

Project Resources and Time Management

PMG 605

Lecture 10

MS Project as a Tool for Resources and
Time Management

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Lecture

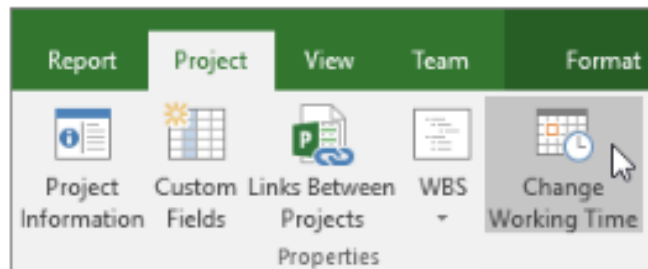
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Session Outline

MS Project as a Tool for Resources and Time Management

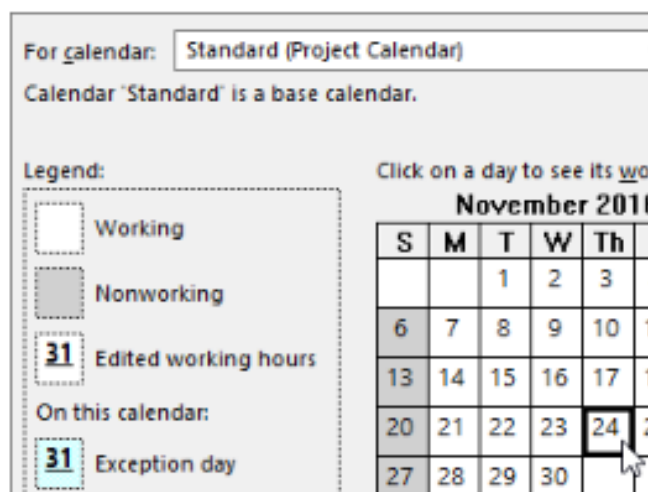
- MS Project 2019 Overview
- Set Project Calendar
- WBS
- Task Type
- Add and Level Resources
- Timeline
- Reports

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

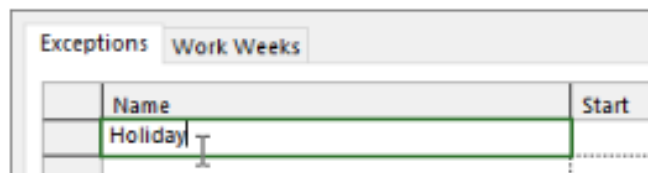


Add A Holiday To The Project Calendar

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

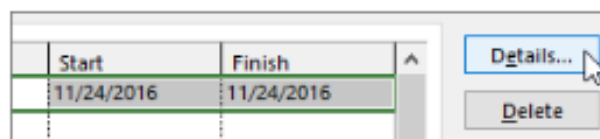


3. On the **Exceptions** tab, type a **Name** for the holiday, and then press **Enter**.

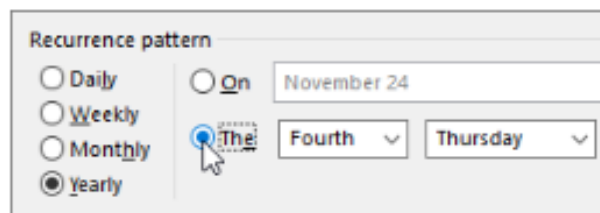


The **Start** and **Finish** dates are populated with what you had selected on the calendar, and the day is marked as nonworking.

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.

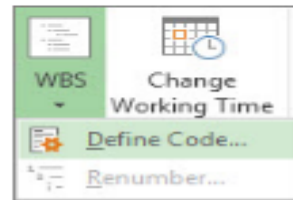


Tip: You can also set a **Range of recurrence** if the holiday happens repeatedly and then stops.

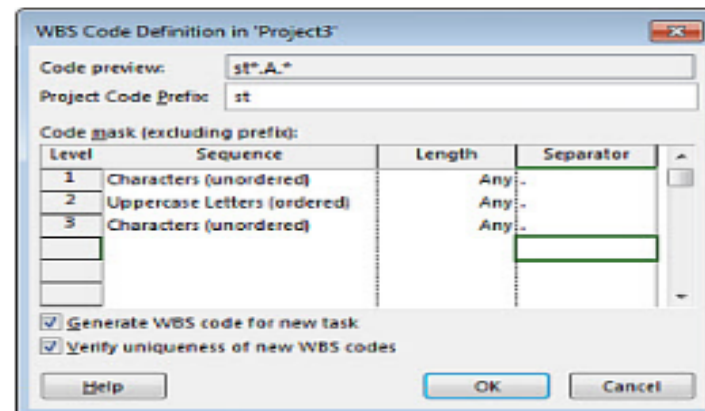
Lecture
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Create WBS codes in Project desktop

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.



