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Using the ACE-to-ACE Plug-in to
Add a Brigade Combat Team (BCT) Estimate View to an Future
Combat Systems (FCS) Platform Based Estimate View

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Agenda

- Purpose

- G-8 vs. DASA-CE Costing

- Commodity Group ACEIT Files

- System of Systems ACEIT File With a BCT View

- ACE-to-ACE Discussion

- ACE-to-ACE Demo

- Summary

Purpose

- To Explain How to Use the ACE-to-ACE Plug-in Using the Future Combat System Estimate as an Example. Scenario was that G8 (Army Affordability Function) Wanted an Independent Comparison of Their Estimate to That of DASA-CE.

G8 vs DASA-CE Costing

- **G8**
  - Spreadsheet Based Using Just a Few Tabs in an Excel File
  - Unit Cost * Quantity
  - No Detail Behind the Unit Cost
  - Costing of a BCT Organization and Total FCS
  - Simple Quantity Drills

- **DASA-CE (Sep 08)**
  - Several Commodity Group (CG) ACEIT Files
  - Existing System of System (SoS) File Only Estimated Costs Above the CG File
    - Relied on the ACE Executive & Excel to Produce Total FCS Cost
    - No Provision for Costing by BCT

WBS/CES Description
FCS BCT (FBCT) - Core
MGV - Manned Ground Vehicles
NLOS-C, Spl
ICV
MCS
NLOS-C
NLOS-M
C2V
RSV
RMV
MV-E
MV-T
Un-Manned Ground Vehicles
ARV-L (Mule-Assault)
MULE-Countermine
MULE-Transport
SUGV
UAV - Un-Manned Aerial Vehicles
UAV - Class I
UAV - Class IV

Commodity Group (CG) ACEIT Files

- Structured by Acquisition Costing Directorate Organization
  - Weapon Systems Division
    - Manned Ground Combat Vehicles (MGVs) – 9 Platforms
    - Unmanned Ground Vehicles (UGVs) – 4 Platforms
    - Unmanned Aerial Vehicles (UAVs) – 2 Platforms
    - Non-Line-of-Site Launch System (NLOS-LS) – 1 Platform
  - Networks, Information Software & Electronics costing Division (NISEC) Teams
    - Software – Network and Platform Development & Support
    - Networks & Electronics Team – Communications, Computers, Sensors, etc. (C4ISR) – All Platforms represented

- Some CG File Attributes
  - Produced by Subject Matter Experts
  - Very detailed
  - Large ACEIT files
  - Sensitive to Phasing and Learning
  - Cost by CG Total and Platforms Within The CG
  - Summary Section with Platform Unit Cost Calculations

Army Cost Element Structure

- Appropriation-based, time-phased
- Produces Detailed Estimates Typically for a Single Item
- Shown Below,
    - 1.0 – Research, Development, Test & Evaluation (RDT&E)
    - 2.0 – Procurement

	WBS/CES Description
108	**Total MGV Family (x.xx level)**
109	Total MGV
110	1.0 - RDT&E Funded Elements
111	1.01 - Development Engineering
112	1.02 - Production Engineering & Planning (PEP)
113	1.03 - Development Tooling
114	1.04 - Prototype Manufacturing
115	1.05 - Systems Engineering / Program Management
116	1.06 - System Test and Evaluation
117	1.07 - Training
118	1.08 - Data
119	1.09 - Support Equipment
120	1.10 - Development Facilities
121	1.11 - Other RDT&E

WBS/CES Description
2.0 - Procurement Funded Elements
2.01 - Non-Recurring Production
2.02 - Recurring Production
2.03 - Engineering Changes
2.04 - Systems Engineering / Program Management
2.05 - System Test & Evaluation
2.06 - Training & Devices
2.07 - Data
2.08 - Support Equipment
2.09 - Operational / Site Activation
2.10 - Fielding
2.11 - Training Ammunition / Missiles
2.12 - War Reserve Ammunition / Missiles
2.13 - Modifications
2.14 - Other Procurement

