

# Parametric Cost Estimating Initiative

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**PRICE Symposium**  
**4-5 September 1996**

***Initiative Overview***

# Overall Objectives of Initiative

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- Test the expanded use of parametrics as primary basis of estimate on proposals submitted to the government
  - » Advocates state that expanded use will result in better estimates and reduced proposal preparation costs and cycle time
- Achieve recognition of parametrics as another acceptable estimating technique
  - » Adding another tool to the estimator's tool box

# Overall Objectives of Initiative (Continued)

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- Provide baseline of actual parametric estimating experiences in support of customer pricing actions
  - » Documented case-based examples will be developed to evaluate initiative results and support any specific needed policy clarification
  - » Supports development of Defense Acquisition University (DAU) training program

# Chronology of Key Events

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- Joint Industry / Government Parametrics Workshop (April 1994)
  - » Workshop attendees
    - Approximately 50 people participate from industry, buying activities (from all 3 services and NASA), DCMC and DCAA
  - » Barrier analysis
  - » Action plan established

# Workshop Barrier Analysis

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- Barriers identified (Real or Perceived by Attendees)
  - » Lack of DoD / NASA policy statement supporting parametrics
  - » High implementation costs
  - » Regulatory concerns
  - » Cultural issues
    - lack of understanding (management and potential practitioners)
    - customer acceptance
    - resistance to change (Government and Industry)
  - » Training void
  - » Limited case studies on successful use of complex parametrics

# Workshop Barrier Analysis (Continued)

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- Conclusion of Attendees
  - » No real barriers exist which would preclude expansion of parametric cost estimating techniques - however, there are concerns which need to be clarified or addressed prior to expansion (e.g., Government / Industry teaming)

# Workshop Action Plan

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- Steering Committee (Working Group) Formed
  - » Provide guidance and encouragement to acquisition workforce
- Develop and Provide Briefings
- Recommend Regulatory Enhancements
- Obtain Senior Management Support and Encouragement
- Promote Parametric Cost Estimating Techniques

# Chronology of Key Events (Continued)

- Commercial Model Suppliers Meeting (January 1995)
  - » Model suppliers support initiative (8 model suppliers attended); no new barriers identified
  - » Initiative does not endorse use of any specific model
  - » Models should be calibrated and validated before use
  - » Working Group will review model disclosures contained in specific whitepapers and provide comments; two have been provided to date:
    - “SEER Software”
    - “PRICE H”

# Chronology of Key Events (Continued)

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- Reinvention Laboratory Kick-off Workshop (July 1995); over 120 participants
- 13 contractors volunteer to test expanded use of parametrics and attend workshop
  - » 20 other contractors sent observers to the workshop
  - » Potential lab sites briefed on initiative objectives
  - » Sites prepared action plans and milestone schedules

# Chronology of Key Events (Continued)

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- Initial Training (under DAU Coordination), Provided to Lab Teams (Feb-Mar, June '96)
  - » Five day workshop involving Government and Industry team members
  - » Metrics recommended to measure results
    - customer satisfaction
    - reduced proposal preparation costs
    - reduced proposal cycle time
    - improved reliability of estimates

# Chronology of Key Events (Continued)

- Executive Steering Committee Meeting (July '96)
  - » Executives from Industry and Government Organizations attended meeting
    - Ms. Eleanor Spector, Director of Defense Procurement attended meeting and continued her support
  - » Executive Steering Committee Members briefed by Working Group on initiative activities, including:
    - Current Challenges, including calibration/validation, TINA, and customer satisfaction
    - Lab Status, including buying activity participation
    - Fall Workshop Logistics
  - » Executive Steering Committee Members offer support of the initiative and assistance in working with the buying activities

# Chronology of Key Events (Continued)

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- Proposed Fall Workshop (Oct 16-17 '96)
  - » Presentations on lab results to date
  - » Key validation of initiative premises - parametric cost estimating can be expanded and documented as an excellent tool in the estimators tool box
  - » Representatives from each lab site team, senior acquisition officials, industry observers with respective DCMC/DCAA counterparts, buying activities, and commercial model suppliers will be invited to attend

# Potential Savings Commercial Model Applications\*

	<i>Faster</i>	<i>Cheaper</i>	<i>Reliability</i>
RAYTHEON E-Systems, Greenville Div.	25%	33%	More reliable
Northrop Grumman ESSD	33%	33%	Equal or better
Lockheed Martin Astronautics	25%	25%	More accurate
Rockwell SSD	40%	35%	More accurate
McDonnell Douglas Helicopters	33%	20%	Equal or better

