

Conference Paper

Method of
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anpower Costs

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Denver, CO
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ICEAA International Cost Estimating and Analysis Association

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- ▶ Problem Statement
- ▶ Establish a Baseline Estimate
- ▶ Conduct the Manpower Survey
- ▶ Normalize Survey Inputs
- ▶ Benefits and Challenges
- ▶ Summary

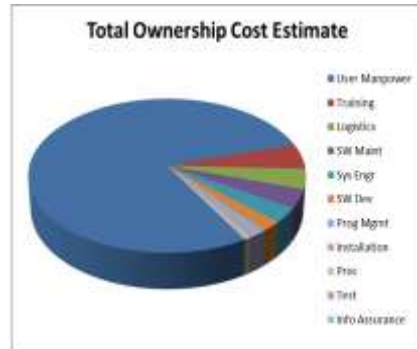
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Problem Statement

- ▶ For a Major ACAT 1A program, military manpower costs was the leading cost driver affecting the program's Total Ownership Cost (TOC)
- System documentation lacked periodicity and frequency of User's system usage --> each User was estimated at 100% utilization
 - User base > 1,000 FTEs* in a given year
 - System Usage cost > \$1B* over its projected lifecycle
- ▶ The program tried to ascertain how much of the system usage was actually being spent by its user base in order to re-baseline the programs #1 cost driver—Military Manpower Costs.



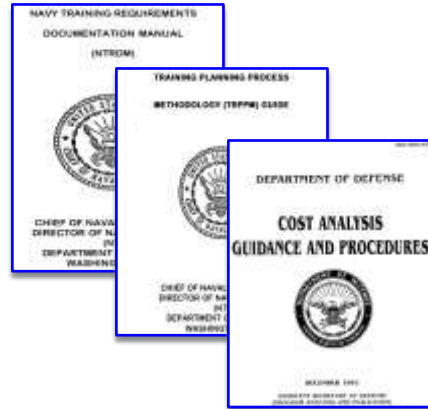
Disclaimer: *FTE figures and cost estimate are not actuals from any actual program. They are used to for ILLUSTRATION PURPOSES ONLY

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Establish a Baseline Estimate

- ▶ Leverage existing data if available that describes the system's manpower requirements such as:
 - Cost Analysis Requirements Description document (CARD)
 - Navy Training Systems Plan (NTSP)
 - Training Planning Process Methodology (TRPPM)
- ▶ These documents were used to establish the program's baseline User base estimate



Establish a Baseline Estimate (cont'd)

- ▶ Documents such as the NTSP/CARD/TRPPM lay the framework for the total expected Billets required to Maintain, Administer, Watch, and Operate a program's system
- ▶ A program's installation profile is used to determine when system utilization occurs
- ▶ Military Composite Rates determine the cost of required billets

| AFLOWN / ASHOW | Class | Ship Type | DISGRTI | SEC | FUNCTION | GRADE | PAY GRADE | FTE Total |
|------------------|--------|-----------|---------|------|---------------|-------|-----------|-----------|
| Afloat Force | CVN | CVN | 22R1113 | 0 | Watch Officer | 02B | O-5 | 1 |
| Afloat Force | CVN | CVN | 07TL | 91B2 | Operator | | E-5 | 2 |
| Afloat Force | CVN | CVN | IT5 | 27XA | Sys Admin | | E-4 | 1 |
| Afloat Group | DDG | | | | | | | |
| Afloat Group | LPD-IT | | | | | | | |
| Afloat Unit | FFG | | | | | | | |
| Afloat Unit | LCS | | | | | | | |
| Afloat Unit | LCS | | | | | | | |
| Afloat Unit | MCV | | | | | | | |
| Afloat Unit | PC | | | | | | | |
| Afloat Unit | PC | | | | | | | |
| Afloat Submarine | SSN | | | | | | | |
| Afloat Submarine | SSGN | | | | | | | |
| Afloat Training | ITP | | | | | | | |
| Afloat Training | ITE | | | | | | | |

| Ship Type | Y2004 | Y2005 | Y2006 | Y2007 | Y2008 | Y2009 | Y2010 |
|--------------------|-----------|-----------|------------|------------|------------|------------|------------|
| Force | 6 | 7 | 8 | 9 | 10 | 10 | 11 |
| Group | 1 | 15 | 30 | 44 | 73 | 76 | 77 |
| Unit | 1 | 15 | 30 | 44 | 73 | 76 | 77 |
| Submarine | 1 | 15 | 30 | 44 | 73 | 76 | 77 |
| Training | 1 | 15 | 30 | 44 | 73 | 76 | 77 |
| Grand Total | 10 | 47 | 103 | 167 | 296 | 305 | 316 |

$$\text{Function} \times \text{Ship Inventory Objc}$$

Leveraging these data sources establishes the baseline manpower estimate

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Conduct the Manpower Survey

- ▶ This formula is what drives many User based cost estimates:

$$\text{Function} \times \text{Ship Inventory Objective}$$

- ▶ The missing variable in the equation above is “system utilization”
 - System Utilization Definition - Depicts the frequency in which a User uses, configures, manipulates, analyzes, administers, and/or maintains the system while on “**underway**” AND is **specific** to the system being estimated, where:

$$\text{System Utilization} \times \text{Ship Inventory Objective} \times \text{Billet}$$

