

NATIONAL RECONNAISSANCE OFFICE

# Realistic Cost Estimates (RCEs): NRO's Innovative Pilot Program for Contract Cost Evaluation

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# The Problem

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- Government contracts have a tendency to grow in value
  - Some growth known and not articulated at contract award
  - Some growth considered preventable<sup>1</sup>
- Government experiences challenges in evaluating cost realism
  - Historically source selection adjustments to a proposal to reach a Probable Cost (PC) were small
  - Leadership may not be aware of the cost risk between the signed contract value and PC
- Programs that experience cost growth can drive program execution challenges and diminish health of larger portfolio
- Characterizing expected growth is critical to setting sufficient budgets to enable acquisition success

<sup>1</sup> Preventable scope is considered scope growth outside of technical baseline growth



## The Solution...Get Cost Estimators Involved!

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- Tap into NRO CAAG-maintained wealth of historical cost data to support realism evaluation
- Collect same type of cost/technical data that Government would use to perform an Agency Cost Position (milestone cost estimate)
- Encourage contractors to submit historical cost data (actuals) they plan to leverage in their proposal
- Tie acceptable proposal methods to cost estimating methods; set requirements for their use
  - Analogy, Parametric, Cost Model, Vendor Quote, Engineering Judgement



# Background

- Predecessor efforts include:
  1. Joint Space Cost Council (JSCC) Proposal Process Enhancement (PPE) Initiative
    - Cost and Acquisition Assessment Group (CAAG) co-led PPE effort
  2. USAF Long Range Strike-Bomber (LRS-B) source selection approach

## JSCC PPE Initiative (2012-2015)

- Several efforts shared by industry and gov't partners
  - Focuses: improved Basis of Estimate (BOE) quality, reduced effort to propose/evaluate, shortened schedule, enhanced realism
- Outreach to contracts and acquisition staff
  - How could cost estimating best practices improve proposal requirements?
- Pilots from several vendors showed promise
  - Smaller-scale, low risk evaluations for demo
  - Significantly reduced schedule/effort, appeared to improve common understanding
- Products include:
  - Data-driven BOE training, Guidebook, Request For Proposal (RFP) language, BOE Examples

## LRS-B Source Selection (2014-2016)

- Cost realism assessment utilized Independent Government Estimate (IGE) approach
  - Tailored analogy/parametric estimate for each offeror's solution
- Comparison of proposal and IGE at "element" level
- Differences between proposal and IGE were focus of discussions with offerors
  - Offeror's were "put on notice" when cost elements were deemed unrealistic
- Source selection approach withstood protest and GAO review (GAO.gov file #: B-412441)
  - Helped set boundaries for when this type of approach is defensible

**Our progress leveraged the foundation laid by many in the cost community!**



# Realistic Cost Estimates Overview

- NRO's Realistic Cost Estimates (RCEs)
  - Focus proposal cost evaluations on cost realism, not proposed cost
  - Leverage wealth of NRO historical program cost databases and methods
  - Drive industry to justify cost proposal using their historical performance as basis
- A new emphasis, not a radical change
  - Provided the Government with a more substantiated estimate of costs at the unit level
  - Leverages technical team evaluation of technical parameters in cost vol.
- Designed to mitigate the Government's concern of an Offeror "buying in" to the contract, decreasing cost risk
  - Higher cost/more realistic proposal (low risk) scores better than a lower cost/less realistic proposal (high risk)

