



Theatre High –Altitude Area Defense Missile Systems (THAAD)



Parts Standardization and Management Committee Conference

4 November 2009

THAAD DMSMS Program

*Presented by:
THAAD Obsolescence Program Lead*



Agenda



- Introduction to THAAD
 - THAAD Program Activities
 - THAAD Program Baseline
- Diminishing Manufacturing Sources and Material Shortages (DMSMS) Requirements
 - THAAD Parts, Materials, and Processes (PMP) Plan
 - Missile Defense Agency (MDA) Parts, Materials, and Processes Mission Assurance (PMAP) Plan
 - Statement of Work
- THAAD DMSMS Approach
 - Process Flowchart
 - Resolution Activities
- Results
 - Engineering and Manufacturing Development (EMD) Metrics
 - Fire Unit Fielding 1 / 2 Metrics
 - Batteries 3 / 4 Metrics
 - Batteries 5 / 6 Metrics
- Summary

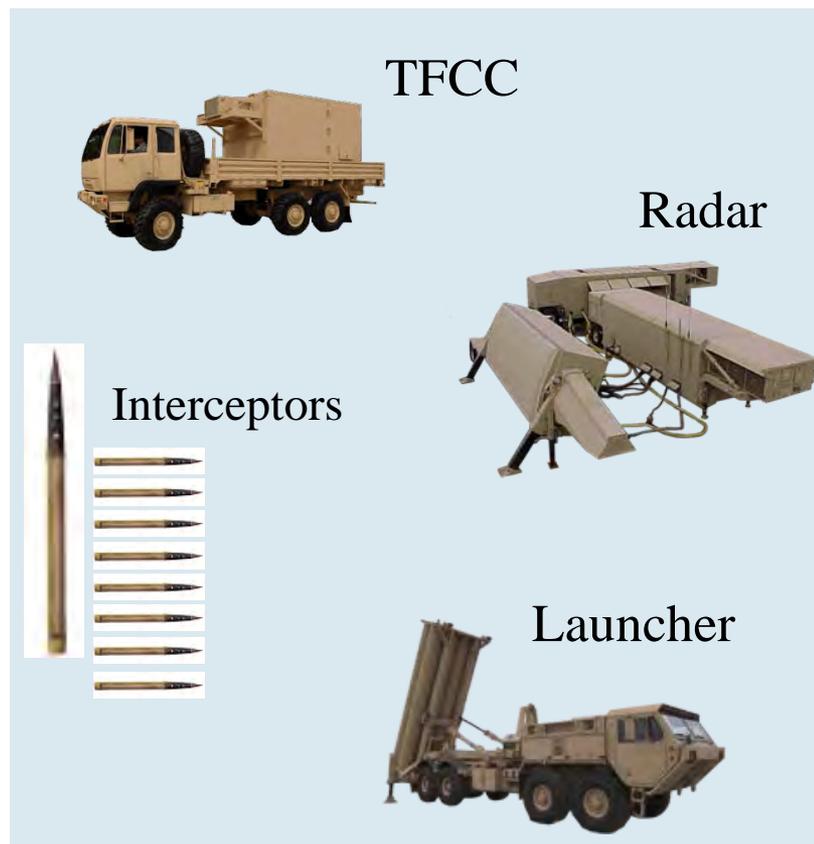


Introduction to THAAD

THAAD – is an easily transportable defensive weapon system to protect against hostile incoming threats



THAAD Weapon System consists of Launchers, Interceptors, Fire Control / Communications (TFCC), and Radars.





THAAD Program Activities



- 1992 - Lockheed Martin (LM) Missiles and Space was awarded \$689M to develop the THAAD System
- 2000 - THAAD entered the [Engineering and Manufacturing Development](#) (EMD) Phase
- 2004 - Present – Flight Testing
 - 2004 (May)– production of 16 flight test missiles began
 - 2005 (November)– flight testing at White Sands Missile Range, New Mexico
 - 2006 (May)– first flight test of the entire system including missile, launcher, radar and fire control system
 - 2007 (January)– Pacific Missile Range, Kauai, Hawaii -a successful intercept test in the high endo-atmosphere
 - 2007 (April)– second successful test with intercept in the mid-endo-atmosphere
 - 2007 (October)– successful intercept of a unitary target outside the atmosphere (exo-atmospheric)
 - 2008 (June)– successfully intercepted a separating target in mid-endo-atmosphere
- 2005 (May) – [Began Early Obsolescence for Fire Units Fielding 1 / 2](#)
- 2007 (January) – LM was awarded a contract for the first two production THAAD systems to include six launchers, 48 missiles, two radars and two tactical operations centers
- 2008 (May) – US Army activated the first THAAD battery unit at Fort Bliss, TX
- 2008 (September) – United Arab Emirates requested the sale of three THAAD Fire Units
- 2009 (June) – Began [Early Obsolescence and Long Lead activities for Batteries 3 / 4](#)



