

# O&S Cost Estimating Capabilities

*briefing for OASN(RD&A)ARO,  
Program Assist Visit (PAV) Team  
and DoN Program Offices*

*updated Friday, February 22, 2002*

*Peter Braxton – Manager,  
Cost and Risk Analysis Section*

# Outline

- **Who Are We?**
  - **Northrop Grumman IT, TASC**
- **What Can We Do?**
  - **Cost Estimating and Analysis**
  - **Operations Research**
  - **Department of the Navy**
- **What Have We Done?**
- **What Would We Do For You?**

# Who Are We?

*Organization of Northrop  
Grumman IT, TASC, Management  
Consulting, and Cost and Risk  
Analysis*



***NORTHROP GRUMMAN***  
*Information Technology*

**TASC**

# Northrop Grumman Information Technology, TASC

- **One of the world's premier providers of systems engineering, information management, and integrated systems management solutions for government and industry**
- **Founded in 1966**
- **More than 3,000 employees**
- **Over 30 offices across the U.S.**
- **Headquartered in Chantilly, Virginia**
- **Subsidiary of Northrop Grumman Corp.**
- **Jim Frey, President**



**NORTHROP GRUMMAN**  
Information Technology

TASC

# Northrop Grumman

**Kent Kresa**  
*Chairman,  
President and CEO*

**Newport News  
Shipbuilding**

Tom Schievelbein  
*President*

**Integrated  
Systems**

Ralph Crosby, Jr.  
*President*

**Electronic  
Systems**

Robert Iorizzo  
*President*

**Information  
Technology**

Herb Anderson  
*President*

**Ship Systems**

Philip Dur  
*President*

**Component  
Technologies**

Frank Brandenburg  
*President*

■ 80,000 employees worldwide

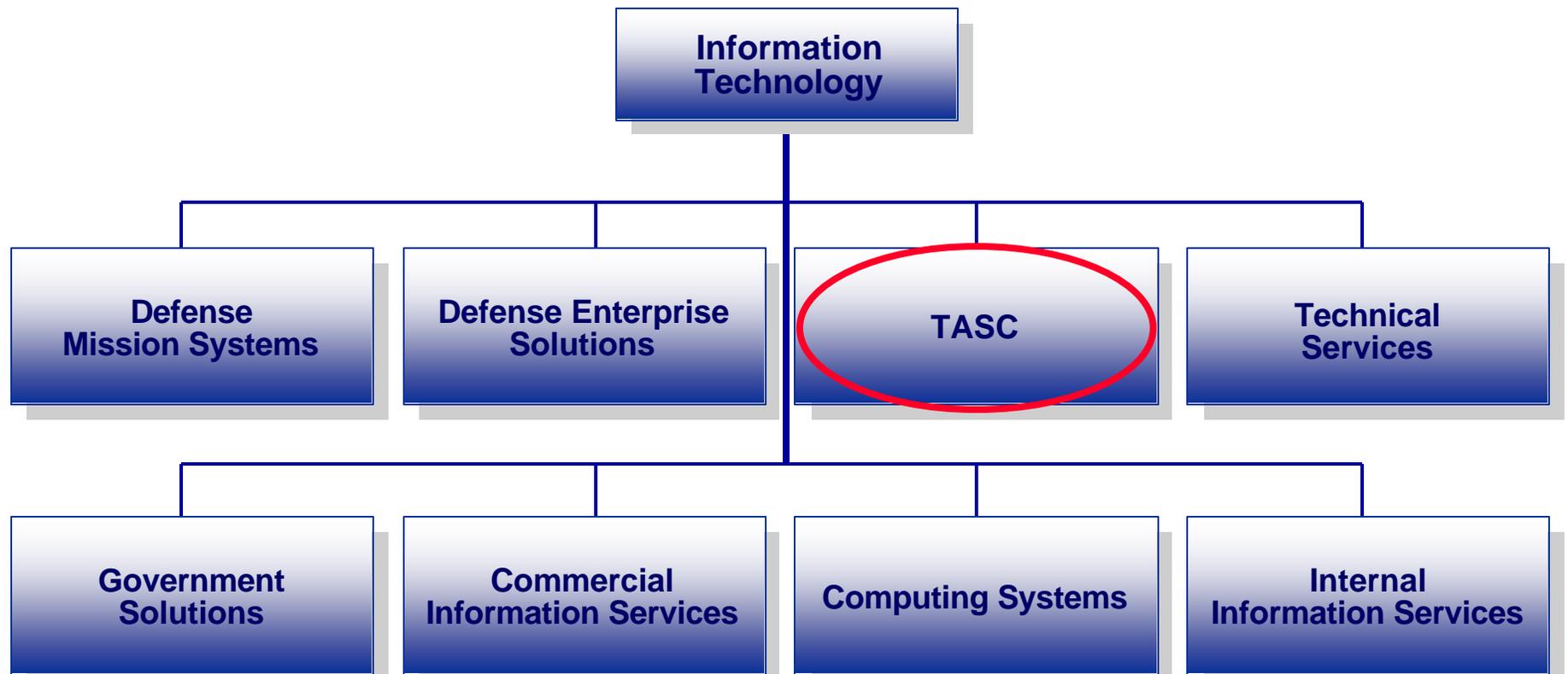
■ 44 states

■ 25 international offices

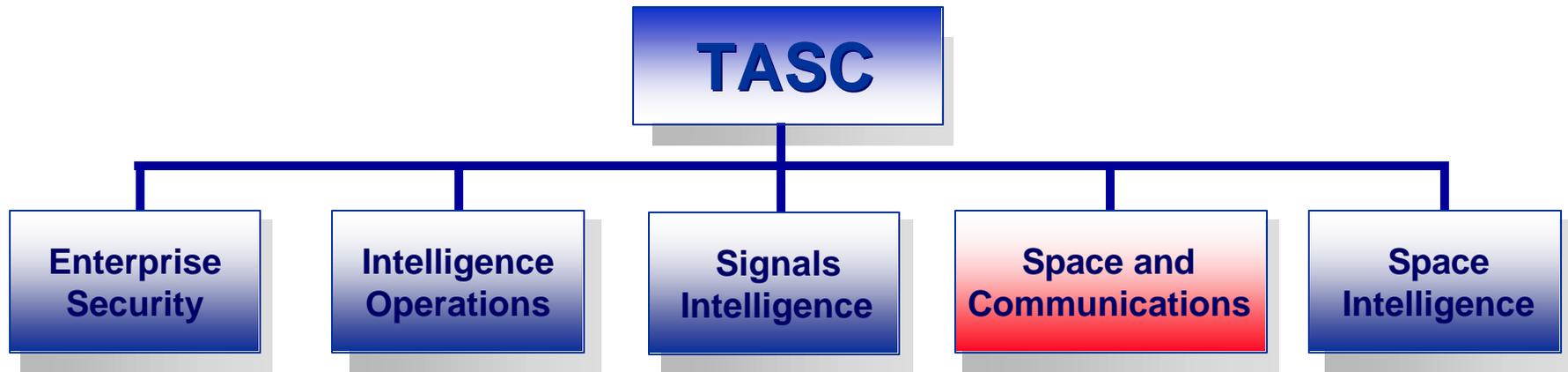
**NORTHROP GRUMMAN**  
*Information Technology*

TASC

# Northrop Grumman's IT Sector

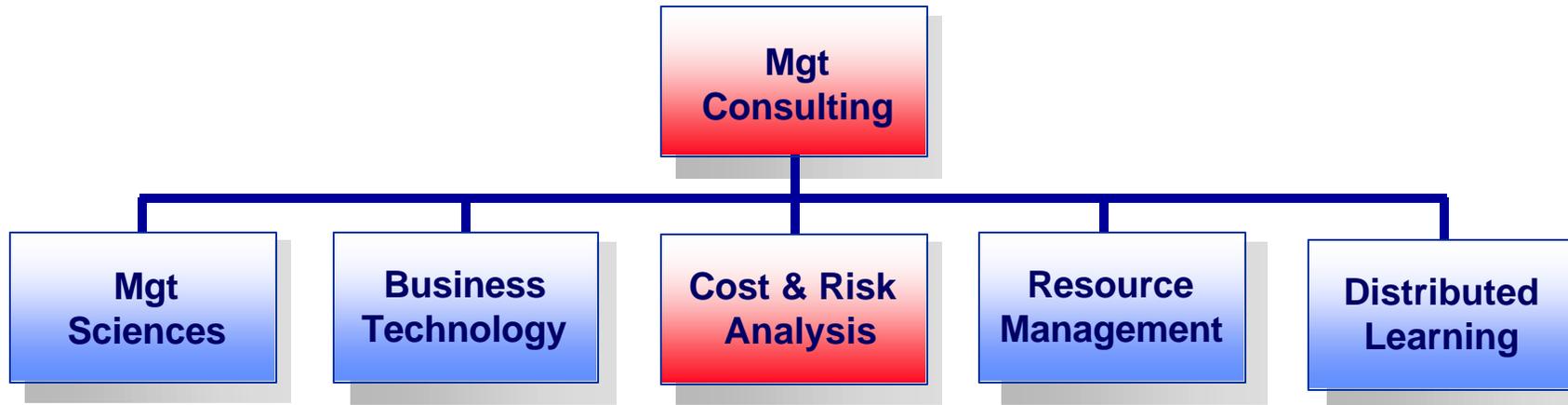


# TASC Organization



- **Leading-edge solutions across a wide range of markets and technical disciplines**
- **Serving customers in the U.S. intelligence community, the Department of Defense, civilian government, and commercial industries such as transportation, telecommunications, and manufacturing**
- **Combining technical excellence and quality with innovation and value**