**Improves NRO's understanding of true acquisition cost**  
**Minimizes unanticipated cost growth**



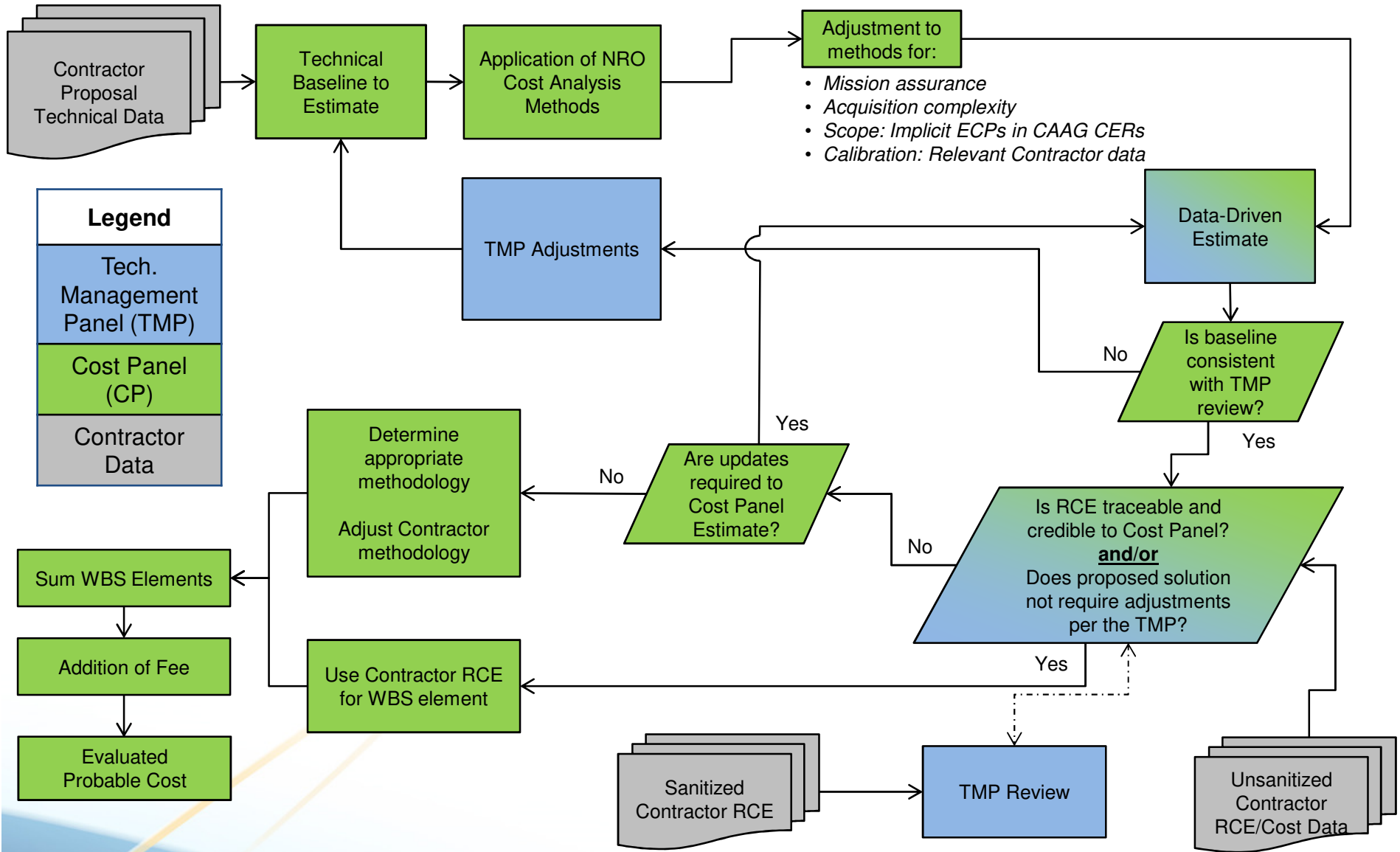
# RCE Proposal Evaluation Process

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- Proposals evaluated on the strength of their justification with an emphasis on offeror's historical cost data
- Cost Panel leverages historical data, estimating methods, and technical team inputs to assess proposed costs and adjust where appropriate
  - Technical Panel evaluates sanitized RCEs, Technical Data Sheets, Integrated Master Schedule (IMS), and other sanitized information as specified in Section L
- Consistent with Section L, PC may include cost adjustments for:
  - Items not included in the submitted proposal, but within the requirements of the solicitation;
  - Inconsistencies, math errors, logic errors;
  - Unsupported assertions and/or inappropriate estimating methodologies