Average Procurement Unit Cost (APUC)

- Each CG file has Summary Sections Containing APUC Calculations
- Army CESs 2.01 – 2.10 & 2.14 (Other)
- Phased APUC Calculation
  - Learning effect
  - Doesn't Mask Large Variations by Year
  - Requires Production Quantities to Calculate
  - Allocated to platform by year
- Non-allocated to Platform, Phase by Year,
  - Actually Allocated to platform, but
  - Requires No Production Quantities to Calculate

409	APUC - Phased			
410	ICV - Infantry Carrier Vehicle	APUC_ICV_2$	If(Prod_Q_ICV >0, SumIf(ProcurementCost_ByVariant, Platform_ID, @MGV_Tot_$)/Prod_Q_ICV ,0)	F
411	MV-T - Medical Vehicle - Treatment	APUC_MEV_T_2$	If(Prod_Q_MEV_T > 0, SumIf(ProcurementCost_ByVariant,	F
412	MV-E - Medical Vehicle - Evacuation	APUC_MEV_E_2$	If(Prod_Q_MEV_E >0, SumIf(ProcurementCost_ByVariant,	F
413	MCV - Mounted Combat System	APUC_MCS_2$	If(Prod_Q_MCS > 0, SumIf(ProcurementCost_ByVariant,	F

421	APUC - Phased, non-Allocated			
422	ICV - Infantry Carrier Vehicle	Proc_Non_allocated_ICV_2$	If(Prod_Q_ICV =0, SumIf(ProcurementCost_ByVariant, Platform_ID, @MGV_Tot_$))	F
423	MV-T - Medical Vehicle - Treatment	roc_Non_allocated_MEV_T_2	If(Prod_Q_MEV_T = 0, SumIf(ProcurementCost_ByVariant,	F
424	MV-E - Medical Vehicle - Evacuation	roc_Non_allocated_MEV_E_2	If(Prod_Q_MEV_E =0, SumIf(ProcurementCost_ByVariant,	F

SoS ACEIT File with BCT View

- Goal: Add Costing of an Organization

- Show Break-Out by Commodity Group and Specific Platforms

- BCTs per Year w/Excel Quantity Spreadsheet Copy/Paste

- Use ACE-to-ACE Plug-in to Transfer Phased Unit Costing from CG Files to SoS

- Total FCS Cost in One ACEIT file

- Sensitive to Quantity Drills

WBS/CES Description	Equation / Throughput	Phasing
FCS BCT (FBCT) - Core		
MGV - Manned Ground Vehicles		
NLOS-C, Spl	Prod_Q_FBCT_MGV_NLOS_C_Spl * APUC_MGV_NLOS_C_Spl_2$	F
ICV	Prod_Q_FBCT_MGV_ICV *	F
MCS	Prod_Q_FBCT_MGV_MCS *	F
NLOS-C	Prod_Q_FBCT_MGV_NLOS_C *	F
NLOS-M	Prod_Q_FBCT_MGV_NLOS_M *	F
C2V	Prod_Q_FBCT_MGV_C2V *	F
RSV	Prod_Q_FBCT_MGV_RSV *	F
RMV	Prod_Q_FBCT_MGV_RMV *	F
MV-E	Prod_Q_FBCT_MGV_MV_E *	F
MV-T	Prod_Q_FBCT_MGV_MV_T *	F
UAV - Un-Manned Aerial Vehicles		
UAV - Class I	Prod_Q_FBCT_UAV_Class_I *	F
UAV - Class IV	Prod_Q_FBCT_UAV_Class_IV *	F
Un-Manned Ground Vehicles		
ARV-L (Mule-Attack)	Prod_Q_FBCT_UGV_MULE_A *	F
MULE-Countermine	Prod_Q_FBCT_UGV_MULE_C *	F
MULE-Transport	Prod_Q_FBCT_UGV_MULE_T *	F
SUGV	Prod_Q_FBCT_UGV_SUGV *	F

