



UNCLASSIFIED



00T-1166.01

Theater High Altitude Area Defense (THAAD)

Common Cost Model & Contractor Cost Data Reporting (U)

*Presented to:
Business Managers' Conference
Defense Systems Management College*

*Presented by:
Reba Seals
Director, Program Management
THAAD Project Office*

14 June 2000

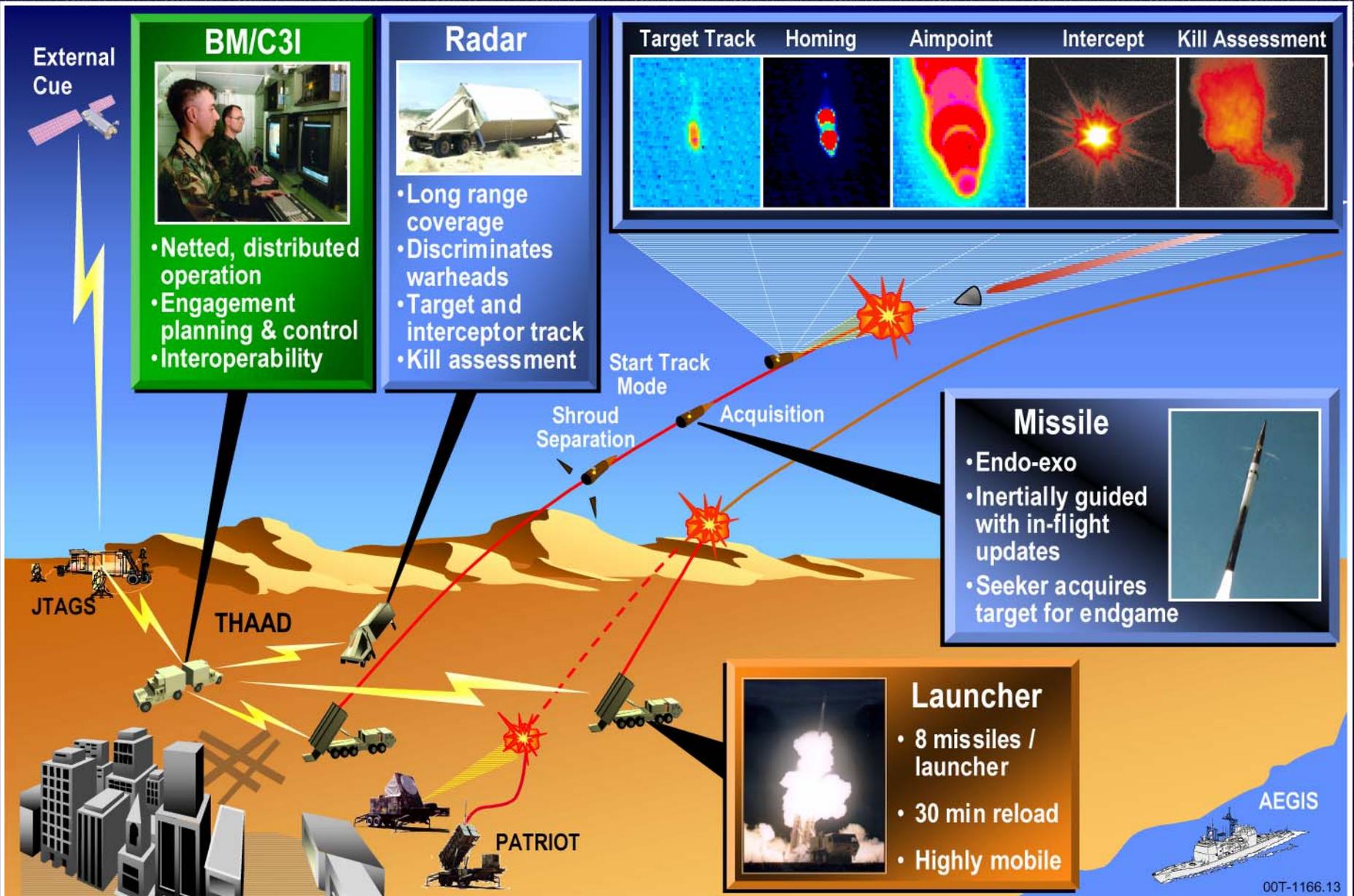


Agenda (U)

00T-1166.02

- **What is THAAD?**
- **Common Cost Model (CCM)**
 - Background
 - Model Development
 - Configuration Control
 - How CCM will be used
 - Lessons Learned
- **Contractor Cost Data Reporting (CCDR)**
 - Definition of CCDRs
 - How costs were accumulated
 - How costs will be accumulated
- **Summary**

UNCLASSIFIED System Description (U)