DMSMS Requirements

Parts, Material, and Process Plan

- Developed under Capability Development (or EMD) and used on all subsequent THAAD contracts
- Establishes requirements for selection and approval of parts, materials, processes used on the THAAD program
- Sub contractors required to submit PMP Plan to THAAD Parts Review Board (TPRB) for approval
- Requires that the Prime and Subcontractors meet GIDEP requirements. TPRB reviews GIDEP alerts and flows down to subs and vice versa for sub GIDEP members
- Includes Obsolescence Management requirements and processes
 - Provides for creation of Obsolescence Working Group (OWG)
 - Process follows 3 step approach that consists of Prediction, Approach and Strategy, and Resolution

MDA-QS-003-PMAP-REV A

- Defines Parts, Materials, and Process (PMP) requirements for all new or modified safety and mission critical products and systems developed for the Missile Defense Agency (MDA).
- Prime contractor to develop PMP plan
- Proactive obsolescence management approach
 - Technology roadmap
 - Use of GIDEP, Product Change Notification (PCN) subscription services, and other sources
- MDA programs will coordinate all obsolescence issues with MDA PMPB to maximize cooperation
- Mitigation plan for each EEE identified as being in decline or phase out





Statement of Work (Example)



3.9.3.3 Obsolescence Management

The contractor shall conduct an internal parts obsolescence program IAW the Government-approved PMP Plan. This program shall include a quarterly obsolescence report to inform the Government of current and predicted obsolescence and Diminishing Manufacturing Sources and Material Shortages (DMSMS) risks IAW DI-MISC-80508 (CDRL A0XX).

The contractor shall maintain a process for identification, resolution and implementation for all DMSMS/Obsolescence issues associated with the hardware, (parts, materials, assemblies, COTS, in-house special test equipment (STE) and special inspection equipment (SIE) under this contract. The contractor's process and notification to the Government shall address all possible options available for economical and timely resolution. The contractor shall generate obsolescence/DMSMS cases and track mitigation status.

The contractor shall actively participate in a quarterly, contractor-led Obsolescence Working Group (OWG) during the life of the contract. The contractor shall notify the Government if it is determined that a component required in the delivery of the system is unavailable due to obsolescence/DMSMS issues within 30 days after identification.

3.9.3.4 Obsolescence Mitigations

The contractor shall identify, and define task and schedule, for the obsolescence follow-on efforts required to complete Long Lead and Production Support (Obsolescence Mitigations) for THAAD Battery procurement. The contractor shall then perform and complete obsolescence mitigation activities for THAAD components and parts as identified. Obsolescence activities shall be completed in a timely manner such that the Battery production schedule is adequately met and there is no impact to production.

The contractor shall identify, define task and schedule, and provide recommended mitigations resulting from Trade Studies performed as a part of the Long Lead and Production Support (Obsolescence Mitigations) for THAAD Battery procurement. The government will review and provide approval / disapproval of the recommended mitigations. For known and emerging DMSMS issues approved by the government, the contractor shall implement and complete defined mitigation in a timely manner such that the THAAD Battery production schedule is adequately met and there is no impact to production.

3.9.3.5 Future Production Support Obsolescence Strategies

The contractor shall canvas each component and coordinate with subcontractors and in house manufacturing to determine Diminishing Manufacturing Sources and Material Shortage (DMSMS), obsolete, end of life, sunset technology or other parts procurement issues that would negatively impact the ability to execute future production. The contractor shall maintain a discrete list of known and emerging parts which require action in order to ensure a timely execution of future and/or added production. This list shall be provided IAW DI-XXXX-XXXX (CDRL XXXX). The contractor shall conduct trade studies to identify mitigations for known DMSMS/obsolescence issues in support of future production. The contractor shall provide the results of trade studies IAW DI-MISC-80508 (CDRL XXXX) (The trade study shall include but not limited too: the part/systems noted to be obsolete or DMSMS; the components affected by the obsolete part; the recommended mitigation inclusive of qualification or testing requirements if needed; cost broken into fiscal year funding profiles, and the schedule of activities to complete mitigation. The contractor shall implement government approved mitigation plans.