Lecture

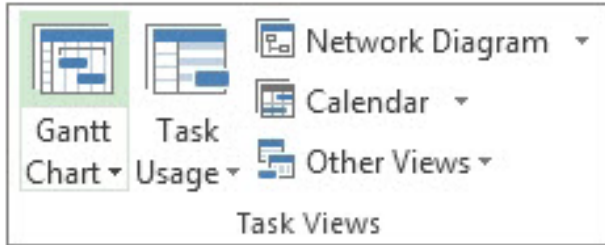
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Add A Milestone

- 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

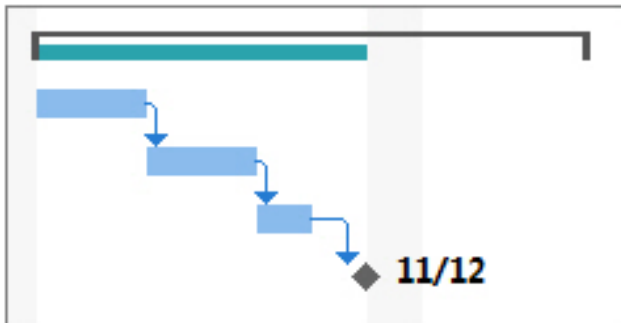
The quickest way to create a milestone is to add a task with no duration to your project plan.

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.

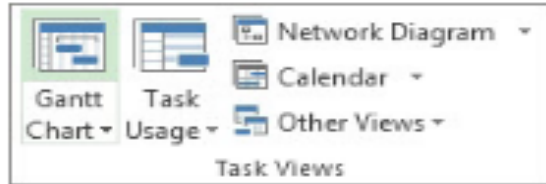
The milestone symbol is now part of your Gantt Chart.



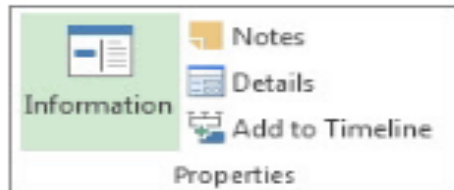
Create A Milestone With Zero Duration

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

Modify Leveling Settings

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 unleveled 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.

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

Lecture

10

The POM+ Project - Big Kola Company

#*	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

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

Lecture
10

The POM+ Project - Big Kola Company

1. Develop the WBS outline using the software available.

WBS	Task Name
1	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
	R&D Development
1.2	Secure fruit suppliers
1.2.1	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
	Initial Production Begin
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
	Product legally Registered
1.6	Prepare product launch
1.6.1	Prepare product launch
	Project completed

Lecture

10

The POM+ Project - Big Kola Company

2. Use this file and the information provided below to create a project schedule.

- The following holidays are observed:
 - New Year January 1,
 - July 4th,
 - Labor Day (first Monday in September),
 - Thanksgiving Day (4th Thursday in November),
 - December 25 and 26.
- The project team works eight-hour days, Saturday through Thursday.

Lecture

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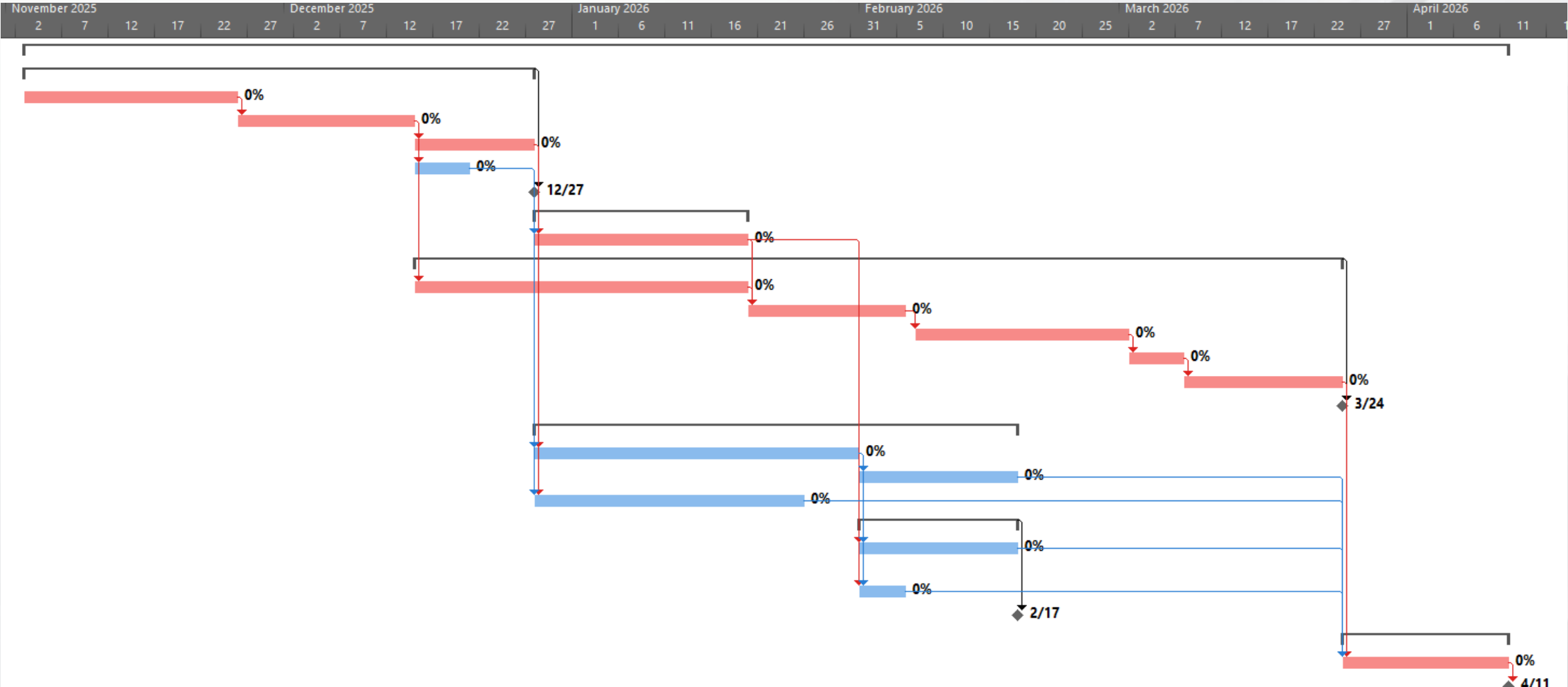
The POM+ Project - Big Kola Company