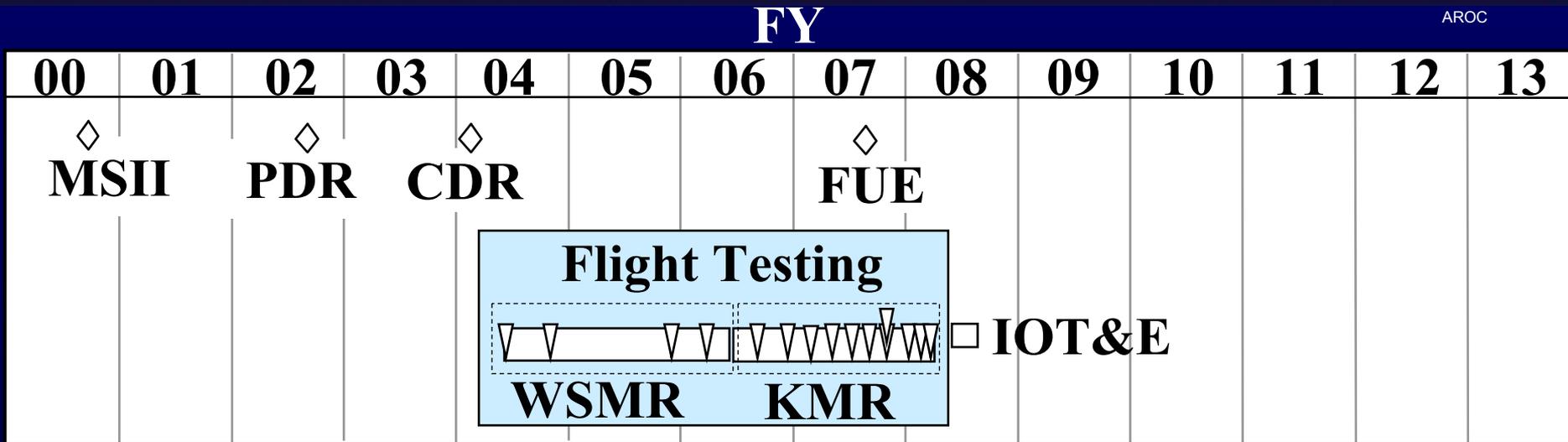


THAAD Facts (U)

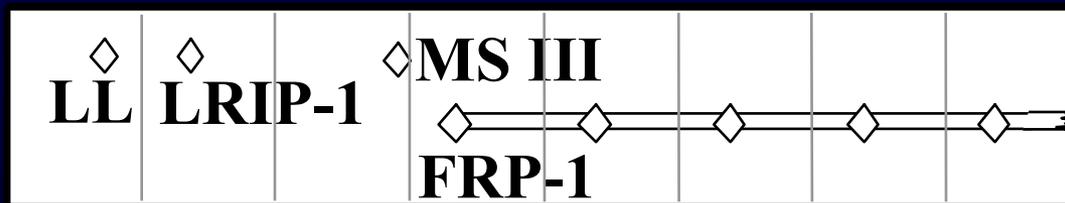
00T-1166.03

- **THAAD is an Army program, managed and funded by the Ballistic Missile Defense Organization (BMDO) - Acquisition Category (ACAT) 1D Program**
- **Engineering & Manufacturing Development (EMD) contract will be sole-sourced to the same contractor who performed Program Definition and Risk Reduction (PDRR) contract - Lockheed Martin Space Systems Company; PDRR phase began in September 1992**
- **Program has been through all traditional reviews, using acquisition Integrated Product Team (IPT) processes**
- **THAAD will complete Milestone II for entry into EMD in late June 2000**
- **Acquisition cost of THAAD is \$16.8B (TY\$)**
- **THAAD EMD contract will be managed entirely by IPTs (contractor led with government participation)**

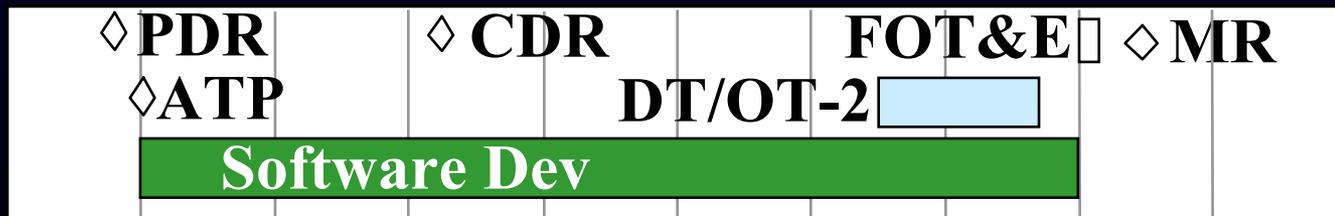
THAAD Program Baseline Schedule (U)



