

# Inflation and Escalation

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Handle with Care



# Transformation in Inflation/Escalation Practices



**Help ! I'm not  
in Kansas  
anymore**

DoD is changing the way we handle Inflation and Escalation in Cost Modeling

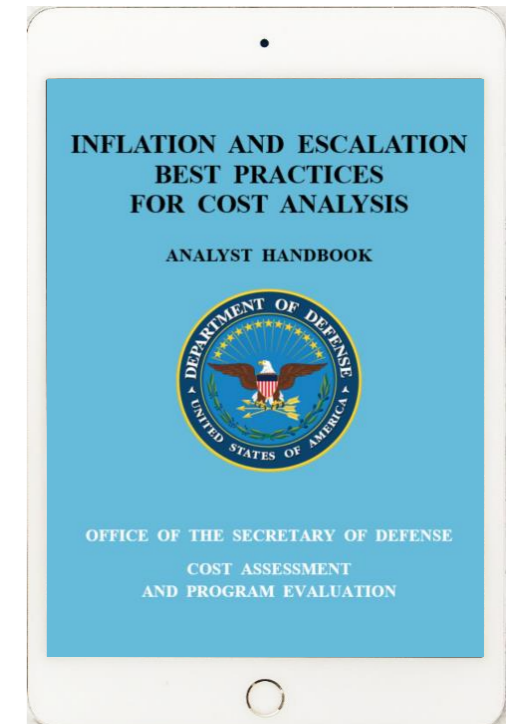
Is your cost model set up adequately to identify and handle all the components of inflation and escalation correctly?

# OSD CAPE Inflation and Escalation Guidance

In December 2021, OSD CAPE published updated guidance on inflation and escalation practices

## CAPE Goals

- ✓ Account for differences between inflation and escalation
- ✓ Adopt consistent terminology
- ✓ Use realistic escalation rates to estimate costs in Then-Year dollars
- ✓ Make long-term assumptions about fuel prices, military pay, others rates that balance realism and stability of estimates
- ✓ Normalize inputs appropriately for use in cost estimate calculations
- ✓ Use Then Year and Constant Year dollars for external budgeting and decision making reports
- ✓ Document and label all indices used



These guidelines go beyond OSD: they are **cost estimation best practices**

# Empowering Analysts to Adopt New Practices

## ACEIT 8.2 is designed and developed to...

**Adopt new terminology:** update cost types throughout suite

**Guide transition:** automate existing model transition to new terminology and document updates

**Label indices clearly:** expand capabilities to distinguish between inflation and escalation



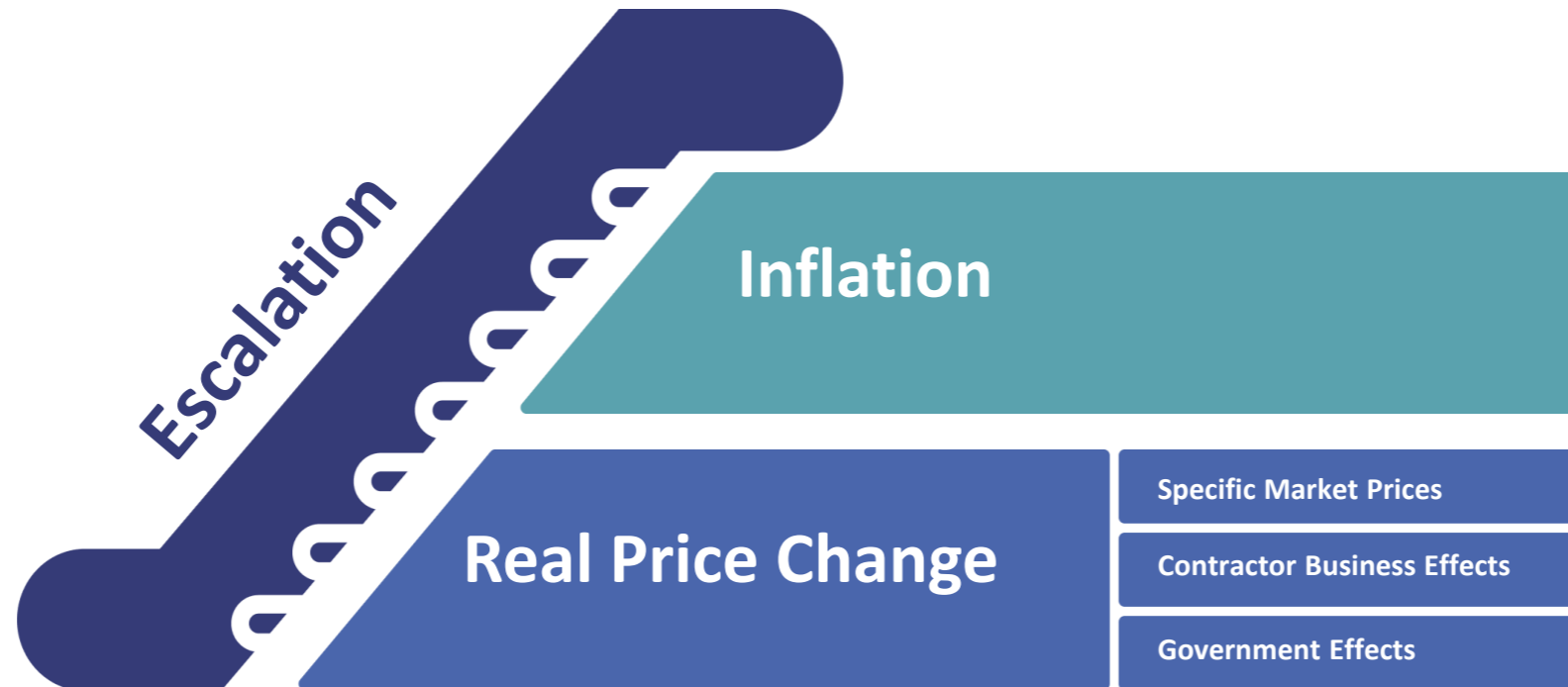
**Facilitate new cost method data entry:** include Constant Year cost types