- The project will begin on November 3 , 2025
- 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.

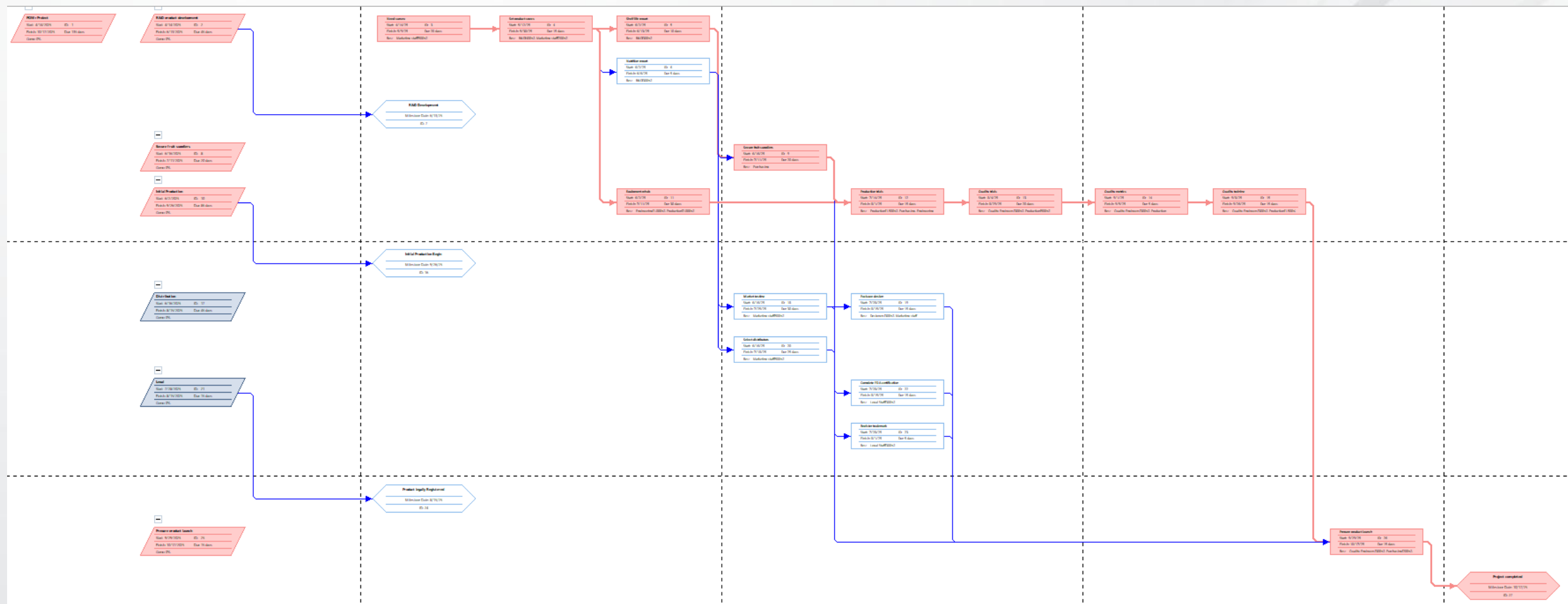
The POM+ Project - Big Kola Company

WBS	Task Name	Type	Duration	Start	Finish	Predecessors
1	▲ POM+Project	Fixed Duration	135 days	11/3/2025	4/11/2026	
1.1	▲ R&D product development	Fixed Duration	45 days	11/3/2025	12/27/2025	
1.1.1	Need survey	Fixed Duration	20 days	11/3/2025	11/25/2025	
1.1.2	Set product specs	Fixed Duration	15 days	11/26/2025	12/14/2025	3
1.1.3	Shelf life report	Fixed Duration	10 days	12/15/2025	12/27/2025	4
1.1.4	Nutrition report	Fixed Duration	5 days	12/15/2025	12/20/2025	4
	R&D Development	Fixed Duration	0 days	12/27/2025	12/27/2025	2
1.2	▲ Secure fruit suppliers	Fixed Duration	20 days	12/28/2025	1/19/2026	
1.2.1	Secure fruit suppliers	Fixed Duration	20 days	12/28/2025	1/19/2026	5,6
1.3	▲ Initial Production	Fixed Duration	85 days	12/15/2025	3/24/2026	
1.3.1	Equipment rehab	Fixed Duration	30 days	12/15/2025	1/19/2026	4
1.3.2	Production trials	Fixed Duration	15 days	1/20/2026	2/5/2026	11,9
1.3.3	Quality trials	Fixed Duration	20 days	2/7/2026	3/1/2026	12
1.3.4	Quality metrics	Fixed Duration	5 days	3/2/2026	3/7/2026	13
1.3.5	Quality training	Fixed Duration	15 days	3/8/2026	3/24/2026	14
	Initial Production Begin	Fixed Duration	0 days	3/24/2026	3/24/2026	10
1.4	▲ Distribution	Fixed Duration	45 days	12/28/2025	2/17/2026	
1.4.1	Market testing	Fixed Duration	30 days	12/28/2025	1/31/2026	5,6
1.4.2	Package design	Fixed Duration	15 days	2/1/2026	2/17/2026	18
1.4.3	Select distributors	Fixed Duration	25 days	12/28/2025	1/25/2026	5,6
1.5	▲ Legal	Fixed Duration	15 days	2/1/2026	2/17/2026	
1.5.1	Complete FDA certification	Fixed Duration	15 days	2/1/2026	2/17/2026	18,9
1.5.2	Register trademark	Fixed Duration	5 days	2/1/2026	2/5/2026	18,9
	Product legally Registered	Fixed Duration	0 days	2/17/2026	2/17/2026	21
1.6	▲ Prepare product launch	Fixed Duration	15 days	3/25/2026	4/11/2026	
1.6.1	Prepare product launch	Fixed Duration	15 days	3/25/2026	4/11/2026	15,19,20,22FS+25 days,23FS+15
	Project completed	Fixed Duration	0 days	4/11/2026	4/11/2026	26

The POM+ Project - Big Kola Company



The POM+ Project - Big Kola Company



The POM+ Project - Big Kola Company

Task ID	WBS	Task Name	Type	Duration	Start	Finish	Predecessors	Early Start	Early Finish	Late Start	Late Finish
1		POM+Project	Fixed Duration	135 days	11/3/2025	4/11/2026		11/3/2025	4/11/2026	11/3/2025	4/11/2026
1.1		R&D product development	Fixed Duration	45 days	11/3/2025	12/27/2025		11/3/2025	12/27/2025	11/3/2025	12/27/2025
1.1.1		Need survey	Fixed Duration	20 days	11/3/2025	11/25/2025		11/3/2025	11/25/2025	11/3/2025	11/25/2025