# Probable Cost Development





# Premise

- Ask vendor for similar information required for an independent estimate: **Section L**
- Encourage offerors to bid commensurate with their historical performance: **Section M**
- Evaluate at higher, box level - Technical panel focus: **Design**
  - Better knowledge of programmatic and technical risks
- Evaluate data and estimating methods - Cost panel focus: **Realism**
  - Better knowledge of cost risks
- Award contracts with better known risks, or enter discussions to define realistic contract value with lower expected growth

## Example Section M: Cost Risk

Risk Rating	Realism Definition   PC - Proposal
High	> 40%
Moderate-High	> 30%
Moderate	> 20%
Moderate-Low	> 10%
Low	≤ 10%

Unobtainable via traditional (i.e. BOE) cost evaluation approach!

Example: \$400 contract value x 25% difference =  
**\$100** in adjustments

Compared to < 10% (\$40) traditionally





## Section L Evolution

- Requirements of RCEs:
  - Vendors propose using a Standard Work Breakdown Structure (SWBS) at specified levels
    - Below subsystem and above task-level - WBS level five is typical
  - Vendors use one of five methodologies: Analogy, Parametric, Cost Model, Vendor Quote, Engineering Judgement
    - Engineering Judgement is allowed but discouraged in language
    - Each methodology comes with unique requirements for evaluation
  - Emphasize that Contractor must provide:
    - Justification with back up data for all historical costs used
    - Traceability through and across RCEs – all RCEs feed into one summary document of costs/prices

**RCEs don't revolutionize the information requested –  
RCEs change the level and type of substantiation required**



# RCE Example (1/2)

## REALISTIC COST ESTIMATE Example UN-SANITIZED

WBS Number	CLIN	NRE/RE	WBS Title	Total Cost (BY18\$K)
1.2.2.2.4	001	NRE	Notional Widget	\$ 12,000

	Total Cost	GFY18	GFY19	GFY20	GFY21	GFY22	GFY23	GFY24
<b>Total</b>	\$ 12,000	\$ 1,200	\$ 3,600	\$ 5,400	\$ 1,200	\$ 600	\$ -	\$ -

Escalation Factor (BY18 to TY)							
	1.03	1.0609	1.092727	1.12550881	1.15927407	1.1940523	

### Table of Cost by Government Fiscal Year (TY\$K)

	Total Cost	GFY18	GFY19	GFY20	GFY21	GFY22	GFY23	GFY24
<b>Total</b>	\$ 13,002	\$ 1,236	\$ 3,819	\$ 5,901	\$ 1,351	\$ 696	\$ -	\$ -

Redacted in sanitized RCE

### WBS Description

**Introduction** - General description, key ground rules and assumptions. (Add lines as needed.)

**Technical Requirements** - Narrative describing the scope of work to be performed. (Add lines as needed.)



# RCE Example (2/2)

## SUBSTANTIATION OF ESTIMATE

**Estimating Rationale** - Narrative describing the estimating methodology used. Reference Section L.5.4.3 (Add lines as needed.)

Only \$ values redacted in sanitized RCE

Tables below are only to be completed for WBS elements with requirement to provide insight into cost by vehicle.