**Enhance reports for all cost types:** convert reports to the new terminology

**These goals can and should be applied to any model adaptation of the OSD guidelines**

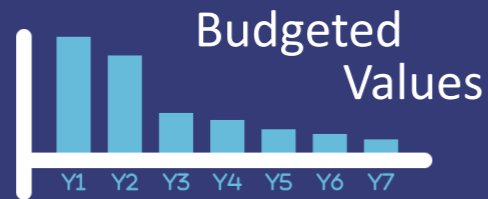
# Price Change: Not Just Inflation

Inflation	Real Price Change*	Escalation*
Economy-wide price change	Any price change a commodity experiences not explained by inflation  *Includes specific market price changes, contractor business effects, government effects	Overall price change to specific commodity  *Includes Inflation and Real Price Change



# Focus on Obligations vs Expenditures

## Obligations



Obligations - recorded prior to disbursement of funds from US Treasury

Include adjustment for timing of expected expenditure (**outlay profile**)

## Expenditures



Expenditures - dollars at the time they leave US Treasury to pay a bill

No time delay means no need to adjust for future changes in value (**no outlay profile**)

### Important distinction when selecting indices:

Weighted indices incorporate outlay profiles;  
appropriate for **Obligations**

Raw indices do not incorporate outlay profiles;  
appropriate for **Expenditures**

# New Cost Types for Improved Clarity

## Constant Year (CY\$)

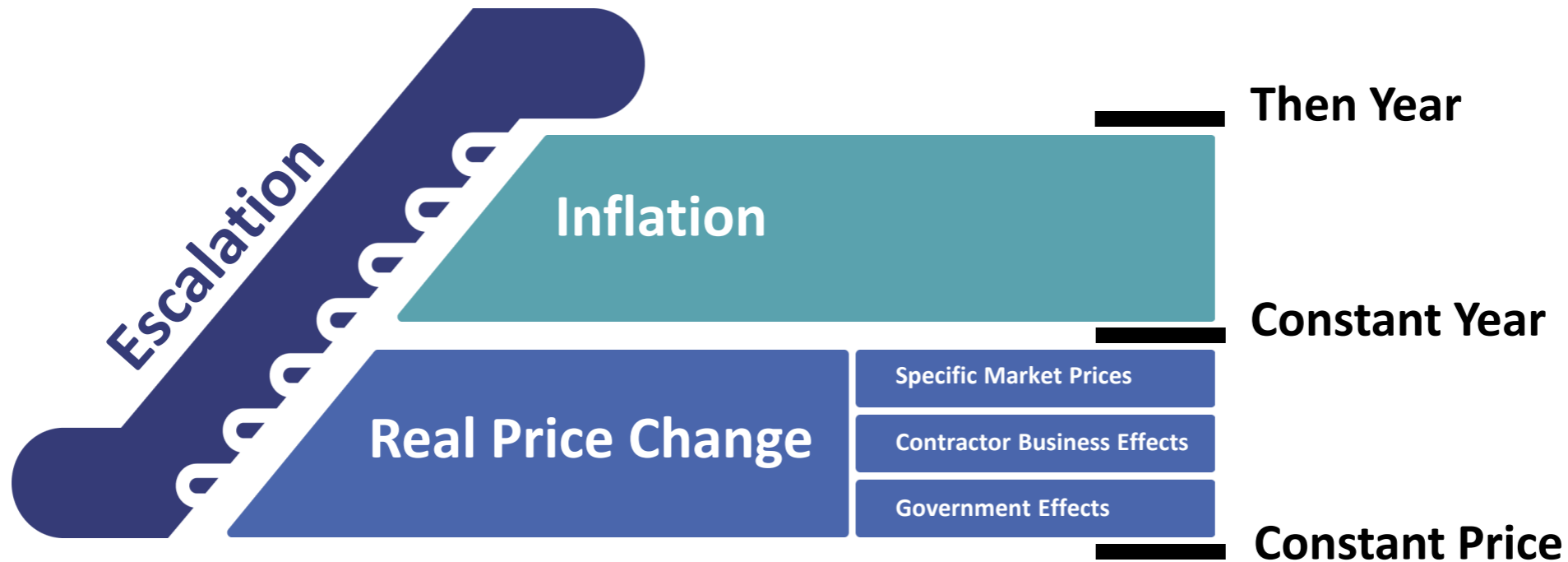
Impacts of real price change included, but not inflation

Often called “real dollars” outside DoD

## Constant Price (CP\$)

Impacts of escalation not included (no inflation or real price change)

Expressed relative to a single normalization year



# Time has run **OUT** for **BASE YEAR** dollars

## Constant Price & Constant Year dollars are **IN**



By replacing Base Year dollars (BY\$) with CP\$ or CY\$ cost estimators can more easily:

