

Lecture 10:

MS Project as a Tool for Resources and Time Management

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PMG 605

**Project Resources and
Time Management**

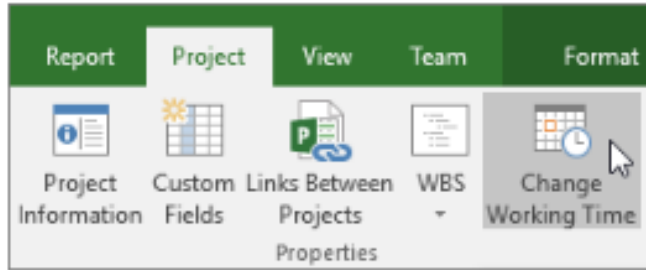
Session Outline

MS Project as a Resources and Time Management

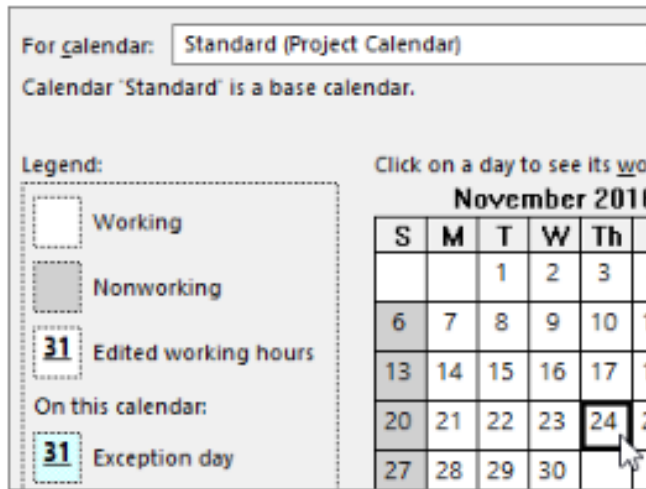
- MS Project 2019 Overview
- Set Project Calendar
- WBS
- Task Type
- Add and Level Resources
- Timeline
- Reports

Add A Holiday To The Project Calendar

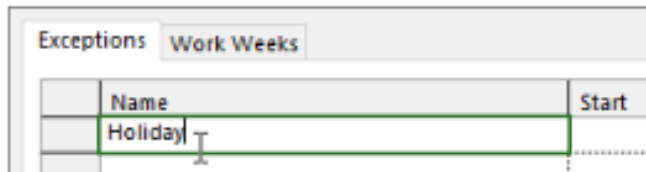
1. Click **Project** > **Properties** > **Change Working Time**.



2. Select a calendar from the **For calendar** list, and then click the holiday on the calendar.

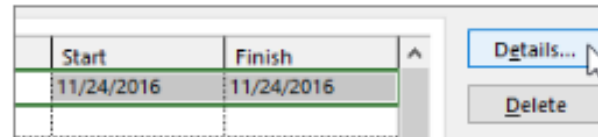


3. On the **Exceptions** tab, type a **Name** for the holiday, and then press **Enter**.

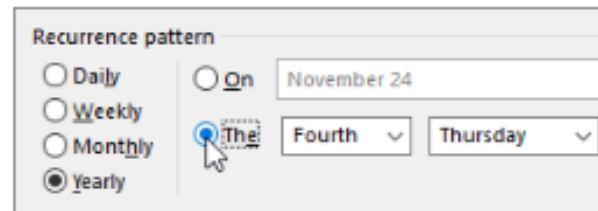


The **Start** and **Finish** dates are populated with what you had selected on the calendar, and the day is marked as nonworking.

4. If this holiday will happen again during the project (especially if the project goes longer than a year), select the holiday and click **Details**.



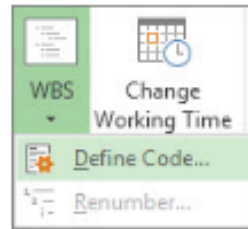
5. Under **Recurrence pattern**, set how often the holiday will repeat.



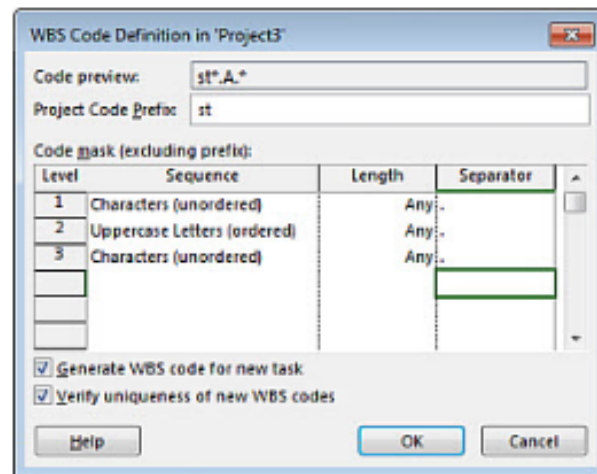
Tip: You can also set a **Range of recurrence** if the holiday happens repeatedly and then stops.

Create WBS codes in Project desktop

1. Click **View**, and then pick a sheet view, such as the Task Sheet or Resource Sheet.
2. Click **Project**. In the **Properties** group, click **WBS** and then click **Define Code**.



3. You can create a project-specific code in the **Project Code Prefix** box. You can use numbers, uppercase and lowercase letters, and symbols.



Change The Task Type For More Accurate Scheduling

- You just assigned a few people to a task, and the task duration got longer, not shorter as you expected. Or maybe the reverse happened. Either way, you're stumped. Some tasks, such as curing cement, take a fixed amount of time no matter how workers are assigned to pouring the cement. Others, like building roads or software, grow or shrink in their durations, depending on the people and resources applied to them.
- To change the task types to better reflect these realities, double-click the task, click Advanced, and change the task type.

How Task Types Change Your Schedule

- Project uses a scheduling formula that relates the three values of work, duration, and assignment units:
- $\text{Work} = \text{Duration} \times \text{Units}$
- Setting a task's type allows you to “fix” (or make unchangeable) one of these values. Fixing one of the values places a priority on that value by telling Project not to change it when the other two values change.
- This applies to both automatically and manually scheduled tasks.
- Here's a handy table to help keep all the moving parts of the scheduling formula in mind.

How Task Types Change Your Schedule

In a	If you revise units	If you revise duration	If you revise work
Fixed units task	Duration is recalculated.	Work is recalculated.	Duration is recalculated.
Fixed work task	Duration is recalculated.	Units are recalculated.	Duration is recalculated.
Fixed duration task	Work is recalculated.	Work is recalculated.	Units are recalculated.

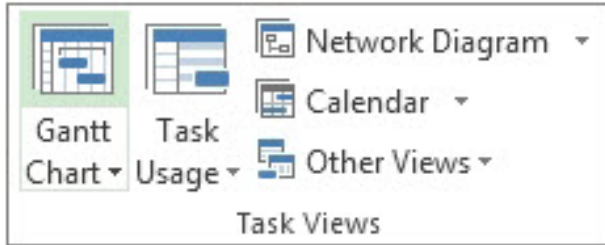
- <https://support.microsoft.com/en-us/office/change-the-task-type-for-more-accurate-scheduling-b0b969ad-45bc-4e9e-8967-435587548a72>

Add A Milestone

- Before your project gets rolling, you will probably want to mark its major goals with milestones.
- Create a milestone with zero duration
- Add a milestone with a duration

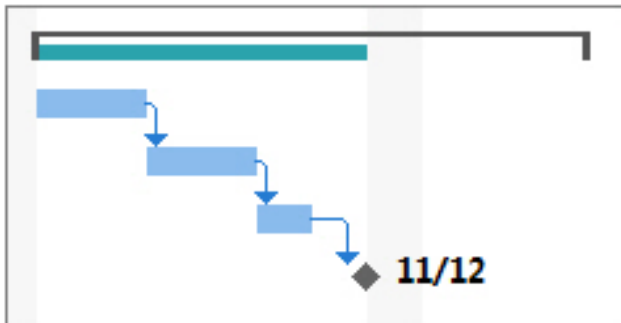
The quickest way to create a milestone is to add a task with no duration to your project plan.

1. Click **View**, and then in the **Task Views** group, click **Gantt Chart**.



2. Type the milestone name in the first empty row or pick a task you want to turn into a milestone.
3. Type **0** in the **Duration** field, and then press Enter.

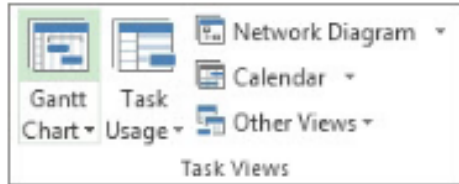
The milestone symbol is now part of your Gantt Chart.



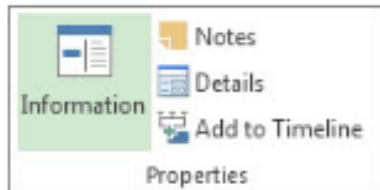
Create A Milestone With Zero Duration

Sometimes a milestone takes time. For example, the approval process at the end of a phase might take a week, so that milestone would need to take place over time like a normal task.

1. Click **View**, and then in the **Task Views** group, click **Gantt Chart**.

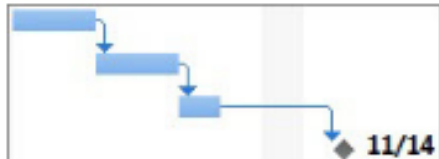


2. Type the milestone name in the first empty row or pick a task you want to turn into a milestone.
3. Select the milestone, and then click **Task**. In the **Properties** group, click **Task Information**.



4. Click the **Advanced** tab, and then type the milestone duration in the **Duration** box.
5. Check **Mark task as milestone**, and then click **OK**.

On the Gantt Chart, the milestone symbol appears on the last day of the task. It doesn't appear as a bar, even though it has duration.



Add A Milestone With A Duration

On the **Resources** tab, in the **Level** group, choose one of the following options.



- **Level Selection** Use this to level only the tasks that are selected. To select multiple tasks that are next to each other, select the first task in the selection, then press SHIFT while selecting the last task in the selection. To select multiple tasks that are not next to each other, select each task by pressing CTRL while selecting the task.

This is useful when it may be acceptable for resources to be overallocated on certain tasks in the project plan, but the project managers would like to resolve overallocation for other specific tasks

- **Level Resource** Use this to level only those tasks with specific resources assigned. Choose **Level Resource**, and then select the resource to whom tasks are assigned. Use CTRL to select multiple resources.

If the selected resource is working on tasks that have multiple resources, the other assignments will not get moved.

- **Level All** Use this to level all resources in all tasks within the project plan.
- **Leveling Options** Use this to modify the settings that Project uses for leveling. See the section on [Modify leveling settings](#) in this article.
- **Clear Leveling** Use this to undo the effects of the previous leveling.
- **Next Overallocation** Use this to go to the next task with overallocated resources. Use this to more easily see the effects of leveling on individual tasks.

Level Resource Assignments

1. On the **Resources** tab, in the **Level** group, choose **Leveling Options**.
2. In the **Resource Leveling** dialog box, under **Leveling calculations**, select how you want leveling to occur.
 - **Automatic** If you choose automatic leveling, clear the **Clear leveling values before leveling** check box. When this check box is cleared, Project levels only new and unlevelled assignments. This check box is selected by default, but when leveling automatically, leaving it selected can significantly slow down your work in the schedule because all tasks are leveled.

In the **Look for overallocations on a** box, choose a time period, or basis, for the sensitivity with which leveling will recognize overallocations. **Day by Day** is the default. This setting establishes the point at which you want leveling to intervene: when you have an overallocation within just one minute, one day, one week, or one month.
 - **Manual** Manual leveling (the default) occurs only when you choose **Level All**. Automatic leveling occurs instantaneously whenever you change a task or resource. Use automatic leveling if you want to reschedule tasks whenever resources are assigned more work than they have the capacity to complete.
3. Under **Leveling range for**, select to level the entire project or to level only those tasks falling within a specific time range.
4. In the **Leveling order** box, select the leveling order that you want:
 - Select **ID Only** to level tasks in ascending order of their ID numbers before considering any other criteria.
 - Select **Standard** to first examine predecessor dependencies, slack, dates, priorities, and constraints to discover whether and how tasks should be leveled. (This is the default setting.)
 - Select **Priority, Standard** to check task priorities first and only then examine the standard criteria.