ACE-to-ACE: Roadmap

- Excel Quantity Spreadsheet Feeds the following (Copy/Paste)
  - Commodity Group (CG) Files
    - Command, Control Communication, Intelligence, Surveillance, Reconnaissance (C4ISR)
    - Manned Ground Vehicles (MGVs)
    - Un-Manned Ground Vehicles (UGVs)
    - Un-Manned Aerial Vehicles (UAVs)
    - Non-Line-Of_Sight Launch System (NLOS-C)
  - System of Systems (SoS) File

- C4ISR File Feeds the Following Files Through the ACE-to-ACE Plug-in
  - Remaining CG Files Through the ACE-to-ACE Plug-in for Total Platform Hardware Cost.
  - SoS File for Non-Allocated C4ISR

- CG Files FeedS SoS Through the ACE-to-ACE Plug-in with
  - Phased RDTE Cost
  - Phased Platform Allocated and Non-AllocatedCosts

- The SoS File Receives Data from
  - Excel Quantity Spreadsheet
  - CG Files
  - C4ISR File
  - Software File

ACE-to-ACE: Definition

- From ACE Help
  - The Focus of This Plug-In is to Allow the User to Import and Update Three Types of Results from One Session into Another:
    - Phased Results (Cost and Non-Cost). Phased Results Will be Brought Over into the Yearly Phasing Columns
    - Total Results (Cost and Non-Cost). Total Results will be Brought Over into Dynamic Equation Columns (DEC)
    - RI$K Results. RI$K Distribution Results Become Custom CDFs.

- Plug-in Also Brings Over Other DECs, Such as Session Path and Case Name.