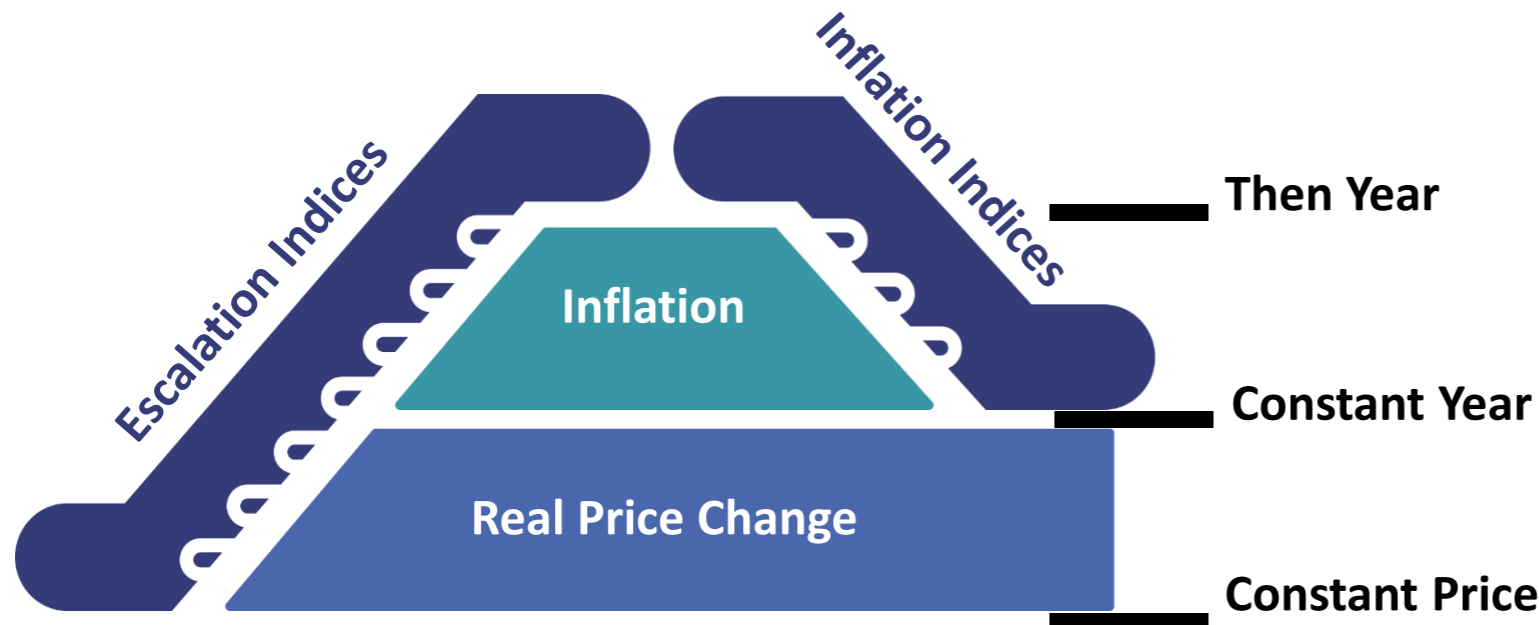
- ✓ Understand if costs include impacts of real price change or not
- ✓ Identify type of index used to produce each value

# Escalation and Inflation Index Types

DoD seeks to have well defined **escalation** and **inflation** indices

With these two measurements, all three major cost type categories can be calculated

- Real Price Change indices not well defined



## In ACE:

Escalation defined in **Approp** column

WBS/CES Description	Approp	Deflator Index
Basic Structure (AF)	APR	APR_D

Inflation defined in **Deflator Index** column

WBS/CES Description	Approp	Deflator Index
Basic Structure (AF)	APR	APR_D

# New Cost Type Terminology in ACEIT

## Constant Price

**CP** Normalized to remove the effects of escalation and any outlay profile

ACEIT 8.1 term: **Base Year (BY) dollars**

## Then Year Obligations

**TYO** Contain effects of Escalation and outlay profiles

ACEIT 8.1 term: **Then Year (TY) dollars**

## Constant Year Obligations

**CYO** Contain effects of Real Price Change and outlay profiles

ACEIT 8.1 term: **Reportable BY (Results only)**

## Then Year Expenditures

**TYE** Contain effects of Escalation but no outlay profiles

ACEIT 8.1 term: **Same Year (SY) dollars**

## Constant Year Expenditures

**CYE** Contain effects of Real Price change but no outlay profile

ACEIT 8.1 term: **Reportable BY (Results only)**

**ACEIT 8.2 adopts OSD CAPE Handbook cost terms.  
Whatever model you use, it is important to map your old terminology to the new**

# ACEIT 8.2 Details and Lessons Learned

# Summary of High Profile Updates to ACE

1. Session Results in Constant Price
2. Renamed “Fiscal Year” Column “Norm. Year”
3. Updated Phasing Methods to new cost types
4. Support for CY\$ inputs with Deflator Index and Trans. Year
5. Review Tags Pane tracks system cost type changes
6. Results in new Cost Types

The screenshot displays the ACE software interface with a spreadsheet titled 'Input Sheet - Methodology'. The spreadsheet has columns for 'WBS/CES Description', 'Approp', 'Deflator Index', 'Unique ID', 'Point Estimate', 'Phasing Method', 'Equation / Throughput', 'Norm. Year', 'Trans. Year', and 'Units'. The 'Phasing Method' column shows 'TYO' for rows 5 and 6. The 'Review Tags' pane at the bottom lists system tags such as 'BY to CP' and 'TY to TYO' with their respective locations and content.