# Management Consulting Organization



- **Approximately 122 employees in Management Consulting Division**
- **Employees support a variety of Intelligence Community, DoD, and commercial customers**
  - **Employees also matrixed to other TASC Operating Units**
- **<http://www.tasc.com/areas/space/mc/ce.html>**

# What Can We Do?

*TASC's capabilities in the areas  
Cost Estimating and Analysis,  
Operations Research, and  
Department of the Navy*

# Capabilities – Cost

- **30+ cost analysts in the DC area**
  - **Leaders in cost, CAIV, and risk**
  - **Majority have advanced degrees (many OR)**
  - **All are members of SCEA**
  - **Experience spans all types of weapon systems and AIS (Navy, Air Force, Army, Coast Guard, SOCOM, and IC)**
- **Experience with most high-profile Navy ship programs:**
  - **DDG 51 Flt IIA**
  - **DD 21 / DD(X)**
  - **CVN**
  - **New Attack Submarine**
  - **Sealift**
  - **LPD 17**
  - **Seawolf**

# Capabilities – Cost

- **Extensive Navy ship system experience:**
  - CEC
  - Navy Area and Theater-Wide TBMD
  - AEGIS
  - SM-2
  - SQQ-89
  - Various classified programs
  - Tomahawk
  - Penguin
  - Cyclone PC
  - DD 21 / DD(X)
- **Extensive Navy VAMOSOC and O&S experience**
- **Expertise in building cost models for any program phase or level of detail**

# Capabilities – OR

- **Approximately 20 OR analysts in DC area**
  - **Majority have advanced degrees**
  - **All are members of the Military Operations Research Society**
  - **Best Paper in the Chemical/Biological working group**
- **Experience in major programs across the DoD and IC**
  - **Discrete event and continuous system simulation for the Army's Domestic Preparedness program and other classified customers**
  - **Roadmapping & process redesign for the Marine Corps, Army and numerous classified customers**
  - **Multi-criteria decision analysis and resource planning throughout the DoD and IC**

# Capabilities – OR

- **Experience in major programs across the DoD and IC (cont'd.)**
  - **Technology base planning and analysis for the Army's Edgewood Biological-Chemical Center**
  - **Numerous Front-End Analyses (FEAs), technology assessments, and research planning efforts for the Army and IC customers**
  - **NAVSEA 92D**

# Capabilities – Navy

- **Significant portion of staff are former Navy (military or civilian)**
  - **Naval Center for Cost Analysis (NCCA)**
    - **Former Director (R. Coleman, Capt, USN, Ret.)**
    - **Lead analyst DDG 51 Flt IIA ICE (F. Blackburn)**
    - **4 other analysts are former NCCA**
  - **2 analysts from Navy Office of Special Projects**
  - **6 others with Navy OR/cost experience as contractors**

# Capabilities – Navy

- **Recent/ongoing Navy experience includes:**
  - **DD 21 / DD(X) Gold Team Cost Team Lead and O&S Estimate (7-member team, 3 years and ongoing)**
  - **Navy ARO CAIV, Total Ownership Cost and Knowledge Management support (4-member team, 5 years and ongoing)**
  - **Patrol Coastal Self Defense System cost/benefit analysis (Coleman & Blackburn)**
  - **NAVAIR Risk Study (4-member team, ongoing)**
  - **NCCA cost research study (2-member team)**
  - **Trident program office support (TASC's first and longest running contract - 30+ years)**