- ▶ A manpower survey was conducted to determine the amount of System Utilization for a given User
 - Specify User’s Function (i.e., Watch Officer, Sys Admin, Maintainer, etc.)
 - Indicate Ship Class the User Supported (i.e., CVN, FFG, Training site)
 - Determine % of time using, configuring, manipulating, analyzing, administering, and or maintaining the **specific system** while **underway** (i.e., not in-port)

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Normalize Survey Inputs

- ▶ Consolidate inputs from the manpower survey by ship class and function to determine average system utilization

– Be sure to factor:

- System usage while “underway”
- User’s system operation over a 24 hour period*

| Responses | Ship Class | User | % of System Utilization While Underway |
|-----------|------------|---------------|--|
| 1 | DIG | Watch Officer | 20% |
| 1 | DIG | Sys Admin | 10% |
| 1 | DIG | Operator | 60% |
| 1 | DIG | Maintainer | 10% |
| 1 | DIG | Watch Officer | 60% |



| | Number of Responses | Average % of System Utilization While Underway | Shift Length as a Percent of 24 hours | Final System Utilization |
|---------------|---------------------|--|---------------------------------------|--------------------------|
| CUN | 77 | | | |
| Watch Officer | 18 | 31% | 23% | 8% |
| Sys Admin | 22 | 32% | 23% | 6% |
| Operator | 19 | 66% | 23% | 32% |
| Maintainer | 22 | 14% | 23% | 2% |
| DIG | 96 | | | |
| Watch Officer | 12 | 39% | 23% | 6% |
| Sys Admin | 18 | 31% | 23% | 5% |
| Operator | 42 | 43% | 23% | 8% |
| Maintainer | 12 | 10% | 23% | 2% |
| LFD-EE | 25 | | | |
| Watch Officer | 9 | 48% | 33% | 6% |
| Sys Admin | 25 | 68% | 23% | 32% |
| Operator | 7 | 32% | 23% | 6% |
| Maintainer | 5 | 30% | 23% | 2% |
| EEG | 64 | | | |
| Watch Officer | 12 | 45% | 23% | 6% |
| Sys Admin | 14 | 43% | 23% | 6% |
| Operator | 25 | 71% | 23% | 32% |
| Maintainer | 7 | 21% | 23% | 4% |

* User's shift length was assumed to 6 working hours out of a 24 hour period

$$) \times \text{Ship Inventory Objective} \times \text{Bille}$$

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Benefits and Challenges

Benefits

Survey can be developed in a short amount of time

Economic Analysis and program ROI decisions

Establish ACAT designation based on a sound methodology

Challenges

Fleet Coordination can be time consuming and may involve multiple individuals

Obtaining an adequate number of responses can be difficult

Follow-up to clarify erroneous responses is practically impossible



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Summary

- ▶ Very successful collaboration between the program office and the fleet
 - Survey was simplistic and easy to understand
 - Received over 300 responses from the system’s User community
- ▶ Survey is now being utilized to re-baseline the program’s cost estimate and is also being leveraged to baseline other analogous programs TOC estimate

| | Estimate Prior to Manpower Survey | Estimate Using Results of Manpower Survey |
|--|-----------------------------------|---|
| User Base: | > 1,000 FTEs | ~90 FTEs |
| User Specific Cost Estimate: | \$1B | \$90M |
| Potential Impact on ACAT Designation: | ACAT 1 threshold | ACAT III threshold |


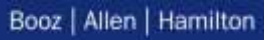
For further information . . .

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Back-up Slides

| ACAT Thresholds | |
|---|---|
| ACAT IA* | > \$32M in FY2000 constant dollars for all expenditures, for all releases, regardless of appropriation or funding source, directly related to the AIS definition, design, development, and deployment incurred <u>in any single fiscal year</u> |
| | > \$126M in FY2000 constant dollars for all expenditures, for all releases, regardless of appropriation or funding source, directly related to the AIS definition, design, development, and deployment incurred from the beginning of the Materiel Solution Analysis Phase <u>through deployment</u> at all sites |
| | > \$378M in FY2000 constant dollars for all expenditures, for all releases, regardless of appropriation or funding source, directly related to the AIS definition, design, development, deployment, operations, maintenance, and incurred from the beginning of the Materiel Solution Analysis Phase <u>through sustainment</u> for the estimated useful life of the system. |
| ACAT III** | \$15M ≤ Program costs/year ≤ \$32M in FY2000 constant dollars |
| | \$30M ≤ Total Program costs/year ≤ \$126M in FY2000 constant dollars |
| | Total life-cycle costs ≤ \$378M in FY2000 constant dollars |
|  <div style="display: inline-block; background-color: black; color: white; padding: 2px; font-size: small;"> *Source : DoDI 5000.02E, CH 144A Reference K **Source : SECNAV INST 5000 </div>  | |
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