Row	WBS/CES Description	Approp	Deflator Index	Unique ID	Point Estimate	Phasing Method	Equation / Throughput	Norm. Year	Trans. Year	Units
3	*Budget Information									
4	▲ Procurement Budget				\$ 369,926.88					
5	Air Force Aircraft (APF) Budget	APR	APR_D		\$ 247,171.068	TYO	[Cost Throughput]			\$K
6	Army Aircraft (APA) Budget	APW	APW_D		\$ 122,755.815	TYO	[Cost Throughput]			\$K
7	*Estimate									
8	▲ Total				\$ 401,668.173					
9	▲ Procurement			Proc\$	\$ 401,668.173					
10	▲ Air Force Procurement	APR	APR_D		\$ 266,865.768					
11	▲ Manufacturing (Air Force)	APR	APR_D	AF_Mfg\$	\$ 191,613.339					
12	▲ Air Vehicle (AF)	APR	APR_D	AF_AV\$	\$ 156,600.276					
13	Basic Structure (AF)	APR	APR_D		\$ 78,922.262	R				Struc_T1\$
14	Navigation/Guidance	APR	APR_D		\$ 16,032.223	FP	StepVal(TVal(@AFBuyQty), @BBQL,@BBQL\$,6)*AFBuyQty			

# Lesson Learned: Adopting new Terminology is Essential

New Landscape: To improve clarity the OSD handbook expands from two to five cost types

For ACEIT we: Changed column fields to align with the handbook

Changed and added new cost types

Added session tracking to identify how sessions are impacted when transitioning to ACEIT 8.2

**You will get lost in the forest if you don't adopt the terminology**

# Support for CY\$ Inputs

The screenshot displays a software interface with several callouts highlighting key features and validation messages:

- Requires Deflator Index:** Points to the 'Deflator Index' column in the input table.
- Rate Types shows Esc or Inf:** Points to the 'Deflator Type' column.
- Supports Time Phased and Equation Inputs:** Points to the 'Phasing Method' column.
- New Trans. Year column:** Points to the 'Trans. Year' column.
- Validation helps analysts with ACE definitions: Missing Norm Year:** Points to an error message in the log: "CCYO phasing method with no Norm. Year input, session Norm. Year will be used."

Row	WBS/CES Description	Approp	Approp Type	Deflator Index	Deflator Type	Unique ID	Point Estimate	Phasing Method	Equation / Throughput	Norm. Year	Trans. Year	Units
<b>WBS</b>												
2	Ground Station Total Cost	APW	Esc	APW_D	Inf	GST\$	\$ 99.927	CCYO	100		2022	\$K
3	Ground Station Annual Cost	APW	Esc	APW_D	Inf	GSA\$	\$ 97.568	CYE	[Cost Throughput]	2020	2022	\$K

Error Code	Row #	Severity	Description	Column Name	Case
MTH562	2	Warning	Unused variable 'GST\$'.	Unique ID	
PHZ1226	2	Warning	CCYO phasing method with no Norm. Year input, session Norm. Year will be used.	Equation / Throughput	Point Estimate
MTH562	3	Warning	Unused variable 'GSA\$'.	Unique ID	

# Results and Reports in All Cost Types

- Clear cost type selection
- Obligations vs. Expenditure options emphasized

Row	WBS/CES Description	Total: Point Estimate	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030
WBS									
2	*EXAMPLE FILE*								
3	*Budget Information								
4	Procurement Budget	\$ 369,926.883				\$ 17,753.893	\$ 17,350.516	\$ 21,169.945	\$ 24,800.819
5	Air Force Aircraft (APR) Budget	\$ 247,171.068				\$ 13,335.573	\$ 13,035.751	\$ 12,742.670	\$ 12,456.178
6	Army Aircraft (APW) Budget	\$ 122,755.815				\$ 4,418.319	\$ 4,314.765	\$ 8,427.275	\$ 12,344.642
7	*Estimate								
8	Total	\$ 401,668.173				\$ 18,013.440	\$ 19,380.773	\$ 21,550.739	\$ 23,161.395
9	Procurement	\$ 401,668.173				\$ 18,013.440	\$ 19,380.773	\$ 21,550.739	\$ 23,161.395
10	Air Force Procurement	\$ 266,865.768				\$ 13,465.744	\$ 14,820.617	\$ 13,206.994	\$ 11,631.915