Production

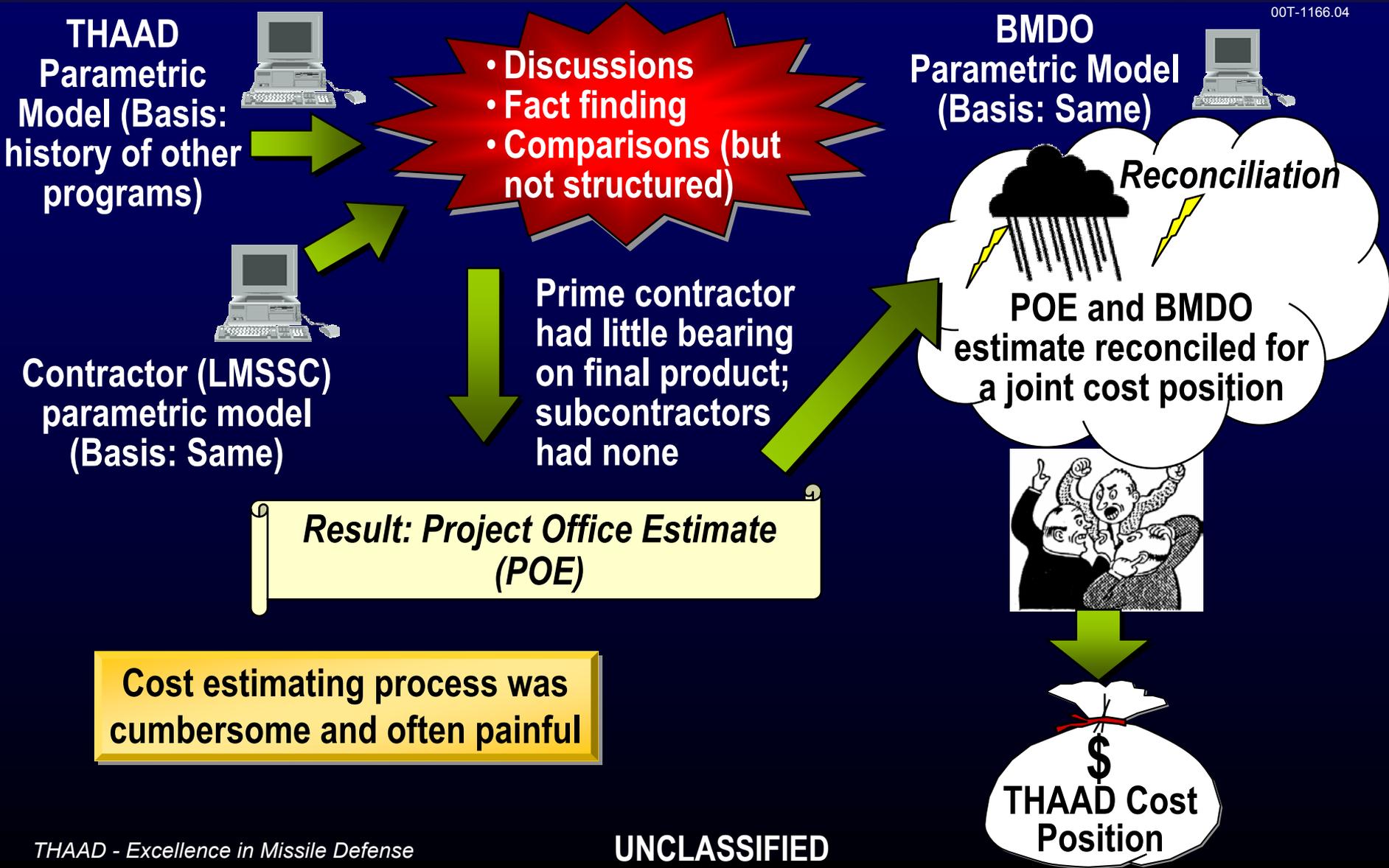


Config 2 (C2)



Cost Estimating Before CCM (U)

