



Earned Value Management Practitioners Forum 2019

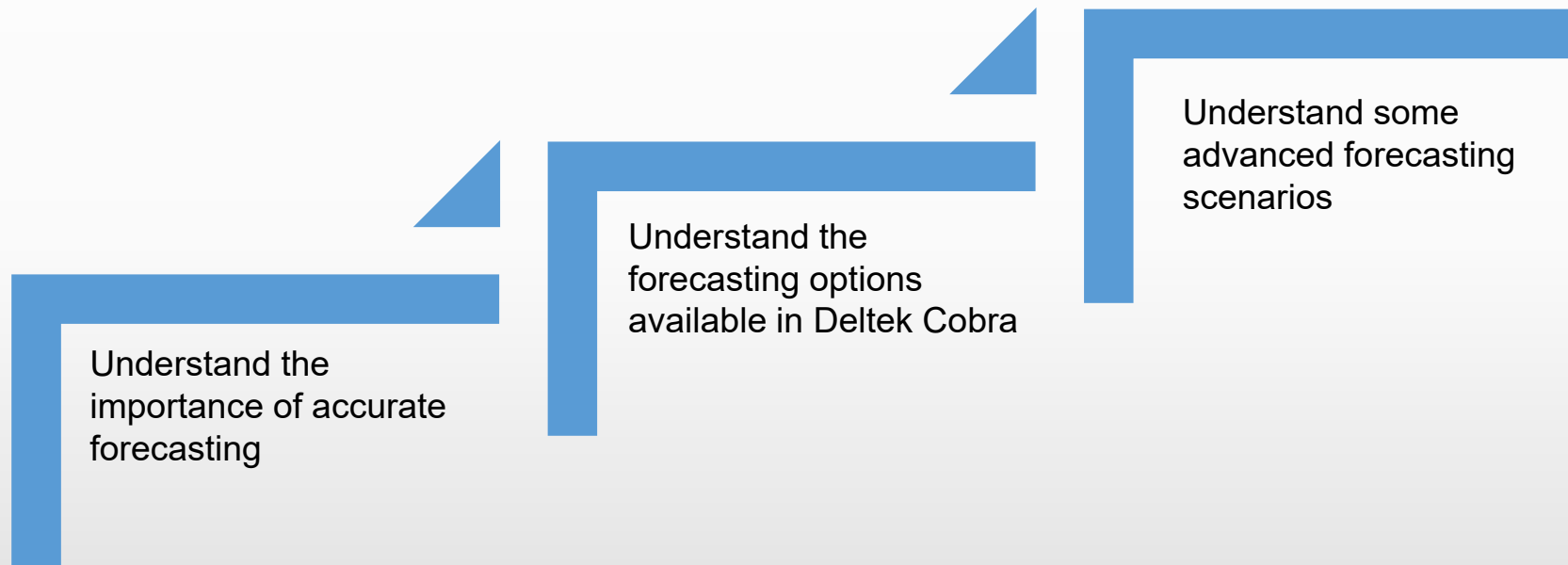
Forecasting Processes and Methods

Helping CAMs Identify Forecast Issues and Developing Estimates to Complete

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2019 EVMP Forum – October 9th and
10th, UVA Darden Center, Arlington VA

Learning Objectives



Agenda

- Overview of Forecasting in Cobra
- Forecasting Case Studies
- Forecast Update Methods

Why the Focus on Forecasting?

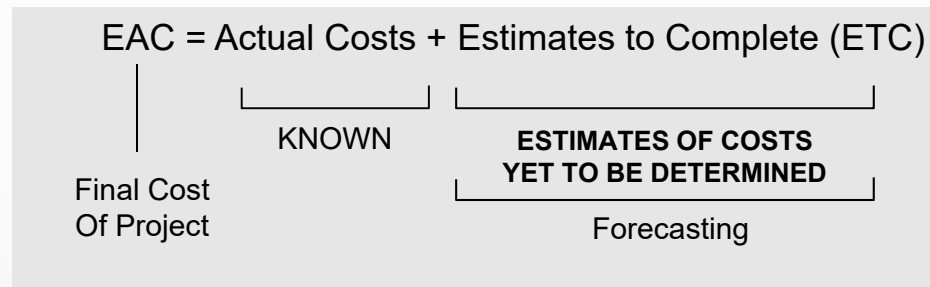
- Accurate forecasting is one of the more challenging issues that a project team will have to tackle through the life of any project or program
- Forecasting at completion costs (actuals to date + remaining forecast) for the project provides valuable insight to both the organization and customers, if done correctly
- Disciplined project management processes and tools facilitate the process of evaluating current projections, pricing new forecasts, and reporting the data internally and externally
- What drives forecast changes
 - Rate changes – both indirect and direct
 - Changes to the project timeline
 - Funding changes