**\*Source: Feedback from early implementers**

# Potential Savings In-House Models\*

	<i>Faster</i>	<i>Cheaper</i>	<i>Reliability</i>
Thiokol Corporation	30%	35%	More accurate
General Electric	40%	30%	Equal or better
McDonnell Douglas Helicopters	33%	20%	Equal or better

**\*Source: Feedback from early implementers**

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*Roles of the Executive Steering Committee and  
Working Group*

# Executive Steering Committee Members

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- Elliott Branch, U.S. Navy
- Scott Carson, Boeing Defense & Space Group
- John Falconi, GE Aircraft Engines
- Col. Elton Minney, U.S. Army
- Tom Luedtke, NASA Office of Procurement
- Gen. Timothy Malishenko, U.S. Air Force
- Richard Pemble, RAYTHEON E-Systems
- Robert Spiker, Northrop Grumman ESSD
- Michael Thibault, DCAA Headquarters
- Gary Thurber, DCMC Headquarters
- Rick Weis, McDonnell Douglas Aerospace
- Chester Wheeler, Lockheed Martin Astronautics

# Working Group

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- Ronald Brandstetter, GE Aircraft Company
- Dean Boyle, DCMC Northrop Grumman
- Jim Collins, Northrop Grumman ESSD
- Gary Constantine, RAYTHEON E-Systems
- Karen Davies, DCAA Mid-Atlantic Region
- Jim Dennedy, Air Force Institute of Technology
- Marty Deutsch, Lockheed Martin Astronautics
- David Eck, DCAA Headquarters
- Mel Eisman, RAND Corporation
- Jim Gleason, US Army Material Command
- Virgil Hertling, US Air Force Headquarters
- Joe LeCren, NASA Headquarters
- Paul Lubell, Northrop Grumman ESSD
- John Matherne, Army Logistics Mgmt College
- Don Reiter, Defense Contract Management Command
- Bernie Rudwick, Defense Systems Mgmt College
- Marcia Rutledge, US Navy - Stricom
- George Salantai, McDonnell Douglas Aerospace

# Responsibilities of the Executive Steering Committee

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- Oversee the initiative
- Provide direction
- Approve major initiative items
  - » Policy recommendations to be forwarded for DoD consideration
  - » Workshop activities
  - » Training / coordination initiatives
- Support the initiative
  - » Reinvention lab activities
    - all organizations represented on team
    - support test on actual proposals

# Responsibilities of the Working Group

- Manage the initiative
- Provide support to lab
  - » Assists in working issues and developing metrics
  - » Assists in bringing buying activity into teams
  - » Assists in sharing best practices / lessons learned
- Help accomplish major action items
  - » Coordinate training
  - » Develop and update handbook
  - » Prepare position papers
  - » Coordinate workshop activities
- Promote the initiative
  - » Prepare and distribute newsletter
  - » Presentations and exhibits at conferences and workshops

# Parametric Cost Estimating Initiative

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*Accomplishments*

# Parametric Cost Estimating Handbook

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- Objective:
  - » Serve as a guide for parametric estimators and cost analysts
    - only consolidated source of parametric cost estimating, preparation and review criteria
  - » Baseline for joint industry/government training course
- Availability:
  - » Wide distribution (paper copies, disks, e-mail)
  - » Available on the World-Wide Web
    - <http://sea02www.navsea.navy.mil/webdata/pceh/pceht.html>
- Utilization Survey:
  - » Obtain user feedback on handbook
    - survey to be included with August newsletter (will help with the updating process)

# Parametric Cost Estimating Handbook (Continued)

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## ⦿ Updates:

- » Need to include real examples
  - calibration
  - validation
    - ⦿ real examples will be based on lab results
- » Suggested changes received to date
  - more practical application (more focus on “how-to’s”)
  - up-front identification of specific barriers
- » 2nd edition targeted for Summer 1997
- » Need to determine who updates the handbook
- » Transition of ownership (ISPA?)

# Training

- Objective: to provide **familiarity training** on parametric cost estimating techniques and related concepts needed to evaluate techniques and tools.
  