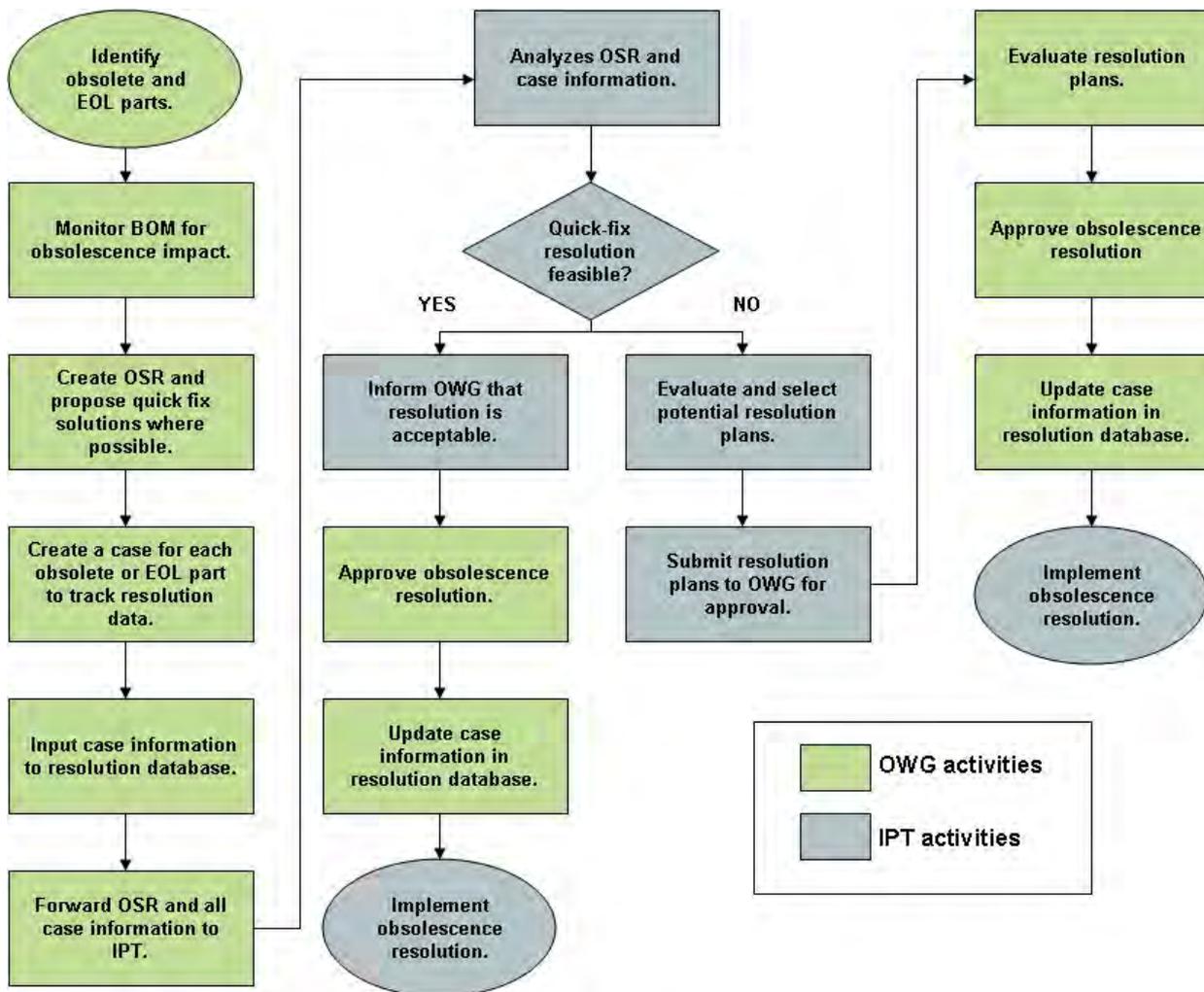
THAAD DMSMS Approach



- Establishment of Obsolescence Working Group per PMP
 - Creates an overarching program to encourage process standardization, commonality, and horizontal integration
 - May include but is not limited to Government, Primes, and Industry
- Indentured Bill of Materials (BOMs) provided through working group
 - Proactive BOM Analysis
 - BOM loaded into commercial predictive tool (TPP, COMET, Qstar, etc) to identify:
 - Part number flag (red, yellow, green, orange)
 - Life cycle stage
 - Any alerts
 - Reactive BOM Analysis
 - Alerts from predictive tools, GIDEP, DSCC, any notices from sub-contractors and suppliers
- Systems are jointly monitored by TPO and Prime contractor creating a more robust tracking system
- When an DMSMS issue is identified a case is opened and tracked through complete mitigation by both TPO and LM
- Perform trade studies and report all analysis levels for cost effective, minimum risk and schedule impacts
- Shared development and implementation of mitigations
- Collaborative maintenance of centralized product availability database (shared by THAAD OWG)
- Coordinated preparation and review of quarterly report
- Combining resources and tools to forecast future obsolescence issues
- Working together to accurately develop POM funding requirements for obsolescence resolutions
- Negotiating mutually-beneficial contract language to address contract management



Process Flowchart



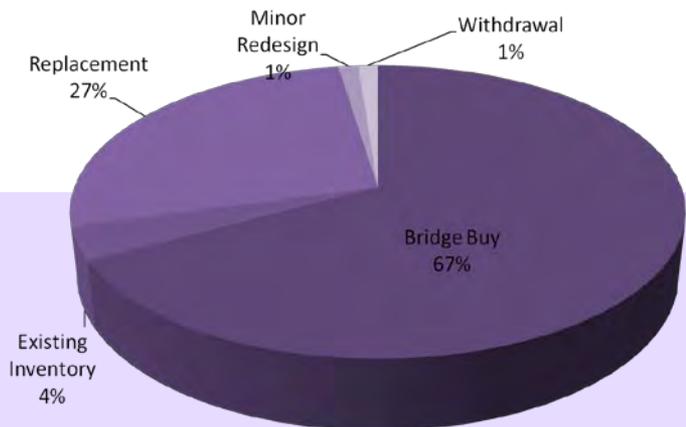


Resolution Activities

- Current Contract
 - Weekly telecons
 - Quarterly Obsolescence Status Report (OSR)
 - Quarterly Obsolescence Working Group Meetings
 - End of Life (EOL) – Bridge Buys
 - Trade studies
- Planning for Future Contracts
 - Yearly forecast of future obsolescence and funding requirements included in Cost Analysis Requirements Description (CARD)
 - Review schedules of future manufacturing strategies
 - Perform early obsolescence mitigations for future manufacturing strategies