1.1.2		Set product specs	Fixed Duration	15 days	11/26/2025	12/14/2025	3	11/26/2025	12/14/2025	11/26/2025	12/14/2025
1.1.3		Shelf life report	Fixed Duration	10 days	12/15/2025	12/27/2025	4	12/15/2025	12/27/2025	12/15/2025	12/27/2025
1.1.4		Nutrition report	Fixed Duration	5 days	12/15/2025	12/20/2025	4	12/15/2025	12/20/2025	12/21/2025	12/27/2025
		R&D Development	Fixed Duration	0 days	12/27/2025	12/27/2025	2	12/27/2025	12/27/2025	4/11/2026	4/11/2026
1.2		Secure fruit suppliers	Fixed Duration	20 days	12/28/2025	1/19/2026		12/28/2025	1/19/2026	12/28/2025	1/19/2026
1.2.1		Secure fruit suppliers	Fixed Duration	20 days	12/28/2025	1/19/2026	5,6	12/28/2025	1/19/2026	12/28/2025	1/19/2026
1.3		Initial Production	Fixed Duration	85 days	12/15/2025	3/24/2026		12/15/2025	3/24/2026	12/15/2025	3/24/2026
1.3.1		Equipment rehab	Fixed Duration	30 days	12/15/2025	1/19/2026	4	12/15/2025	1/19/2026	12/15/2025	1/19/2026
1.3.2		Production trials	Fixed Duration	15 days	1/20/2026	2/5/2026	11,9	1/20/2026	2/5/2026	1/20/2026	2/5/2026
1.3.3		Quality trials	Fixed Duration	20 days	2/7/2026	3/1/2026	12	2/7/2026	3/1/2026	2/7/2026	3/1/2026
1.3.4		Quality metrics	Fixed Duration	5 days	3/2/2026	3/7/2026	13	3/2/2026	3/7/2026	3/2/2026	3/7/2026
1.3.5		Quality training	Fixed Duration	15 days	3/8/2026	3/24/2026	14	3/8/2026	3/24/2026	3/8/2026	3/24/2026
		Initial Production Begin	Fixed Duration	0 days	3/24/2026	3/24/2026	10	3/24/2026	3/24/2026	4/11/2026	4/11/2026
1.4		Distribution	Fixed Duration	45 days	12/28/2025	2/17/2026		12/28/2025	2/17/2026	1/3/2026	3/24/2026
1.4.1		Market testing	Fixed Duration	30 days	12/28/2025	1/31/2026	5,6	12/28/2025	1/31/2026	1/3/2026	2/5/2026
1.4.2		Package design	Fixed Duration	15 days	2/1/2026	2/17/2026	18	2/1/2026	2/17/2026	3/8/2026	3/24/2026
1.4.3		Select distributors	Fixed Duration	25 days	12/28/2025	1/25/2026	5,6	12/28/2025	1/25/2026	2/24/2026	3/24/2026
1.5		Legal	Fixed Duration	15 days	2/1/2026	2/17/2026		2/1/2026	2/17/2026	2/7/2026	3/7/2026
1.5.1		Complete FDA certification	Fixed Duration	15 days	2/1/2026	2/17/2026	18,9	2/1/2026	2/17/2026	2/7/2026	2/23/2026
1.5.2		Register trademark	Fixed Duration	5 days	2/1/2026	2/5/2026	18,9	2/1/2026	2/5/2026	3/2/2026	3/7/2026
		Product legally Registered	Fixed Duration	0 days	2/17/2026	2/17/2026	21	2/17/2026	2/17/2026	4/11/2026	4/11/2026
1.6		Prepare product launch	Fixed Duration	15 days	3/25/2026	4/11/2026		3/25/2026	4/11/2026	3/25/2026	4/11/2026
1.6.1		Prepare product launch	Fixed Duration	15 days	3/25/2026	4/11/2026	15,19,20,22FS+25 days,23FS+15	3/25/2026	4/11/2026	3/25/2026	4/11/2026
		Project completed	Fixed Duration	0 days	4/11/2026	4/11/2026	26	4/11/2026	4/11/2026	4/11/2026	4/11/2026