00T-1166.04



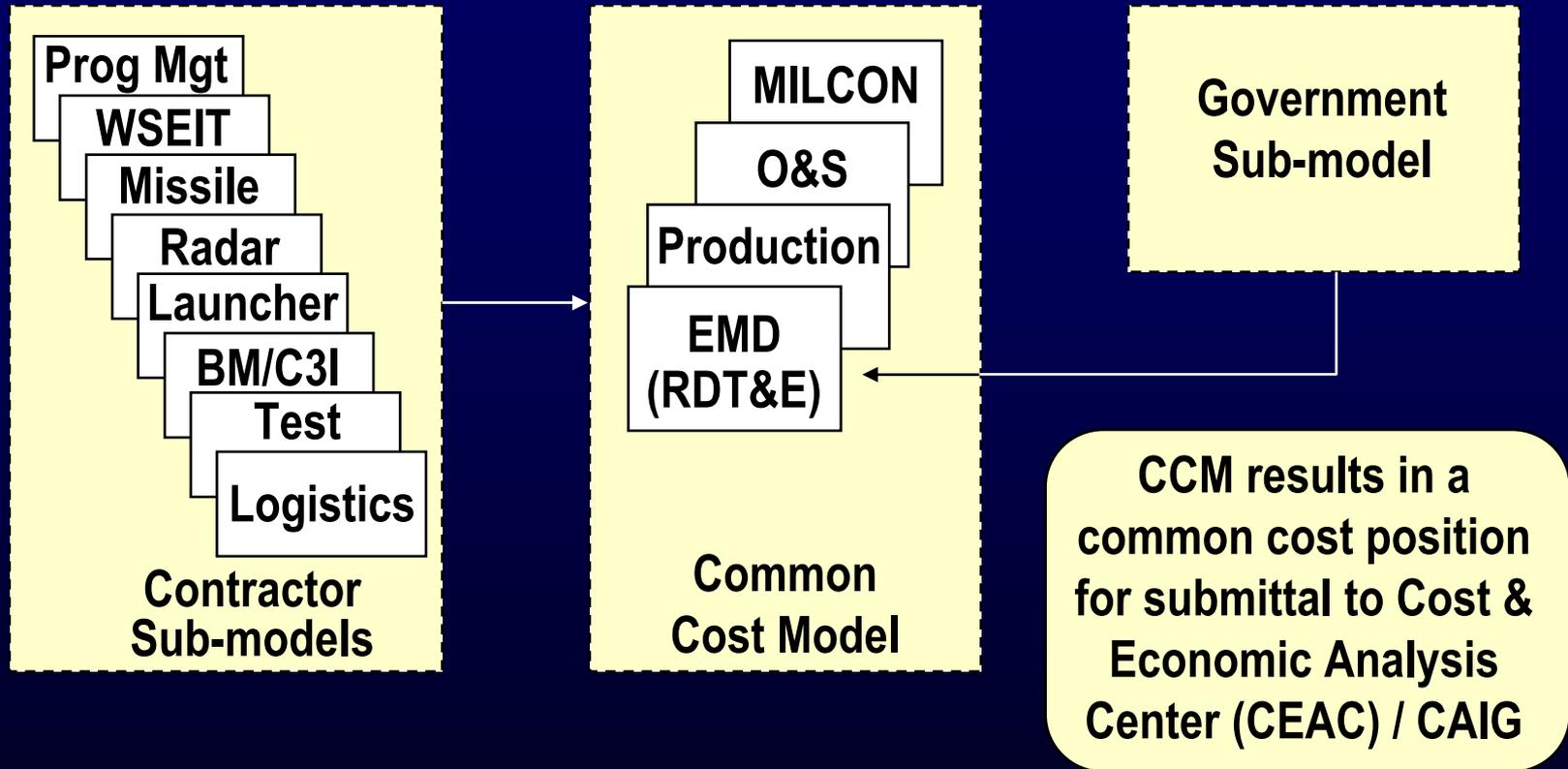
Common Cost Model Approach (U)

00T-1166.16

- **Director, BMDO guidance:** Develop a common BMDO / THAAD Project Office (TPO) / LMSSC cost model for the THAAD program
- **Purpose:** Maximize expertise/knowledge developing the best possible cost estimate
- Attempts to use best portions of TPO and LMSSC models were futile - became antagonistic
- Conscious decision to start with blank piece of paper
- Determined not to drive toward a pre-conceived number, but use best methodology and let results “happen”
- Quickly determined need for key participant involvement:
 - BMDO – LMSSC
 - TPO – Raytheon (40% of program)
- Available time became critical - cost analysts worked 7 days/week, 12-14 hours/day for 9 weeks
- Participants’ management reviewed results frequently once “numbers” became available

Common Cost Model Philosophy (U)

OOT-1017.05



*Participants Jointly Developed Contract
Sub-Models Facilitating Construction of the CCM*

Missile C1 EMD Methodology (U)