- Accomplishments:
  - » Completed classes
    - 6 classes / February - March and June 1996
    - coordinated effort between Defense Acquisition University (DAU), Air Force Institute of Technology (AFIT), Army Logistics Management College (ALMC), and Defense Systems Management College (DSMC)
    - integrated team training (**industry and government**)
    - instruction on core concepts and site specific issues

# Training (Continued)

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- Accomplishments (Continued):
  - » DAU debriefed (May '96)
    - provided feedback from initial classes
      - 95% indicated training was very beneficial or beneficial
    - addressed future training needs and requirements
      - 1-2 week course needed
      - advanced statistical analysis
      - calibration and validation criteria
      - acceptance of commercial models
      - key proposal disclosures
      - review criteria

# Training (Continued)

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- Accomplishments (Continued):
  - » Working Group recommended IPT approach for development of formal training course
    - joint efforts of DAU, AFIT, ALMC, DCAI, DSMC and the Working Group
    - formal training course to be developed after completion of the October workshop (build upon team's recommendations)
    - DAU agreed with recommendations

# Communication Mechanisms

- Purpose: To share information on a real-time basis with all lab site team members as well as others interested in the parametric cost estimating initiative.
  
- Mechanisms Include:
  - » Parametric Initiative Newsletter **(1st issue-June '96)**
    - feedback very favorable
    - updates on current lab status
    - current action items
    - issues, concerns and Working Group suggested solutions
    - bi-monthly distribution
    - contributions encouraged

# Communication Mechanisms (Continued)

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- ⊙ Mechanisms Include (Continued):
  - » DCAA Bulletin Board System **(October 1995)**
    - electronic means of sharing information between all sites on a real-time basis
    - a “quick fix” until web site is up and running
  - » Web Site **(Under Construction)**
    - will be accessible through “Defense Contract Audit Agency” home page
    - will include background information, electronic files, and announcements page
    - will include links to Working Group e-mail addresses, other acquisition reform sites, etc.

# Communication Mechanisms (Continued)

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- Mechanisms Include (Continued):
  - » Recent exhibits
    - National Performance Review **(Mar '96)**
    - Federal Quality Conference **(June '96)**
    - Society of Cost Estimating and Analysis **(June '96)**
  - » Recent conferences
    - International Society of Parametric Analysts Panel Discussion **(June '96)**
    - Society of Cost Estimating and Analysis **(June '96)**

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*Lab Objectives and Examples of Techniques Being Tested*

# Lab Site Objectives

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- The company demonstrates the parametric cost estimating opportunities to be tested
- The company participates with its local oversight and buying activities as an integrated product team to validate parametric techniques
- The integrated product team tests techniques on actual proposals

# Lab Site Objectives (Continued)

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- Best practices and lessons learned are developed and publicized by the team and disseminated to the Working Group
- The team analyzes and helps remove regulatory and cultural barriers
- The team establishes metrics to measure the success of its test results and analyzes customer satisfaction
- The team documents and publicizes test results

# Current Lab Sites

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- Boeing Defense & Space Group, Seattle, WA
- GE Aircraft Engines, Evendale, OH
- Lockheed Martin Astronautics, Denver, CO
- Lockheed Martin Electronics & Missiles, Orlando, FL
- Lockheed Martin Tactical Aircraft Systems, Ft. Worth, TX
- McDonnell Douglas Aerospace, St. Louis, MO
- McDonnell Douglas Helicopters, Mesa, AZ
- Northrop Grumman ESID-EIWS, Rolling Meadows, IL
- Northrop Grumman ESSD, Baltimore, MD
- Raytheon E-Systems ECI Division, St. Petersburg, FL
- Raytheon HRB Systems, Inc., State College, PA
- Rockwell Space Systems Division, Downey, CA
- Thiokol, Brigham City, UT

# Examples of Techniques Being Tested (Continued)

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- In-House Models:
  - » Database model for estimating life cycle costs of jet engines for development proposals
  - » Development of a standard software sizing database which will be a key cost driver input into an in-house software estimation model
  - » Database model for estimating life cycle costs of solid rocket motor costs
  
- Cost Estimating Relationships (CER's):
  - » Examples range from simple CER's used to estimate travel costs to more advanced, multi-variate CER's to estimate costs such as recurring manufacturing support and engineering design preparation for use on change order proposals

# Examples of Techniques Being Tested

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## Commercial Models:

- » “PRICE H” being used to estimate hardware costs - test applications include:
  - utilizing tool to estimate specific costs such as engineering and manufacturing direct labor costs for satellite systems
  - utilizing tool to estimate full life cycle costs for radar systems and radar jamming devices
  - utilizing tool to estimate full life cycle costs for space shuttle orbitor spares
  
- » “PRICE S” being used to estimate software development costs through integration and test