Lecture

10

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.

Lecture

10

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

Lecture

10

The POM+ Project - Big Kola Company – Part 2

Activity

Need survey
Set product specs
Shelf life report
Nutrition report
Select fruit suppliers
Equipment rehab
Production trials
Quality trials
Quality metrics
Quality training
Market testing
Package design
Select distributors
Complete FDA certification
Register trademark
Prepare product launch

Resources

MRKT (500%)
R&D (400%), MRKT (200%)
R&D (300%)
R&D (300%)
PURCH (100%)
ENG (1,000%), PROD (2,000%)
PROD (1,500%), PURCH (100%), ENG (1,000%)
QUAL (300%), PROD (500%)
QUAL (300%), PROD (100%)
QUAL (300%), PROD (1,500%)
MRKT (500%)
DESIGN (300%), MRKT (100%)
MRKT (500%)
LEGAL (300%)
LEGAL (300%)
QUAL (300%), PURCH (200%), PROD (1,500%),
MRKT (500%), ENG (500%), R&D (100%)

Lecture

10

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 over allocated?
 - 2. Assume that the project is time constrained and try to resolve any over allocation problems by leveling within slack. What happens?
 - 3. Assume the project is resource constrained and resolve any over allocation problems by leveling outside of slack. What happens?

Lecture
10

The POM+ Project - Big Kola Company – Part 2

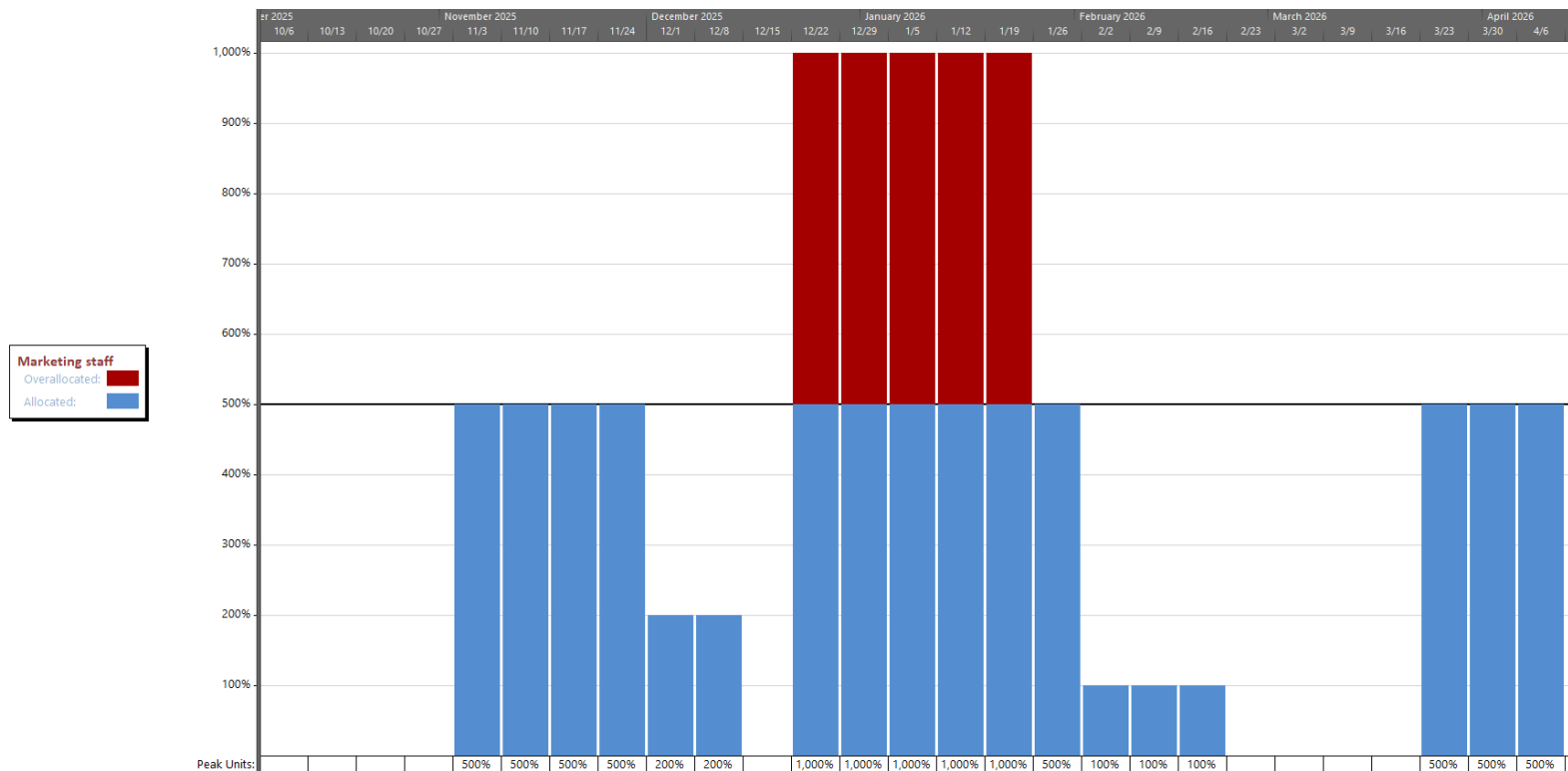
- 1. Which if any of the resources are over allocated?