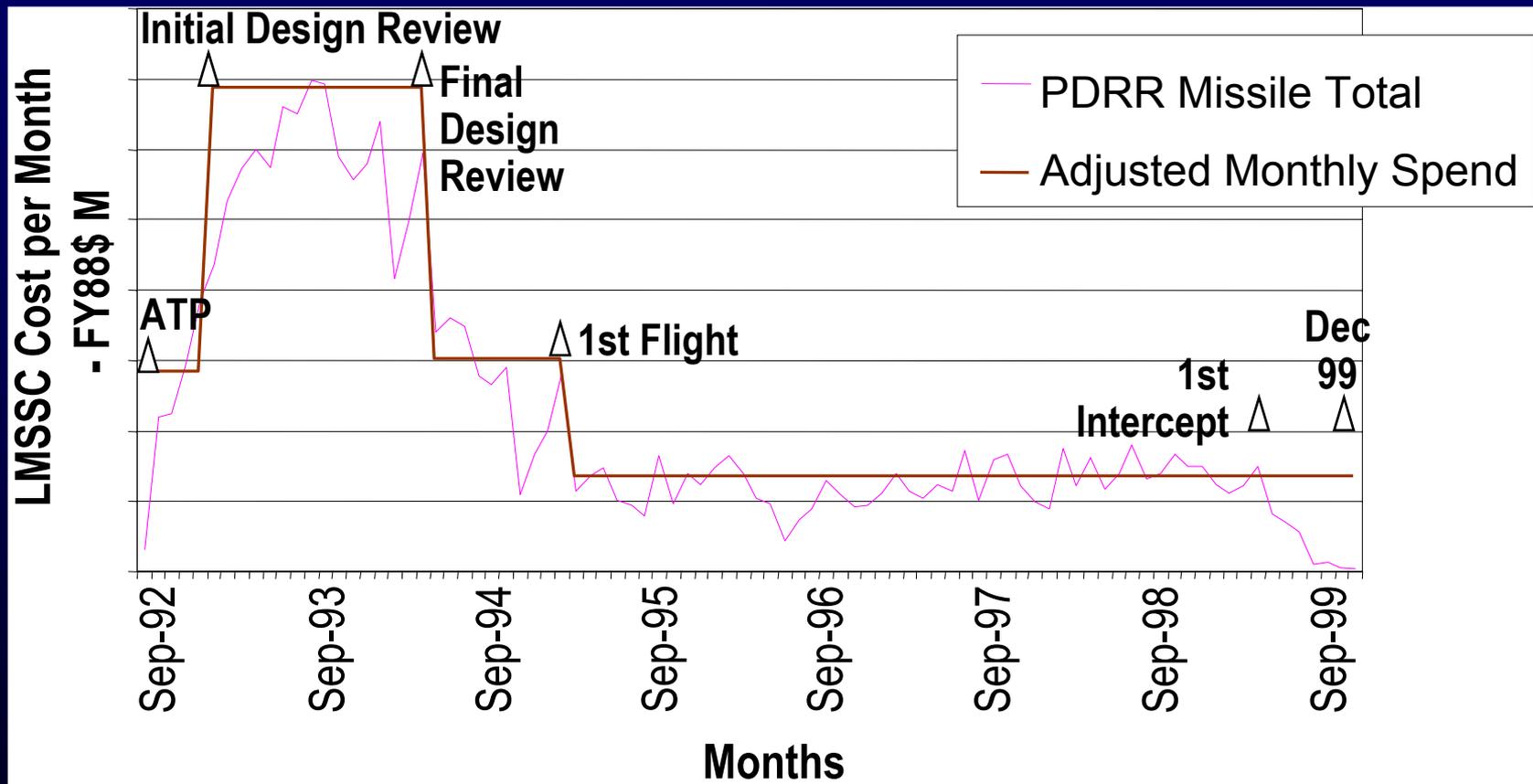
00T-1121.19a

<u>Missile</u>	<u>Methodology</u>
Non-recurring	Projection off PDRR Actuals
Sys Engr	Projection off PDRR Actuals
Software	COCOMO 2 (Software model)
Hardware	
Prod. Engr. & Plan (PEP)	Cost to Cost Factor
Tooling	Analogy to PAC-3
Prototype Mfg	Projection off PDRR Actuals
C2 Preliminary Design Review	Engineering Estimate
Fee	Cost to Cost Factor

Missile	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	Total
Cost % by Year	4.3%	9.3%	17.4%	17.4%	13.7%	13.7%	11.7%	9.2%	3.3%	100%

Missile Total Non-Recurring (U)