ACE-to-ACE: Add Workscreen in Destination Files

- For Any File that will Receive ACE-to-ACE Plug-in Data
- Will Add Eight Dynamic Equation Columns to the Active Workscreen.
- To Avoid Changing Your Favorite Workscreen Use Workscreen Arrange Feature to Create a New Workscreen Before Adding These DECs
- Two of the Comment DECs Used for Linking to New Scenarios Within the Source Files
    - ACE_SESSION (*) ACE Session Path
    - ACE_CASE_NAME (*) Source Case Name
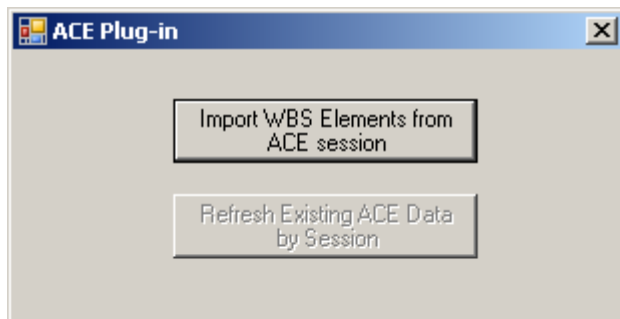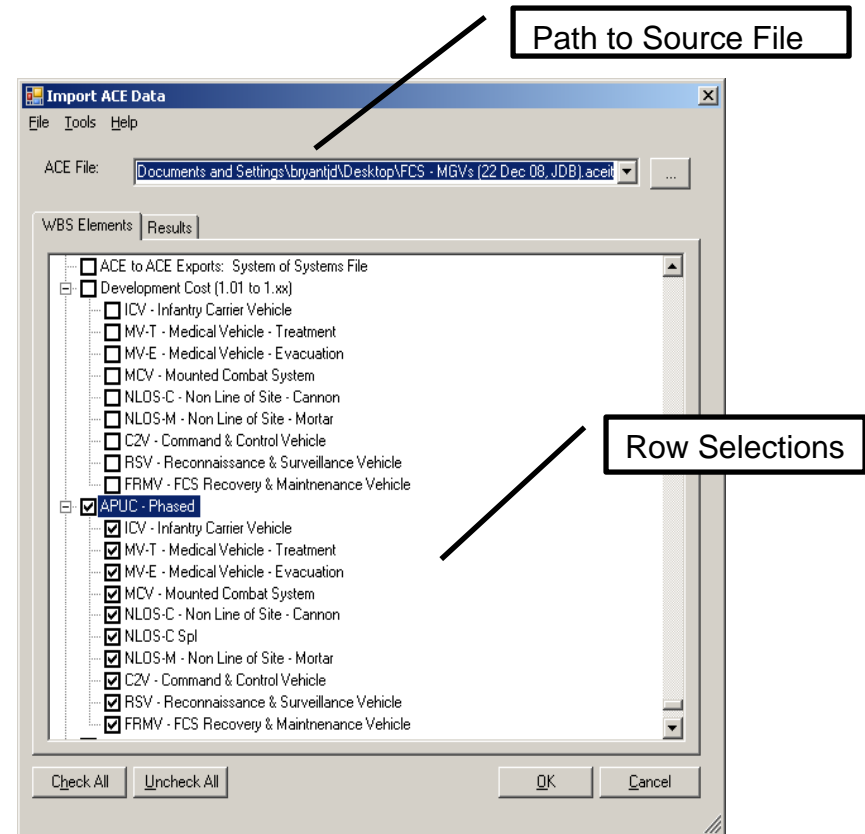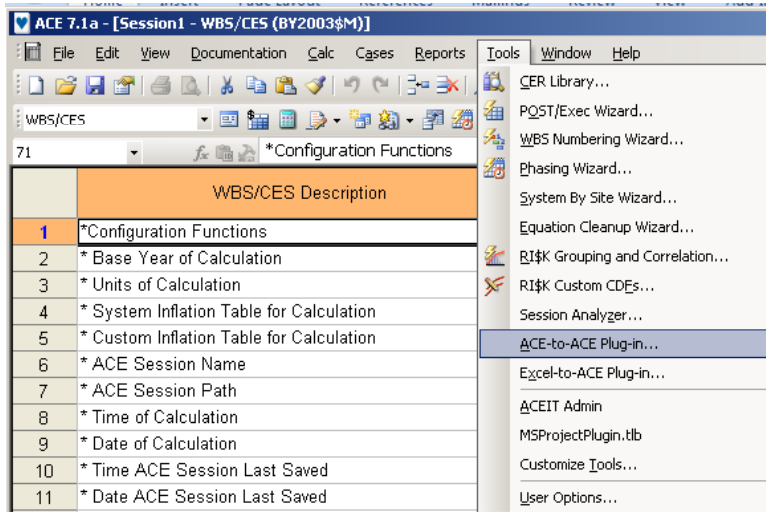- Example Below is the Information the SoS File gets from MGV CG File

WBS/CES Description	ACE_SESSION (*) ACE Session Path	ACE_CASE_NAME (*) Source Case Name
*** C:\Documents and Settings\bryantjd\D	C:\Documents and Settings\bryantjd\Desktop\FCS - MGVs (22 Dec 08, JDB).aceit	
APUC - Phased	C:\Documents and	BASELINE
ICV - Infantry Carrier Vehicle	C:\Documents and	BASELINE
MV-T - Medical Vehicle - Treatment	C:\Documents and	BASELINE
MV-E - Medical Vehicle - Evacuation	C:\Documents and	BASELINE
MCV - Mounted Combat System	C:\Documents and	BASELINE
NLOS-C - Non Line of Site - Cannon	C:\Documents and	BASELINE
NLOS-C Spl	C:\Documents and	BASELINE
NLOS-M - Non Line of Site - Mortar	C:\Documents and	BASELINE
C2V - Command & Control Vehicle	C:\Documents and	BASELINE
RSV - Reconnaissance & Surveillance V	C:\Documents and	BASELINE
FRMV - FCS Recovery & Maintnenance	C:\Documents and	BASELINE

