.

Reactive Approach

11. The "do nothing" practice is a reactive approach to the issue of obsolescence that assumes little or no planning will be undertaken to devise methods for mitigating the low risk of an obsolescence issue. It may appear to be inadequate but it is consistent with items that are not operationally critical or where the diminishing supply can be easily and quickly resolved. Traditionally, the majority of the equipment's mechanical structure and some minor equipment will, as a result of the risk assessment, be covered by this practice. It will apply largely to items that where the engineering drawings are available, proprietary items where manufacturing data or licences can be negotiated in the event of a supplier withdrawing support or items available from a multitude of sources.

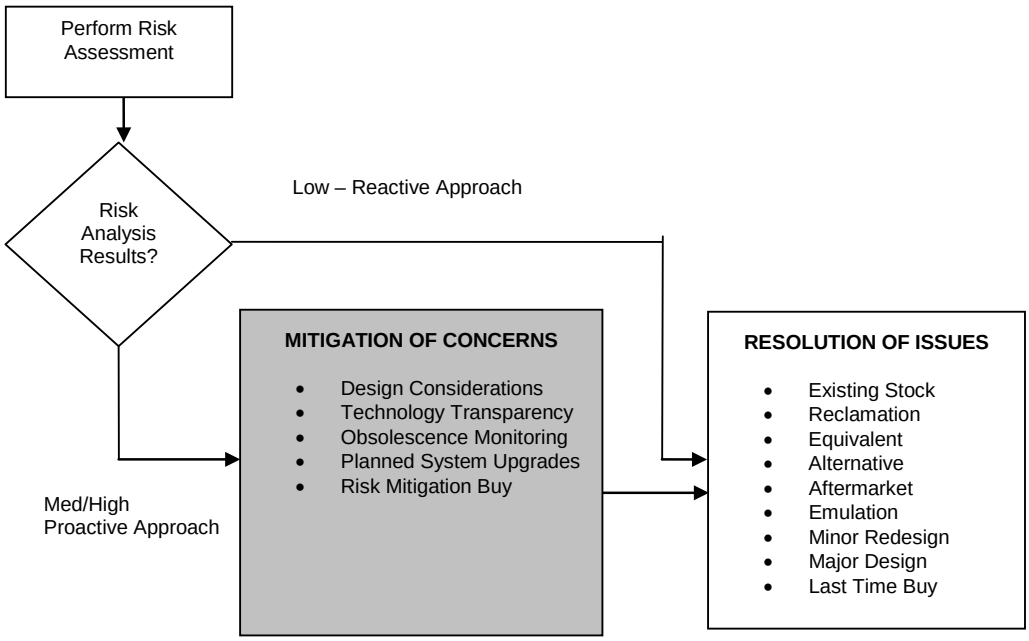
12. Being reactive to an obsolescence issue is not avoiding the problem, as the first visible symptom of the impact of obsolescence occurring may only be discovered when the supply chain attempts to source the original part for replacement. Similarly, where the risk to the operational support of the end system or commodity is very low, or a fully proactive approach is neither appropriate nor cost effective for the remaining equipment life, then a reactive approach may be wholly acceptable.

13. As mentioned a reactive approach must not be seen as ignoring the problem. The selection of a reactive approach shall be an informed decision based on an assessment of the obsolescence risk in the context of the specific equipment. From this informed position a decision is taken to live with the consequences of the obsolescence risk and react when

the item or service is no longer available. This detail shall then be recorded in an OMP including plans for a future risk assessment review.

Proactive Approach

Figure 4: Reactive versus proactive approach



14. Proactive management can entail varying levels of effort and activity. Those items that are assessed as 'medium risk' will not warrant the same level of effort and activity that those assessed as 'high risk' will. There is therefore a wide scale of proactive OM activity which can be tailored to the particular needs of the project.