# What Have We Done?

## *Past Performance Examples*

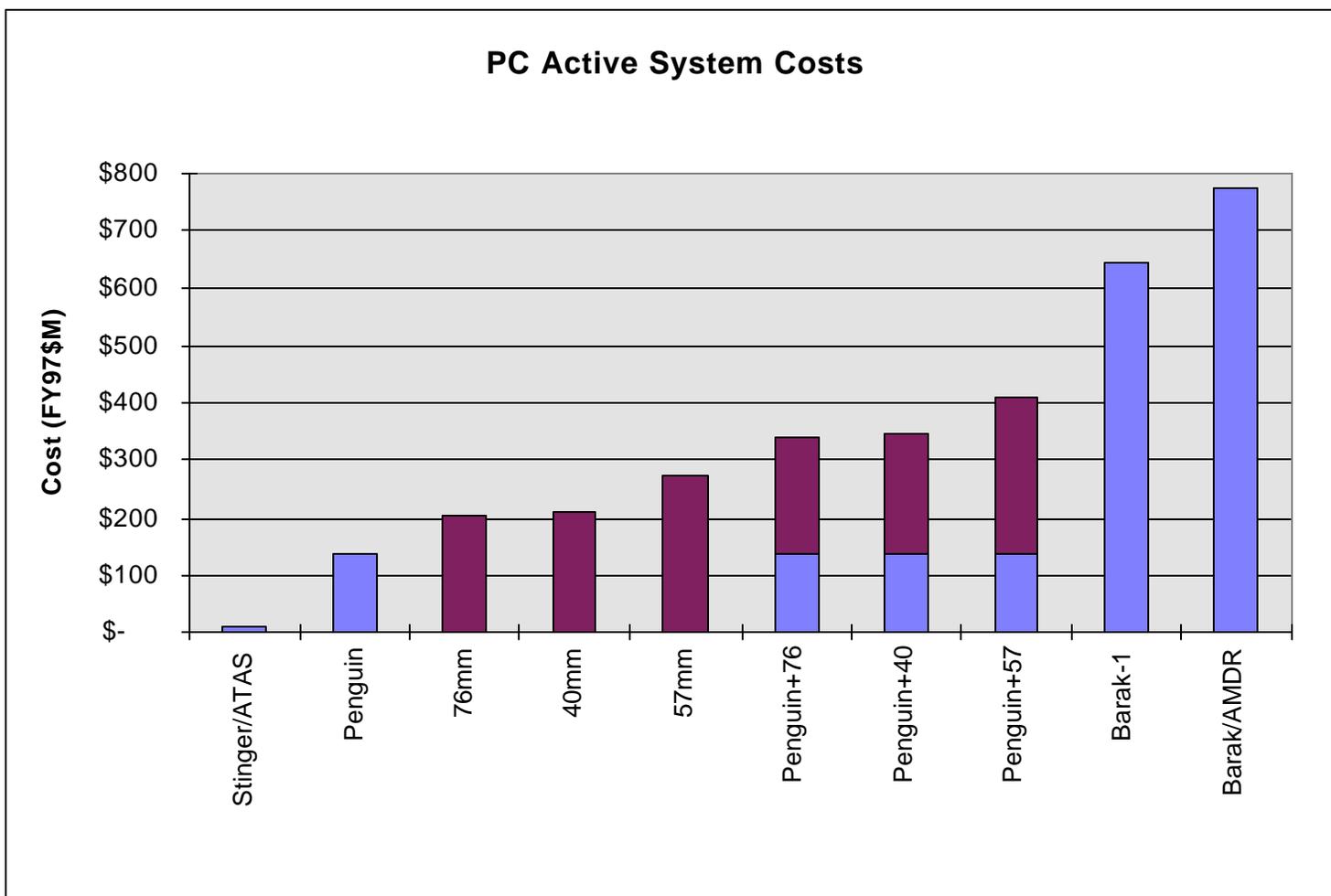
# DD 21 / DD(X) Cost Estimating

- **Gold Team Cost Lead**
- **O&S Estimating, using both traditional models and those which captured impacts of new initiatives**
- **LCCE Rollup Model**
- **Learning Curve Analyses**
- **Basis of Estimate (BOE) QA for all phases**
- **Risk Estimating**
- **(Details covered by non-disclosure agreement until award)**

# PC Self-Defense System Study

- **Congressionally directed study**
  - **Examine self-defense requirements under a variety of operational scenarios**
  - **Provide a comparison of evaluated weapon systems**
  - **Examine Barak-1 Missile**

