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Estimating the Cost of the Aegis Flight III Test Platform

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Agenda

- Intro
- Scope
- Work Breakdown Structure
- Data Collection
- Ground Rules and Assumptions
- Model Development
- CERs
- Results

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Intro

- The latest version of the Aegis Combat System is currently under development and will include the Navy's newest radar – the Air and Missile Defense Radar (AMDR).

- The Director, Operational Test and Evaluation (DOT&E) under the Office of the Secretary of Defense (OSD) requested an analysis of four alternative methods to perform live fire testing of the system at sea.
  - Navy disagrees with OSD DOT&E position that a Flight III test ship is required; cost estimates were provided by direction.

- This analysis directly contributes to the development of the final test plan for the Aegis Combat System.

- This analysis resulted in various cost estimating relationships (CERs) which can be used for future cost studies.

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Scope

- Required Equipment

AMDR	Aegis Weapon System (AWS)
SPQ-9B	Vertical Launch System (VLS)
Navigation Systems	Close In Weapon System
Fire Control System (FCS)	Moriah Wind System
Cooperative Engagement Processors (CEP)	Remote Control Systems

- Range upgrades required to support test events
- Four alternative platforms
  - EDD 964 Ex-Paul F. Foster
  - CG-47 Ticonderoga Class Cruiser
  - Roll-On, Roll-Off (RO-RO) commercial vessel
  - Commercial barge
- The estimate needed to account for all activities associated with procurement, installation, and activation of the identified systems as well as rental costs for commercial vessels.
- Additionally the estimate accounted for potential cost recovery resulting from equipment removal and reuse.
- Operational Test (OT) events were out of scope.

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Work Breakdown Structure

- Ship Design – Space, Power, Weight requirements
- Vessel Procurement – Rental cost of commercial vessels
- Equipment Procurement – Total procurement unit cost of each required system
- Equipment Installation – Shipboard installation and checkout of each required system
- Activation / Pre-operational Testing – Activation of the ship, sea trials, and developmental testing (DT)
- Range Facility Upgrades – Procurement and installation of equipment needed for required upgrades to the test ranges
- Sustainment
- Equipment Removal and Refurbishment

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Data Collected

- Procurement Contracts
- Obligation / Expenditure Reports
- Technical space and weight data
- Subject matter expert (SME) opinion for engineering and design hours
- Forward rate pricing agreements (FRPAs)
- Warfare Center Stabilized Rates Memo
- Previously computed cost estimating relationships (CERs)
  - Procurement Support Costs (PM, SE, ILS, CM, others)
  - Installation cost to weight
  - Installation cost to spaces touched

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Major Assumptions

- Scalable Cost - Equipment procurement costs are scalable based on the number of cabinets, processors, servers, and/or arrays; installation costs can be scaled by equipment weight and/or percent of spaces touched
- Consistent Contract Pricing – Cost of procurements made outside of the current contract period of performance (PoP) would be consistent with current CLIN pricing
- Static Staffing Levels - Naval Surface Warfare Center (NSWC) staffing levels for combat system procurements are relatively static from year to year
- Equipment Removal and Refurbishment – Nearly all combat system equipment can be removed, refurbished, and reutilized for a future effort

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Results

WBS Element	Modify EDD 964	Modify CG 47	Commercial Hull	Commercial Barge
Ship Design	$2.82	$2.82	$1.54	$1.54
Vessel Procurement			$11.28	$4.36
Equipment Procurement (Incl. RCS)	$59.23	$42.05	$64.36	$64.36
Installation	$16.92	$17.95	$10.00	$11.03
Activation / Pre-Ops Testing	$8.72	$8.72	$8.72	$8.72
Range Facility Upgrades (Incl. ESSM & PATAS)	$9.23	$9.23	$9.23	$9.23
Sustainment	$3.08	$8.21	$3.08	$3.59
TOTAL	$100.00	$88.97	$108.21	$102.82
Equip Removal & Refurbishment	$9.74	$6.92	$11.54	$12.56
(less Potential Future Cost Avoidance)	($38.21)	($34.10)	($39.23)	($39.23)
POTENTIAL TOTAL W/ COST AVOIDANCE	$71.54	$61.79	$80.51	$76.15

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Ex-Post Observed Crosschecks

Ship Design Changes As Percent of Installation	15.4%
Installation As Percent of Procurement	26.0%
Removal/Refurbishment As Percent of Procurement	17.6%
Activation/Developmental Test As Percent of Procurement	15.6%