15. This practice takes an actively managed approach to mitigate the risk of obsolescence by early identification of a concern and either eliminating the concern or ensuring that options are in place to ensure continued support. The following proactive approaches will reduce the probability of an obsolescence issue.

a. **Design Considerations.** The requirement to influence the design of the equipment must be applied from the outset of the project. The choice of materials, components and interfaces shall be made in order to minimize the risk of obsolescence. Factors such as changes to regulations which may affect the market, investigating multiple sourcing, indications of discontinuance (Last Time Buy (LTB) notices) and changes to technology which result in component obsolescence shall be considered.

b. **Technology Transparency.** This design methodology depends on the specification of interfaces. It is particularly relevant to modular equipment and COTS items where the individual module or component can be substituted (where the fit, form and function is maintained) provided that its interfaces are completely specified.

c. **Obsolescence Monitoring**. This involves tracking the processes, materials and components used in the equipment design. For a detailed explanation of the activities involved refer to Obsolescence Monitoring.

d. **Planned Systems Upgrades**. This option involves predetermining points during the product's life at which the design of all, or parts, of the equipment will be brought up to date and obsolete items replaced. These upgrades may or may not be synchronized with "mid-life updated" which can enhance the requirement that the product is designed to satisfy. The equipment upgrade programme shall take into account the need to minimize life cycle costs. This approach may be useful where the extensive use of COTS or Military Off-The-Shelf (MOTS) is envisaged for the equipment.

e. **Risk Mitigation Buy.** The procurement of items sufficient to support the product throughout its life cycle, or until the next planned system upgrade, to reduce an identified obsolescence risk to a project.

Note. Examples of Risk Mitigation Buys are: Life Time Buy, Life of Type Buy and Bridge Buy.

OBSOLESCENCE MONITORING

16. If a proactive OM approach is being used it would be expected that the minimum requirement for this approach would be a form of obsolescence monitoring activity. This can range from referring to technology roadmaps to component monitoring tools. With regards to obsolescence monitoring, the OMP shall give;

a. Detail of level that monitoring will be conducted (assy, LRU, component etc).

b. Detail of who will be doing the monitoring.

c. Detail of how the monitoring will be conducted (tool, process etc).

d. Detail of how the results will be communicated (means & frequency).

Component Availability Monitoring Tool

17. There are commercially available Component Availability Monitoring Tools which a PT may wish to utilize. These will allow a PT to become an Intelligent Customer when engaging with Contractors regarding the obsolescence health of the equipment. PTs will arrange for the components within the equipment, along with the associated build structure (indenture) to be loaded into a tool. PTs can have the components monitored against the extensive database and obtain:

a. Real-time assessment of the impact of component obsolescence throughout the equipment, identifying all locations where problem parts are used. There may be a significant and expensive problem of which there is no current awareness.

b. Current and predicted availability of parts, with summaries at any level of indenture, predicting up to 8 years ahead giving valuable time to plan and act.

c. Notification of last time buy dates for loaded parts, allowing potential obsolescence problems to be solved inexpensively.

d. Identification and availability of equivalent parts, so avoiding expensive redesigns and possible re-certification issues.

e. Identification of other users of the same parts within MOD, allowing the development of common or shared solutions.

Component List

18. A Component Availability Monitoring tool will require a list of components that are used within the equipment (this could be hierarchical in nature). To identify a component, the minimum data must be provided:

a. Original manufacturer's part number (some lists may contain only supplier's internal part references which are not suitable).