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 Com
2		R&D	Work		R&D		500%	\$80.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Com
3		Engineering	Work		ENG		1,000%	\$100.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Com
4		Purchasing	Work		PURCH		200%	\$60.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Com
5		Quality Engineers	Work		QUAL		300%	\$80.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Com
6		Designers	Work		DESIGN		300%	\$60.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Com
7		Legal Staff	Work		LEGAL		300%	\$120.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Com
8		Production	Work		PROD		2,000%	\$60.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Com

Lecture
10

The POM+ Project - Big Kola Company – Part 2

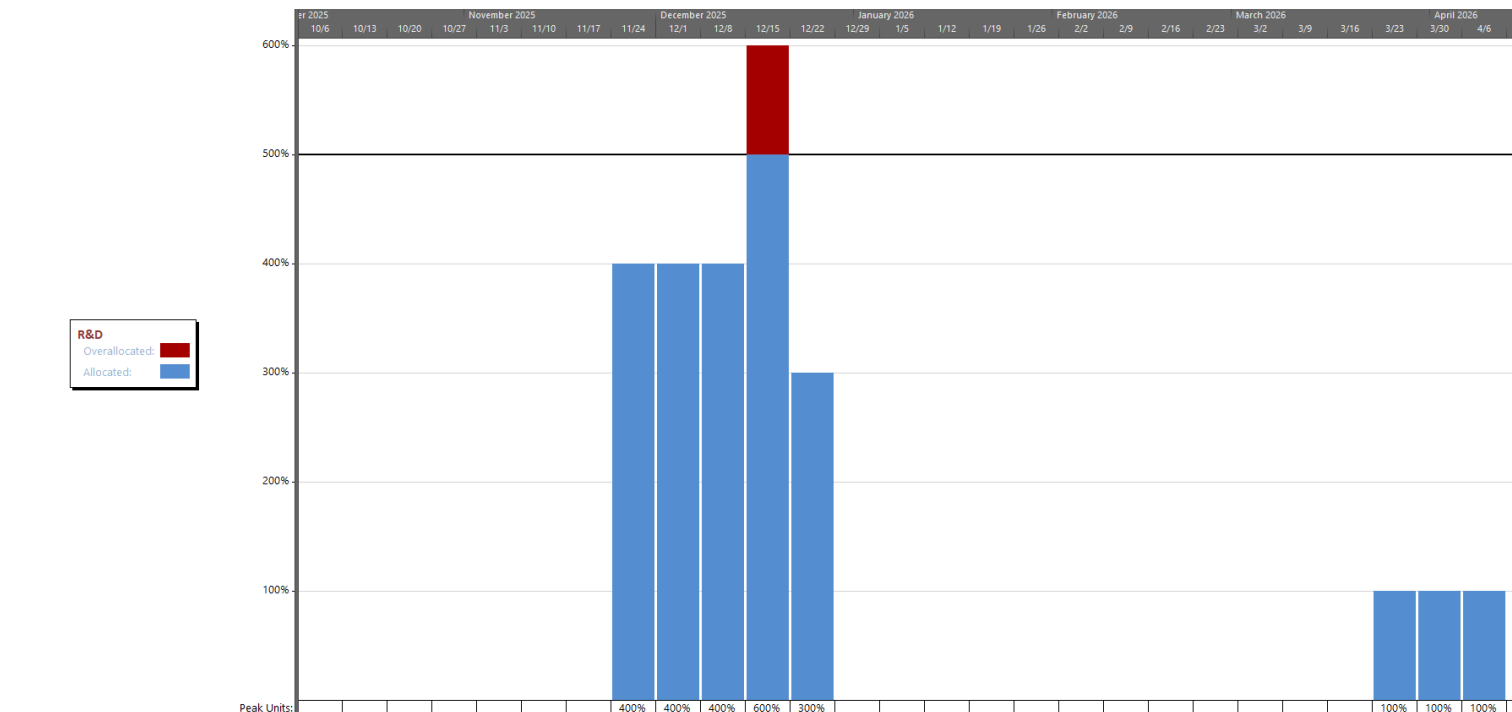
- 1. Which if any of the resources are over allocated?