Modify Leveling Settings

5. To prevent the finish date of your project from being delayed, select the **Level only within available slack** check box.

Note: If you select this check box, you may get error messages indicating that Project can't level the entire schedule. Project may not level the schedule because there is seldom enough slack in a schedule to reschedule assignments without running out of slack time.

6. To allow leveling to adjust when a resource works on a task independently of other resources that are working on the same task, select the **Leveling can adjust individual assignments on a task** check box.
7. If you want leveling to interrupt tasks by creating splits in the remaining work on tasks or resource assignments, select the **Leveling can create splits in remaining work** check box. If a resource is assigned to tasks concurrently beyond what the resource's schedule can handle, then a task that has remaining work can be split and worked on when the resource's schedule will allow it.
8. To include proposed resources, select the **Level tasks with the proposed booking type** check box.
9. To allow leveling to change manually scheduled tasks, select the **Level manually scheduled tasks** check box.
0. If you want to clear the previous leveling results before leveling again, then choose **Clear Leveling**.
1. If you are leveling manually, choose **Level All**. If you are leveling automatically, choose **OK**.

Note: If you level tasks in projects that are scheduled from a finish date, then negative delay values are applied from the end of the task or assignment, causing the task or resource assignment's finish date to occur earlier.

Modify Leveling Settings

Tip	What you can do
Review overallocated resources	Overallocated resources are marked in red in resource views, including Team Planner. In the Gantt Chart, overallocated resources are indicated by a red figure in the Indicators column.
Remove leveling each time you level	Every time you level a project, the previous effects of leveling are cleared. To change this, choose Resource > Leveling Options .
Clear leveling	To clear leveling immediately before doing any other action, choose Undo Level . If you don't undo the leveling, you can also choose Clear Leveling to clear the previous leveling results.
See which tasks got leveled	To see the changes made to tasks by leveling, use the Leveling Gantt view. Choose Views > Other Views > More Views .
Level within a specific time period	Choose Resource > Leveling Options , and then enter a From and To date.
Don't level manually scheduled tasks	Usually, all task types are leveled. To change this, choose Resource > Leveling Options .

Some Tips You Can Use While Leveling

Tip	What you can do
Level without changing the end date of the project	Choose Resource > Leveling Options, and then select the Level only within available slack box. Note: If you select this check box, you may get an error message about Project unable to level the entire project. There may not be enough slack in your schedule to move assignments without changing the end date of the project.
Manually resolve overallocations	If you don't want to level, you can try other ways to remove overallocations. ▪ Replace one resource with another who is available to work at that time. ▪ Replace more skilled resources on critical tasks early in the project. A more skilled resource is likely to get the same job done in less time. ▪ Change a task link so that some tasks start at the same time. ▪ Reduce the scope of your schedule by removing tasks. ▪ Spread the workload out by Increase the duration of tasks with overallocated resources. ▪ Reduce workload by reducing the amount of work required for completing the task. ▪ Change the working hours of resources to shorten the duration of tasks. ▪ Reduce the duration of tasks, especially critical tasks that directly impact the project end date. ▪ Check that resources are not working during non-working time. If a resource is working during non-working hours, Project will show them as overallocated.

Some Tips You Can Use While Leveling

The POM+ Project - Big Kola Company – Part 1

The Priority Matrix for the POM+ Project is:

	Time	Scope	Cost
Constrain			X
Enhance		X	
Accept	X		

1.0 POM+Project

1.1 R&D product development

- 1.1.1 Need survey
- 1.1.2 Set product specs
- 1.1.3 Shelf life report
- 1.1.4 Nutrition report

1.2 Secure fruit suppliers

1.3 Initial Production

- 1.3.1 Equipment rehab
- 1.3.2 Production trials
- 1.3.3 Quality trials
- 1.3.4 Quality metrics
- 1.3.5 Quality training

1.4 Distribution

- 1.4.1 Market testing
- 1.4.2 Package design
- 1.4.3 Select distributors

1.5 Legal

- 1.5.1 Complete FDA certification
- 1.5.2 Register trademark

1.6 Prepare product launch

The POM+ Project - Big Kola Company

1. Develop the WBS outline using the software available.
2. Use this file and the information provided below to create a project schedule.
3. The following holidays are observed: January 1, Martin Luther King Day (third Monday in January), Memorial Day (last Monday in May), July 4th, Labor Day (first Monday in September), Thanksgiving Day (4th Thursday in November), December 25 and 26.
4. If a holiday falls on a Saturday, then Friday will be given as an extra day off, and if it falls on a Sunday then Monday will be given off.
5. The project team works eight-hour days, Monday through Friday.

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#*	Activity	Duration	Predecessor(s)
3	Need survey	20	None
4	Set product specs	15	3
5	Shelf life report	10	4
6	Nutrition report	5	4
7	Select fruit suppliers	20	5, 6
9	Equipment rehab	30	4
10	Production trials	15	7, 9
11	Quality trials	20	10
12	Quality metrics	5	11
13	Quality training	15	12
15	Market testing	30	5, 6
16	Package design	15	15
17	Select distributors	25	5, 6
19	Complete FDA certification	15	7, 15
20	Register trademark	5	7, 15
21	Prepare product launch	15	13, 16, 17, 19FS + 25 days, 20FS + 15 days

FS = Finish to Start lag

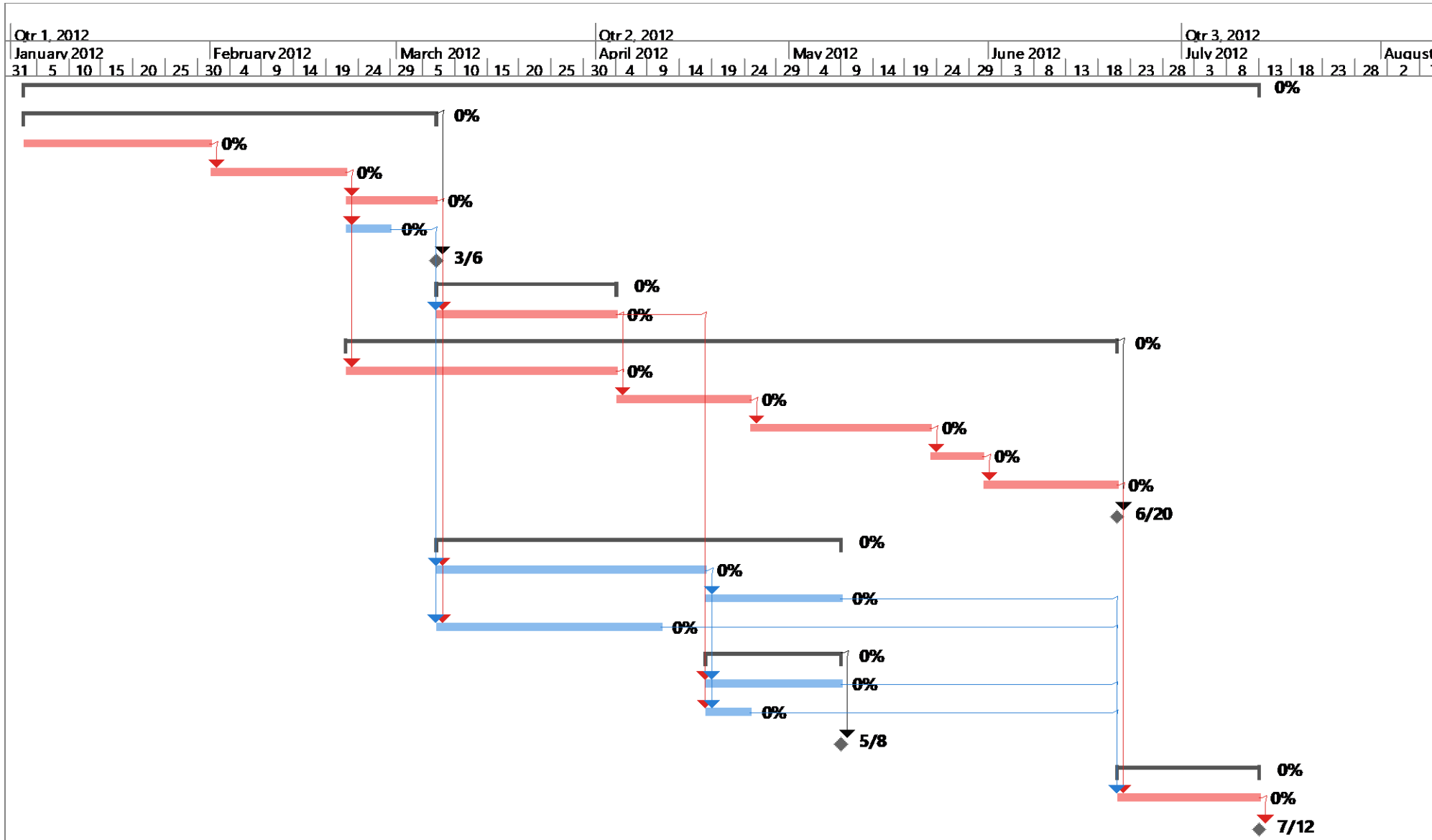
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- The project will begin on January 3, 2012.
- Based on this schedule, submit a memo that answers the following questions:
 - a. When is the project estimated to be completed? How many working days will it take?
 - b. What is the critical path?
 - c. Which activity has the most total slack?
 - d. How sensitive is this network?
 - e. Identify two sensible milestones and explain your choice.