Forecasting Overview

- Cobra has a powerful forecasting capabilities that can be easily scaled depending on the project requirements
- An unlimited number of time-phased forecasts can be created, including:
 - Optimistic, pessimistic and most-likely forecasts for client reporting
 - Calculated forecast methods that use project status and past performance (such as CPI)
 - Multiple forecasts based on the effects of future rate changes
- Forecasts are maintained in cost classes, so they don't conflict with Budget/Earned/Actuals

Forecast Options

Forecasting allows the CAM to **estimate final cost of project (EAC)**



2 TYPES of forecasts in Cobra:

- Manual – Bottoms up estimate of TO GO effort; info can be manually entered or loaded from schedule
- Statistical / Calculated – calculates future cost based on formula that includes pas performance

ETC = BAC – EV (then PF based on past performance is applied)

The KINDS of forecasts you will typically need in Cobra:

- Customer forecast (retain EAC)
- Statistical forecast
- Support of further analysis based on different rates or date sets

Typical Forecast Scenario

- One of the more common forecasting scenarios that we see:
 - CAM is updating the forecast from the bottom up for their assigned Control Accounts
 - This may be in a resource loaded schedule, through a tool like PM Compass, or using excel files
 - Timeframe for updates varies from weekly, monthly, or quarterly
 - Those manual updates are compared to statistical forecasts to provide a validity check or frame of reference

Let's look at how this is supported by the tools...

Cost Classes

Class	Description	Class Type	Level
OTB	Over Target Baseline	Budget	Work Package
PA	Planning Account	Budget	Control Account
Replanned	Replanned Budget	Budget	Work Package
CAMs EAC	CAMs EAC (Retain ETC)	Forecast	Work Package
PA ETC	Planning Account Forecast	Forecast	Control Account
▶ Worst EAC	Statistical (1/CPI*SPI)	Forecast	Work Package
FF	Frozen EAC	Forecast	Work Package
Forecast	Customer EAC (Retain EAC)	Forecast	Work Package
Earned	Performed (BCWP)	Progress	Work Package

Forecast method: PF=1/(CPI*SPI) Prevent editing Time Phased Grid
Performance factor level: Control Account Include in EAC
 Suppress calculation of source results

Level: Work Package
Calendar Set: 00
Rate File: Project Rate File: Demo Advance Rate
Forecast Dates: Forecast

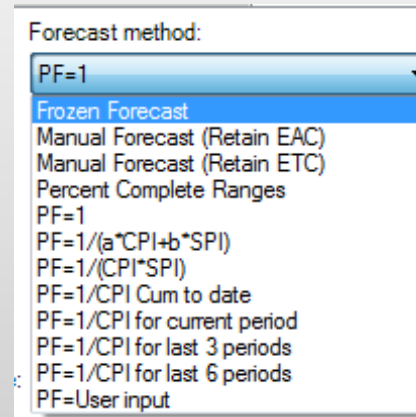
Classes are different buckets of money that fall into 4 major types: budgets, earned value, actuals, and forecasts

Additional forecast classes can be defined to track different types of information

For each class, you define different characteristics such as the calendar (controls time periods), rates, level of detail, etc.

Forecast Methods

- For forecast classes, some of the available options include:
 - Level - Can be entered/calculated at either the CA or WP level. However, you cannot generate forecasts for WPs if you have entered actual costs for the forecast at the CA level.
 - Define an alternate rate file, making it possible to consider forecasts using a range of “what-if” scenarios.
 - Define forecast cost classes using multiple forecast dates. This feature allows you to define one forecast based on early dates, another based on late dates, and still another based on default dates.
 - Choose which budget and actual cost classes should be considered when calculating performance factors and generating forecasts.
 - Forecast methodology →