Lecture
10

The POM+ Project - Big Kola Company – Part 2

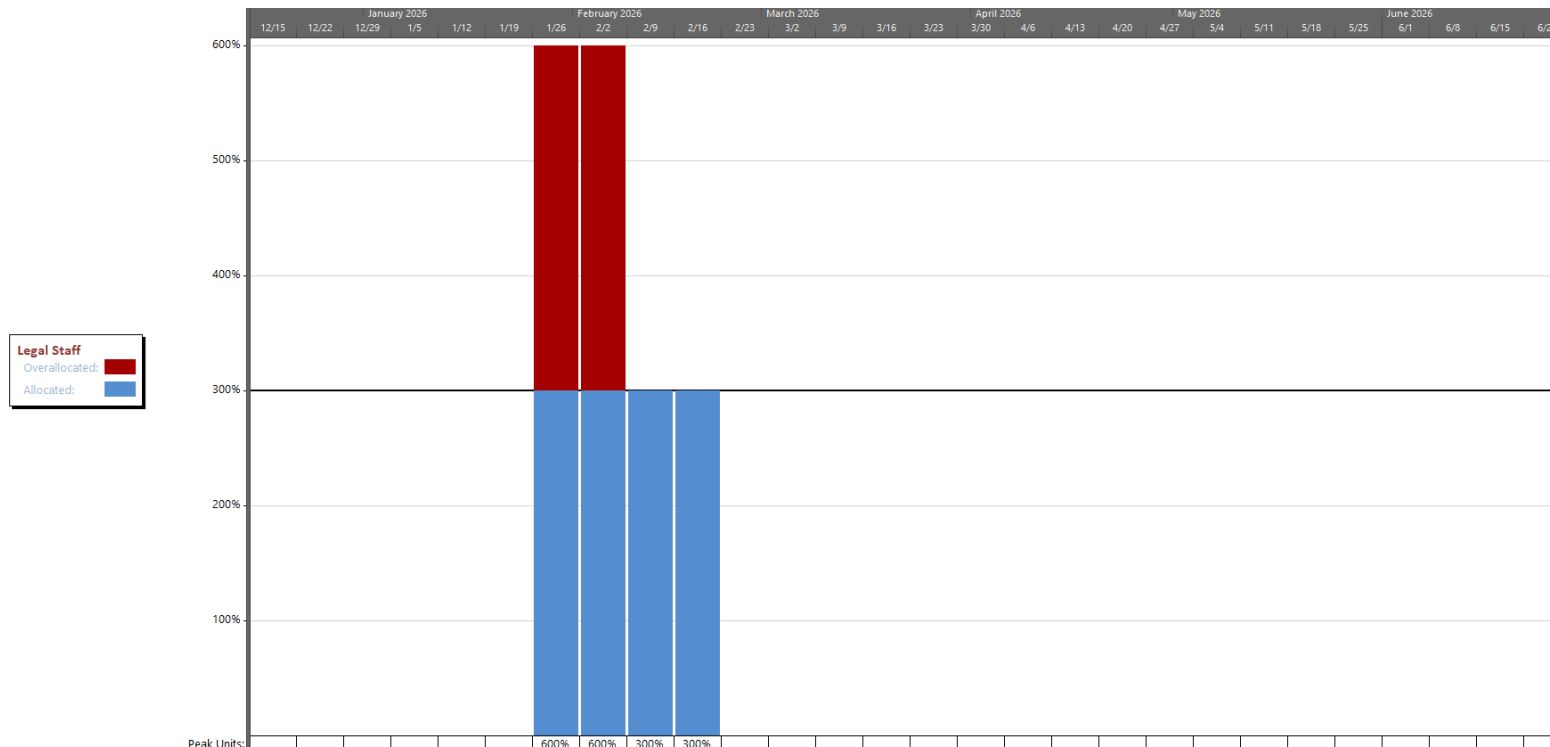
- 1. Which if any of the resources are over allocated?