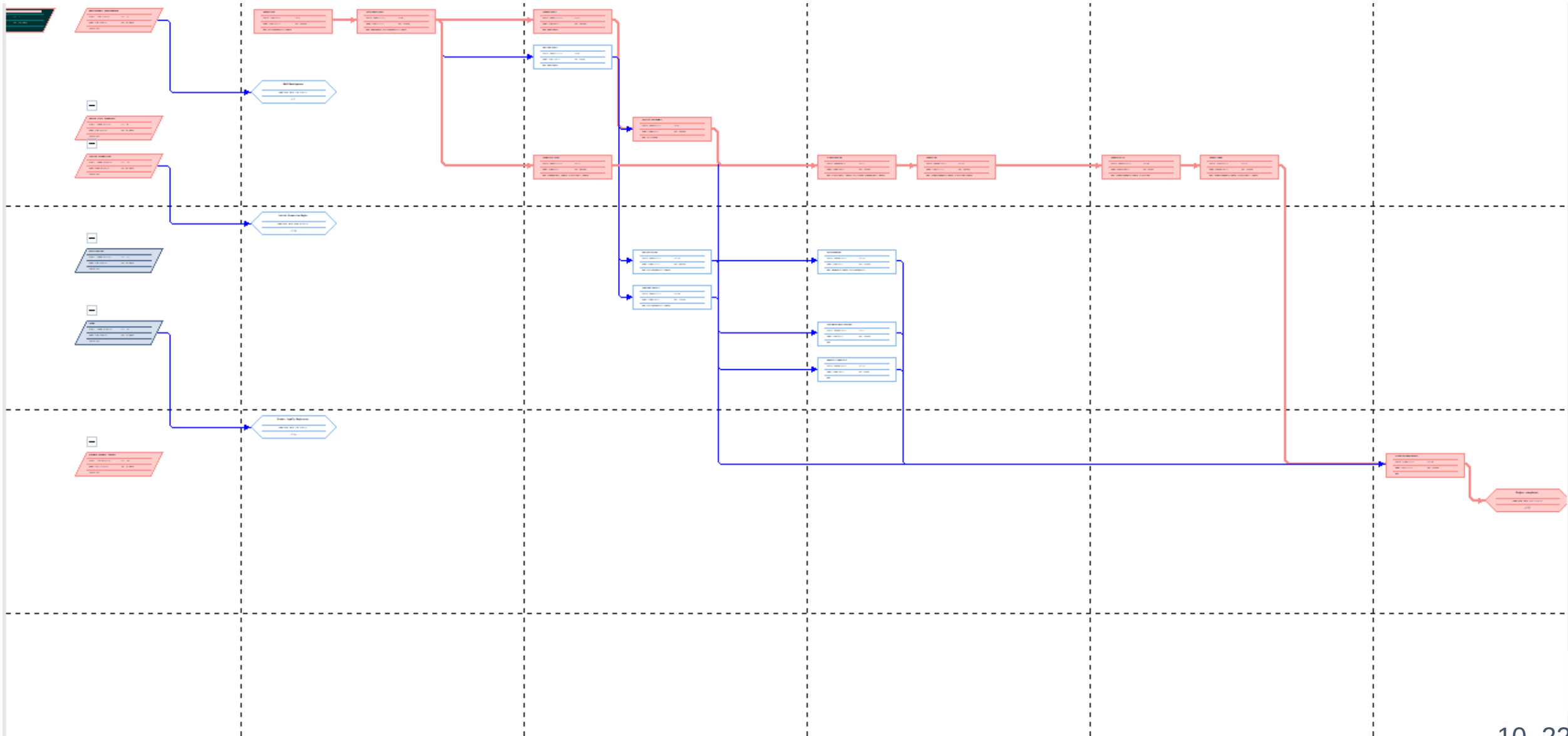
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ID		Task Mode	WBS	Task Name	Duration	Start	Finish	Predecessors	Q
1			1	POM+Project	135 days	Tue 1/3/12	Thu 7/12/12		-
2			1.1	R&D product development	45 days	Tue 1/3/12	Tue 3/6/12		-
3			1.1.1	Need survey	20 days	Tue 1/3/12	Tue 1/31/12		
4			1.1.2	Set product specs	15 days	Wed 2/1/12	Tue 2/21/12	3	
5			1.1.3	Shelf life report	10 days	Wed 2/22/1	Tue 3/6/12	4	
6			1.1.4	Nutrition report	5 days	Wed 2/22/1	Tue 2/28/12	4	
7				R&D Development	0 days	Tue 3/6/12	Tue 3/6/12	2	
8			1.2	Secure fruit suppliers	20 days	Wed 3/7/12	Tue 4/3/12		
9			1.2.1	Secure fruit suppliers	20 days	Wed 3/7/12	Tue 4/3/12	5,6	
10			1.3	Initial Production	85 days	Wed 2/22/1	Wed 6/20/12		
11			1.3.1	Equipment rehab	30 days	Wed 2/22/1	Tue 4/3/12	4	
12			1.3.2	Production trials	15 days	Wed 4/4/12	Tue 4/24/12	11,9	
13			1.3.3	Quality trials	20 days	Wed 4/25/1	Tue 5/22/12	12	
14			1.3.4	Quality metrics	5 days	Wed 5/23/1	Wed 5/30/12	13	
15			1.3.5	Quality training	15 days	Thu 5/31/12	Wed 6/20/12	14	
16				Initial Production Begin	0 days	Wed 6/20/1	Wed 6/20/12	10	
17			1.4	Distribution	45 days	Wed 3/7/12	Tue 5/8/12		
18			1.4.1	Market testing	30 days	Wed 3/7/12	Tue 4/17/12	5,6	
19			1.4.2	Package design	15 days	Wed 4/18/1	Tue 5/8/12	18	
20			1.4.3	Select distributors	25 days	Wed 3/7/12	Tue 4/10/12	5,6	
21			1.5	Legal	15 days	Wed 4/18/1	Tue 5/8/12		
22			1.5.1	Complete FDA certification	15 days	Wed 4/18/12	Tue 5/8/12	18,9	
23			1.5.2	Register trademark	5 days	Wed 4/18/1	Tue 4/24/12	18,9	
24				Product legally Registered	0 days	Tue 5/8/12	Tue 5/8/12	21	
25			1.6	Prepare product launch	15 days	Thu 6/21/12	Thu 7/12/12		
26			1.6.1	Prepare product launch	15 days	Thu 6/21/12	Thu 7/12/12	15,19,20,22FS+25 days,23FS+15 days	
27				Project completed	0 days	Thu 7/12/12	Thu 7/12/12	26	

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WBS	Task Name	Duration	Start	Finish	Predecessors	Early Start	Early Finish	Late Start	Late Finish
1	POM+Project	135 days	Tue 1/3/12	Thu 7/12/12		Tue 1/3/12	Thu 7/12/12	Tue 1/3/12	Thu 7/12/12
1.1	R&D product development	45 days	Tue 1/3/12	Tue 3/6/12		Tue 1/3/12	Tue 3/6/12	Tue 1/3/12	Tue 3/6/12
1.1.1	Need survey	20 days	Tue 1/3/12	Tue 1/31/12		Tue 1/3/12	Tue 1/31/12	Tue 1/3/12	Tue 1/31/12
1.1.2	Set product specs	15 days	Wed 2/1/12	Tue 2/21/12	3	Wed 2/1/12	Tue 2/21/12	Wed 2/1/12	Tue 2/21/12
1.1.3	Shelf life report	10 days	Wed 2/22/12	Tue 3/6/12	4	Wed 2/22/12	Tue 3/6/12	Wed 2/22/12	Tue 3/6/12
1.1.4	Nutrition report	5 days	Wed 2/22/12	Tue 2/28/12	4	Wed 2/22/12	Tue 2/28/12	Wed 2/29/12	Tue 3/6/12
	R&D Development	0 days	Tue 3/6/12	Tue 3/6/12	2	Tue 3/6/12	Tue 3/6/12	Thu 7/12/12	Thu 7/12/12
1.2	Secure fruit suppliers	20 days	Wed 3/7/12	Tue 4/3/12		Wed 3/7/12	Tue 4/3/12	Wed 3/7/12	Tue 4/3/12
1.2.1	Secure fruit suppliers	20 days	Wed 3/7/12	Tue 4/3/12	5,6	Wed 3/7/12	Tue 4/3/12	Wed 3/7/12	Tue 4/3/12
1.3	Initial Production	85 days	Wed 2/22/12	Wed 6/20/12		Wed 2/22/12	Wed 6/20/12	Wed 2/22/12	Wed 6/20/12
1.3.1	Equipment rehab	30 days	Wed 2/22/12	Tue 4/3/12	4	Wed 2/22/12	Tue 4/3/12	Wed 2/22/12	Tue 4/3/12
1.3.2	Production trials	15 days	Wed 4/4/12	Tue 4/24/12	11,9	Wed 4/4/12	Tue 4/24/12	Wed 4/4/12	Tue 4/24/12
1.3.3	Quality trials	20 days	Wed 4/25/12	Tue 5/22/12	12	Wed 4/25/12	Tue 5/22/12	Wed 4/25/12	Tue 5/22/12
1.3.4	Quality metrics	5 days	Wed 5/23/12	Wed 5/30/12	13	Wed 5/23/12	Wed 5/30/12	Wed 5/23/12	Wed 5/30/12
1.3.5	Quality training	15 days	Thu 5/31/12	Wed 6/20/12	14	Thu 5/31/12	Wed 6/20/12	Thu 5/31/12	Wed 6/20/12
	Initial Production Begin	0 days	Wed 6/20/12	Wed 6/20/12	10	Wed 6/20/12	Wed 6/20/12	Thu 7/12/12	Thu 7/12/12
1.4	Distribution	45 days	Wed 3/7/12	Tue 5/8/12		Wed 3/7/12	Tue 5/8/12	Wed 3/14/12	Wed 6/20/12
1.4.1	Market testing	30 days	Wed 3/7/12	Tue 4/17/12	5,6	Wed 3/7/12	Tue 4/17/12	Wed 3/14/12	Tue 4/24/12
1.4.2	Package design	15 days	Wed 4/18/12	Tue 5/8/12	18	Wed 4/18/12	Tue 5/8/12	Thu 5/31/12	Wed 6/20/12
1.4.3	Select distributors	25 days	Wed 3/7/12	Tue 4/10/12	5,6	Wed 3/7/12	Tue 4/10/12	Wed 5/16/12	Wed 6/20/12
1.5	Legal	15 days	Wed 4/18/12	Tue 5/8/12		Wed 4/18/12	Tue 5/8/12	Wed 4/25/12	Wed 5/30/12
1.5.1	Complete FDA certification	15 days	Wed 4/18/12	Tue 5/8/12	18,9	Wed 4/18/12	Tue 5/8/12	Wed 4/25/12	Tue 5/15/12
1.5.2	Register trademark	5 days	Wed 4/18/12	Tue 4/24/12	18,9	Wed 4/18/12	Tue 4/24/12	Wed 5/23/12	Wed 5/30/12
	Product legally Registered	0 days	Tue 5/8/12	Tue 5/8/12	21	Tue 5/8/12	Tue 5/8/12	Thu 7/12/12	Thu 7/12/12
1.6	Prepare product launch	15 days	Thu 6/21/12	Thu 7/12/12		Thu 6/21/12	Thu 7/12/12	Thu 6/21/12	Thu 7/12/12
1.6.1	Prepare product launch	15 days	Thu 6/21/12	Thu 7/12/12	15,19,20,22FS+25 days,23FS+15 days	Thu 6/21/12	Thu 7/12/12	Thu 6/21/12	Thu 7/12/12
	Project completed	0 days	Thu 7/12/12	Thu 7/12/12	26	Thu 7/12/12	Thu 7/12/12	Thu 7/12/12	Thu 7/12/12

The POM+ Project - Big Kola Company – Part 2

- Remember the old saying, “A project plan is not a schedule until resources are committed.”

This exercise illustrates this sometime subtle, but important point.

- Using your files from Part 1, input resources and their costs if you have not already done so.

The POM+ Project - Big Kola Company – Part 2

Activity	Resources
Need survey	MRKT (500%)
Set product specs	R&D (400%), MRKT (200%)
Shelf life report	R&D (300%)
Nutrition report	R&D (300%)
Select fruit suppliers	PURCH (100%)
Equipment rehab	ENG (1,000%), PROD (2,000%)
Production trials	PROD (1,500%), PURCH (100%), ENG (1,000%)
Quality trials	QUAL (300%), PROD (500%)
Quality metrics	QUAL (300%), PROD (100%)
Quality training	QUAL (300%), PROD (1,500%)
Market testing	MRKT (500%)
Package design	DESIGN (300%), MRKT (100%)
Select distributors	MRKT (500%)
Complete FDA certification	LEGAL (300%)
Register trademark	LEGAL (300%)
Prepare product launch	QUAL (300%), PURCH (200%), PROD (1,500%), MRKT (500%), ENG (500%), R&D (100%)

The POM+ Project - Big Kola Company – Part 2

Resource	Abbrev	Available	Hourly rate
Marketing staff	MRKT	5	\$ 80/hr
R&D	R&D	5	\$ 80/hr
Engineering	ENG	10	\$100/hr
Purchasing	PURCH	2	\$ 60/hr
Quality engineers	QUAL	3	\$ 80/hr
Designers	DESIGN	3	\$ 60/hr
Legal staff	LEGAL	3	\$120/hr
Production	PROD	20	\$ 60/hr

The POM+ Project - Big Kola Company – Part 2

- Remember the old saying, “A project plan is not a schedule until resources are committed.” This exercise illustrates this sometime subtle, but important point.
- Using your files from Part 1, input resources and their costs if you have not already done so.
- Prepare a memo that addresses the following questions:
 - 1. Which if any of the resources are overallocated?
 - 2. Assume that the project is time constrained and try to resolve any overallocation problems by leveling within slack. What happens?
 - 3. Assume the project is resource constrained and resolve any overallocation problems by leveling outside of slack. What happens?