ACE-to-ACE: Dialog Boxes

- Example Below Shows Selection of Information File Being Pulled from the MGV CG File

Path to Source File

Row Selections

ACE-to-ACE: Imported Data

- Give it a Case Specific Variable Name so the Information can be Transferred to Where it is Needed in the Estimate
- Example Below is Some of the Information the MGV CG File gets from C4ISR CG File

WBS/CES Description	Approp	Unique ID	Equation / Throughput	Phasing	Fiscal Year	Units
ACE to ACE Imports: C4ISR file						
C4ISR Cost: Baseline (Mar 06)						
MGVs						
2.0 - Procurement						
MCS	OPA	Case_Base_MCS_C4ISR_2$	[Cost Throughput]	BY	2003	$K
ICV	OPA	Case_Base_ICV_C4ISR_2$	[Cost Throughput]	BY	2003	$K
NLOS-M	OPA	Case_Base_NLOS_M_C4ISR_2$	[Cost Throughput]	BY	2003	$K
NLOS-C	OPA	Case_Base_NLOS_C_C4ISR_2$	[Cost Throughput]	BY	2003	$K
NLOS-C Special Interest	OPA	Case_Base_NLOS_C_Spl_C4ISR_2$	[Cost Throughput]	BY	2003	$K
C2V	OPA	Case_Base_C2V_C4ISR_2$	[Cost Throughput]	BY	2003	$K
RSV	OPA	Case_Base_RSV_C4ISR_2$	[Cost Throughput]	BY	2003	$K
MV	OPA	Case_Base_MV_C4ISR_2$	[Cost Throughput]	BY	2003	$K
FRMV	OPA	Case_Base_FRMV_C4ISR_2$	[Cost Throughput]	BY	2003	$K

Transfer Variable Section

- Can Make an Import Section to Organize the Data
- Assign "Transfer" Variables to the Imported Rows so the Data can be Used Elsewhere in the Estimate.
- Updates
  - Simple Refresh (i.e., No Record of Previous Data is Needed)
  - New Case (Record is Desired)
    - Move Transfer Variable
    - Use Case Function
- The Figure Below Shows the APUC Transfer Variables for the SoS File.

WBS/CES Description	Approp	Unique ID
APUC - Phased		
ICV - Infantry Carrier Vehicle	WTCV	APUC_MGV_ICV_2$
MV-T - Medical Vehicle - Treatment	WTCV	APUC_MGV_MV_T_2$
MV-E - Medical Vehicle - Evacuation	WTCV	APUC_MGV_MV_E_2$
MCV - Mounted Combat System	WTCV	APUC_MGV_MCS_2$
NLOS-C - Non Line of Site - Cannon	WTCV	APUC_MGV_NLOS_C_2$
NLOS-C Spl	WTCV	APUC_MGV_NLOS_C_Spl_2$
NLOS-M - Non Line of Site - Mortar	WTCV	APUC_MGV_NLOS_M_2$
C2V - Command & Control Vehicle	WTCV	APUC_MGV_C2V_2$
RSV - Reconnaissance & Surveillance V	WTCV	APUC_MGV_RSV_2$
FRMV - FCS Recovery & Maintnenance	WTCV	APUC_MGV_RMV_2$

Case Function: Definition

- From ACE Help

  Purpose:

  This function allows the use of selectors to pick a specific case value from a user-identified list.

  Syntax:

  Case (Selector, CaseValue1, ..., CaseValueN **)**
  where N > 1, 1 <= Selector <= N

  Selector

  This argument is an integer to select the case value from the list to return. The first case value in the list
    (CaseValue1) is returned by using a selector value of 1, and the CaseValueN is returned using a value of N
    for the Selector. The Selector's value must be between 1 and N
    inclusive. The selector argument can either be a value or a variable, but must be an integer.