Report Name: Phased Report

Report Title: CP Phased Costs

**Cost Type**

General

Constant Price

Then Year Obligations

Then Year Expenditures

Constant Year Obligations

Constant Year Expenditures







RISK

Case

Configuration Info

OK Cancel

# Cost Types Updated Across the ACEIT Suite

 <p>Flight Control Hardware 1...n (Specify) Flight Control Software Release 1...n (Specify) Flight Control Software CSCI 1...n (Specify) Auxiliary Power Subsystem Auxiliary Power Integration, Assembly, Test, and Checkout Auxiliary Power Hardware 1...n (Specify) Auxiliary Power Software Release 1...n (Specify) Auxiliary Power Software CSCI 1...n (Specify) Hydraulic Subsystem Hydraulic Integration, Assembly, Test, and Checkout</p> <h2>ACE</h2>	 <p>08,366,060 75,611,233 57,111,111 45,050,390 78,909,449 56,851,111</p> <h2>CO\$TAT</h2>	 <h2>POST</h2>	 <p>Stacks of coins</p> <h2>INFLATION</h2>	 <h2>JACS</h2>	 <p>Library shelves</p> <h2>LIBRARIAN</h2>
<p><u>Updated Cost Types</u></p> <ul style="list-style-type: none"> <li>Phasing Methods</li> <li>Data Tables</li> <li>Cost overrides</li> <li>Sunk costs</li> <li>Summary Sections</li> <li>Results/Reports /Charts</li> </ul> <p><u>New Columns</u></p> <ul style="list-style-type: none"> <li>Norm. Year</li> <li>Deflator Index</li> <li>Approp/ Deflator Type</li> <li>Trans. Year</li> </ul> <p><u>New Cost Types</u></p> <ul style="list-style-type: none"> <li>CY Obs</li> <li>CY Exp</li> </ul> <p><u>Other</u></p> <ul style="list-style-type: none"> <li>New Inf/Esc Functions</li> <li>Updated Plug-ins</li> <li>System Tags</li> <li>Backwards Compatibility</li> <li>Inf/Esc index labels</li> <li>New .ACT file extension</li> <li>Updated error logging</li> <li>Outlay Reporting</li> <li>What-If Analysis for Inf/Esc indices</li> </ul>	<ul style="list-style-type: none"> <li>Norm. Year</li> </ul>	<ul style="list-style-type: none"> <li>Updated Cost Types             <ul style="list-style-type: none"> <li>Results</li> <li>Reports</li> <li>Charts</li> </ul> </li> <li>Norm. Year</li> </ul>	<ul style="list-style-type: none"> <li>Updated Cost Types</li> <li>Updated Function</li> <li>Updated Wizard</li> </ul>	<ul style="list-style-type: none"> <li>Updated Cost Types</li> <li>Norm. Year</li> </ul>	<ul style="list-style-type: none"> <li>Inf / Esc index labels</li> <li>Increased code / term length</li> <li>Negative codes</li> </ul>
<p>Help text updated throughout the suite</p>					

# Lesson Learned: Look for ways to improve Transparency

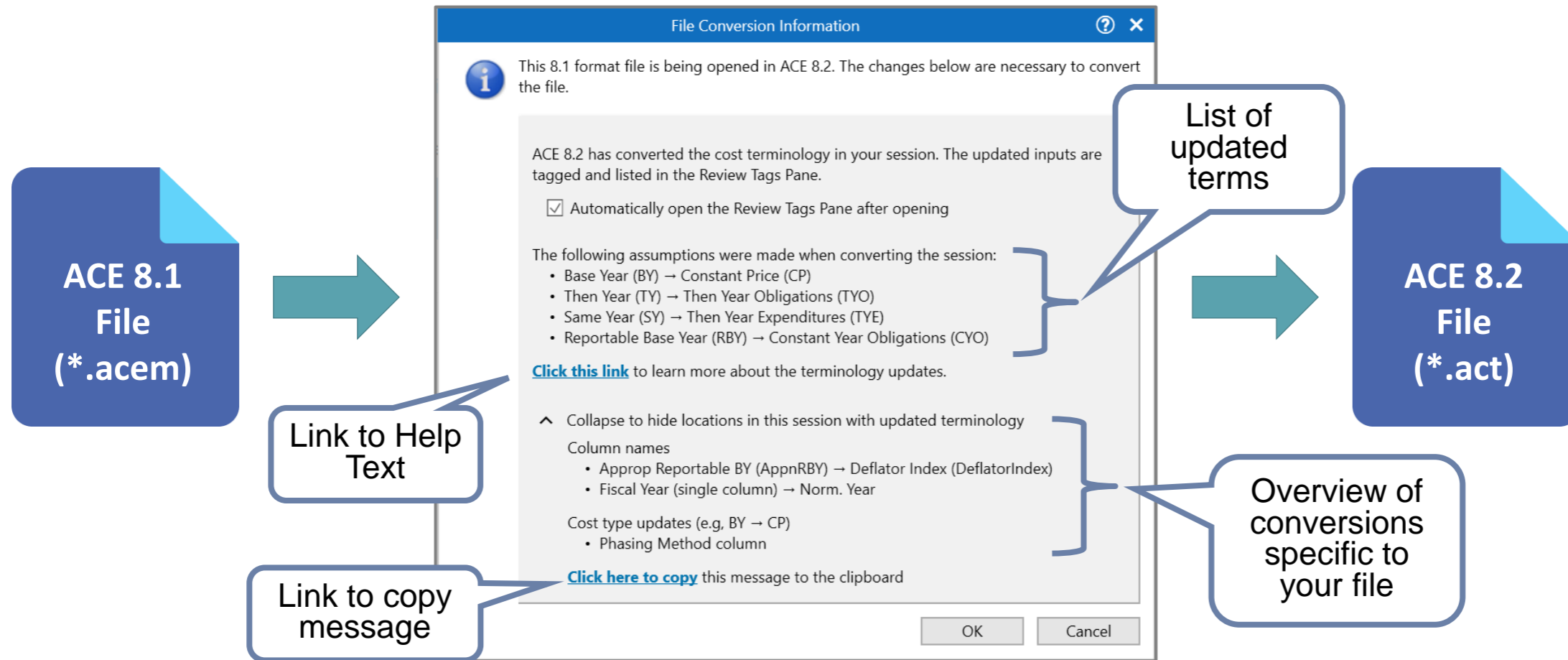
Pain point: Analysts and decision makers don't know what cost types they are looking at