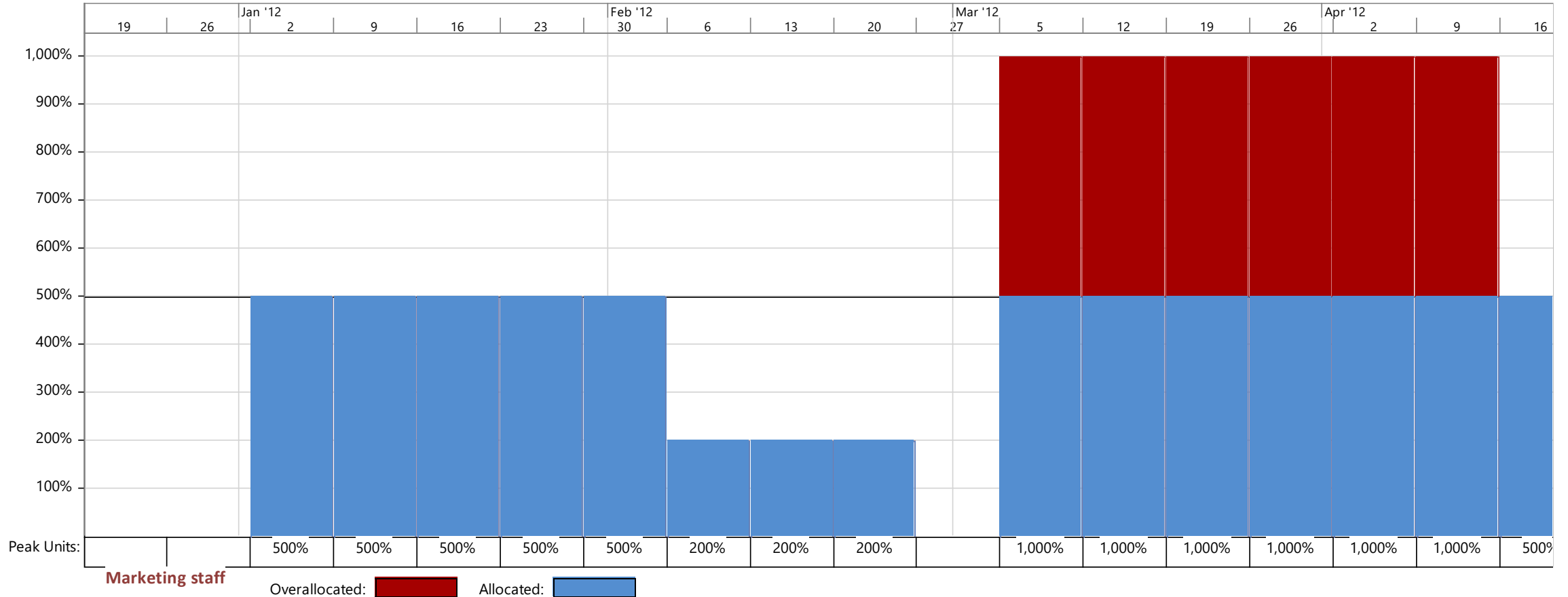
The POM+ Project - Big Kola Company – Part 2

- 1. Which if any of the resources are overallocated?

ID		Resource Name	Type	Material Label	Initials	Group	Max. Units	Std. Rate	Ovt. Rate	Cost/Use	Accrue At	Base Calendar
1		Marketing staff	Work		MRKT		500%	\$80.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Comp
2		R&D	Work		R&D		500%	\$80.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Comp
3		Engineering	Work		ENG		1,000%	\$100.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Comp
4		Purchasing	Work		PURCH		200%	\$60.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Comp
5		Quality Engineers	Work		QUAL		300%	\$80.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Comp
6		Designers	Work		DESIGN		300%	\$60.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Comp
7		Legal Staff	Work		LEGAL		300%	\$120.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Comp
8		Production	Work		PROD		2,000%	\$60.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Comp

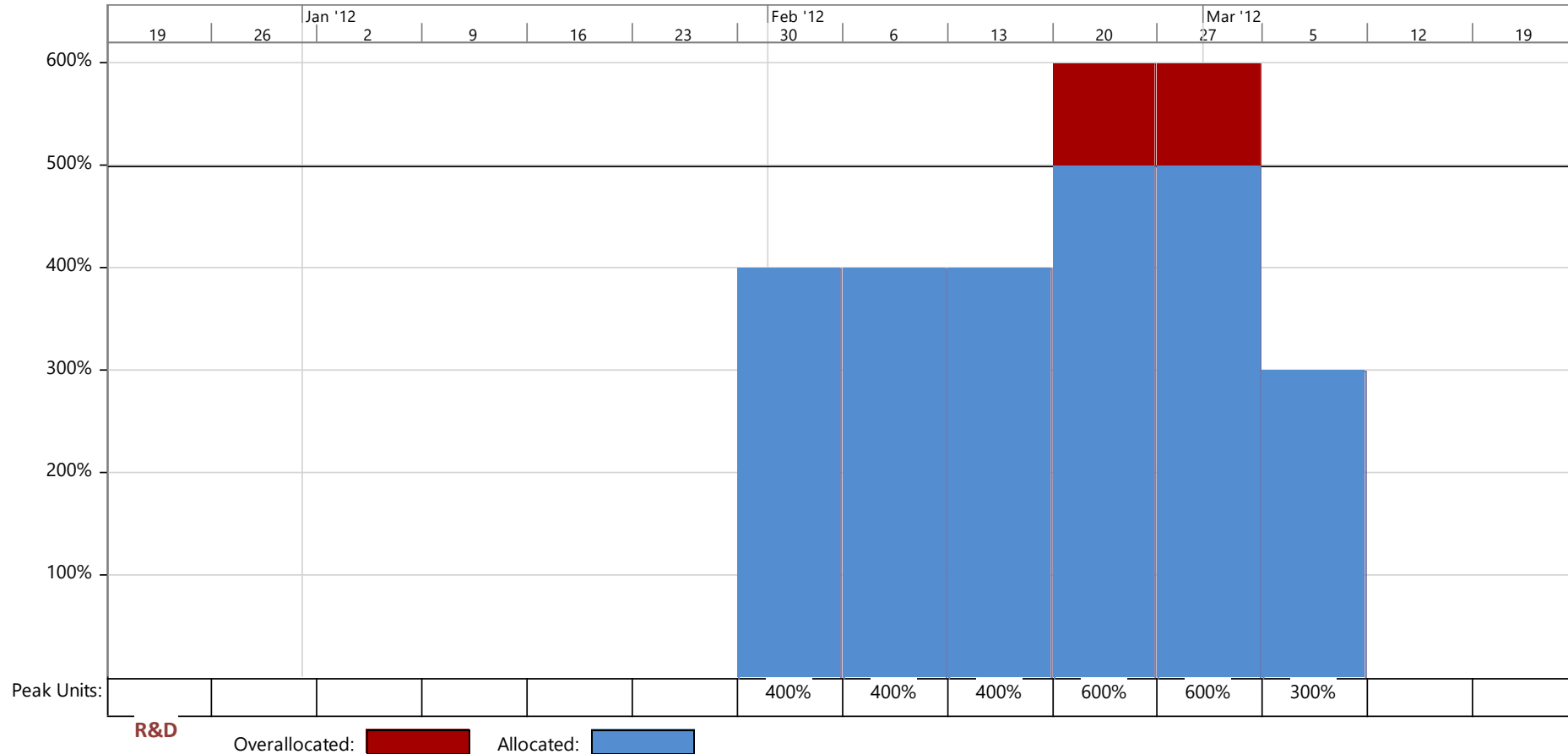
The POM+ Project - Big Kola Company – Part 2

- 1. Which if any of the resources are overallocated?



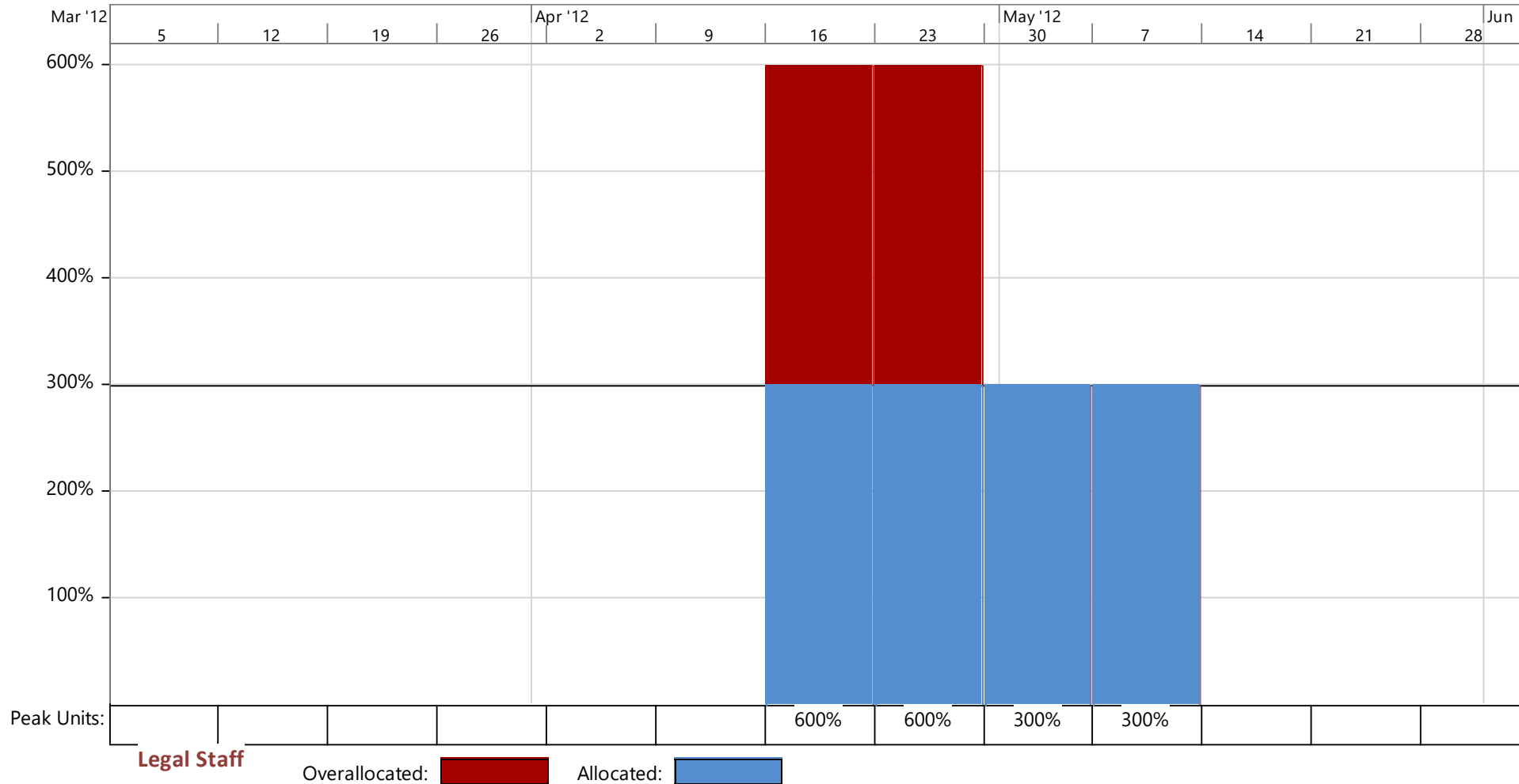
The POM+ Project - Big Kola Company – Part 2

- 1. Which if any of the resources are overallocated?