Calculating Forecast

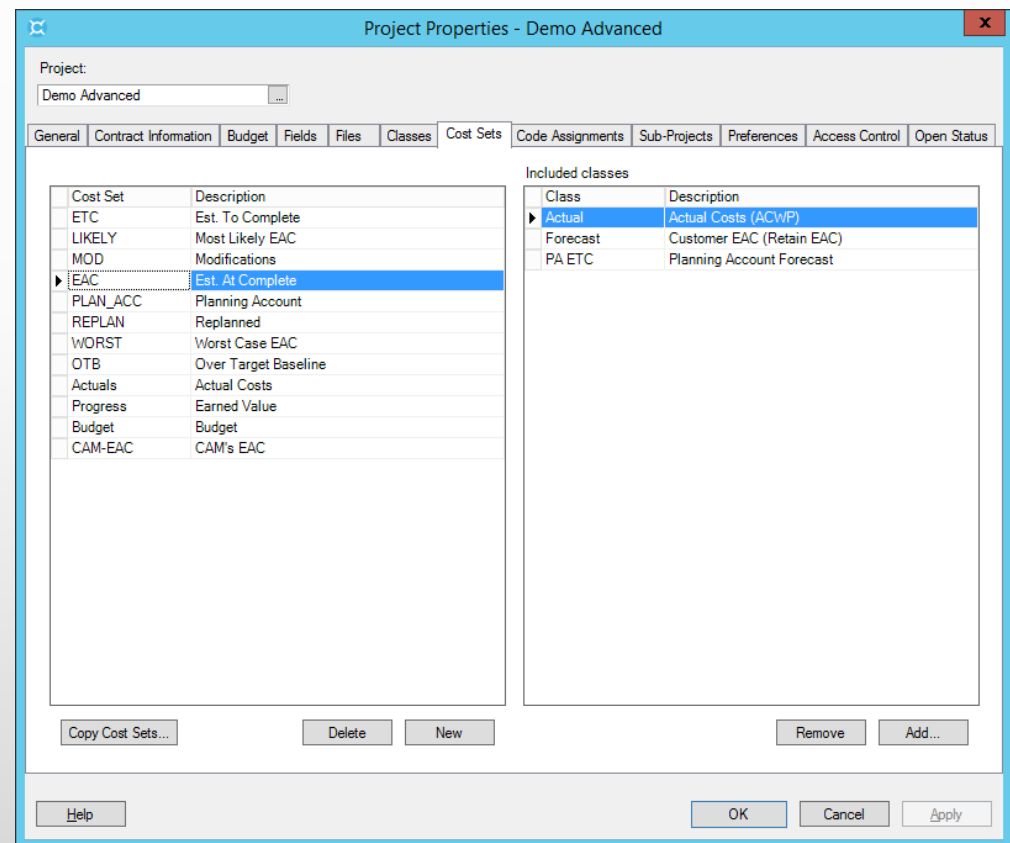
- During project execution, forecast classes are updated by running “Calculate Forecast” or “Freeze Forecast” on the Processes tab
- Calculate forecast will remove any forecast up to and including the status date as well as calculate the remaining forecast by resource assignment based on the selected method
- Freeze Forecast takes a snap shot of the selected cost set and copies it to the frozen class
 - Commonly used to copy the EAC cost set to a frozen class
 - Allows you to compare the current EAC to a prior period EAC

The screenshot displays a software interface with a main table and a detailed view. The main table lists project elements with columns for ID, WBS, Description, Start, End, Status, and various cost metrics. The detailed view, titled 'Time-phase Detail', provides a breakdown of costs by quarter and year.