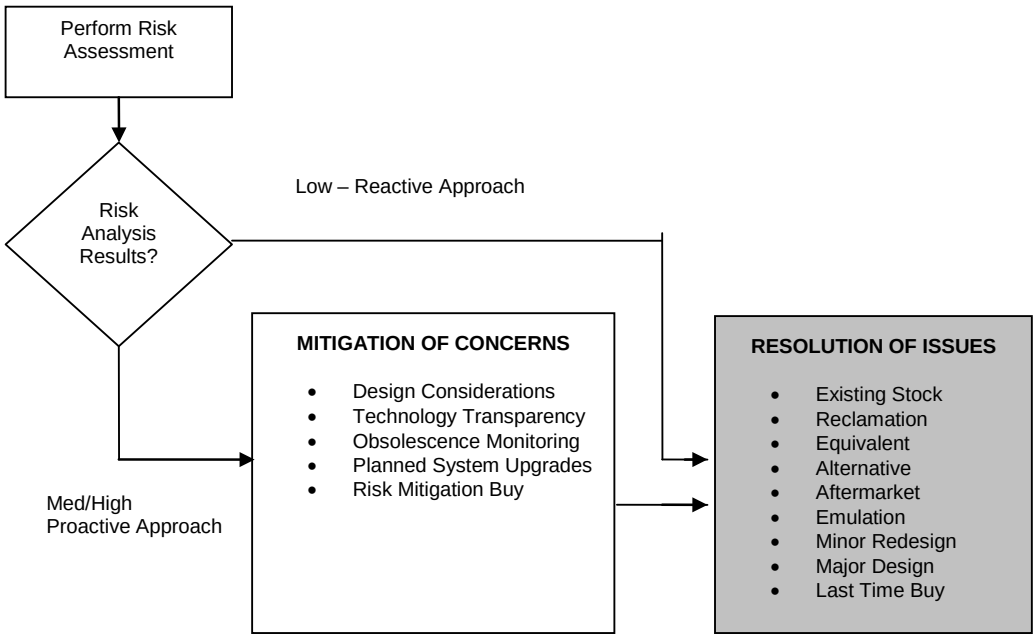
b. The name of the original manufacturer.

c. Component or part description.

d. Any specification associated with the part (e.g. the BS/CECC detail specification or US MIL Standard reference for an approved military part).

RESOLUTION PROCESS

Figure 5: Reactive versus proactive approach



19. The risk of obsolescence cannot be eliminated entirely. Once an obsolescence issue is identified it is the responsibility of the Obsolescence Manager to develop a robust resolution process which shall minimize the financial and operational impact of the obsolescence issue on the project programme. The resolution process shall include:

a. Who is responsible for identifying obsolescence issues?

b. How is the issue communicated and to whom (means and timescale)?

c. Who assesses the impact of the obsolescence issue?

d. How is this assessment conducted?

e. Who identifies the resolution options?

f. Who selects the resolution option to be implemented?

g. Who decides when the resolution option is to be implemented?

20. Before implementing the appropriate resolution option its cost-effectiveness must be considered. The Non Recurring Engineering (NRE) costs of implementing each resolution option has been calculated as part of the MOD Component Obsolescence Resolution Cost Metrics Study dated March 2004. A guide to the potential resolution options are detailed below in cost order where 'Existing Stock' has the lowest NRE cost to implement. This is also represented in graphical form; see Figure 6 to highlight the difference in the costs incurred in implementing each resolution option.

a. **Existing Stock**. An item that is owned within the supply chain and that can be allocated to the project.

b. **Reclamation** (Cannibalisation). The use of an item found in surplus equipment or equipment beyond economical repair.

c. **Equivalent**. An item which is functionally, parametrically and technically interchangeable (form, fit and function).

d. **Alternative**. An item whose performance may be different from that specified for one or more reasons (e.g., quality or reliability level, tolerance, parametric, temperature range).

e. **Authorised Aftermarket**. An item is available on the market but not from the original manufacturer or supplier (typically finished goods provided by licensed suppliers).

f. **Emulation**. A manufacturing process that produces a substitute form, fit and function, and interface (F3I) item for the unobtainable item. Microcircuit emulation can replicate with state-of-the art devices that emulate the original and can be manufactured and supplied on demand.