For ACEIT we:

- ✓ Clearly labeled cost types for
  - ✓ Obligations and Expenditures
  - ✓ Inflation and Escalation
- Added a Transaction Year column to clearly handle Constant Year cost types
- Updated all ACEIT Applications for continuity on ACE Input and Outputs

**You have to know what is going on behind the curtain – transparency is necessary**

# Process of Transitioning Files



When opening an existing session in ACE 8.2 there is messaging to help the user through the process

# Analyst Responsibility after Conversion



DoD Analyst

**ACE 8.2 automatically converts terminology**

**Analyst must review and update as desired**



The screenshot displays the ACE 8.2 software interface. At the top, there are navigation tabs: 'Input Form - Methodology', 'Input Sheet - Methodology' (selected), 'Results - Phased Costs', 'Overrides - Phased', and 'Charts - Estimate'. Below these is a data table with columns: Row, WBS/CES Description, Approp, Deflator Index, Unique ID, Point Estimate, Phasing Method, Equation / Throughput, Norm. Year, Trans. Year, and Units. Row 65 is highlighted with a blue background and a 'CP' tag. Row 66 is highlighted with a brown background and an 'Updated Interpretation' tag. Below the table is a 'Review Tags' pane with a 'Show Tagged Cells' toggle, a 'Type' dropdown set to 'System Tags', and a 'State' dropdown set to 'Unreviewed'. The pane contains a table with columns: Tags, Location, Content, Reviewed, and Comments. Three tags are listed: 'BY to CP' (Row 65, Phasing Method), 'BY to CP' (Override: Lower Cost Propulsion, Row 61), and 'Updated Interpretation' (Row 66, Phasing Method). Callout boxes point to the 'Show Reviewed, Unreviewed, or All tags' dropdown, the 'Review tags' button, and the 'Delete tags' button.

Row	WBS/CES Description	Approp	Deflator Index	Unique ID	Point Estimate	Phasing Method	Equation / Throughput	Norm. Year	Trans. Year	Units
63	*Block Buy Unit Cost Prices for N									
64	Block Buy Quantity Limits			BBQL		I	[Input Throughput]			
65	Block Buy Cost at Quantity Limits	APR	APR_D	BBQL\$	\$ 674.477	CP	[Cost Throughput]	2021		\$K
66	GS Su		D	GSPay\$	\$ 69.564	C	68000	2023		\$
67	Grou		D	GSHWUC\$			75	2021		\$K
68	Grou		D	GSTVUC\$			65	2021		\$K

Tags	Location	Content	Reviewed	Comments
BY to CP	Row 65, Phasing Method	CP		
BY to CP	Override: Lower Cost Propulsion, Row 61 (Cost Interpre	CP2020\$K		
Updated Interpretation	Row 66, Phasing Method	C		[System Note: Constant cost interpreted as CP (previously BY)]

**Review Tags Pane** lists every change made to the session

**Main Pane** shows cells with conversions visibly tagged

# Lesson Learned: Automate but with Flexibility

- Challenge:** The mapping between the cost types is not exclusive
- Analysts have to look at their existing models, understand their cost inputs, and carefully select the appropriate cost types
- Example: BY is not always the same as CP
- Vision:** Our automation vision was to automate as much as we could but provide a mechanism to handle deviations
- Transition is dependent on analyst interpretation
- For ACEIT we:**
- ✓ Assisted with the model transition to the new terms but we require the analyst to review the changes
  - ✓ Introduced more explicit cost types including obligations and expenditure specification

**Beware of Magic Wands**

# New Features Added to Support Inflation/Escalation

## New Global Case Overrides

The screenshot displays the 'Global Overrides for Change Approp' dialog box, which is used to apply global overrides to the entire session. The dialog box contains a table with the following data:

Apply override to	Existing value	Override with	
1	Approp	APR	NOINF
2	Approp	APW	NOINF
3	Approp	MPR	NOINF
4	Approp	MPW	NOINF
5	Approp	OMR	NOINF
6	Approp	OMW	NOINF
7	Approp	RDTER	NOINF
8	Approp	RDTEW	NOINF

Below the dialog box, the 'Cases' table is visible, showing a list of cases with their respective override settings. The 'Global Overrides' column is highlighted in blue, indicating that the override is applied globally.