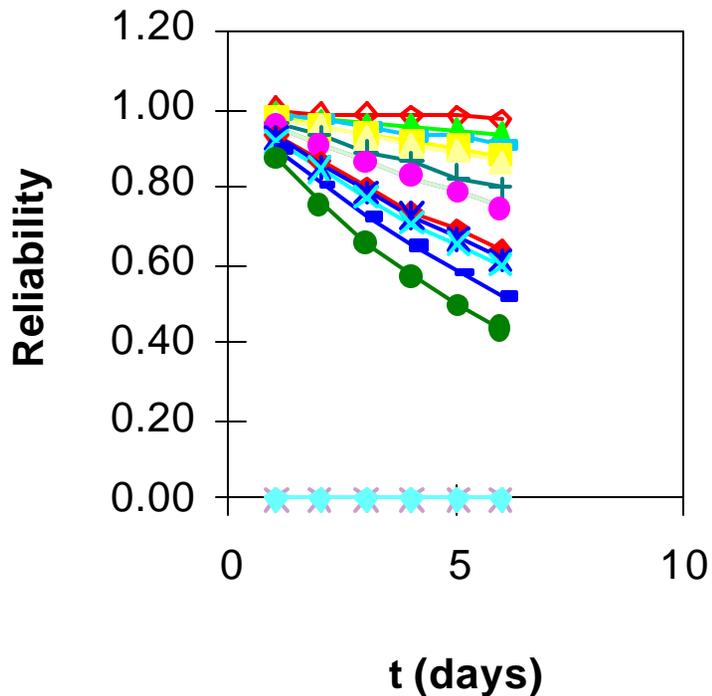
# Active System Costs



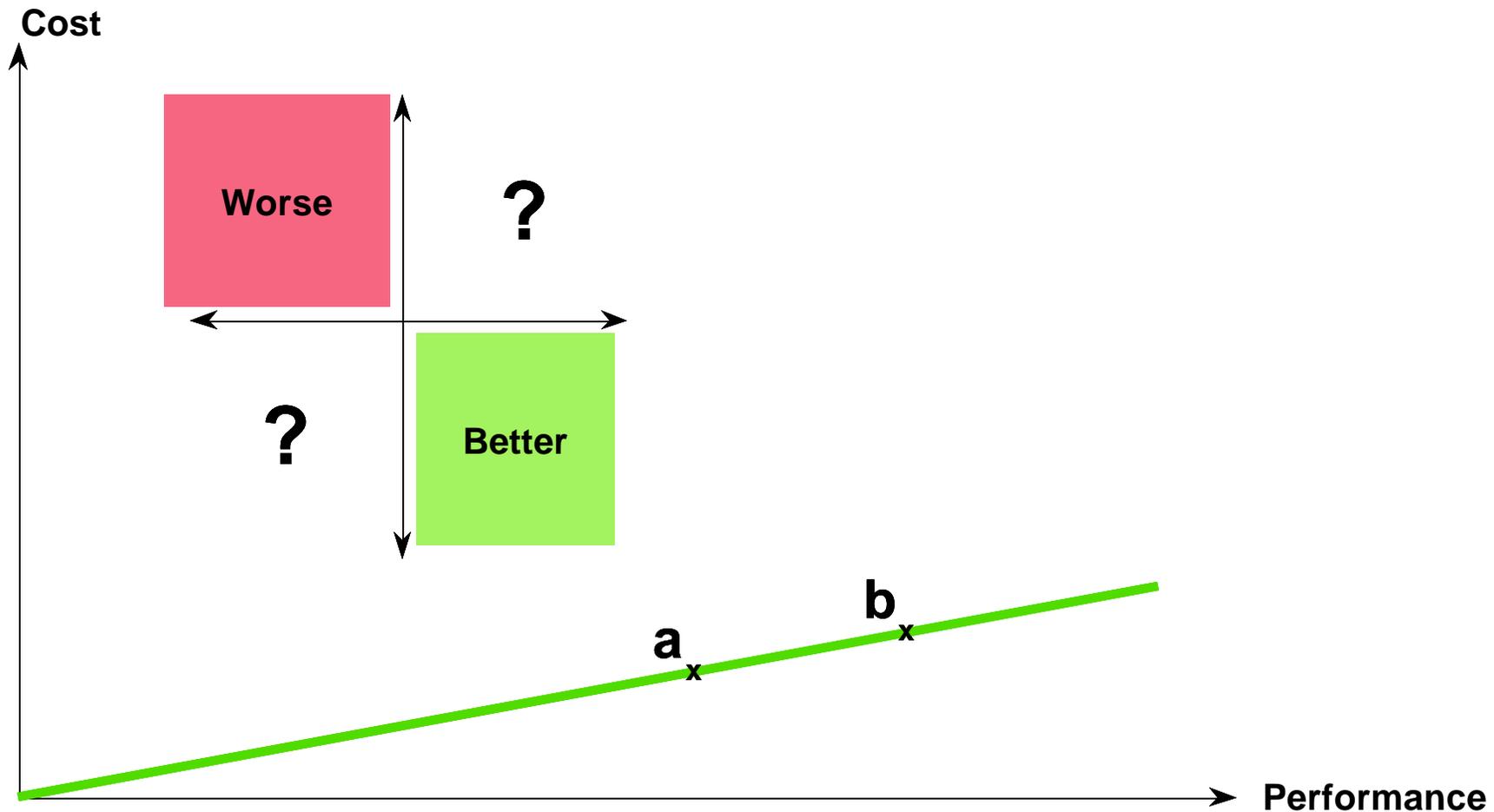
# Reliability vs. Time

## Reliability vs Time

$$R = e^{-t/MTBF}$$

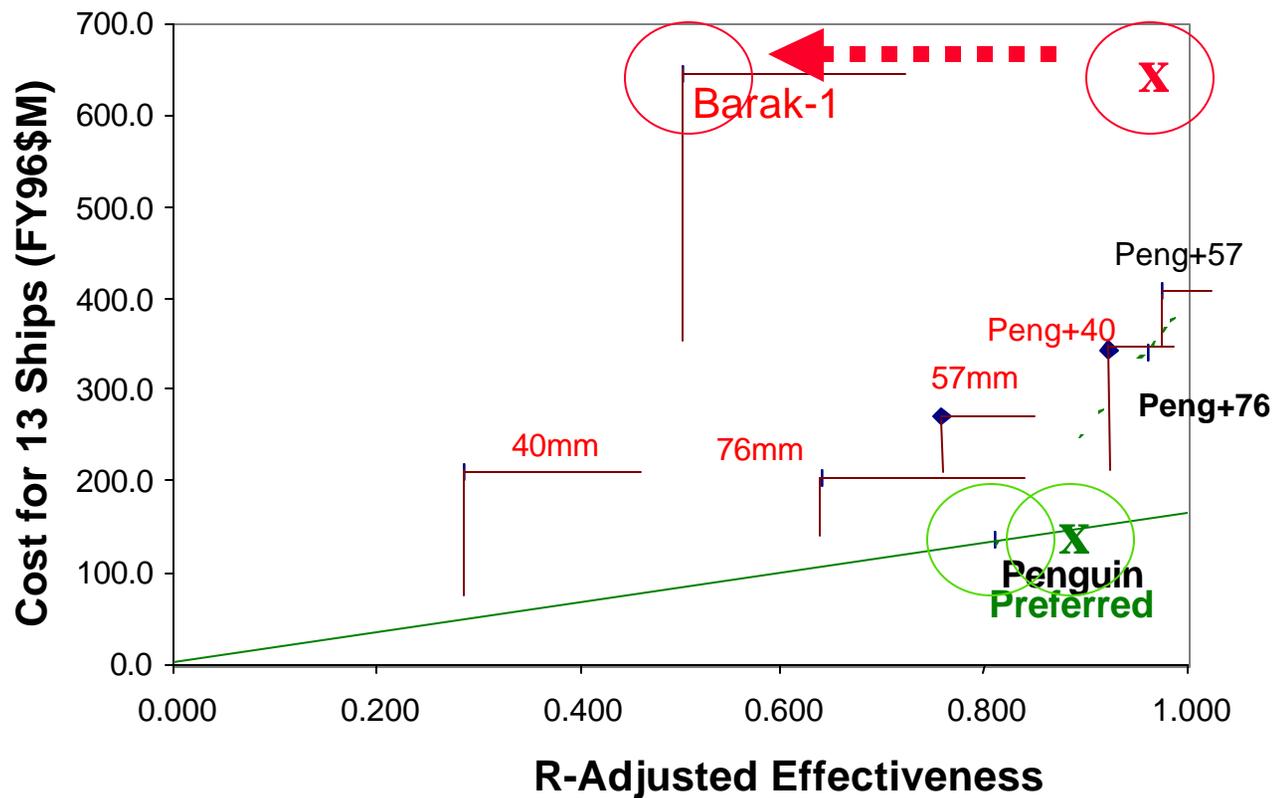


# Cost/Performance Choices



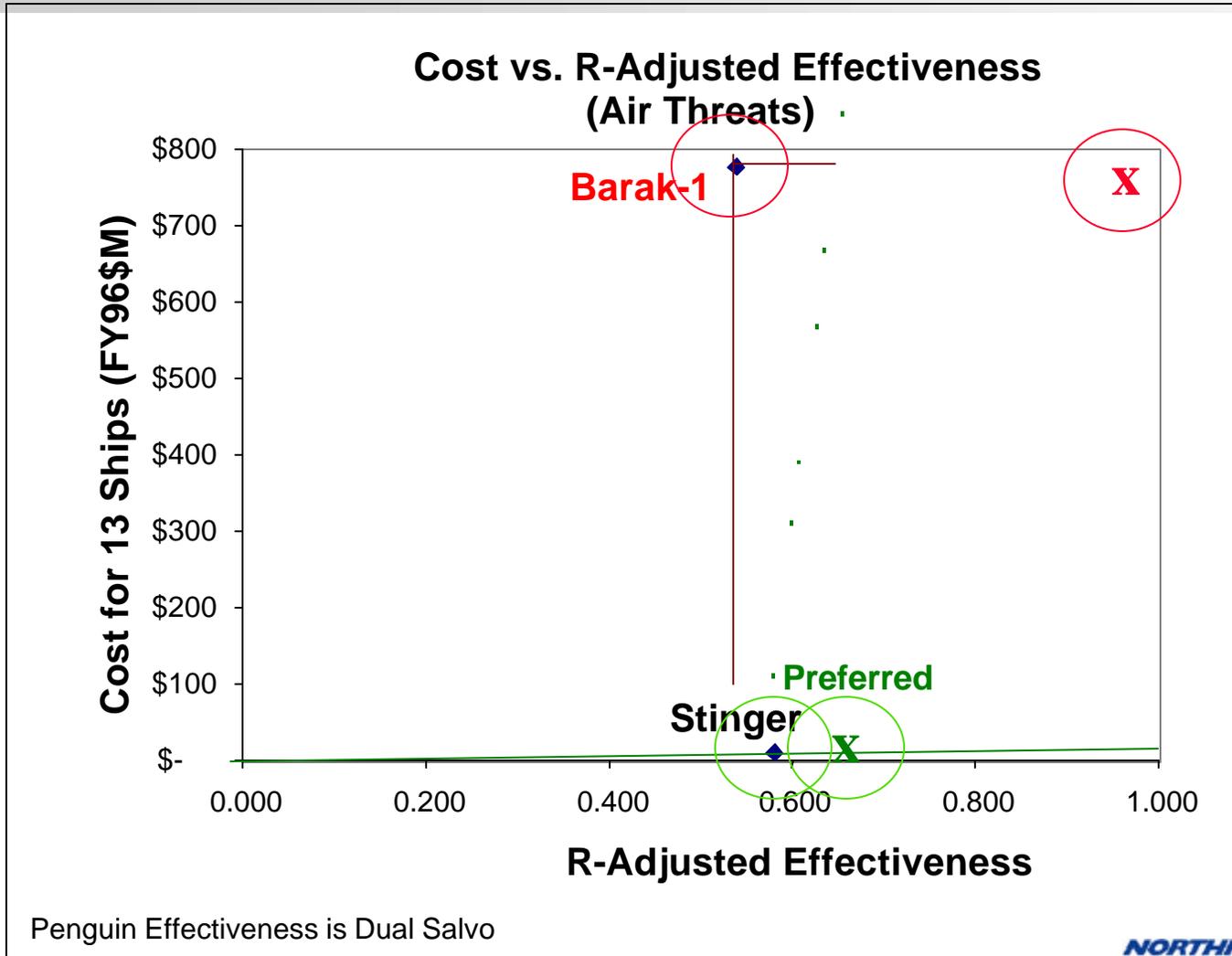
# Cost vs. Effectiveness - Surface Threat 2

Cost vs R-Adjusted Effectiveness  
(Baseline = Current PC) (Threat 2)



Penguin Effectiveness is Dual Salvo

# Cost vs. Effectiveness - Air Threats



# What Would We Do For You?

*Cost Estimating, Analysis, and  
Modeling Processes*

# Develop Process to Assess O&S

- **Develop Work Breakdown Structure (WBS)**
  - Typical CAIG WBS or tailored to particular program?
  - Level of Detail?
- **Reporting Requirements**
  - What data is available?
  - What additional data will be collected?
  - How often will data be collected?
- **Unique Requirements**
  - A-76 studies require extensive commercial data collection; may need coordination with unions, etc.

# Develop Models to Assess O&S

- **Develop a single model which captures all scenarios**
  - **Government logistics, commercial vs. government trades, or full service contractor approach**
- **For each particular estimate, omit sections as appropriate**
- **Combination of VAMOSC, Commercial, and Government data**
- **“Continuous Improvement” approach**
  - **Initially, combination of existing and placeholder data will be necessary**
- **As additional data becomes available, either as designs mature or contractor data is submitted, model and supporting CERs will be updated**

# Develop Metrics to Assess O&S

- **“True Facts” means of comparing TOC of various system designs and operating profiles**
- **Current metrics do not capture several significant areas of cost**
- **Metrics should reflect those areas of cost that the logistics organization, whether government or commercial, has the most control over**
- **Results of cost reduction initiatives should be visible and traceable**