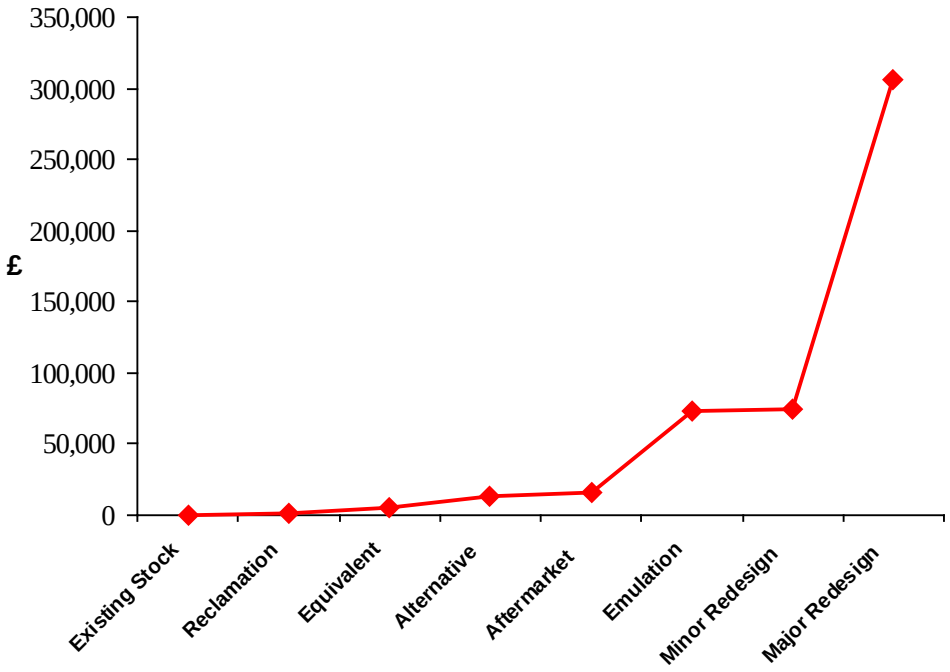
g. **Minor Redesign**. An item is designed out of the equipment. The cost for redesign can include engineering, programme management, integration, qualification and testing. Eg, a minor redesign would represent a change to the layout of a circuit board.

h. **Major Redesign**. An item is designed out of the equipment. The cost for redesign can include engineering, programme management, integration, qualification and testing. Eg, a major redesign would be a circuit board replacement.

Note. As the costs of Last Time Buys were considered to be project specific they were not included in the MOD Component Obsolescence Resolution Cost Metrics Study dated March 2004.

i. **Last Time Buy**. As a result of a product discontinuance notice, the procurement of items sufficient to support the life cycle of the project or until the next planned technology upgrade.

Figure 6: Non Recurring Engineering Resolution Costs (£)



SUPPLIER ARRANGEMENTS

21. If the OM activity is being cascaded through the Supply Chain (SC) then it will be necessary to instigate arrangements with suppliers to ensure that they are conducting the appropriate level of OM activity. The plan shall incorporate the supply chain arrangements and list the following:

a. Details of arrangements with suppliers, specifying if these are contractual requirements or requests (including means and frequency of communication).

b. Has the requirement for Component Lists been cascaded through the SC.?

22. If the monitoring activity is being undertaken down the SC, it is important to ensure that the communications chain in reporting a notification of any issue and the subsequent decision making process in addressing the issue, is effective enough to provide the appropriate time to respond (i.e. the time taken to pass information up and down the SC does not impact on the options available to address the obsolescence issues.

PERFORMANCE MANAGEMENT

23. Regardless of whether an OM programme is run by the PT, Industry or as a partnership between both, the cost of conducting an OM programme can involve considerable expense. The project shall be able to demonstrate that the cost of the programme will be offset by the cost avoidance of undertaking the activity.

24. In order to justify the expense of the OM programme, it is necessary to measure the performance of the plan (and therefore the programme). The plan shall specify how the performance of the plan is to be assessed, specifically:

a. Details of how performance will be measured.

b. Detail of how metrics will be used (who is to capture them and how they will be captured).

c. Detail on reporting of performance information.

25. Chapter 7 – Cost Avoidance demonstrates an example of how to use the cost metrics to determine cost avoidance to defend the cost of the OM programme. The entire study can be found at MOD Component Obsolescence Resolution Cost Metrics Study dated March 2004.

PLAN TRANSITION

26. If the plan does not cover to the Out of Service Date (OSD) for the project, it must state how the project intends to manage obsolescence at the end of the current plan. All known obsolescence concerns and issues must be identified and have mitigation plans. All data gathered in the implementation of this plan shall be passed to the Authority no less than 12 months prior to contract end.

CHAPTER 6 – OBSOLESCENCE IMPACT ASSESSMENT

PROBLEM

1. There are many tools and processes in existence that allow the Obsolescence Manager to ascertain the current Obsolescence Health of their equipment. Some of these tools have a predictive element that will give a forecast of predicted availability at the component level, sometimes out to eight years ahead.

2. However, this is only part of the requirement to be wholly proactive in OM. One of the most important questions a PT should ask is:

   a. What impact will Obsolescence have on my project until OSD?