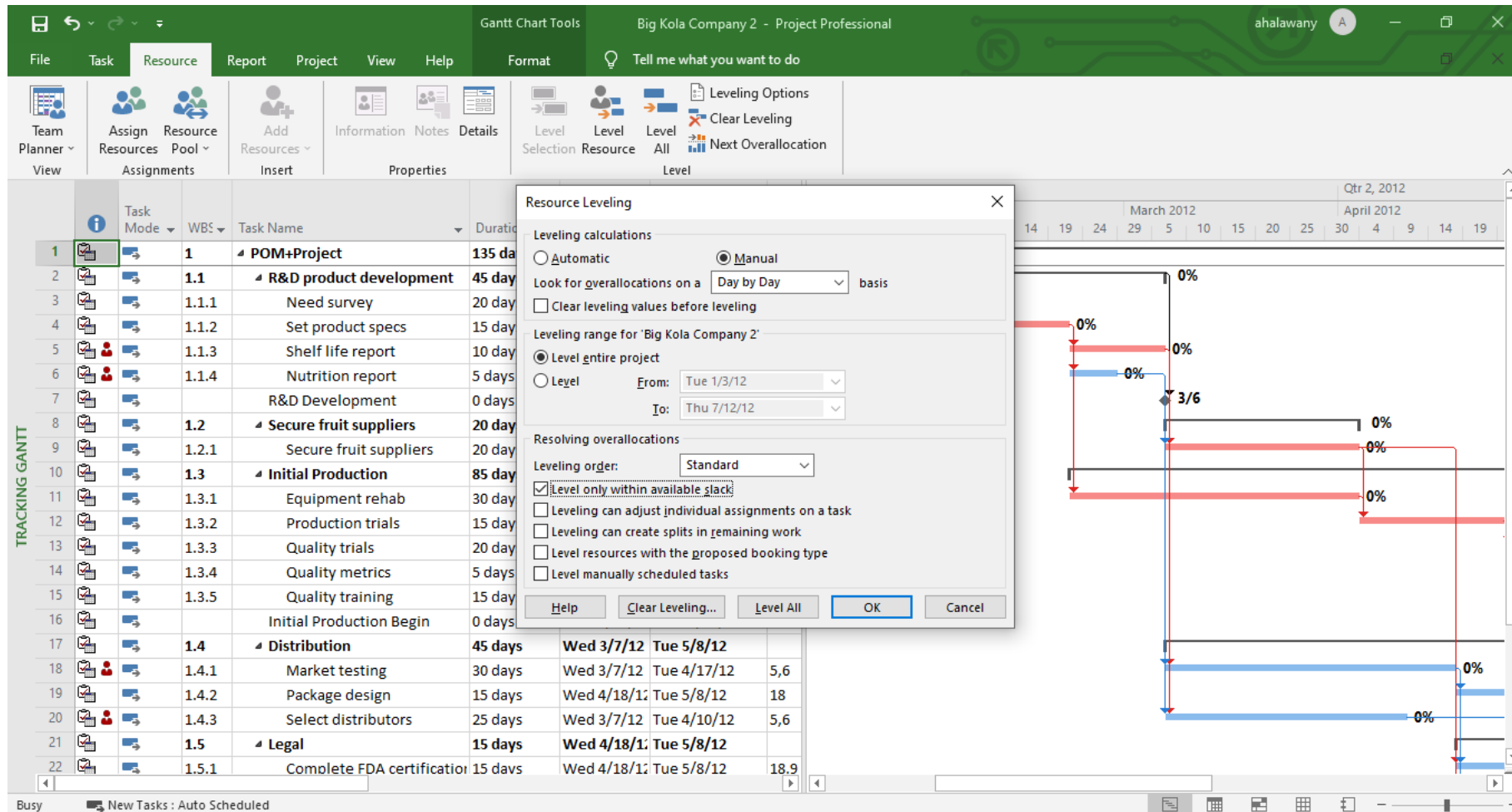
The POM+ Project - Big Kola Company – Part 2

- 1. Which if any of the resources are overallocated?



The POM+ Project - Big Kola Company – Part 2

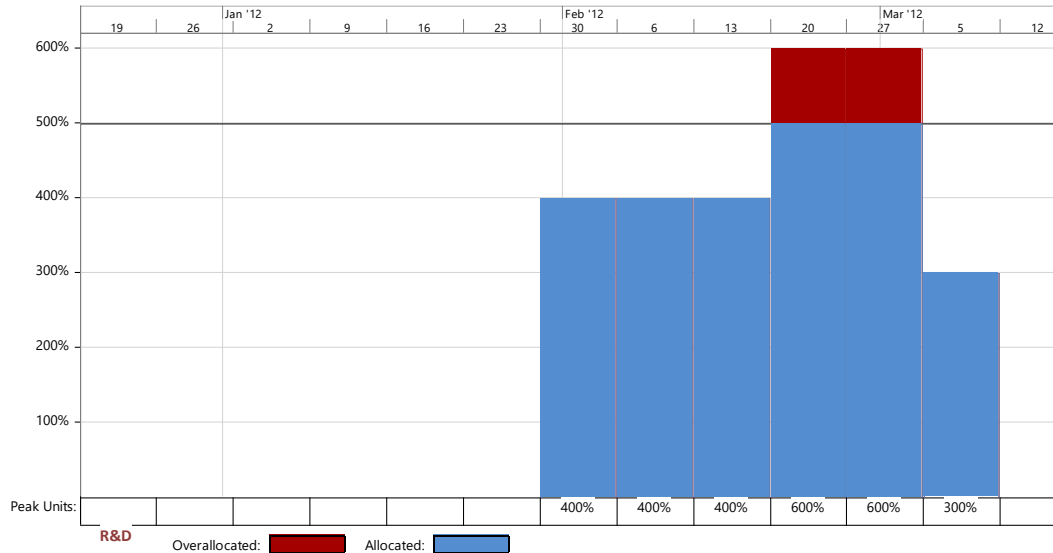
- 2. Assume that the project is time constrained and try to resolve any overallocation problems by leveling within slack. What happens?



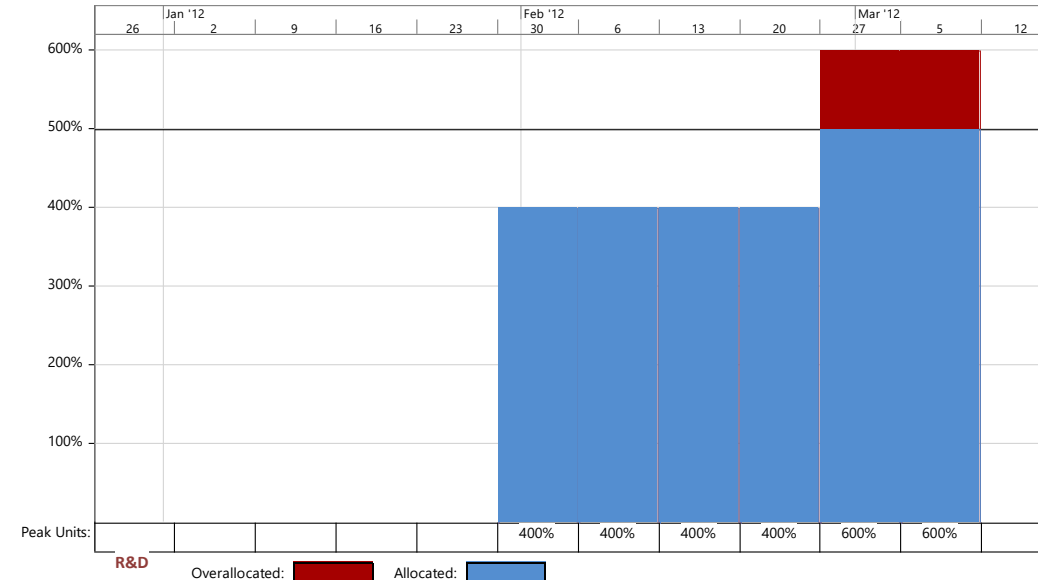
The POM+ Project - Big Kola Company – Part 2

- 2. Assume that the project is time constrained and try to resolve any overallocation problems by leveling within slack. What happens?

ID		Resource Name	Type	Material Label	Initials	Group	Max. Units	Std. Rate	Ovt. Rate	Cost/Use	Accrue At	Base Calendar	Code
1		Marketing staff	Work		MRKT		500%	\$80.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Comç	
2		R&D	Work		R&D		500%	\$80.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Comç	
3		Engineering	Work		ENG		1,000%	\$100.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Comç	
4		Purchasing	Work		PURCH		200%	\$60.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Comç	
5		Quality Engineers	Work		QUAL		300%	\$80.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Comç	
6		Designers	Work		DESIGN		300%	\$60.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Comç	
7		Legal Staff	Work		LEGAL		300%	\$120.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Comç	
8		Production	Work		PROD		2,000%	\$60.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Comç	

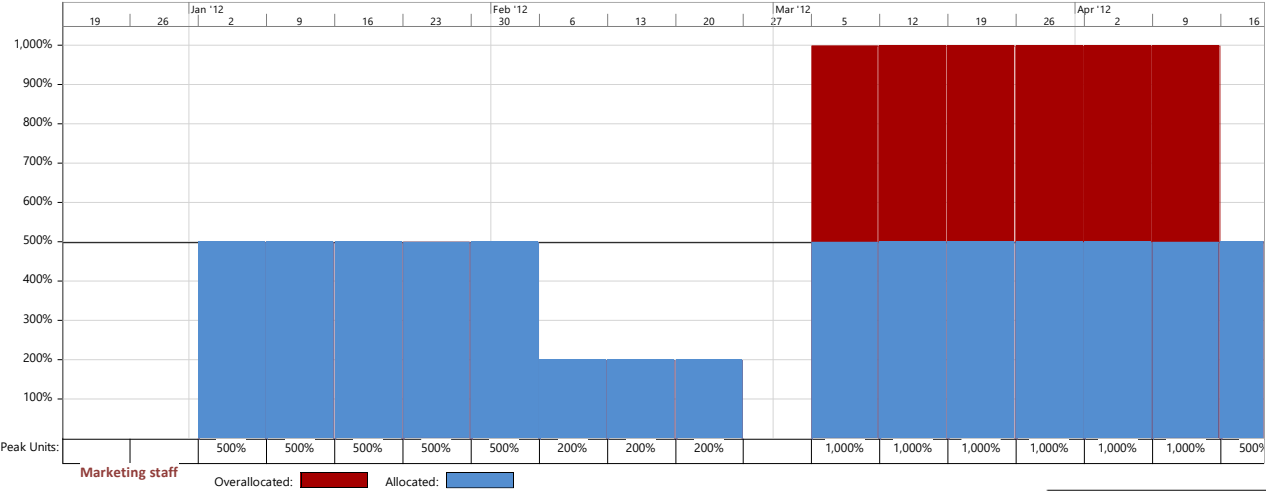


Before Leveling within Slack



After Leveling within Slack

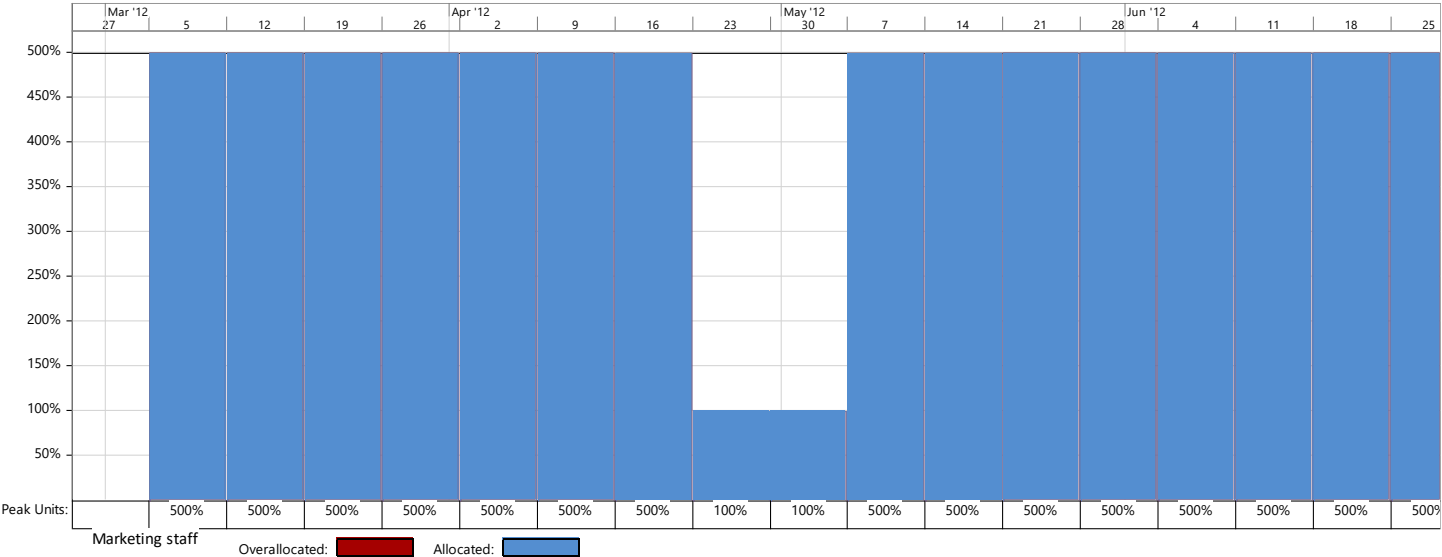
The POM+ Project - Big Kola Company – Part 2