Case Name	Compare	Time Last Calculated	Description	Overrides	Individual Row Overrides	Overrides on Total	Overrides on RISK	Overrides on Custom	Global Overrides
Propulsion, Ground Station, and O&S Mods	<input type="checkbox"/>		Overrides to NREC complexity factor and Propulsion un	Yes	9	✓			
More Detailed Uncertainty	<input type="checkbox"/>		Changed uncertainty to put low and high percent of PE	Yes	4		✓		
Inflation as a Global Overric	<input type="checkbox"/>			Yes	0				✓

Visible on Overrides – Custom Text Columns  
 Appears blue, but not bold, to distinguish between global and row-based index overrides

Override an Index throughout the session - includes data tables and functions

# Lesson Learned: Start Planning for the Future

**Innovations:** As analysts gain more control over the inflation/escalation details – they will be able to explore ideas

**For ACEIT we:** Our new Global What – If feature allows for examining changing index selections across the model and comparing the results of cases

**Use all the tools available to start looking into the future**

# The Software is Updated...What's Next?

Inflation/Escalation Index Properties

Inflation/Escalation Index Details

Code: 7000 Revision Date: 18-Mar-2024 Use Current

Term: APW Revision Time: 00:00:00

Phase Code: FSED Norm. Year: 2024

Inf/Esc Label: Escalation (Esc)

Description: Aircraft Procurement - Whiskey (Esc)

Raw Inputs

Fixed Rate  Raw Factors  Annual Change (%)

From Year: 1980 To Year: 2124

ACEIT 8.2 allows you to **label indices** as *Inflation, Escalation, or Other*

- ✓ Add labels in the **LIBRARIAN**
- ✓ View labels in ACE columns and reports
- ✓ Create new indices for inflation or escalation in Librarian Custom Tables
- ✓ Utilize new cost types

**Updated software unlocks functionality.  
Now it's up to the community to evolve their indices.**

# Lesson Learned: Work Remains

**Observation:** What we are hearing from the community is that analysts want more specification on published tables

**For ACEIT we:** We created the plumbing to handle various escalation and inflation approaches

**What work remains:**

- Evolve Indices to better label what they cover
- Generate new Indices

**Guide the Munkins with service and commodity specific escalation and inflation indices**

# Conclusion

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ACEIT is empowering DoD analysts  
to transition to new escalation  
framework

Escalation issues properly  
conquered in our models...

*then this is a day of  
independence for all the  
Munchkins and their  
descendants.*

# More Information

Visit [www.ACEIT.com](http://www.ACEIT.com)

Please contact ACEIT Support

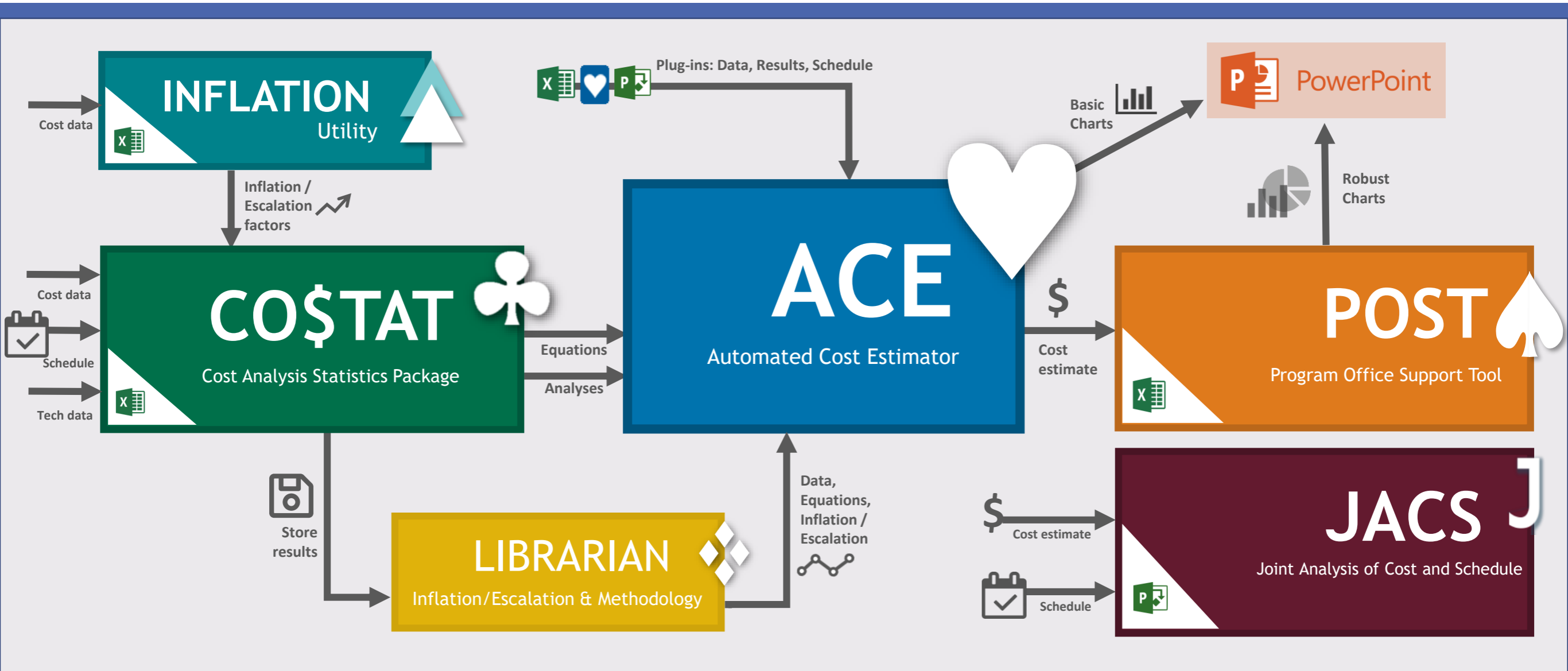
Email: [aceit\\_support@tecolote.com](mailto:aceit_support@tecolote.com)