3. The main focus for this question is to look at the Obsolescence risk to the project and define the impact on cost and the impact on availability for a defined period in the future. Currently there is no one solution to this question.

4. This question is also very relevant in Contracting for Availability contracts as it will greatly affect the amount of money that is set aside to resolve Obsolescence issues. Indeed, the bidding contractor may choose not to take on this risk or provide a much inflated cost if the risk falls to him.

5. It is therefore important the Authority has the ability to become more informed in this area to allow decisions to be made and cost assumptions to be verified, or challenged. This ability is informed by an Obsolescence Impact Assessment.

OVERVIEW

6. An Obsolescence Impact Assessment (OIA) provides a quantifiable justification for budget forecasts and will illustrate when, and where, important decisions need to be made to reduce the impact on equipment supportability caused by Obsolescence. The OIA will have definitive outputs to help a PT in the decision making process. It is a detailed look at an equipment, to develop:

   a. An understanding of its current Obsolescence health.

   b. A prediction of future obsolescence problems and determine when, and where, the impact of Obsolescence will affect the supportability of the equipment.

7. The main outputs from the exercise will be:

   a. What do you need to do?

   b. When do you need to do it?

   c. How much will it cost?

   d. What is the impact of not doing it?

8. The main output will be an executive summary of the answers to the above questions. The output will emphasize the cost profile and timeline with a synopsis of the important decision points.

Figure 7: OIA Supportability Prediction –

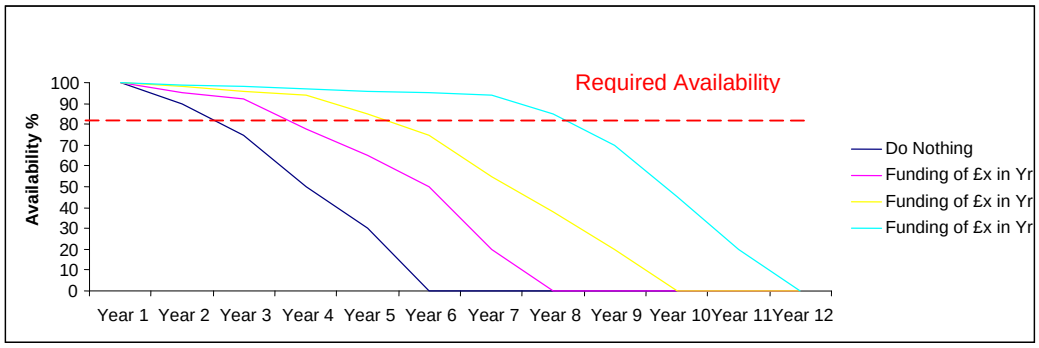
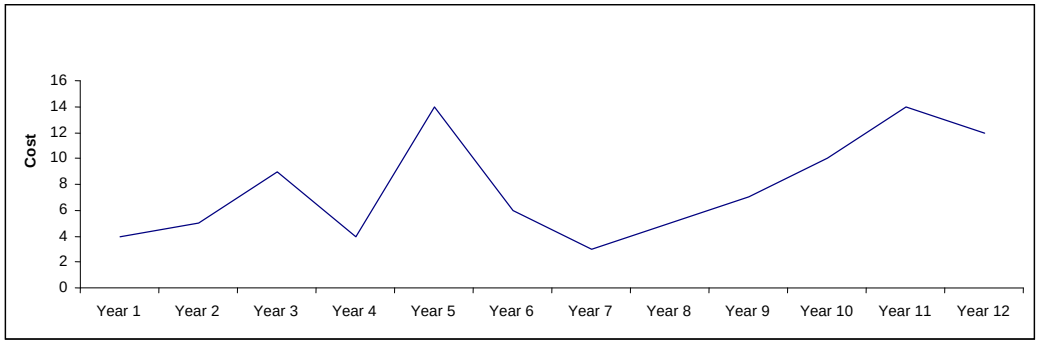


Figure 8: OIA Cost Profile



9. The above graphs (which are for illustration only) show two important elements. They are (from an Obsolescence perspective only):

a. What are the major milestones required to sustain the availability at 85% (for example)?

b. What is the likely cost profile required to implement the above milestones?