Table of Cost by Government Fiscal Year (BY18\$K)								
	Total Cost	GFY18	GFY19	GFY20	GFY21	GFY22	GFY23	GFY24
Unit 1	\$ 10,800	\$ 1,200	\$ 3,600	\$ 5,400	\$ 600			
Unit 2	\$ 1,200				\$ 600	\$ 600		
Unit n...								
<b>Total</b>	\$ 12,000	\$ 1,200	\$ 3,600	\$ 5,400	\$ 1,200	\$ 600	\$ -	\$ -

Escalation Factor (BY18 to TY)	1.03	1.0609	1.092727	1.12550881	1.15927407	1.1940523		
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Redacted in sanitized RCE

Table of Cost by Government Fiscal Year (TY\$K)								
	Total Cost	GFY18	GFY19	GFY20	GFY21	GFY22	GFY23	GFY24
Unit 1	\$ 11,631	\$ 1,236	\$ 3,819	\$ 5,901	\$ 675	\$ -	\$ -	
Unit 2	\$ 1,371	\$ -	\$ -	\$ -	\$ 675	\$ 696	\$ -	
Unit n...								
<b>Total</b>	\$ 13,002	\$ 1,236	\$ 3,819	\$ 5,901	\$ 1,351	\$ 696	\$ -	\$ -



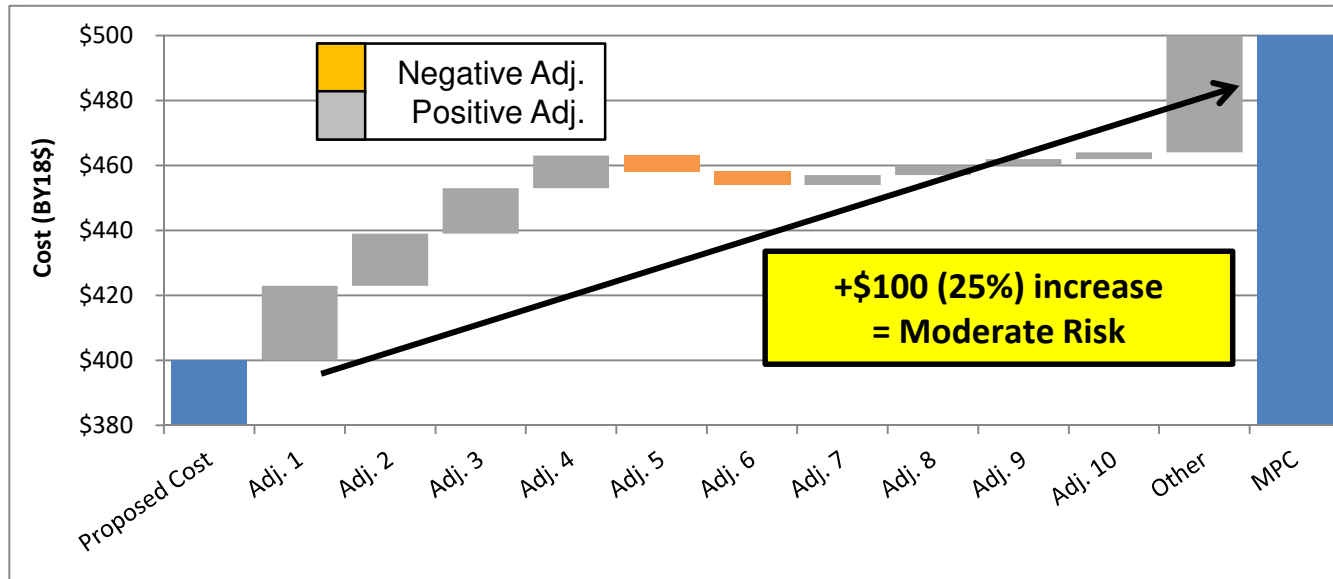
# Approach Piloted

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- Program offices successfully applied approach in multiple major source selections in 2017-2018
- NRO CAAG worked with Program offices and Contracts officers on comprehensive rewrites of traditional Section L and M language related to the cost volume and associated attachments
- Trained cost analysts were heavily involved in source selections
  - Supplemented/served in all roles of Cost Panel across piloted source selections (chairs, evaluators, advisors)
- NRO CAAG participation in evaluation included more than people
  - Normalized data spanning 40+ years
  - Cost estimating tools/methods
  - Cost estimating Subject Matter Experts and experience