EMD Contract - Metrics



82 Obsolescence Cases Mitigated

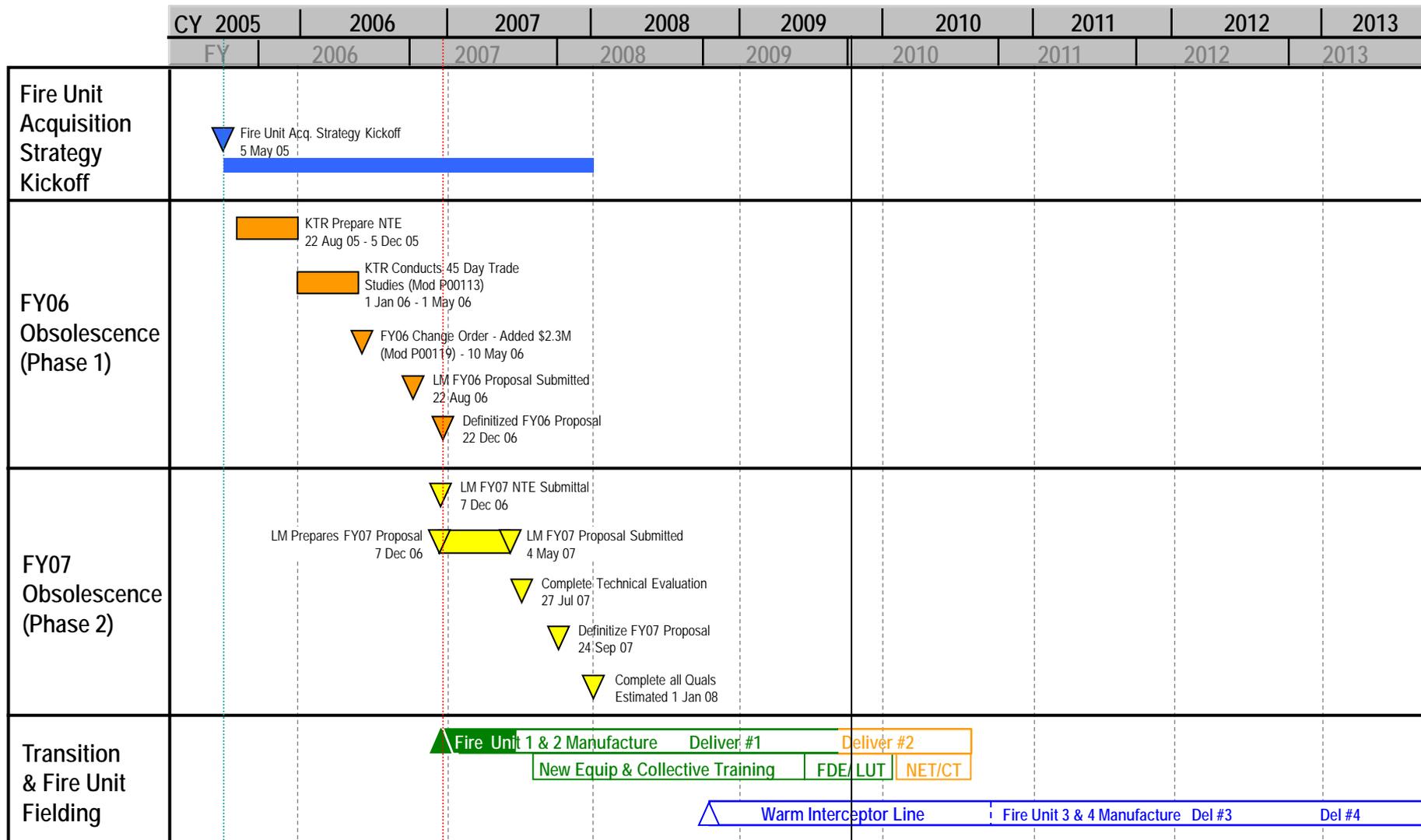
- 55 Bridge Buy
- 22 Replacement Part
- 3 Existing Inventory
- 1 Minor Redesign
- 0 Aftermarket
- 0 Substitution
- 1 Withdrawal

VE Cost Avoidance/Savings – 19.11M





Timeline for Execution of Early FUF 1 / 2 Obsolescence (U)