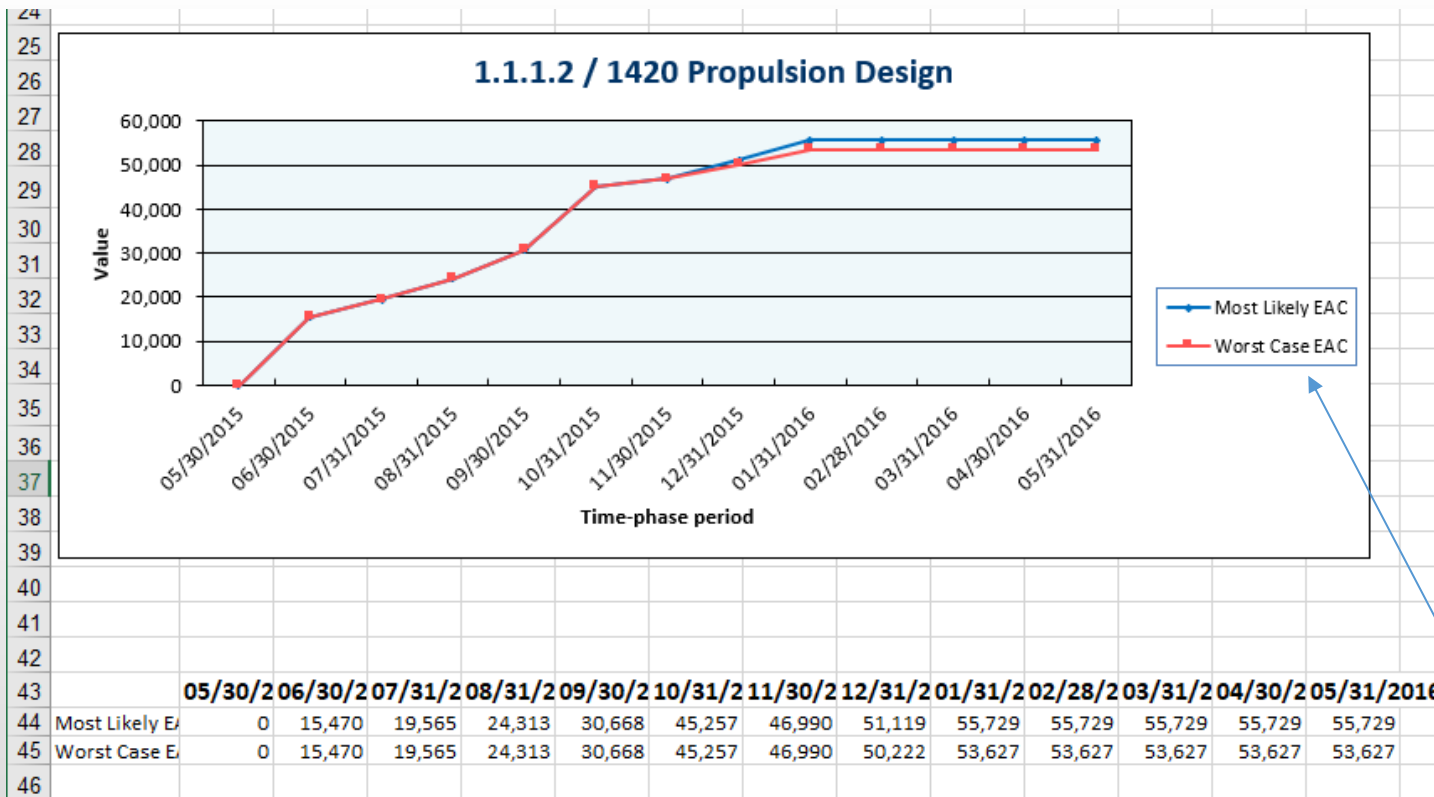
Result	Units	TOTAL	Q2_FY17	Q3_FY17	Q4_FY17	Q1_FY18	Q2_FY18	Q3_FY18
Percent		100.00	16.82	16.82	16.82	16.82	16.82	16.06
HOURS	HOURS	60,000.00	10,091.67	10,091.66	10,091.67	10,091.67	10,000.00	9,633.33
FTE	HEADS	345.69	58.27	58.38	57.39	57.39	58.67	55.59
DIRECT	DOLLARS	899,707.60	146,531.05	146,530.90	146,531.05	146,531.05	159,720.00	153,863.55
FRINGE	DOLLARS	31,489.77	5,128.59	5,128.58	5,128.59	5,128.59	5,590.20	5,385.22
OVERHEAD	DOLLARS	139,679.62	22,748.95	22,748.92	22,748.95	22,748.95	24,796.53	23,887.32
G&A	DOLLARS	107,087.70	17,440.86	17,440.84	17,440.86	17,440.86	19,010.67	18,313.61
COM	DOLLARS	99,770.16	16,115.35	16,115.34	16,115.35	16,115.35	17,984.10	17,324.67
Total Currency		1,277,734.85	207,964.80	207,964.58	207,964.80	207,964.80	227,101.50	218,774.37

Cost Sets

- Forecast classes can be combined with actual cost classes to determine at completion costs for reporting purposes



Truhfdw2HDF#Jhsrwlgj



Compare multiple cost sets to determine if bottoms up EAC is within tolerance of statistically calculated cost sets

Case Study 1

- Indirect rates are expected to change in the new fiscal year but prior to official approval, the baseline cannot be changed. The contractor would like to communicate the potential impact to the EAC prior to change becoming official.

Forecasting Rate Changes

- Changes to indirect rates can be forecasted using alternate cost classes associated with new rate files:
 1. Create the new rate file as a copy of the prior rate and change the indirect rate sets as necessary
 2. Create a new forecast cost class and the associated cost set(s) (rate variations will be easier to see with a manual forecast class)
 3. Assign the new rate file to the new class
 4. Reclass the current forecast into the new class and recalc to allow the new rates to take effect

Truhfdwhg#Jdwh#Dgmkwv hqww

Added New 2016
G&A Rate

Rate Set	Description	Date	Value
ASTRO	Astronomer	01/01/2015	0.100000
CHEM	Chemical Engineer	01/01/2016	0.120000
COM	Cost of Money		
DRAFT	Draftsman		
EENG	Electrical Engineer		
ERGOENG	Ergonomics Engineer		
FRINGE	Fringe benefit rate		
G&A	General and Administrative Rate		
MANAG	Management		
MONTHS	Staff Month (heads) rate		
OVERHEAD	Overhead		
SENG	Structural Engineer		
SYSAN	Systems Analyst		
TECH	Technician		