00T-1121.54b



Ramp Off % based on PDRR

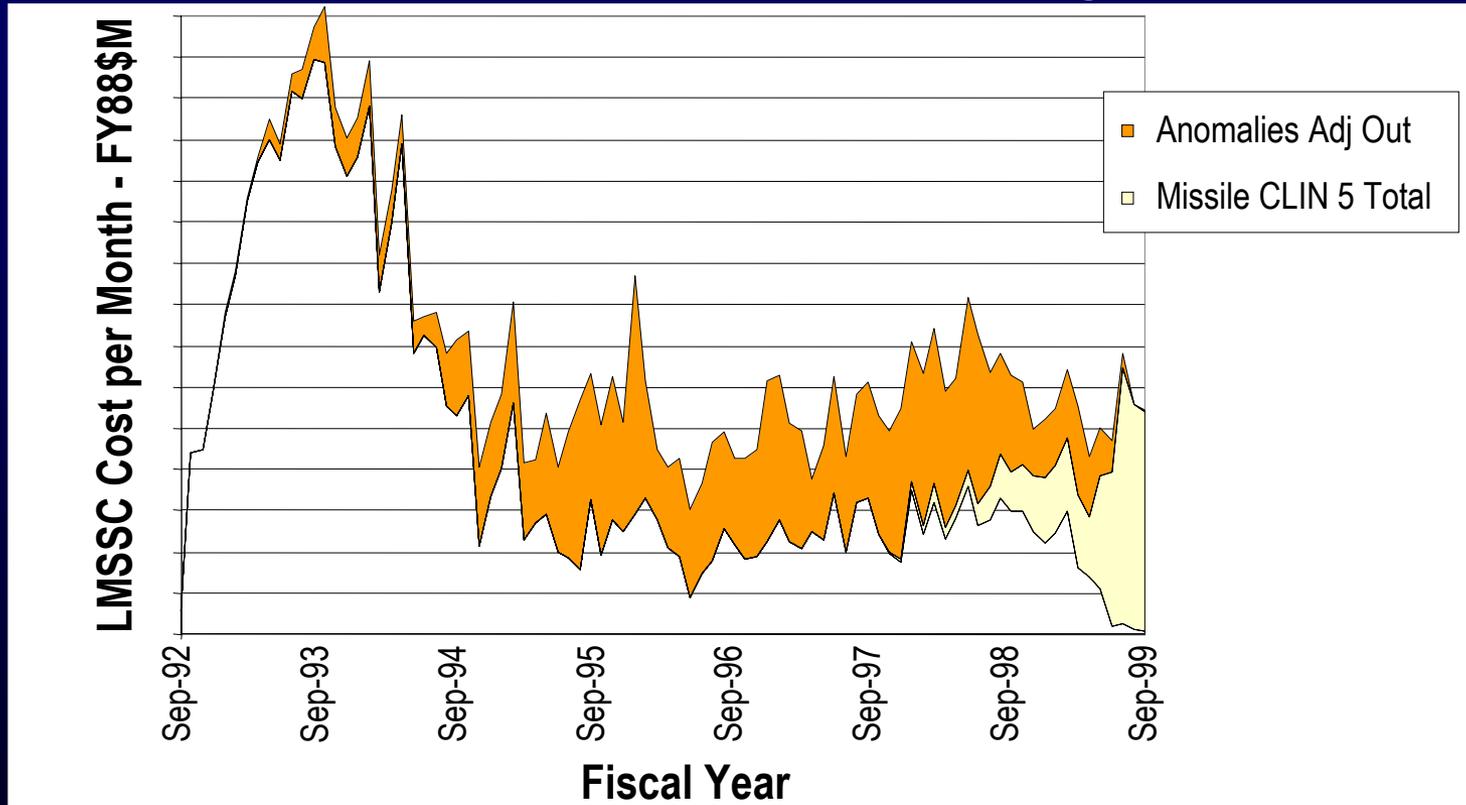
% Applied to Previous Year

FY05	FY06	FY07	FY08
100.00%	79.97%	66.87%	16.69%

Normalized Missile (U)

PDRR Missile Total Non-Recurring

00T-1121.53



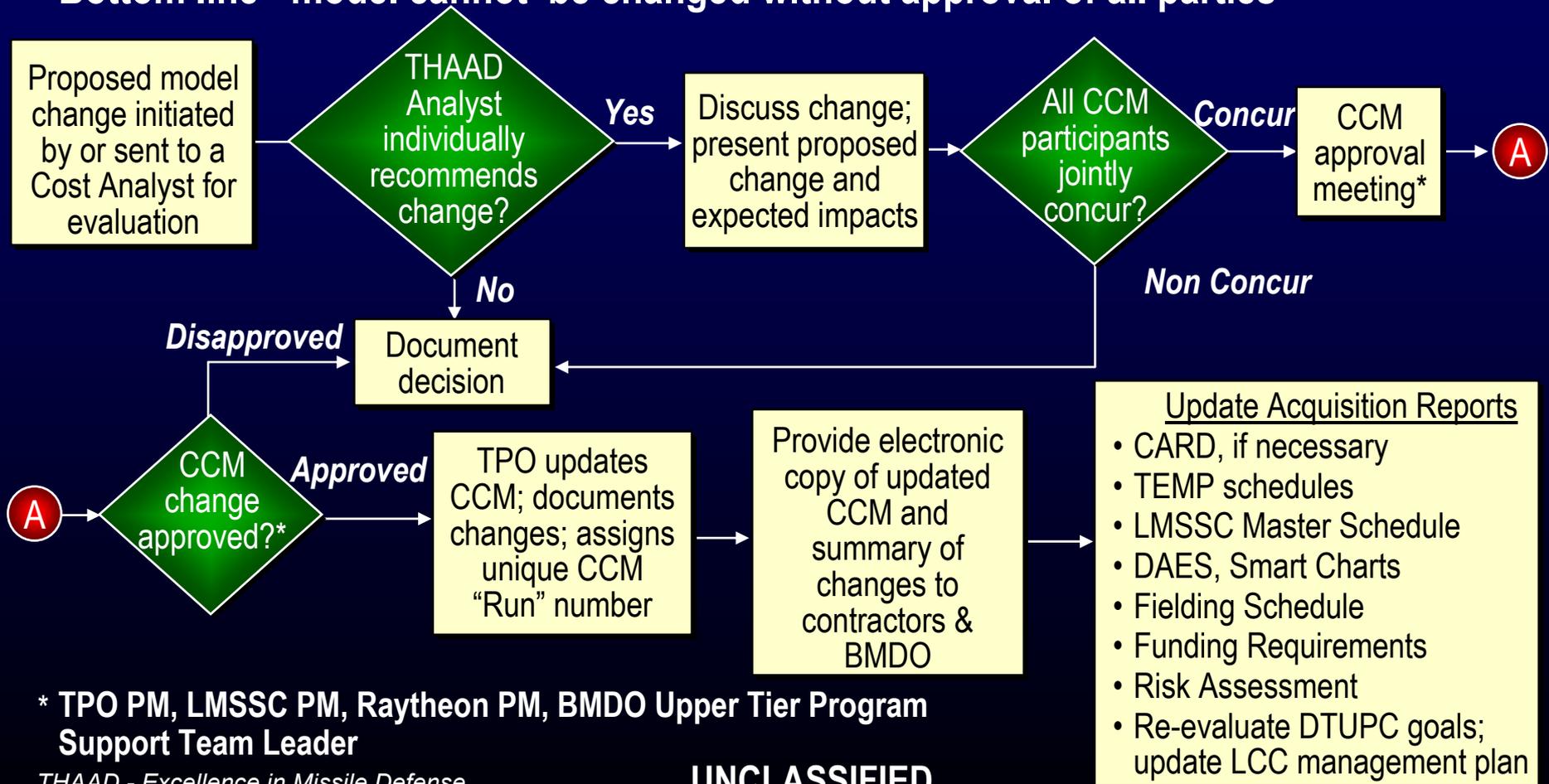
- Added Missile testing from systems area
- Removed In-Flight Survivability
- Removed GEL Divert and Attitude Control System and Alternate Seeker