# What makes a cost estimate good?

- **Auditable - Easily replicated with same results**
- **Credible -**
  - **Based on accepted cost estimating practices**
  - **All cost-driving groundrules and assumptions are reasonable and clearly presented**
  - **Appropriate use of historical data and statistical analysis**
  - **If resulting from statistical analysis, based on CERs with minimal error bands**
- **Technically Accurate - Reflects correct technical/design baseline and WBS**
- **Comprehensive – No cost elements are left out or double-counted**
- **Unbiased - Neither optimistic nor pessimistic, but an assessment of the most likely cost**

# Contracting Vehicles / POC

- **TASC has a variety of simplified acquisition vehicles, including:**
  - **GSA Schedules**
    - **Financial Management Services (FMS)**
    - **Management, Organizational and Business Improvement Services (MOBIS)**
    - **Information Technology (IT)**
- **Point of Contact**
  - **Peter Braxton, [pjbraxton@tasc.com](mailto:pjbraxton@tasc.com), (703) 633-8300 x4327**

# Backup

*Additional information on  
Customers and Contracting  
Vehicles*

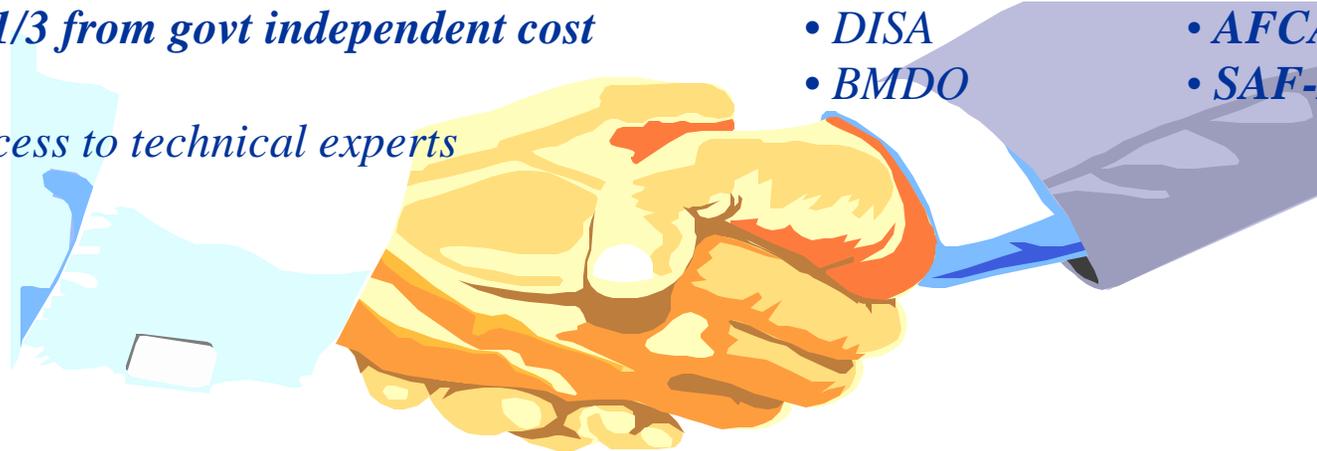
# Cost Estimating & Analysis

## *People:*

- 30 Plus cleared cost analysts (most with advanced degrees)
- Award winning authors (Risk, CAIV, etc.)
- SCEA/ISPA certified
- Roughly 1/3 from govt independent cost agencies
- Direct access to technical experts

## *Customers:*

- CMS
- CIA
- NIMA
- NRO
- DISA
- BMDO
- Commercial Space
- NCCA
- NAVAIR
- ASN(RD&A)
- AFCAA
- SAF-AQ



## *Products/Services*

- Independent Cost Estimates
- Program Office Estimates
- Risk Analysis
- CAIV
- CARD Development/Review
- Cost Benefit Analyses
- EVM
- TOC/RTOC

# Contracting Vehicle

- **GSA Financial Management Services Schedule**
  - **Contract Number: GS-23F-0039J**
  - **Through end CY 2002 (with option through end CY 2007)**
  - **Services include:**
    - **Cost Estimating**
    - **Decision Support**
    - **Financial Analysis and Risk Analysis**
    - **Other Financial Management Consulting/Assistance**
  - **<http://www.tasc.com/federal/fms/>**

# Contracting Vehicle – Alternative

- **GSA Management, Organizational and Business Improvement Services (MOBIS) Schedule**
  - **Contract Number: GS-23F-8081H**
  - **Through end FY 2002 (with option through end FY 2007)**
  - **Services include:**
    - **Decision Support**
    - **Outsourcing/Privatization**
    - **Integrated Product/Process Teams**
    - **Strategic Planning**
  - **<http://www.tasc.com/federal/mobis/>**