	A	B	AQ	AR	AS	AT	AU	AV
1	Control Account		09/30/2018	10/31/2018	11/30/2018	12/31/2018	01/31/2019	Cumulative
34	1.3.2 / 1220 Software Testing							
35		Budget	0.00	0.00	0.00	0.00	0.00	35,302.40
36		CAM's EAC	0.00	0.00	0.00	0.00	0.00	35,302.40
37		EAC with New Indirects	0.00	0.00	0.00	0.00	0.00	35,944.20
38	1.4 / 1500 Systems Checks							
39		Budget	0.00	0.00	0.00	0.00	0.00	88,478.33
40		CAM's EAC	0.00	0.00	0.00	0.00	0.00	45,339.90
41		EAC with New Indirects	0.00	0.00	0.00	0.00	0.00	46,164.05
42	1.6 / 1000 Launch Preparations							
43		Budget	0.00	0.00	0.00	0.00	0.00	1,307,734.85
44		CAM's EAC	0.00	0.00	0.00	0.00	0.00	1,307,734.85
45		EAC with New Indirects	0.00	0.00	0.00	0.00	0.00	1,307,734.85
46	Grand Total							
47		Budget	0.00	0.00	0.00	0.00	0.00	2,553,052.22
48		CAM's EAC	0.00	0.00	0.00	0.00	0.00	2,274,855.37
49		EAC with New Indirects	0.00	0.00	0.00	0.00	0.00	2,285,290.91

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Case Study 2

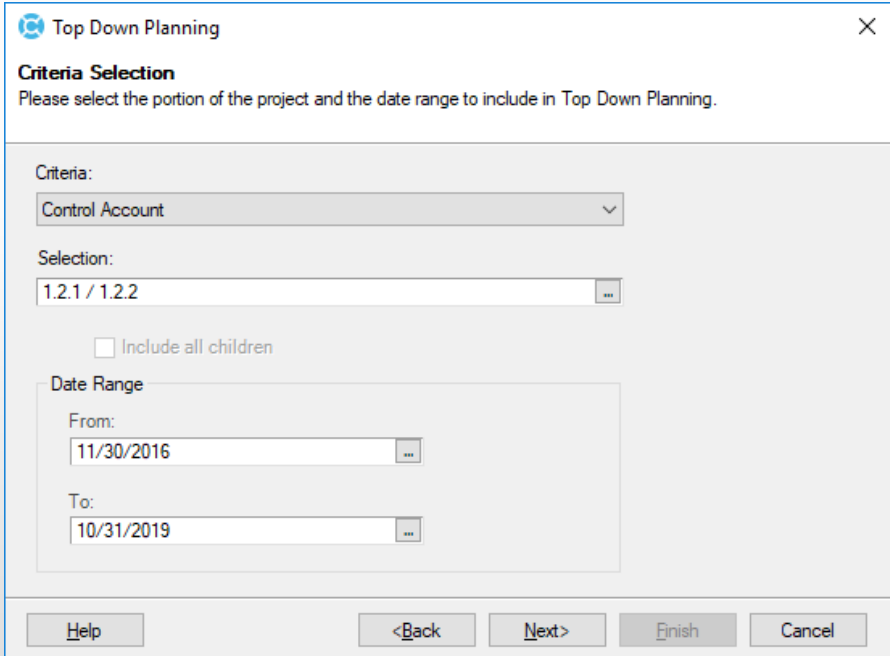
- Due to a personnel rate changes, the current EAC is over the contract value. The contractor has been asked to look for cost saving measures so a reduction in travel expenses is being explored.

Top Down Planning

- Allows users to create “what-if” scenarios based on proposal requirements
 - Specific budget for a FY
 - Specific budget for a WBS like Project Management
- Tool adjusts budgeted costs for any aspect of the project
 - Can be limited to specific CAs, WPs, or Resource Assignments
 - Adjusts hours to meet a designated dollar amount
- Remember:
 - Create backups before running the tool, changes can be undone
 - Flow of information from the scheduling tool to Cobra is one-way, changes resulting from Top Down Planning can’t be “imported” back into the schedule

Top Down Planning Wizard

- In this example, the overall forecast for Domestic Travel is \$165k
 - Change the criteria to Control Account and/or WBS and select the appropriate criteria
 - Users can also change the date range but we will leave the default option (the remaining periods in the project) for this example



The screenshot shows a software window titled "Top Down Planning" with a close button (X) in the top right corner. Below the title bar, the text "Criteria Selection" is displayed, followed by the instruction "Please select the portion of the project and the date range to include in Top Down Planning." The main area of the window contains several input fields: a "Criteria:" dropdown menu currently set to "Control Account"; a "Selection:" text box containing "1.2.1 / 1.2.2" with a search icon (three dots) to its right; an unchecked checkbox labeled "Include all children"; and a "Date Range" section with "From:" and "To:" labels, each followed by a text box containing a date ("11/30/2016" and "10/31/2019" respectively) and a search icon. At the bottom of the window, there are five buttons: "Help", "<Back", "Next>", "Finish", and "Cancel".