- Removed Peer Review / Risk Mitigation Task
- Removed Block Upgrade & Liquid Warm Gas Pressurization System Non-Recurring

Configuration Control Of CCM (U)

00T-1166.06a

- TPO published Operating Instruction (OI) on how configuration control is maintained
- OI concurrence by all participants - BMDO / TPO / Contractors
- Bottom line - model cannot be changed without approval of all parties



* TPO PM, LMSSC PM, Raytheon PM, BMDO Upper Tier Program Support Team Leader

How CCM Will Be Used (U)

00T-1166.07

- **All parties have soft copy of baselined CCM**
- **All parties can use the copy of the baseline to run informal excursions**
- **Formal “what-if” exercises will be accomplished using copy of baseline and incorporating all parties’ judgment**
- **CCM will form basis for estimating cost savings from Cost Reduction Initiatives and CAIV trades**
- **CCM will alleviate requirement for future reconciliations with BMDO**
- **CCM provides CAIG with estimate of greater confidence**

UNCLASSIFIED

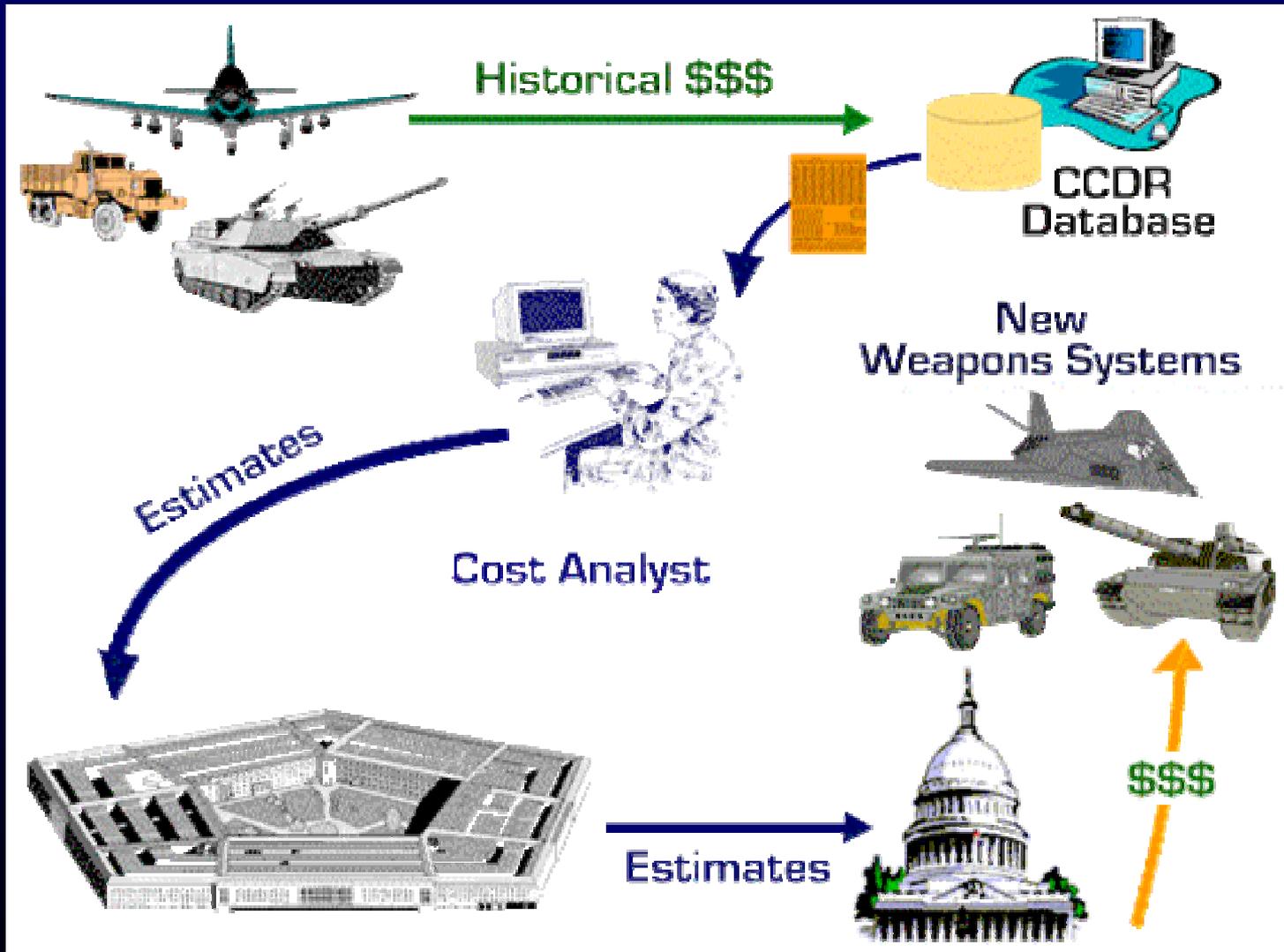
Common Cost Model Lessons Learned (U)

