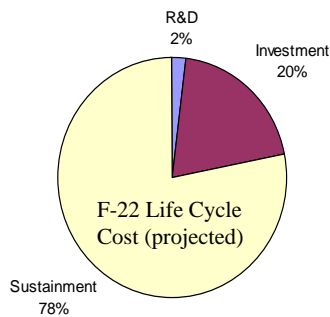


Introduction

- Obsolescence is defined as the loss or impending loss of original manufacturers or suppliers of items or raw materials (also known as DMSMS - Diminishing Manufacturing Sources and Material Shortages).
- Technology obsolescence is a significant contributor to the high sustainment costs of complex systems.
- As sustainment-dominated systems are forced to use more COTS (Commercial Off the Shelf) technology, obsolescence problems become more significant.

Obsolescence affects:

- Electronic parts
- Materials
- Software
- Intellectual property
- Requirements and specifications

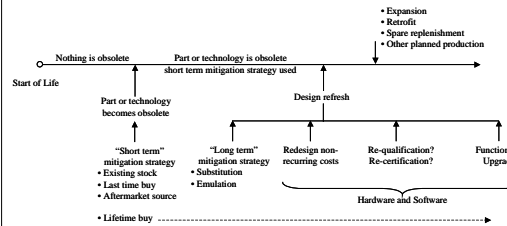


The F-22 program has spent over \$80M on electronic part obsolescence resolution already

Design Refresh Planning

- Design refreshes are performed on sustainment-dominated systems to update functionality/performance and to mitigate technology obsolescence problems.
- Design refreshes must balance the cost avoidance from mitigating obsolescence problems with potentially large costs associated with system redesign and re-qualification.

- To perform design refresh planning, a timeline of obsolescence, mitigation, production, and design refreshes for hardware and software must be modeled:

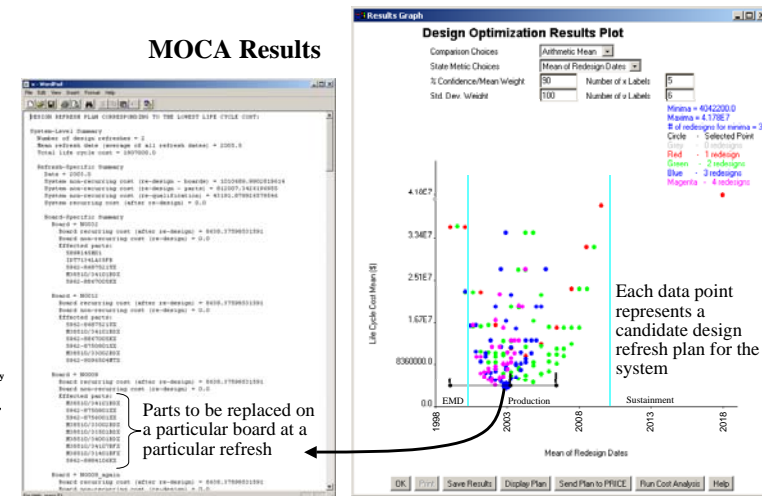


Mitigation of Obsolescence Cost Analysis (MOCA) Tool

The MOCA software tool determines the optimum design refresh date(s) based on:

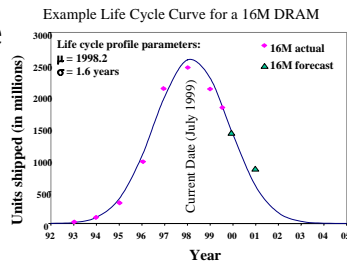
- Forecasted technology obsolescence (what and when)
- How obsolescence events are mitigated
- Production, retrofit and sparing requirements

MOCA Results

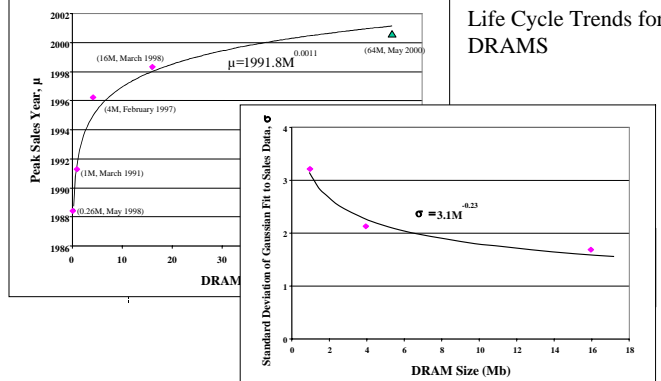


Obsolescence Forecasting

Most electronic part manufacturers are driven by high-volume commercial applications, e.g., mobile phones. Therefore, parts often have lifetimes that are far shorter than that of sustainment-dominated systems, e.g., avionics.



By curve fitting part sales data, trend equations can be formulated to forecast the obsolescence dates of current and future electronic parts.



MOCA Design Example

The Mitigation of Obsolescence Cost Analysis (MOCA) tool was used to determine the optimum design refresh dates and refresh content for an avionics module subject to electronic part obsolescence.

- 2 boxes (4 levels of hierarchy)
- 20 boards (13 unique)
- 1310 parts (175 unique)
- 20 year sustainment life
- Scheduled manufacturing during first 12 years
- All obsolescence forecasts from TACTrac data (circa 1998)