Top Down Planning Wizard (cont.)

- Select the Forecast cost class as the class you want to include in Top Down Planning
 - Users are limited to Forecast or Budget class types
 - Select all of the results that can be adjust to meet the target amount

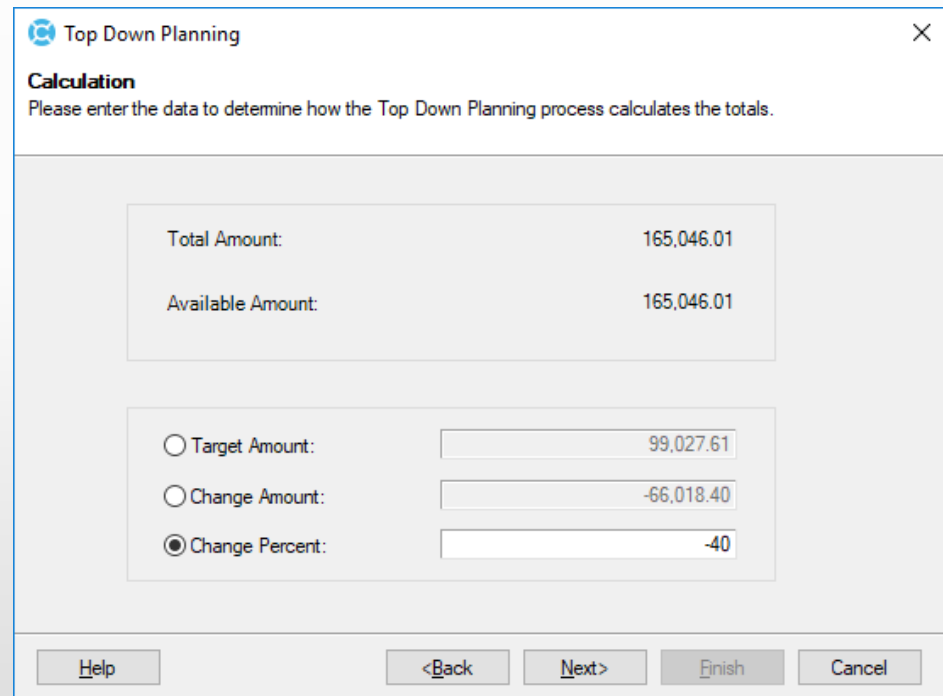
The screenshot shows the 'Classes' step of the Top Down Planning wizard. The title bar reads 'Top Down Planning' with a close button. Below the title, the text says 'Classes' and 'Please select the classes to include in Top Down Planning.' A table lists various classes with checkboxes and columns for Class, Description, and Class Type. The 'Forecast' class is selected with a checkmark and highlighted in blue. At the bottom, there are buttons for Help, <Back, Next>, Finish, and Cancel.

Classes:	Class	Description	Class Type
<input type="checkbox"/>	Budget	Current Budget (BCWS)	Budget
<input checked="" type="checkbox"/>	Forecast	Estimate To Complete (ETC)	Forecast
<input type="checkbox"/>	Forecast CPI	Forecast Based on CPI	Forecast
<input type="checkbox"/>	Forecast New Rates	Forecast Based on New Rates	Forecast
<input type="checkbox"/>	Funding INL		Budget
<input type="checkbox"/>	OTB	Over target baseline	Budget
<input type="checkbox"/>	Proposal_1		Budget
<input type="checkbox"/>	Replanned	Replanned Budget	Budget
<input type="checkbox"/>	Unfinalized Budget	Unfinalized Budget	Budget

The screenshot shows the 'Results' step of the Top Down Planning wizard. The title bar reads 'Top Down Planning' with a close button. Below the title, the text says 'Results' and 'Please select the results to include in Top Down Planning.' A list of results is shown with checkboxes: DIRECT, FRINGE, MH, OVERHEAD, and GANDA. All are checked. To the right of the list are buttons for 'Select All' and 'Deselect All'. At the bottom, there are buttons for Help, <Back, Next>, Finish, and Cancel.

Top Down Planning Wizard (cont.)

- Use the Calculation page to determine how new totals should be calculated
 - In this example we will reduce the Domestic Travel forecast by 40% which can be achieved using any of the options shown



The screenshot shows a software window titled "Top Down Planning" with a close button (X) in the top right corner. The window is divided into a header section and a main content area. The header section contains the title "Top Down Planning" and a sub-section titled "Calculation" with the instruction "Please enter the data to determine how the Top Down Planning process calculates the totals." The main content area is divided into two sections. The first section displays two rows of data: "Total Amount: 165,046.01" and "Available Amount: 165,046.01". The second section contains three radio button options for calculation methods: "Target Amount:" with a text box containing "99,027.61", "Change Amount:" with a text box containing "-66,018.40", and "Change Percent:" with a text box containing "-40". The "Change Percent:" option is selected. At the bottom of the window, there are four buttons: "Help", "<Back", "Next>", and "Cancel".

