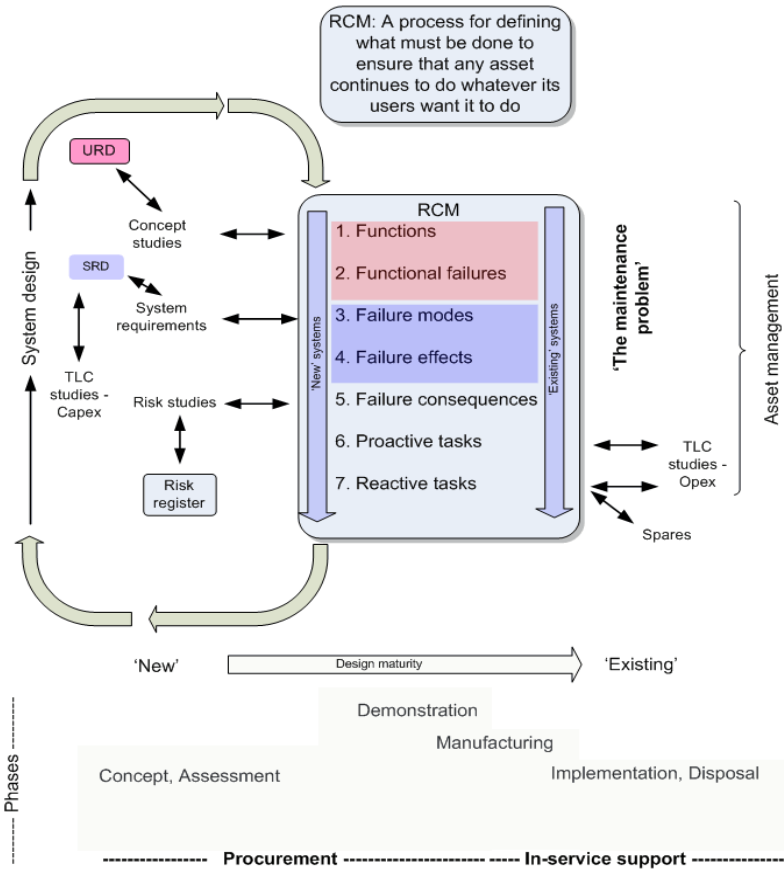


## SYSTEMS ENGINEERING

Systems Engineering (SE) processes are about satisfying user's through life requirements in an auditable and cost-effective manner and to this extent SE and RCM share the same goals. The diagram shows how these SE goals can be achieved using the RCM process.



To the left of the diagram it can be seen that successive iterations of the RCM process for new-to-service equipments capture and document conceptual user requirements in terms of primary and secondary functions



(see item 1, Functions). As the initial design progresses through the assessment phase, more technical information is gathered, allowing systems requirements to be specified (in terms of functional failures, failure modes and effects). As the initial design progresses through the CADMID cycle and physical entities are determined, the through life costs associated with capital expenditure can be determined, together with realistic estimates of design, project and cost risks.

When the physical makeup of the final design is established, the through life cost (TLC) due to maintenance, spares and support can be determined. Iterations of the RCM process provide an important input to these estimates.

Where suitable asset management tasks cannot deliver all of the required functionality and/or is unable to do so to the required performance level, additional assets in the form of redundancy or other protection can be considered. Such additions to the system must also provide an input to the cost and risk assessment exercise. The RCM process can be an effective means of developing the risk register for physical assets and to manage identified risks an auditable way.

A final pass through the RCM process at the system delivery stage ensures that the asset management strategy is current, appropriate and defensible. At this stage, the application of the RCM process to the new system is no different to the application of RCM to an existing system, but because the bulk of asset management information has already been analysed, this pass of RCM is simply a final pre-delivery check.

It should be noted that each iteration through the RCM process considers only the 'deltas' and therefore can be applied quickly, particularly if applied frequently (for example, as part of monthly design reviews). The process provides a rigorous agenda for carrying out such reviews and ensures that all stakeholders are party to engineering and design decisions.

**Summary:** Rmada has a considerable track record in RCM and with adaptations to the core RCM process as applied to new-to-service equipments, particularly to warship new build.