Before Leveling within Slack

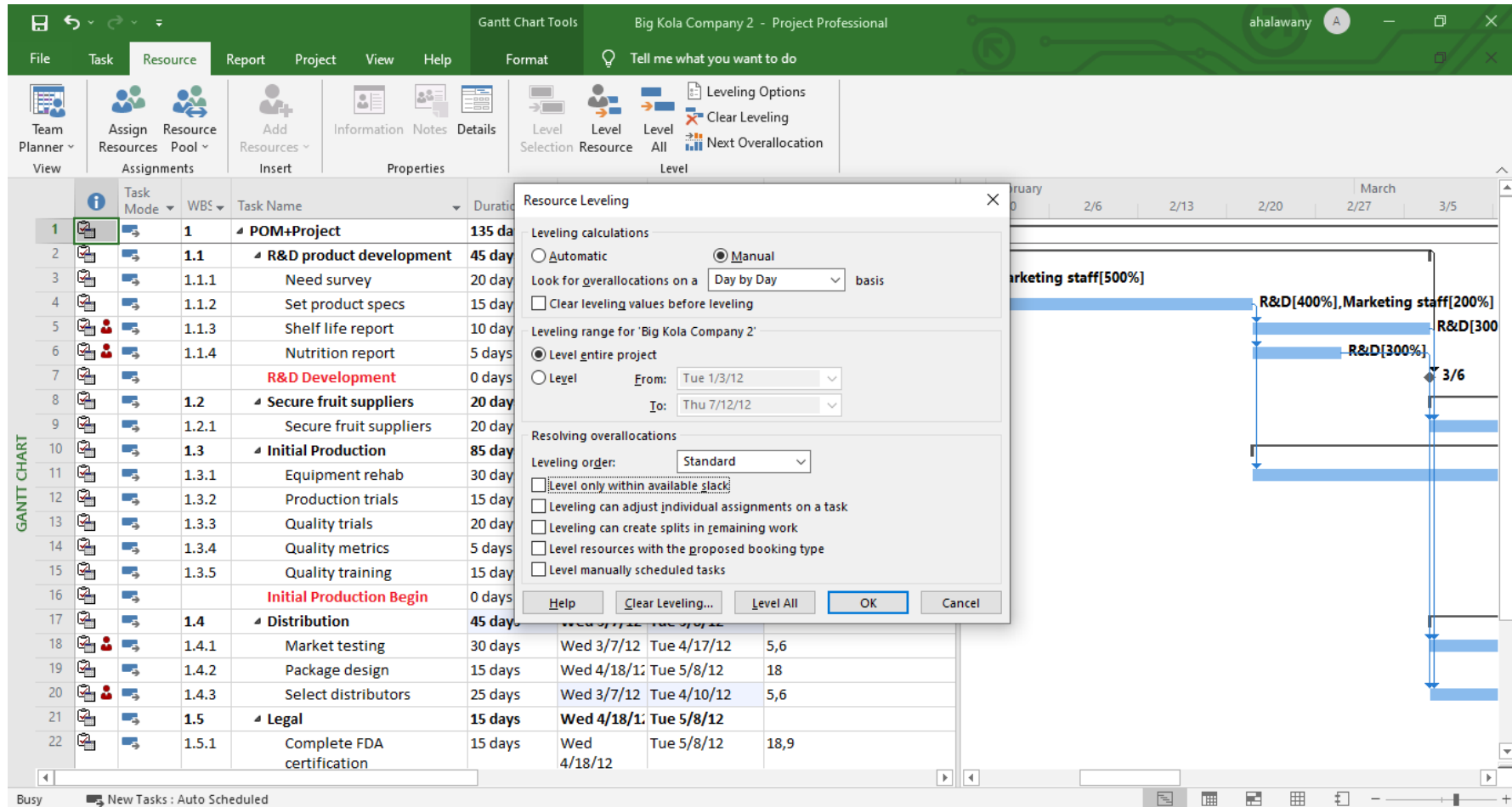


After Leveling within Slack



The POM+ Project - Big Kola Company – Part 2

- 3. Assume the project is resource constrained and resolve any overallocation problems by leveling outside of slack. What happens?



The screenshot displays the Microsoft Project Professional interface. The main window shows a Gantt chart for the 'Big Kola Company 2 - Project Professional'. The task list on the left includes tasks such as 'POM+Project', 'R&D product development', 'Need survey', 'Set product specs', 'Shelf life report', 'Nutrition report', 'R&D Development', 'Secure fruit suppliers', 'Initial Production', 'Equipment rehab', 'Production trials', 'Quality trials', 'Quality metrics', 'Quality training', 'Initial Production Begin', 'Distribution', 'Market testing', 'Package design', 'Select distributors', 'Legal', and 'Complete FDA certification'.

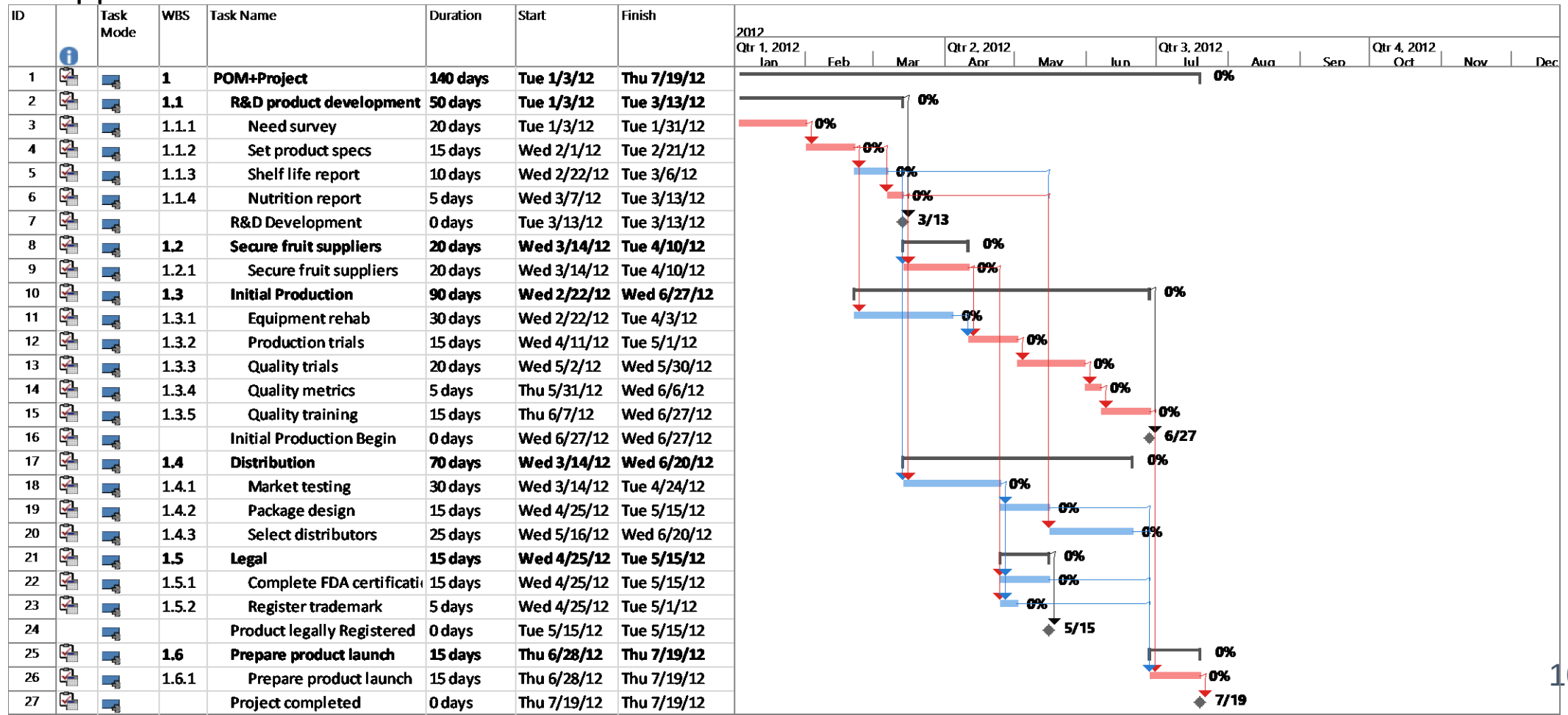
The 'Resource Leveling' dialog box is open, showing the following settings:

- Leveling calculations: ☒ Automatic, ☐ Manual
- Look for overallocations on a: Day by Day basis
- Clear leveling values before leveling: ☐
- Leveling range for 'Big Kola Company 2':
 - ☒ Level entire project
 - ☐ Level From: Tue 1/3/12 To: Thu 7/12/12
- Resolving overallocations:
 - Leveling order: Standard
 - ☐ Level only within available slack
 - ☐ Leveling can adjust individual assignments on a task
 - ☐ Leveling can create splits in remaining work
 - ☐ Level resources with the proposed booking type
 - ☐ Level manually scheduled tasks

The dialog box has buttons for Help, Clear Leveling..., Level All, OK, and Cancel.

The POM+ Project - Big Kola Company – Part 3

- 3. Assume the project is resource constrained and resolve any overallocation problems by leveling outside of slack. What happens?