# Backup



# ACEIT 8.2 Architecture



# Session Results in Constant Price

- Constant Price used to understand historical trends, compare costs, develop CERs
- ACE sessions calculated in CP\$ of user-selected Norm. Year

The screenshot shows the ACE software interface with the following data in the spreadsheet:

Row	WBS/CES Description	Approp	Deflator Index	Unique ID	Point Estimate	Phasing Method	Equation / Throughput	Norm. Year	Trans. Year	Units
3	*Budget Information									
4	▲ Procurement Budget				\$ 369,926.883					
5	Air Force Aircraft (APF) Budget	APR	APR_D		\$ 247,171.068	TYO	[Cost Throughput]			\$K
6	Army Aircraft (APA) Budget	APW	APW_D		\$ 122,755.815	TYO	[Cost Throughput]			\$K

# Renamed Session “Base Year” and “Fiscal Year” Column to “Norm. Year”

- **Base Year** and **Fiscal Year** terms were overloaded in ACEIT
- Session base year renamed Norm. Year
- Renamed to Norm. Year as a descriptor year of normalization

### Options

**General**

Inflation/Escalation

Calculation

Format

Advanced

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User Settings

#### General

**Estimate Information**

Program Name:

Norm. Year:

Units:  Currency:

First Year:  Last Year:

Default Case:

Row	WBS/CES Description	Approp	Deflator Index	Unique ID	Point Estimate	Phasing Method	Equation / Throughput	Norm. Year	Trans. Year	Units
56	*Production Inputs									
57	*Cost Inputs									
58	▲ Air Vehicle T1				\$ 1,934.457					
59	Basic Structure T1	APR	APR_D	Struc_T1\$	\$ 1,255.835	C	1200	2022		\$K
60	Navigation/Guidance T1	APR	APR_D		\$ 160.590	C	TVal(@BBQL\$, SFirst)			
61	Propulsion T1	APR	APR_D	PropT1\$	\$ 518.032	C	495	2022		\$K
62	Transportation Unit Cost	APR	APR_D	TransUC\$	\$ 10.706	C	10	2021		\$K

# Updated Cost Phasing Methods

Phasing Methods drive how ACE calculates a row's equation or time phased inputs

## Time Phased Inputs

## Equation/Throughputs

Row	WBS/CES Description	Approp	Deflator Index	Unique ID	Point Estimate	Phasing Method	Equation / Throughput	Norm. Year	Trans. Year	Units
64	Block Buy Cost at Quantity	APR	APR_D	BBQL\$	\$ 674.477	CP	[Cost Throughput]	2021		\$K

Row	WBS/CES Description	Approp	Deflator Index	Unique ID	Point Estimate	Phasing Method	Equation / Throughput	Norm. Year	Trans. Year	Units
60	Propulsion T1	APR	APR_D	PropT1\$	\$ 493.065	CTYO	495		2022	\$K

Input Form - Methodology | Input Sheet - Methodology | Results - Phased Costs | Overrides - Phased | Charts - Estimate

Title: Block Buy Cost at Quantity Limits

Unique ID: BBQL\$ | CES#: | WBS#: | PE Value: \$ 674.477

CP
  TY obs.
  TY exp.
  CY obs.
  CY exp.

Approp: APR | Deflator Index: APR\_D | Norm. Year: 2021 | Units: \$K

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Yearly Input	150	125	100	95	85	75

Input Form - Methodology | Input Sheet - Methodology | Results - Phased Costs | Overrides - Phased | Charts - Estimate

Title: Propulsion T1

Unique ID: PropT1\$ | CES#: | WBS#: | PE Value: \$ 493.065

Periodic
  Constant

Equation/Value: 495

Calculate Constant:  Non-cost / CP  TY obs.  CY obs.  CY exp.

Approp: APR | Deflator Index: APR\_D | Norm. Year: | Trans. Year: 2022 | Units: \$K

### Time Phased Cost Phasing Methods

Yearly/Monthly cost data entered by time period

CP TYO TYE CYO CYE

ACEIT 8.1 terms: **BY, TY, SY**

### Equation/Throughput Cost Phasing Methods

ACE uses the term "Constant" for non-Time phased methods

C CTYO CCYO CCYE

ACEIT 8.1 terms: **C and CTY**

# ACEIT 8.2 Training

Instructors with real-world experience with ACEIT provide hands-on training.



In-person



Self-paced



Onsite



## ACEIT for Model Builders

- Construct an estimate
- Enter methods
- Incorporate Uncertainty
- Generate a CER
- Create What-if Cases
- Open estimate in POST

Introductory Course  
4 Days of Instruction



## ACEIT for Reviewers

- Review an estimate
- Understand methods
- Understand Uncertainty
- Generate Reports

Introductory Course  
2 Days of Instruction



## ACEIT for Advanced Model Builders

- Modeling Durations
- Advanced Functions
- Data Table
- Advanced Uncertainty Analysis
- Model Integration

Advanced Course  
4 Days of Instruction



## ACEIT for CER Developers

- Dataset Organization
- Understand the dataset
- Analyze the dataset
- Validate the analysis
- Document

Independent Course  
2 Days of Instruction



## ACEIT for Schedulers

- Introduction to Joint Confidence, JACS, and MS Project
- Using JACS to build a JCL
- Analysis Results
- Working with JACS files

Independent Course  
2 Days of Instruction