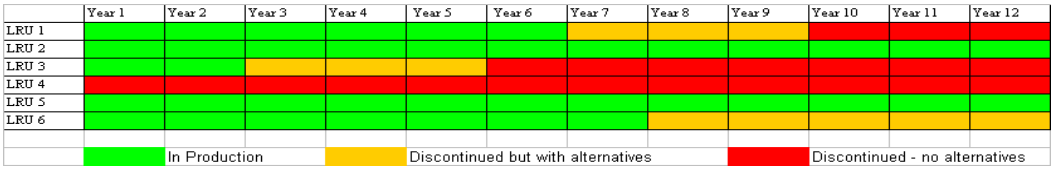
Major Milestones

10. These major milestones are typically defined as funding of a particular value, in a particular Financial Year. They can be a variety of Obsolescence resolutions that are required to maintain the equipment e.g. planned system upgrades or risk mitigation buys.

Supporting Data

11. The above outputs will be supported by underlying data which has been collected and analysed, a typical example of this would be an obsolescence prediction analyses on a particular sub system. A typical example for a sub system of 6 LRU's is below:

Figure 9: Obsolescence Prediction Analyses



This data is indicative only but is representative of the type of data that will constitute the OIA Executive Summary.

INPUT DATA

12. As with most of these types of activities, the quality of the output data is directly proportional to the quality of the input data. A sample of the type of input data required for a fully reliable OIA is detailed below:

a. **Component List**. A list of components that constitute the equipment that is being evaluated. The data shall include: Item Description, Original Manufacturer Part No., Quantity Used, Location, Cost

b. **Reliability Data**. Mean Time Between Failures (MTBF), Mean Time To Repair, Turn Around Time (TAT) etc.

c. **Supply Chain Data**. Inventory levels, Consumption Rates, Purchase Lead Time, Shelf Life, Operational Life etc.

d. **Output** from a Component Availability Monitoring Tool.

e. **Cost Data**. LRU Cost, Repair Cost, Storage Cost, Cost to Order.

f. **Project Data**. OSD date, Planned Capability Upgrades.

13. This list is not exhaustive but is representative of the type of data that is required for a fully viable OIA. The quality of the resultant analysis will be compromised if there are certain missing elements of the above input data.

14. The PT may not have all of the data available. It may become part of the requirement that whoever is performing the OIA is also tasked to gather the above data.

15. The accuracy and validity of an OIA will be determined by the availability and accuracy of this input data.

REFRESH

16. It is envisaged that the OIA should (ideally) look ahead until OSD, this could be typically 10, 25 or even 30 years. However, it is recognised in this field that the industry leading Obsolescence predictive tools typically look ahead 8 years for an accurate prediction. Therefore the OIA should be accurate for the first eight years and out with this timescale the risk of inaccuracies are greatly enhanced. It is therefore recommended that an OIA should be refreshed periodically. This will vary from equipment to equipment, but may be typically every 2 or 3 years.

SUMMARY

17. The OM SME has produced this document to provide PTs with a framework for establishing the future Obsolescence risk to a project. It is a further step in being proactive in OM.

18. An OIA will be useful to a PT who wishes to gain a better understanding of how Obsolescence will affect equipment in the future. It will provide evidence for business cases when bidding for finance and will help in profiling future costs in this area.

19. Although the SME has outlined the purpose and scope of this activity, it is a process that will ultimately be performed by Industry. A PT can task their Prime or a 3rd party contractor if they wish an independent assessment.

20. The role of the SME is to help develop this capability, to ensure that PTs are aware of the benefit of performing this type of exercise, and to assist them in defining and shaping the requirement if they wish to undertake an OIA.

CHAPTER 7 - COST AVOIDANCE

INTRODUCTION

1. Using obsolescence resolution cost metrics will allow the PT to conduct the following tasks with confidence:

   a. Perform trade-off studies for their programmes and projects to select the most cost effective solution.

   b. Conduct cost avoidance analyses to determine the financial savings that can be made by implementing a proactive OM strategy.

   c. Determine the impact of obsolescence on whole life costs.