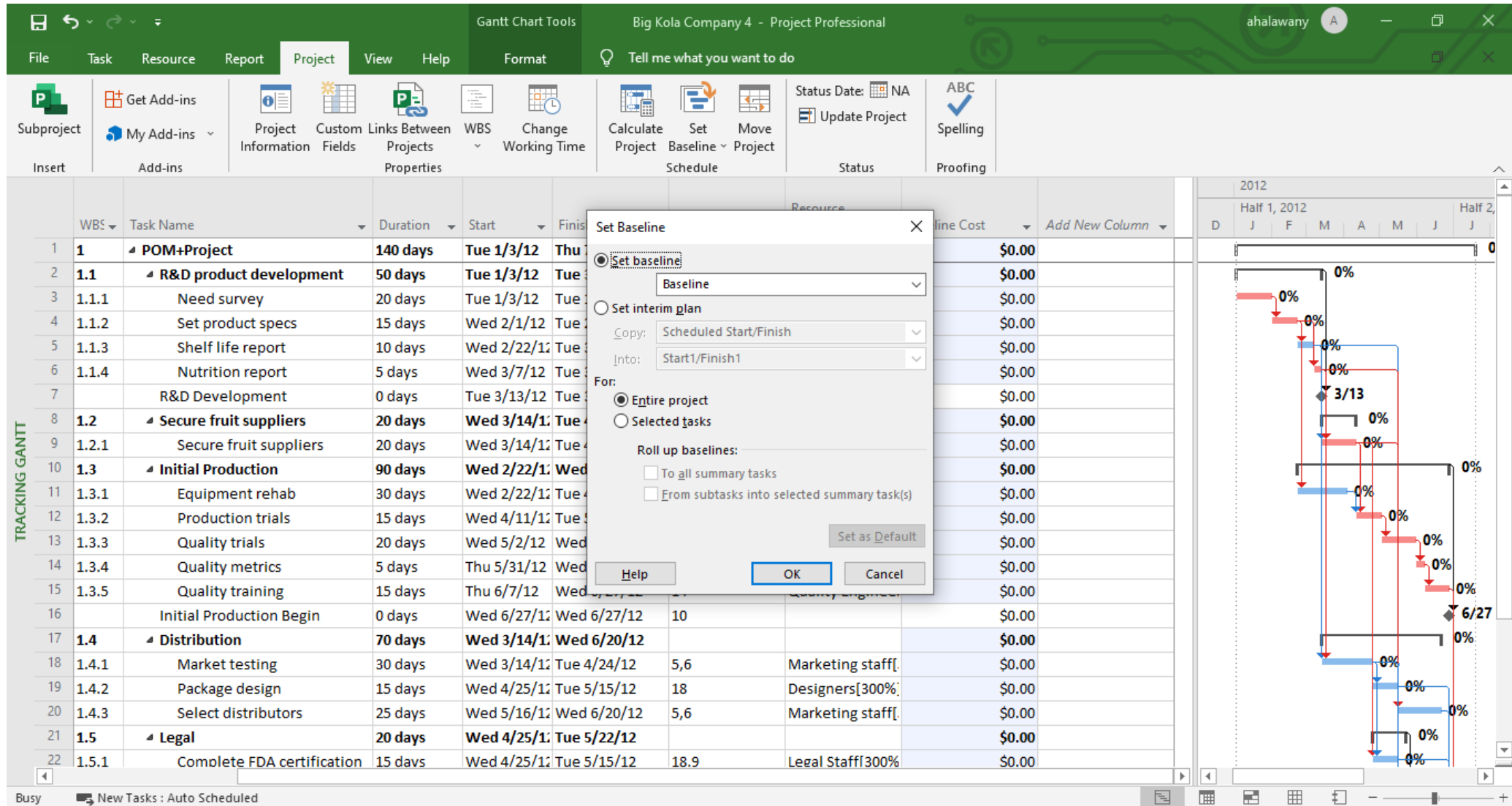


The POM+ Project - Big Kola Company – Part 3

- 3. Assume the project is resource constrained and resolve any overallocation problems by leveling outside of slack. What happens?

ID		Resource Name	Type	Material Label	Initials	Group	Max. Units	Std. Rate	Ovt. Rate	Cost/Use	Accrue At	Base Calendar
1		Marketing staff	Work		MRKT		500%	\$80.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Compx
2		R&D	Work		R&D		500%	\$80.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Compx
3		Engineering	Work		ENG		1,000%	\$100.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Compx
4		Purchasing	Work		PURCH		200%	\$60.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Compx
5		Quality Engineers	Work		QUAL		300%	\$80.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Compx
6		Designers	Work		DESIGN		300%	\$60.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Compx
7		Legal Staff	Work		LEGAL		300%	\$120.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Compx
8		Production	Work		PROD		2,000%	\$60.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Compx

The POM+ Project - Big Kola Company – Part 3



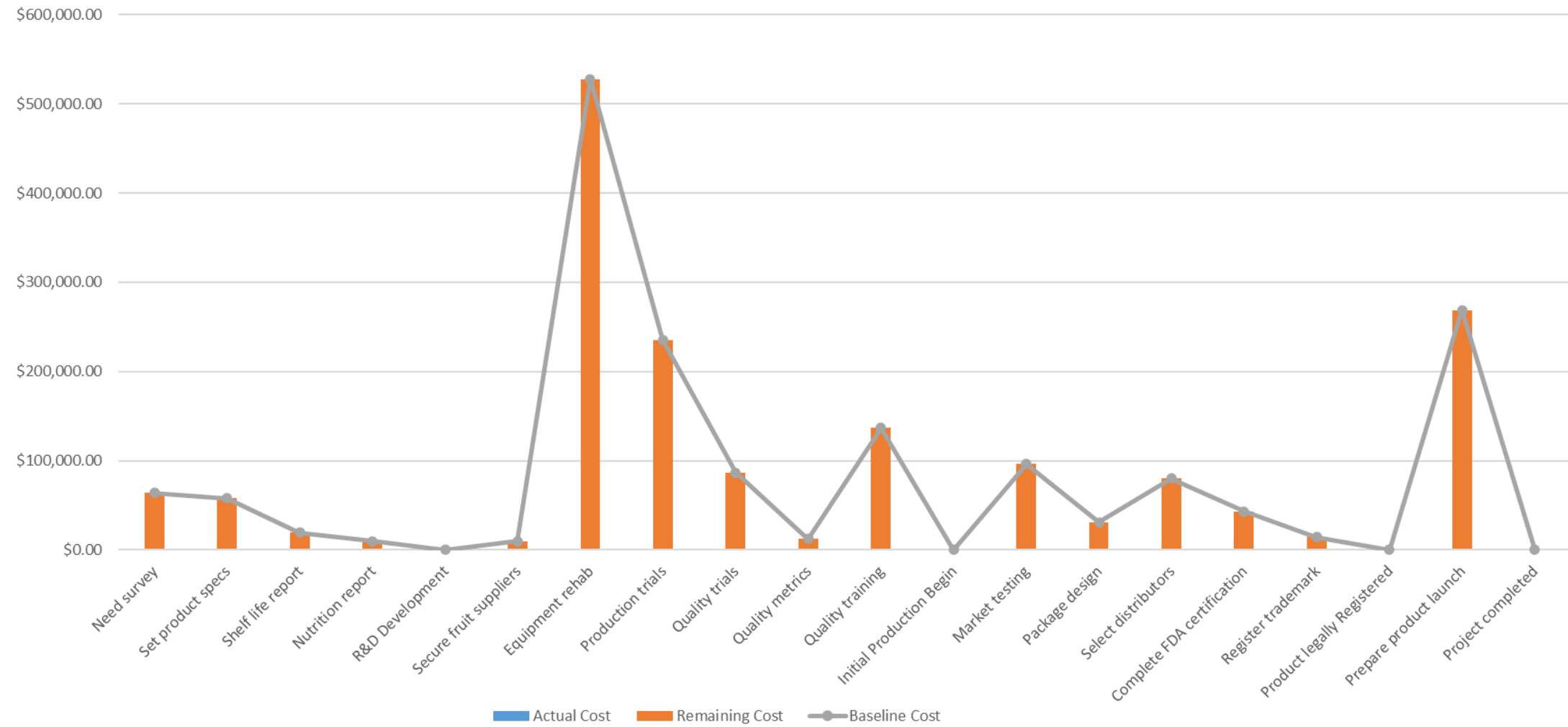
The POM+ Project - Big Kola Company – Part 3

- Top management has accepted the July 19th completion schedule created at the end of Part 2. Prepare a brief memo that addresses the following questions:
 1. How much will the project cost? What is the most expensive activity?

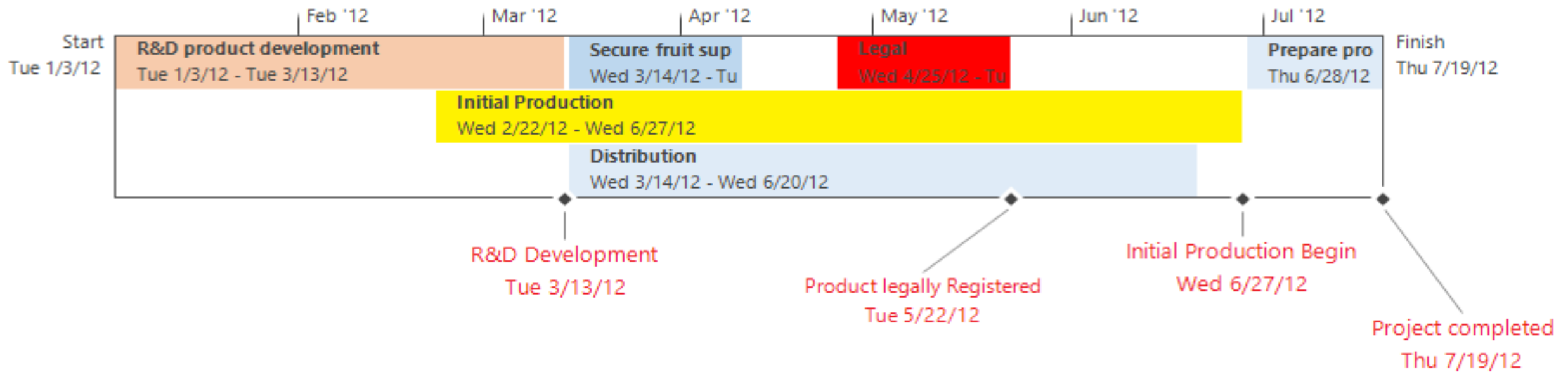
The POM+ Project - Big Kola Company – Part 3

ID		Task Mode	WBS	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Baseline Cost
1			1	POM+Project	140 days	Tue 1/3/12	Thu 7/19/12			\$1,692,000.00
2			1.1	R&D product development	50 days	Tue 1/3/12	Tue 3/13/12			\$150,400.00
3			1.1.1	Need survey	20 days	Tue 1/3/12	Tue 1/31/12		Marketing staff	\$64,000.00
4			1.1.2	Set product specs	15 days	Wed 2/1/12	Tue 2/21/12	3	R&D[400%], Mar	\$57,600.00
5			1.1.3	Shelf life report	10 days	Wed 2/22/1	Tue 3/6/12	4	R&D[300%]	\$19,200.00
6			1.1.4	Nutrition report	5 days	Wed 3/7/12	Tue 3/13/12	4	R&D[300%]	\$9,600.00
7				R&D Development	0 days	Tue 3/13/12	Tue 3/13/12	2		\$0.00
8			1.2	Secure fruit suppliers	20 days	Wed 3/14/1	Tue 4/10/12			\$9,600.00
9			1.2.1	Secure fruit suppliers	20 days	Wed 3/14/1	Tue 4/10/12	5,6	Purchasing	\$9,600.00
10			1.3	Initial Production	90 days	Wed 2/22/1	Wed 6/27/12			\$998,400.00
11			1.3.1	Equipment rehab	30 days	Wed 2/22/1	Tue 4/3/12	4	Engineering[1,0	\$528,000.00
12			1.3.2	Production trials	15 days	Wed 4/11/1	Tue 5/1/12	11,9	Production[1,5C	\$235,200.00
13			1.3.3	Quality trials	20 days	Wed 5/2/12	Wed 5/30/12	12	Quality Engineer	\$86,400.00
14			1.3.4	Quality metrics	5 days	Thu 5/31/12	Wed 6/6/12	13	Quality Engineer	\$12,000.00
15			1.3.5	Quality training	15 days	Thu 6/7/12	Wed 6/27/12	14	Quality Engineer	\$136,800.00
16				Initial Production Begin	0 days	Wed 6/27/1	Wed 6/27/12	10		\$0.00
17			1.4	Distribution	70 days	Wed 3/14/1	Wed 6/20/12			\$207,200.00
18			1.4.1	Market testing	30 days	Wed 3/14/1	Tue 4/24/12	5,6	Marketing staff	\$96,000.00
19			1.4.2	Package design	15 days	Wed 4/25/1	Tue 5/15/12	18	Designers[300%	\$31,200.00
20			1.4.3	Select distributors	25 days	Wed 5/16/1	Wed 6/20/12	5,6	Marketing staff	\$80,000.00
21			1.5	Legal	20 days	Wed 4/25/1	Tue 5/22/12			\$57,600.00
22			1.5.1	Complete FDA certification	15 days	Wed 4/25/1	Tue 5/15/12	18,9	Legal Staff[300%	\$43,200.00
23			1.5.2	Register trademark	5 days	Wed 5/16/1	Tue 5/22/12	18,9	Legal Staff[300%	\$14,400.00
24				Product legally Registered	0 days	Tue 5/22/12	Tue 5/22/12	21		\$0.00
25			1.6	Prepare product launch	15 days	Thu 6/28/12	Thu 7/19/12			\$268,800.00
26			1.6.1	Prepare product launch	15 days	Thu 6/28/12	Thu 7/19/12	15,19,20,22FS+2	Quality Engineer	\$268,800.00
27				Project completed	0 days	Thu 7/19/12	Thu 7/19/12	26		\$0.00

The POM+ Project - Big Kola Company – Part 3



Timeline



The POM+ Project - Big Kola Company – Part 4

- Assume that today is March 31, 2012, and Table A2.3 contains the tracking information for the project up till now. Enter this information into your saved baseline file and prepare a status report for the first three months of the POM+ project.
- Your status report should also address the following questions:
 - 1. How is the project progressing in terms of cost and schedule?
 - 2. What activities have gone well? What activities have not gone well?
 - 3. What do the PCIB and PCIC indicate in terms of how much of the project has been accomplished to date?
 - 4. What is the forecasted cost at completion (EAC_f)? What is the predicted VAC_f ?
 - 5. Report and interpret the TCPI for the project at this point in time.
 - 6. What is the estimated date of completion?

