NAVSEAN Cost Engineering and Industrial Analysis
Cost Tools Update
for
DoN Cost Analysis Symposium

SEA05C Information Management System
NAVSEAN Common Cost Model
Risk Allocation Process

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Distribution Statement A: Approved for Public Release,
Distribution is unlimited.
Topics

• SEA05C Information Management System (IMS)
• NAVSEA Common Cost Model (NCCM)
• Mapped Values Risk Allocation Process
SEA05C Information Management System Overview

• The development of the IMS database structure started in FY06. The ship module was completed in July 2007.
• The Combat System Module leverages off of the development of the IMS Ship Module and its lessons learned.
• All components of Combat System Module (Cost and Contracts, Budget, Programmatic, Technical, FPRA) are in final testing.
• Web based application
• Server hosted by Naval Center for Cost Analysis
• Report formats (Microsoft Excel, xml, PDF)

Establish an information system to support timely, accurate and complete NAVSEA cost engineering products for our ship and combat system programs
What’s Next with IMS?

• Grant access to Navy Cost Community users
• Complete testing of combat system modules
  – ECD: mid-Nov 2009
• Locate and fill in gaps in data
• Correct minor problems
• Identify enhancements
NAVSEA Common Cost Model (NCCM)

Objective

- Consolidate and standardize NAVSEA cost estimating tools and models
  - A different model for every program
- Provides for effective configuration control, documentation and formal verification/validation of models
- Increase consistency and provide for standardized inputs/outputs
- Incorporate estimating “best practices” both current and future
- Allows for a more flexible workforce

Analysts can focus on subject matter expertise and analysis instead of varied modeling practices...don’t need to learn a new model for each program

Attributes

- Standard process oriented framework using a step by step flow
- Leverages use of libraries and data sets such as:
  - Shipyard workload/rate assumptions
  - Material inflation tables
  - Cost Estimating Relationship (CER) libraries
  - Tech Data, CER and other Data Sets
- Support cost risk analysis process
- Uses menu to “assign” input sets to hulls prior to calculation
- Calculation options based on user needs
- Provides standard output reports that can be integrated into more detailed documentation of the estimate
Integrated Rates – Workload Capability

- NCCM uses both workload and rate set assumptions in development of rates for specific estimates
  - Ships in estimate are “linked” to ships in rates – workload data set
- User ability to run “what if” scenarios varying workload assumptions for ships within their “class”
  - Include all ships in the estimate
  - Exclude specified ships from the estimate, but retain their impact in the workload assumptions
  - “Delete” ships from the rate – workload assumptions
  - “Add” new ships in the estimate that are NOT in the assumptions
- Ability to select different baseline scenario workload – rates data sets for use in estimates
  - Supports development of estimates for major variations across the SCN/NDSF portfolio
  - Used to consider “cross class” impacts

All example scenarios use fictitious data.
“Instant” Rate Updates Within The Estimate

- Shipyard workload updated to account for modifications resulting from the estimate
- Ability to review and modify the composite rates computed for this estimate

All example scenarios use fictitious data
Risk Adjusted Point Estimate

- Select confidence level and determine risk adjusted point estimate
- Identifies risk “cost”
- Allocates risk “cost” against elements with risk distributions

All example scenarios use fictitious data
Risk Allocated Estimates

Purpose

- One of SEA 05C’s (Naval Sea Systems Command - Cost Engineering and Industrial Analysis) strategic initiatives from 20 Feb 2007 was to create a methodology for allocating risk dollars to the P5 budget exhibit level

- Need ability to take a deep dive on risk allocated estimates – determine inputs at the same level in which the estimate was built

- Need ability to take money away from point estimate if necessary

- Need risk allocation process to take correlation into consideration when allocating

- Evaluated current methodologies and determined creating our own risk allocation process was the best way to accomplish all goals

- Collaborative effort between NAVSEA05C, NSWCCD, NAVAIR, and Industry
Interpreting “S” Curves

- **Decision Maker** decides to fund to a different total cost
  - What comprises this Total Cost?
- **How can we as estimators provide some breakdown / insight to input level elements (especially if input level elements are not dollar inputs)?**
Problem

• Analysts know the total cost associated with a desired confidence, but cannot determine the input level elements that created the specified total cost
  – What is a representative overhead percentage for the chosen confidence (80%)?

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<th>Point Estimate</th>
<th>Element 1 = $545</th>
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<td>Element N = $278</td>
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<td>Confidence</td>
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<table>
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<td>Element 1 = ?</td>
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<td>Element 2 = ?</td>
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<tr>
<td>...</td>
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<tr>
<td>Element N = ?</td>
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<table>
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<tr>
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<td>Confidence = 80%</td>
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Mapped Values Risk Allocation Process

- Allocates based on input level element’s “Mapped Value”
- Mapped Value: amount of standard deviations total cost is moved when input level element is moved one standard deviation
  - Example: If Overhead Percentage has a mapped value of 27%, that indicates one standard deviation shift in the Overhead Percentage input will move the total cost 27% of a standard deviation
- Crystal Ball uses Rank Correlation instead of Mapped Values (@RISK) but both are measuring the same effects
  - Mapped value = rank correlation * standard deviation of the output variable