# Insights Gained



- Use of data driven methods provides insights:
  - Depict the **largest cost drivers**
  - Identify **unrealistic cost** with the least amount of justification
  - Highlight where offerors **potentially “buying in”**
- Program Manager can translate insights to watch items/risk areas in execution



# Benefits/Outcomes

- Piloted programs awarded ahead of schedule<sup>1</sup>, without protest
  - Cost evaluation was not on the critical path
- Methodology addressed the Government's concern of an offeror "buying in," decreasing cost growth risk
  - Provided a more substantiated estimate of costs at the unit level
  - Allowed cost risk to be analyzed independent of proposal price
  - Through a customized Section M, allowed program office to set levels of acceptable risk
- Improvements realized in evaluation:
  - Reduced quantity of RCEs (100+) compared to BOEs (1000+)
  - Improved speed of cost evaluation, significantly<sup>1</sup>

<sup>1</sup> Speed of evaluation subject to many external factors; lag time to technical team reduced to 1-2 days (vice weeks)



# Industry Feedback & Observations

- Contractors recognize the importance of pre-acquisition discussions
  - Industry day restrictions preclude meaningful cost related Q & A
  - Industry is reaching out to share/normalize data proactively
- RCEs pilot is causing industry to prioritize use of historical data and recognized cost estimating methods
  - Many contractors shared they are bolstering data normalization, data sharing, and/or methods development
- Some Contractors expressed concern of maintaining two distinct company proposal bidding processes
  - Bottoms up and top down estimates developed for management and staffing planning
  - Challenges mapping RCE basis to detailed plan

**Challenges introduced by RCEs are no more cumbersome than BOEs**



## Lessons Learned

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- Government emphasize to industry to include cost team members at industry day (prime and subcontractors)
  - Highly encourage timely questions on draft RFP
- Datasheets require same scrutiny/consideration as other technical submittals in Section L
  - Quality RCEs and datasheets require Chief Technical Lead and Proposal Manager oversight
- Feedback from industry and experience incorporated to improve Section L and attachments





# Tenets for Continued Success

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- Stay the course
  - “We will believe the government wants to change only after the government demonstrates they have modified their own behavior”
  - Apply with care - not recommended if historical data unavailable
- Prepare
  - Early/Pre-RFP communications with industry on RCEs are critical
  - Industry Day briefing include cost proposal/RCE requirements
  - Upfront training and “dry” runs when practical (Cost/Technical Panel)
  - Upfront time dedicated to gathering draft RFP questions, generating Section M, and communicating intent is highly valuable
- Staff
  - Cost Panel comprised of seasoned cost analysts, Contracting Office, Program Management Office staff
  - Technical/Management Panel comprised of engineers familiar with and accustomed to evaluating effort at the functional “box” level



# Enablers

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- CAAG continues to be involved in industry outreach
  - Regular forums: Cost Improvement Process Team (CIPT), JSCC
  - Ad-hoc as necessary
- SWBS Mapping and Reporting Template (SMaRT)
  - Provides mutual understanding of how contractor WBS maps to NRO SWBS
  - Consistent data traceability throughout contract
- Proactive management providing the top cover for continued involvement
- Continued support from contracts and acquisition specialists
- Engagement with acquisition program office
  - Early and often!



# Summary

- NRO CAAG supported multiple data driven source selection pilots to quantify cost realism risk
  - Cost evaluation approach exercised with successful outcomes
  - Applicable for competitive and sole source situations
- New Section L and Section M criteria were effective; improvements continue
- Improvements realized:
  - Cost proposal evaluations completed faster than standard BOE approach
  - Cost & Technical Panel interaction focused on areas most familiar to analysts, improving evaluation quality
- New approach requires training and expanded dialogue between all source selection participants
- Partnership with industry to develop common understanding of data and methods a key to success

**Data driven cost evaluations work!**



# Contact Information

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