The POM+ Project - Big Kola Company – Part 4

TABLE A2.3
Status Report
March 31, 2012

Activity	Actual Start	Actual Finish	Actual Duration	Remaining Duration
Need survey	1/3/12	2/2/12	22	0
Set product specs	2/3/12	2/28/12	18	0
Shelf life report	2/29/12	3/13/12	10	0
Nutrition report	3/14/12	3/19/12	4	0
Equipment rehab	2/29/12		23	12

The POM+ Project - Big Kola Company – Part 4

ID	Task Name	Planned Value - PV (BCWS)	Earned Value - EV (BCWP)	Remaining Cost	CV	CV%	SV	SV%	CPI	SPI	BAC	EAC	VAC	TCPI
1	POM+Project	\$691,040.00	\$497,369.33	\$1,224,800.00	(\$73,830.67)	-15%	(\$193,670.67)	-28%	0.87	0.72	\$1,692,000.00	\$1,943,164.44	(\$251,164.44)	1.07
2	R&D product development	\$150,400.00	\$150,400.00	\$0.00	(\$16,000.00)	-11%	\$0.00	0%	0.9	1	\$150,400.00	\$166,400.00	(\$16,000.00)	-0
3	Need survey	\$64,000.00	\$64,000.00	\$0.00	(\$6,400.00)	-10%	\$0.00	0%	0.91	1	\$64,000.00	\$70,400.00	(\$6,400.00)	-0
4	Set product specs	\$57,600.00	\$57,600.00	\$0.00	(\$11,520.00)	-20%	\$0.00	0%	0.83	1	\$57,600.00	\$69,120.00	(\$11,520.00)	-0
5	Shelf life report	\$19,200.00	\$19,200.00	\$0.00	\$0.00	0%	\$0.00	0%	1	1	\$19,200.00	\$19,200.00	\$0.00	1
6	Nutrition report	\$9,600.00	\$9,600.00	\$0.00	\$1,920.00	20%	\$0.00	0%	1.25	1	\$9,600.00	\$7,680.00	\$1,920.00	0
7	R&D Development	\$0.00	\$0.00	\$0.00	\$0.00	0%	\$0.00	0%	0	0	\$0.00	\$0.00	\$0.00	0
8	Secure fruit suppliers	\$6,240.00	\$0.00	\$9,600.00	\$0.00	0%	(\$6,240.00)	-100%	0	0	\$9,600.00	\$9,600.00	\$0.00	1
9	Secure fruit suppliers	\$6,240.00	\$0.00	\$9,600.00	\$0.00	0%	(\$6,240.00)	-100%	0	0	\$9,600.00	\$9,600.00	\$0.00	1
10	Initial Production	\$492,800.00	\$346,969.33	\$681,600.00	(\$57,830.67)	-17%	(\$145,830.67)	-30%	0.86	0.7	\$998,400.00	\$1,164,807.03	(\$166,407.03)	1.1
11	Equipment rehab	\$492,800.00	\$346,969.33	\$211,200.00	(\$57,830.67)	-17%	(\$145,830.67)	-30%	0.86	0.7	\$528,000.00	\$616,003.72	(\$88,003.72)	1.47
12	Production trials	\$0.00	\$0.00	\$235,200.00	\$0.00	0%	\$0.00	0%	0	0	\$235,200.00	\$235,200.00	\$0.00	1
13	Quality trials	\$0.00	\$0.00	\$86,400.00	\$0.00	0%	\$0.00	0%	0	0	\$86,400.00	\$86,400.00	\$0.00	1
14	Quality metrics	\$0.00	\$0.00	\$12,000.00	\$0.00	0%	\$0.00	0%	0	0	\$12,000.00	\$12,000.00	\$0.00	1
15	Quality training	\$0.00	\$0.00	\$136,800.00	\$0.00	0%	\$0.00	0%	0	0	\$136,800.00	\$136,800.00	\$0.00	1
16	Initial Production Begin	\$0.00	\$0.00	\$0.00	\$0.00	0%	\$0.00	0%	0	0	\$0.00	\$0.00	\$0.00	0
17	Distribution	\$41,600.00	\$0.00	\$207,200.00	\$0.00	0%	(\$41,600.00)	-100%	0	0	\$207,200.00	\$207,200.00	\$0.00	1
18	Market testing	\$41,600.00	\$0.00	\$96,000.00	\$0.00	0%	(\$41,600.00)	-100%	0	0	\$96,000.00	\$96,000.00	\$0.00	1
19	Package design	\$0.00	\$0.00	\$31,200.00	\$0.00	0%	\$0.00	0%	0	0	\$31,200.00	\$31,200.00	\$0.00	1
20	Select distributors	\$0.00	\$0.00	\$80,000.00	\$0.00	0%	\$0.00	0%	0	0	\$80,000.00	\$80,000.00	\$0.00	1
21	Legal	\$0.00	\$0.00	\$57,600.00	\$0.00	0%	\$0.00	0%	0	0	\$57,600.00	\$57,600.00	\$0.00	1
22	Complete FDA certification	\$0.00	\$0.00	\$43,200.00	\$0.00	0%	\$0.00	0%	0	0	\$43,200.00	\$43,200.00	\$0.00	1
23	Register trademark	\$0.00	\$0.00	\$14,400.00	\$0.00	0%	\$0.00	0%	0	0	\$14,400.00	\$14,400.00	\$0.00	1
24	Product legally Registered	\$0.00	\$0.00	\$0.00	\$0.00	0%	\$0.00	0%	0	0	\$0.00	\$0.00	\$0.00	0
25	Prepare product launch	\$0.00	\$0.00	\$268,800.00	\$0.00	0%	\$0.00	0%	0	0	\$268,800.00	\$268,800.00	\$0.00	1
26	Prepare product launch	\$0.00	\$0.00	\$268,800.00	\$0.00	0%	\$0.00	0%	0	0	\$268,800.00	\$268,800.00	\$0.00	1
27	Project completed	\$0.00	\$0.00	\$0.00	\$0.00	0%	\$0.00	0%	0	0	\$0.00	\$0.00	\$0.00	0

The POM+ Project - Big Kola Company – Part 4

- $PCIB = EV/BAC = \$497,369.33 / \$1,692,000.00 = 0.29$
- $PCIC = AC/EAC_{re} = \$571,200.00 / \$1,943,164.44 = 0.29$

Finish Date	PCIB	PCIC	EACf	VACf	TCPI
July 26, 2012	0.29	0.29	\$1,943,164.44	-\$251,64.44	1.07

Basics		Calculation	Comments
PV	The planned time-phased value of the work that is scheduled		MS Project: BCWS – Budgeted cost of the work scheduled
EV	Earned value is simply percent complete times its budgeted cost of the work	$EV = \% \text{ Complete} * PV$	MS Project: BCWP – Budgeted cost of the work performed
AC	Actual cost of the work completed		MS Project: ACWP – Actual cost of the work performed
BAC	The total planned value of the project		Budgeted cost at completion
Cost			
CV	Cost variance adjusted budget costs to the actual spent costs	$CV = EV - AC$	Negative number indicates over budget. Positive number indicates under budget. Need to know % over budget to indicate magnitude.
CPI	Cost performance index is a measure of cost efficiency on a project	$CPI = EV / AC$	A value less than 1 indicates a cost overrun. A value greater than 1 indicates cost savings. CPI = .90 means “we are only earning 90 cents of planned work for each dollar spent.” Found on the EV Cost Indicators Table in MS Project.
TCPI	To complete performance index	$TCPI = (BAC - EV) / (BAC - AC)$	The amount of value each remaining dollar must earn for the project to stay within budget. A number greater than 1 means there is more work than there is budget left. A number less than 1 means there is less work than there is budget left. Found on the EV Cost Indicators Table in MS Project.
Schedule			
SV	Schedule variance: How much work that has been done compared with how much should have done at this point in time	$SV = EV - PV$	Negative number indicates work that was suppose to be done at this time has not been done. Positive number indicates work that was not suppose to be done by this time has been accomplished. SV = -1,000 means \$1,000 worth of work that was scheduled to be done at this time has not been accomplished.
SPI	Schedule performance index is a measure of schedule efficiency on a project	$SPI = EV / PV$	A value less than 1 indicates that work on the project is behind schedule. A value greater than 1 indicates work on the ahead of schedule. SPI = 1.10 means “\$1.10 worth of work has been accomplished for each \$1 worth of scheduled work.” Found at MS EV Schedule Indicators Table.
Critical Path	Look at current activity on the critical path or most recent milestone to see if it is on schedule		Compare the planned early start of most recent critical activity with the actual start. Alternative compare most recent milestone date and actual milestone date.
PCIB	Percent complete in terms of <i>budget</i>	$PCIB = EV / BAC$	What percentage of work has been completed to date based on planned budget. A good indicator of how much of the project has been completed. <u>Not available in MS Project.</u>
PCIC	Percent complete in terms of <i>expected costs</i>	$PCIC = AC / EAC_e$	What percentage of work has been completed to date based on revised estimates of total project costs. Preferred when you have confidence in revised estimates and or budget is not fixed. <u>Not available in MS Project.</u>
Forecast			
EAC_f	Forecasted estimate cost at completion	$EAC_f = AC + [(BAC - EV) / CPI]$	Gray & Larson refer to this as FAC or EAC_f . If we continue to earn ?? (CPI) on the project, how much will the total cost be? Reliability increases as PCIB or PCIC increases.
EAC_e	Revised estimate cost at completion	$EAC_e = AC + ETC$	ETC equals the revised estimates for remaining work. Only valid if revised estimates have been entered.
VAC	Forecasted cost variance	$VAC = BAC - EAC_f$	Positive number indicates that the project will be completed under budget. A negative number suggests that it will be completed over budget. Gray & Larson refer to it as VAC_f . Preferred on large projects and when it is not practical to obtain valid revised estimates.
VAC_e	Revised estimate cost variance	$VAC_e = BAC - EAC_e$	Positive number indicates that the project will be completed under budget. A negative number suggests that it will be completed over budget.

Resources

- Project Management: The Managerial Process
Fifth Edition.
- By: Erik W. Larson, Oregon State University,
Clifford F. Gray, Oregon State University