Fire Unit Fielding 1&2 - Metrics



220 Obsolescence Cases Mitigated

78 Bridge Buy

37 Replacement Part

60 Existing Inventory

3 Minor Redesign

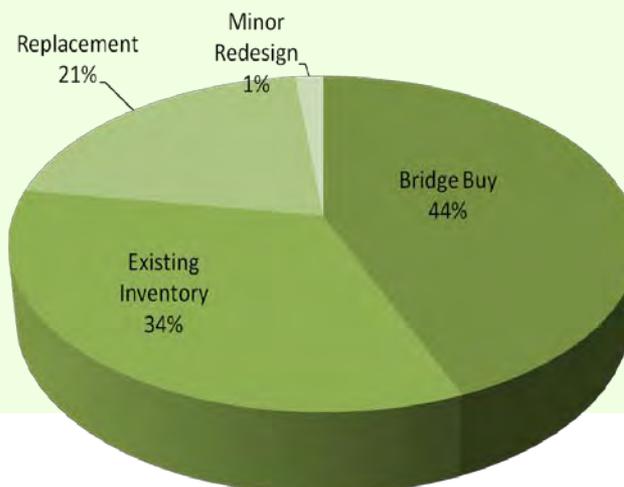
2 Aftermarket

1 Substitution

39 Withdrawal

3 Cases Pending – have solutions

VE Cost Avoidance/Savings - \$21.2M





Future: Batteries 3&4 - Metrics



101 Obsolescence Cases - Currently

14 Cases Closed

11 Withdrawal

3 Existing Stock

67 Cases Pending

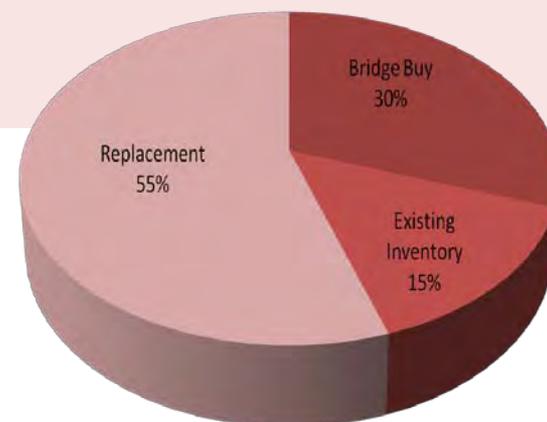
38 Replacement Parts

21 Bridge Buy

7 Existing Stock

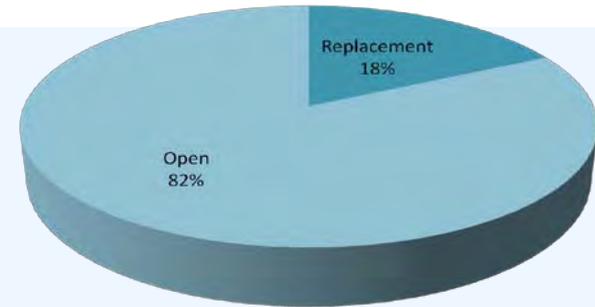
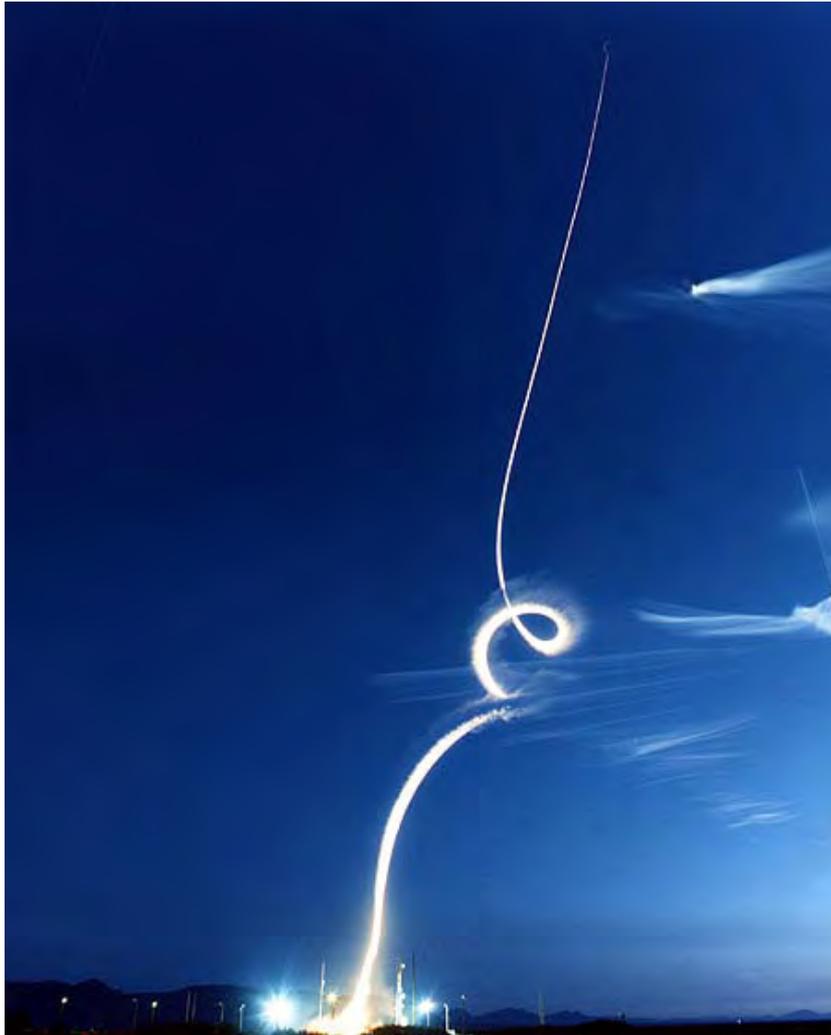
1 No Mitigation Needed
(testing only)

20 Cases Open





Future Batteries 5&6 - Metrics



- Minor Redesign on 1 board.
 - Designing out 3 parts in Phase Out or Discontinued Life Cycle
 - Replacing 2 parts in Decline Phase
 - Replacing up to 12 parts in Mature Phase
- 17 Cases
 - 3 Obsolete items have replacement parts
 - 14 remaining components TBD



Summary of Success

Bottom-line: THAAD Obsolescence Program success has been through early intervention, early discovery of product changes, and teaming to develop and execute desire mitigations plans.

- No schedule delays due to obsolescence
- Funding identified to mitigate obsolescence issues in timely manner
- Redesigns have been blended into planned design updates

“Procrastination is the bad habit of putting off until the day after tomorrow what should have been done the day before yesterday.” – Hill, Napoleon