  CaseValue1, ..., CaseValueN

  This argument is a list of values, variables, or mathematical expressions. There must be at least 2 case values to
    choose from and each case value must be separated by a comma

ACE-to-ACE: Import Transfer Section with Case Function

- **Transfer Section**
  - Moves the Information from the Import Section to Where it is Needed in the Estimate
  - Uses Case to Provide for Multiple Scenarios

- **Preserves All Cases**
  - One File, Rather Than Many.
  - Compare Several Scenarios Using the Inputs Results Viewer
  - Underlying Methodology Changes are Easier to Handle (i.e., Exported Items like APUC, don't change)

WBS/CES Description	Unique ID	Equation / Throughput	Phasing	Fiscal Year	Units
ACE-to-ACE: C4ISR Import Transfer section					
Which Case	WhichCase	1	C		
MGVs					
1.0 - RDTE					
MCS	MCS_C4ISR_1$	Case (WhichCase, Case_Base_MCS_C4ISR_1$, Case G8 POM MCS C4ISR 1$)	F		
ICV	ICV_C4ISR_1$	Case (WhichCase, Case_Base_ICV_C4ISR_1$,	F		

ACE to ACE Imports: C4ISR file					
C4ISR Cost: Baseline (Mar 06)					
MGVs					
1.0 - RDTE					
MCS	Case_Base_MCS_C4ISR_1$	[Cost Throughput]	BY	2003	$K
ICV	Case_Base_ICV_C4ISR_1$	[Cost Throughput]	BY	2003	$K

ACE-to-ACE: MGV Inputs Results Viewer

- Change MGV Quantities for Drill
  - Simple Copy Paste Overrides for Now, (Will Use CASE Function in the Future)
- Change Case for Imported Data (C4ISR, in This Case)

BASELINE
G-8, P-Form Quantities, MGVs, v.13 (Aug 08)

	WBS/CES Description	Cost Interpretation	FY 2007	FY 2008	FY 2009	FY 2010
472	2.021 - Platform Production Quantities					
473	TOTAL VEHICLE PRODUCTION QUANTITIES				5.0 *	5.0 *
474	MANNED GROUND VEHICLES (MGV)				5.0 *	5.0 *
475	MCS					
476	ICV					
477	NLOS MORTAR					
478	NLOS-C					
479	NLOS-C Special Interest				5	5

BASELINE
G-8, P-Form Quantities, MGVs, v.13 (Aug 08) [out o

	WBS/CES Description	Cost Interpretation	Total
5415			
5416	ACE-to-ACE: C4ISR Import Transfer section		
5417			
5418	Which Case		2

ACE-to-ACE: Managing Cases in the Inputs Results Viewer

- Use for Both Source and Destination Files

- Create a New Case
  - Normally, Copy an Existing Case and Change the Name
  - In Example below, Case Name = G-8, P-Form Quantities, MGVs, v.13 (Aug 08)
  - Make Changes Based Upon Some Scenario
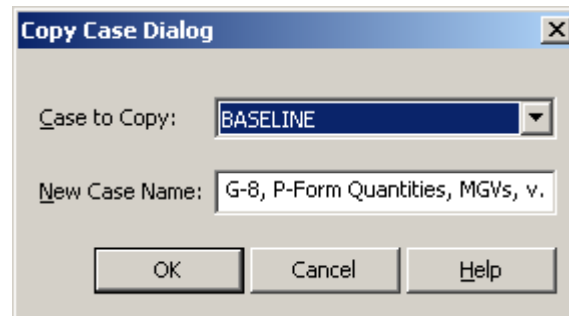
ACE-to-ACE: Managing Cases in CG & SoS Files

- For CG & SoS Destination Files

- Need to Copy/Paste New Case Name From the Inputs Results Viewer from the Source File to the ACE_CASE_NAME DEC in the Destination file

- If the Path/File Name has Changed then the ACE_SESSION DEC Must be Changed to Reflect the Change.