COST AVOIDANCE CALCULATIONS

2. This example will show how to use cost metrics to determine cost avoidance. The data used to demonstrate this has been extracted from the MOD Component Obsolescence Resolution Cost Metrics Study dated March 2004, which explains, in full, the methodology behind the study and the terminology used.

3. To determine cost avoidance resulting from implementing a proactive OM strategy, we will use the Defence Microelectronics Activity (DMEA) cost avoidance methodology that requires the use of the calculated cost summarised in Table 1. (Last Time Buy is not included because those costs are program-specific).

Table 1: Non Recurring Engineering Resolution Costs

Resolution	Cost £
Existing Stock	100
Reclamation	1,300
Equivalent	5,300
Alternative	13,500
Aftermarket	15,900
Emulation	73,000
Redesign—Minor	74,400
Redesign—Major	305,900

DMEA COST AVOIDANCE METHODOLOGY

4. The DMEA cost avoidance methodology ranks each resolution from lowest cost to highest cost. Cost avoidance is determined by subtracting the cost of a resolution (Table 1) from that of the next-higher-cost resolution. Figure 10 provides graphical representation and Table 2 lists all the resulting values.

Figure 10: Cost Avoidance

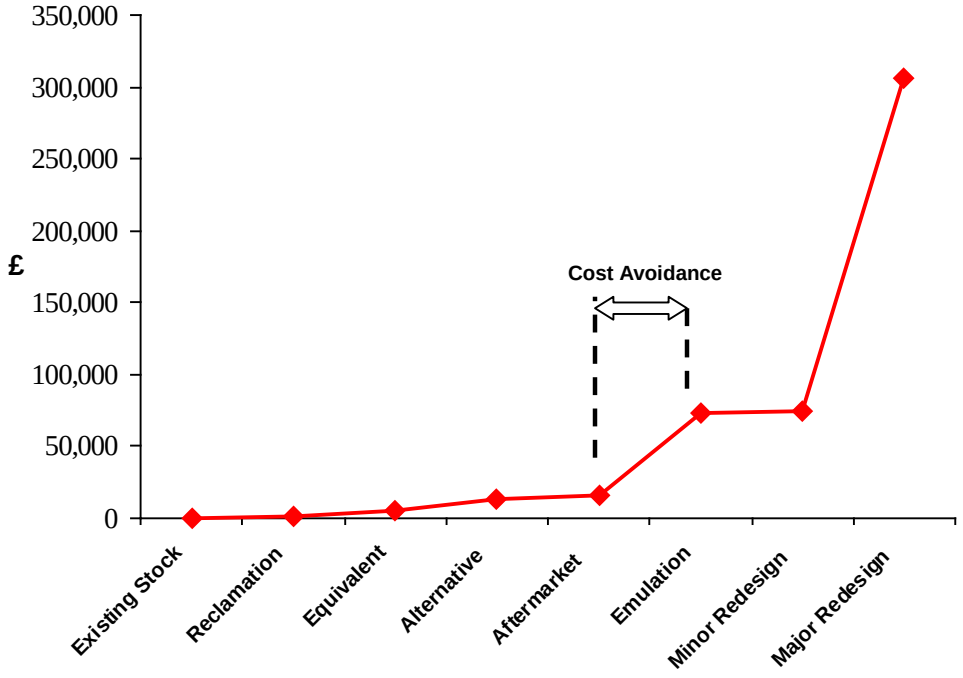


Table 2: Cost Avoidance Values

Resolution	Cost Avoidance £
Existing Stock	1,200
Reclamation	4,000
Equivalent	8,200
Alternative	2,400
Aftermarket	57,100
Emulation	1,400
Redesign—Minor	231,500
Redesign—Major	0

COST AVOIDANCE EXAMPLE

5. Table 3 provides a fictional example whereby implementing the most effective resolutions for each obsolescence issue or concern during the program will provide the total cost avoidance achieved by adopting a proactive OM strategy.