00T-1121.02

- **Start as early as possible! Takes much effort - rough estimate is 5400 hours direct cost analysis support (not including TPO and contractor segment support and management oversight)**
- **Toss out prior government and contractor estimates - start from “scratch” so as not to bias results**
- **Do not start with any preconceived end number to drive toward – use best logic along the way – arrive at best number**
- **Get buy-in early from technical managers – have senior management set the focus and priority**
- **Develop accurate and complete Cost Analysis Requirements Description (CARD) first – don’t let the estimate drive the CARD**
- **Have frequent “check sessions” with technical managers to ensure effort is properly captured**

Contractor Cost Data Reporting Process (U)

00T-1166.15



Contractor Cost Data Reports (CCDRs) (U)

(Formal Contract Data Requirements List (CDRL) Requirement)

00T-1166.08

- **1921 - Cost Data Summary Report**
 - Depicts actual incurred costs and estimated incurred costs at completion
 - Segregates recurring and nonrecurring costs
 - Depicts number of units being produced by Work Breakdown Structure (WBS)
- **1921-1 - Functional Cost-Hour Report**
 - Depicts actual incurred costs & estimated incurred costs at completion per WBS element
 - Breaks down costs by functional category (i.e. Engineering, Quality Control (QC), etc.)
 - Segregates functional area by direct labor hours and cost category (Direct Labor, Material, Overhead)
- **1921-2 - Progress Curve Report**
 - Depicts actual incurred costs and estimated incurred costs at completion (by WBS) by unit or lot of recurring costs only
 - Segregates costs further by Contractor, Subcontractor, and Total
 - Breaks down costs by functional category (QC and Engineering) and by major cost category (Direct Labor, Raw Material and Purchased Parts, and Purchased Equipment)
 - CAIG no longer requires - TPO still needs

CCDR References (U)

00T-1166.14

- Guidance:
- DOD 5000.4.M-1, Contractor Cost Data Reporting (CCDR) Manual, April 1999
 - Cost Data Reporting Plan, May 1999 (DD Form 2794)

Data Item	DD Form 1921	DI-FNCL-81565
<u>Descriptions:</u> (updated 22 Oct 99)	DD Form 1921-1	DI-FNCL-81566
	DD Form 1921-2	DI-FNCL-81567

Other reference: Acquisition Deskbook
<http://web2.deskbook.osd.mil/default.asp>

Manual and DIDs are Available at: <http://ccdr.pae.osd.mil>

Cost Accumulation (U)

00T-1166.17

	How costs were accumulated:	How costs will be accumulated:
Method	<ul style="list-style-type: none"> • Annual reporting • Progress curve-only select data 	<ul style="list-style-type: none"> • Milestone driven • Tied to hardware lots • Reporting concentrated during production
Advantage	<ul style="list-style-type: none"> • Continuity of reporting 	<ul style="list-style-type: none"> • More detailed costs, tied to specific lots • Better actual data • Improved production estimates
Disadvantage	<ul style="list-style-type: none"> • No tie to specific quantity/lots 	<ul style="list-style-type: none"> • Finding a clean separation between hardware buys in R&D

**CAIG very complimentary of amount of data accumulated during PDRR;
Stated that several programs have little, if any, actuals on previous phases**

Summary (U)

00T-1166.11

- **New THAAD Common Cost Model promises to “make life easier” relative to cost estimating**
 - Gives automatic sanity check and buy-in from four different vantage points and areas of expertise
 - Makes what-if drills easier to execute
 - Provides sound basis for estimating cost savings from Cost Reduction Initiatives and CAIV trades
- **Common Cost Model has resulted in a much better understood and integrated program - from both government and contractor perspectives**
- **New contractor cost data reporting initiatives promise to provide better data for estimating production cost - to support LRIP-1 Milestone**

UNCLASSIFIED

THAAD Flight Test Video (U)

A dark, grainy video frame with a bright, circular light source in the center. The text "THAAD Ft 10 Intercept" is overlaid in a bold, yellow, sans-serif font. The background appears to be a night sky or a dark environment with some faint, scattered light points.

**THAAD
Ft 10 Intercept**

UNCLASSIFIED

Backup Charts

General Methodology (U)

00T-1121.52

Phase	Description of Process
EMD Configuration 1 (C1) Configuration 2 (C2)	<ul style="list-style-type: none">• Primarily PDRR actuals, with historical AMCOM data• Manloading
Production	<ul style="list-style-type: none">• Hardware based on PDRR actuals• Cost Estimating Relationships (CERs)• Historical AMCOM and Patriot data• PAC-3 Reduction Assessment Team Input
O&S	<ul style="list-style-type: none">• Manloading• CERs
MILCON	<ul style="list-style-type: none">• THAAD Logistics Directorate Planning Documentation