Field	Value
Total Amount:	165,046.01
Available Amount:	165,046.01
Target Amount:	99,027.61
Change Amount:	-66,018.40
Change Percent:	-40

Case Study 3

- Your organization is trying to assess the future resource needs on a large contract so they can make more informed decisions regarding hiring needs.

Resource Forecasting

- Cobra allows for flexibility in resource naming through the creation of the Resource Breakdown Structure

- RBS

- Labor

- Project Management
 - Level 1 PM
 - Level 2 PM
 - Level 3 PM
 - Administrator
 - Systems Engineering

- Non-Labor

- Travel
 - Materials
 - ODCs

- RBS

- Labor

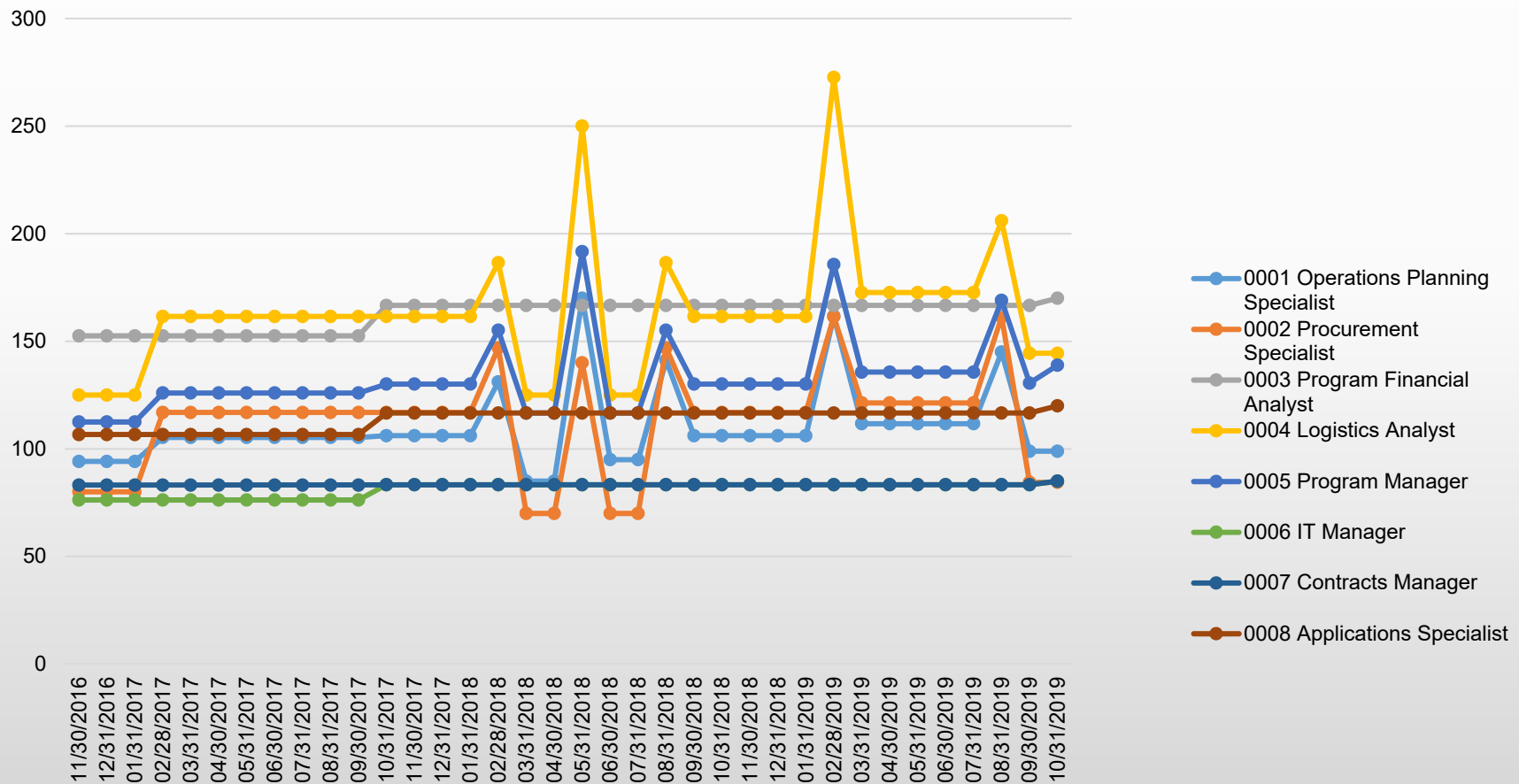
- Project Management
 - JOSEPH
 - ANNA
 - Systems Engineering