Table 3: Cost Avoidance Estimates Using DMEA Methodology

Resolution	Number of Resolutions Implemented	Cost Avoidance £	Total Cost Avoidance £
Existing Stock	14	1,200	16,800
Reclamation	0	4,000	0
Equivalent	140	8,200	1,148,000
Alternative	16	2,400	38,400
Aftermarket	14	57,100	799,400
Emulation	12	1,400	16,800
Redesign—Minor	4	231,500	926,000
Redesign—Major	0	0	0
Total	**200**		**2,945,400**

6. To determine the estimated cost avoidance of the example, the cost of the OM strategy is deducted from the Total Cost Avoidance figure. Assuming an OM strategy cost of £100,000 per year for three years (£300,000), the resultant project cost avoidance is £2,645,400.

7. Adjustments to the cost avoidance calculation would be required in two situations:

a. In some instances, the next-higher-cost resolution may not be technically feasible; for example, emulation may not be a viable alternative for a complex ASIC.

b. A redesign may resolve obsolescence problems for more than one component at once; often five problems can be resolved with one redesign.

COST AVOIDANCE SPREADSHEET

8. PTs shall ensure that the Contractor is producing Cost Avoidance data as part of their Performance Measurement. Where actual project specific resolution costs are available these shall be used, otherwise the data in Table 2 will be used to calculate cost avoidance. As an example, a simple spreadsheet may be used to provide the following data:

a. The number of obsolescence concerns addressed per year.

b. The number of obsolescence issues resolved per year.

c. The number and percentage of each type of resolution implemented.

d. The cost of implementing each resolution.

e. The cost avoidance of implementing this resolution.

f. The cost of implementing a proactive OM strategy per year.

g. The Total Cost Avoidance of implementing a proactive OM strategy per year.

GLOSSARY OF OBSOLESCENCE MANAGEMENT TERMS AND DEFINITIONS

Through the Joint Obsolescence Management Working Group (JOMWG), the following terms and definitions have been agreed, in an aim to standardise the way in which PTs develop their contracting requirements for OM.

Alternative	An item whose performance may be different from that specified for one or more reasons (e.g., quality or reliability level, tolerance, parametric, temperature range).
Authorised Aftermarket	An item is available on the market but not from the original manufacturer or supplier (typically finished goods provided by licensed sources).
Emulation	A manufacturing process that produces a substitute form, fit and function, and interface (F3I) item for the unobtainable item. Microcircuit emulation can replicate with state-of-the art devices that emulate the original and can be manufactured and supplied on demand.
Equivalent	An item which is functionally, parametrically and technically interchangeable (form, fit and function).
Existing Stock	An item that is owned within the supply chain and that can be allocated to the project.
Last Time Buy	As a result of a product discontinuance notice, the procurement of items sufficient to support the life cycle of the project or until the next planned technology upgrade. Note: The Last Time Buy is a reactive resolution
Obsolescence	Transition from availability from the original manufacturer to unavailability.
Obsolescence Concern	As a result of a proactive approach, a future obsolescence issue has been identified. A resolution needs to be developed and implemented to minimise the impact on future availability, and cost to, a project.
Obsolescence Issue	An item within a project has been declared obsolescent. A resolution needs to be identified and implemented to minimise the impact on availability, and cost to, a project.
Obsolescence Management	The co-ordinated activities to direct and control an organisation with regard to obsolescence.

Obsolescence Resolution	A resolution type (as defined in JSP 886 Volume 7 Part 8.13) as a result of an obsolescence concern, or obsolescence issue, requires to be implemented. One concern, or issue, may generate a number of resolution types that impact multiple equipments within a project.
Obsolescent	Subject to an announced future end of production date by the original manufacturer.
Obsolete	Not available from the original manufacturer to the original specification.
Reclamation (Cannibalisation)	The use of an item found in surplus equipment or equipment beyond economical repair.
Redesign	An item is designed out of the system. The cost for redesign can include engineering, programme management, integration, qualification and testing. Redesign can be further broken down into categories, e.g. minor (board re-layout) and major (board replacement).
Risk Mitigation Buy	The procurement of items sufficient to support the product throughout its life cycle, or until the next planned technology upgrade, to reduce an identified obsolescence risk to a project. Note: The Risk Mitigation Buy is a proactive risk reduction measure, triggered by the user, where an unacceptable obsolescence risk to a project has been identified. Examples of RMB are: Life Time Buy, Life of Type Buy, Bridge Buy.
Unavailable	No longer available from any sources.