- Use the Procedure in the "ACE-to-ACE: Import Transfer Section with Case Function" Slide to Manage Multiple Scenarios.
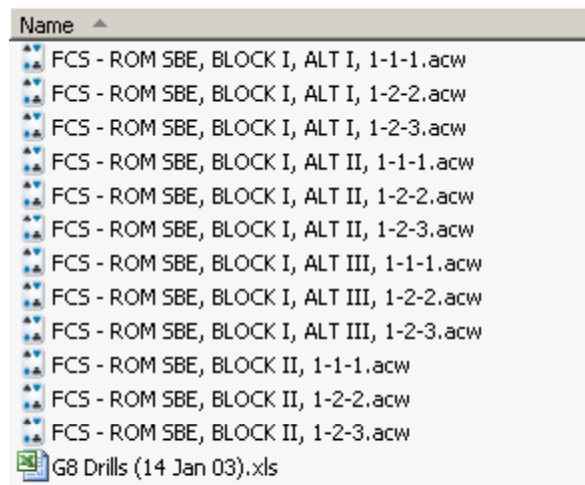
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MV-E - Medical Vehicle - Evacuation	C:\Documents and	BASELINE
MCV - Mounted Combat System	C:\Documents and	BASELINE
NLOS-C - Non Line of Site - Cannon	C:\Documents and	BASELINE
NLOS-C Spl	C:\Documents and	BASELINE
NLOS-M - Non Line of Site - Mortar	C:\Documents and	BASELINE
C2V - Command & Control Vehicle	C:\Documents and	BASELINE
RSV - Reconnaissance & Surveillance V	C:\Documents and	BASELINE
FRMV - FCS Recovery & Maintnenance	C:\Documents and	BASELINE

ACE-to-ACE: Advantages

- Done In-House, no Contractor Was Used This Time

- Can all be Done Within ACEIT, no Excel or ACE Executive.

- Eliminates Many Copy/Paste Errors

- The Average Drill can be Done in Less Than a Days vs. Up to Two and Half for One of the Older Methods

- The old way of 2003-2004
    - Many SoS Files to Keep Track Of, But no CG Files Yet
    - Prior to Phased Overrides & the Inputs Results Viewer.
    - Any Methodology Change had to be Duplicated in Each File.

Name ▲
- FCS - ROM SBE, BLOCK I, ALT I, 1-1-1.acw
- FCS - ROM SBE, BLOCK I, ALT I, 1-2-2.acw
- FCS - ROM SBE, BLOCK I, ALT I, 1-2-3.acw
- FCS - ROM SBE, BLOCK I, ALT II, 1-1-1.acw
- FCS - ROM SBE, BLOCK I, ALT II, 1-2-2.acw
- FCS - ROM SBE, BLOCK I, ALT II, 1-2-3.acw
- FCS - ROM SBE, BLOCK I, ALT III, 1-1-1.acw
- FCS - ROM SBE, BLOCK I, ALT III, 1-2-2.acw
- FCS - ROM SBE, BLOCK I, ALT III, 1-2-3.acw
- FCS - ROM SBE, BLOCK II, 1-1-1.acw
- FCS - ROM SBE, BLOCK II, 1-2-2.acw
- FCS - ROM SBE, BLOCK II, 1-2-3.acw
- G8 Drills (14 Jan 03).xls

Demo

- MGV File Set-Up
  - Create ACE-to-ACE Workscreen
  - Add ACE-to-ACE Export Section
    - Phased AUPC calculation
    - Non-Platform Allocated Phased Costs
  - ACE-to-ACE Import Section
    - Transfer Variables
    - Case Function
  - Add a New Case (Quantity Drill)

- Import to SoS File

Summary

- Set up
  - ACE-to-ACE Workscreen
  - ACE-to-ACE Export Section
  - ACE-to-ACE Import Section

- IRV
  - Add Cases
  - Case Name Management

- Update Source & Destination Files for each Case

- CG and Sos Files are Linked, but not Automated.
  - Session/Path & Case Name Need to be Current to Maintain Link
  - Import/Refresh, Calculate, Save for Information to be Current

- Saves Time When You Need It the Most