- Non-Labor

- Travel
 - Airfare
 - Meals
 - Materials
 - ODCs

Forecasting – Resource Estimates and Planning

Forecasted Resource Curve



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Forecast Integration Options - Direct Schedule Integration

- Resource loaded MS Project Server, Primavera, and Open Plan schedules allow for direct integration of baseline, forecast, and status information with Cobra
- No export files are necessary
- Initial setup required to establish the database connection for Project and Primavera
- The integration wizard prompts you to select how the schedule links to the project's key fields and which forecast class will be used

Pros

- Ensures cost / schedule integration
- No additional export required
- Bottoms up estimate at the activity level
- Time-phasing is easier to control in the schedule and replicate in Cobra

Cons

- Fluctuations in month to month statusing are reflected in the ETC
- Changes to the forecast have to be filtered through the scheduler

Forecast Integration Options - CSV/XML File

- Commonly used to integrate baseline, forecast, and status information from a resource loaded MS Project schedule
- If using CSV files you can create Activity & Resource Assignment files or a single combined file
- Schedule fields are mapped to Cobra fields in the integration wizard

Pros

- Ensures cost/schedule integration
- Bottoms up estimate at the activity level

Cons

- Requires export
- Difficult to control the time-phasing that gets imported into Cobra
- XML files can be very large
- Changes to the forecast have to be filtered through the scheduler

Forecast Integration Options - Resource Assignment Import / Export

- Good option for updating forecast if a resource loaded schedule is not available
- Existing forecast can be exported, modified in the excel file, and imported back into Cobra
- You can change the hours/dollars for the assignment, the way the resource is spread within the WP dates, or add new assignments

Pros

- Assignments are made at the Work Package level
- Formatted for reimport
- CAMs can make changes directly in the excel file

Cons

- Assignments are made at the Work Package level
- Requires export
- Cannot change time-phasing outside of the WP dates without changing WP dates

Forecast Integration Options - PM Compass Workflow

- PM Compass uses workflow functionality to update forecast, via the project schedule or Cobra, depending on where timephased resources are maintained
- The workflow steps are set up during an initial configuration which includes approval steps before finally pushing the change back to the scheduling tool or Cobra project
- Monthly forecast updates can be kicked off manually or automatically

The screenshot shows the 'Forecast Change Request' configuration window in Deltek PM Compass. The interface includes a navigation pane on the left, a main configuration area with tabs for 'General', 'Workflow Steps', 'Tabs on Form', 'Fields on Form', 'Cost Details on Form', 'Change Details on Form', and 'Access Control'. The 'Workflow Steps' tab is active, displaying a table of workflow steps.

Step	Description	In-Progress Step Status	Assigned To	Who Must Complete	Days Allotted	Completed Step Status	Review Action
1	PCA Approves	In Approval	PCA	Any		3 Completed	None

Below the steps table, the 'Step 1 Actions' section is visible, showing a list of actions for the first step:

Step Action	Description	Edit Content	Active
Reminder	Notify Every 3 Days	Email	<input checked="" type="checkbox"/>
Reminder	Notify Every 3 Days	Dashboard	<input checked="" type="checkbox"/>
Past Due Step	Notify When the Step Becomes Past Due	Email	<input checked="" type="checkbox"/>
Past Due Step	Notify When the Step Becomes Past Due	Dashboard	<input checked="" type="checkbox"/>
Notification	Notify at Step Beginning	Email	<input checked="" type="checkbox"/>
Notification	Notify at Step Beginning	Dashboard	<input checked="" type="checkbox"/>
Apply Cost Cha	Apply Cost Changes on Completed		<input checked="" type="checkbox"/>
Remove Tempo	Remove Temporary Data Used to Store the Change Request.		<input checked="" type="checkbox"/>

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Forecast Integration Options - PM Compass Workflow

Pros

- Assignments are made at the Work Package level
- No formatting, importing, or exporting required – changes are pushed directly into the source system
- CAMs can make their changes directly in the system while still allowing for approval steps

Cons

- Requires forecast adjustments at a detailed level

Key Takeaways

- Improved forecasting provides integrated management of program planning and execution which will enable accomplishment of technical scope within cost and schedule parameters; as well as reduce or eliminate cost overruns
- Regardless of which method you use, the goal is to provide objective analysis of forecasts which will provide visibility to Program Management and the Customer
- Enable Project Management to make proactive operational and administrative decisions based on forward looking reporting rather than making reactive decisions after an issue has occurred