Lecture
10

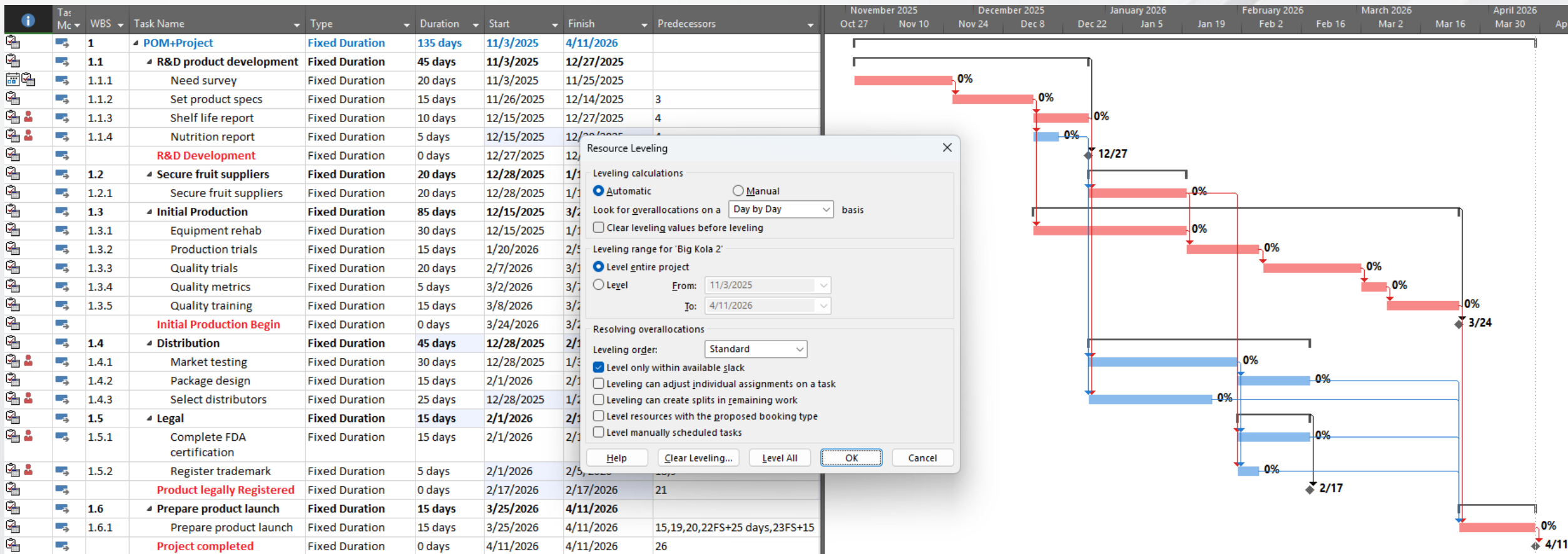
The POM+ Project - Big Kola Company – Part 2

- 1. Which if any of the resources are over allocated?



The POM+ Project - Big Kola Company – Part 2

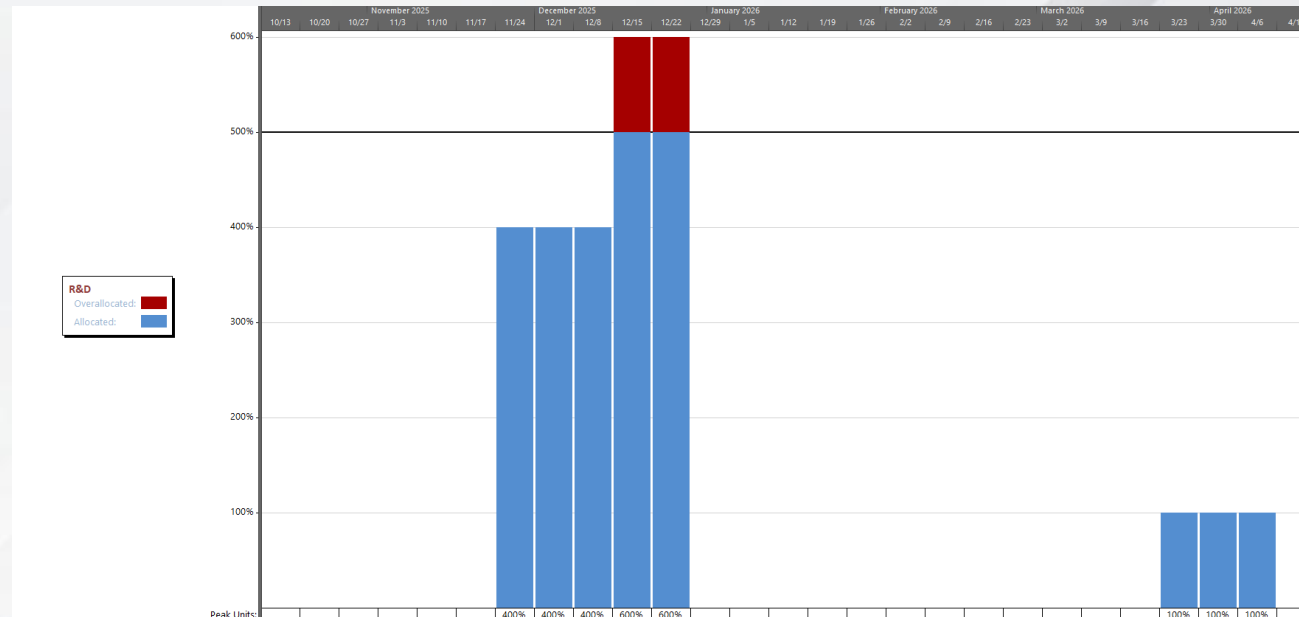
- 2. Assume that the project is time constrained and try to resolve any overallocation problems by leveling within slack. What happens?



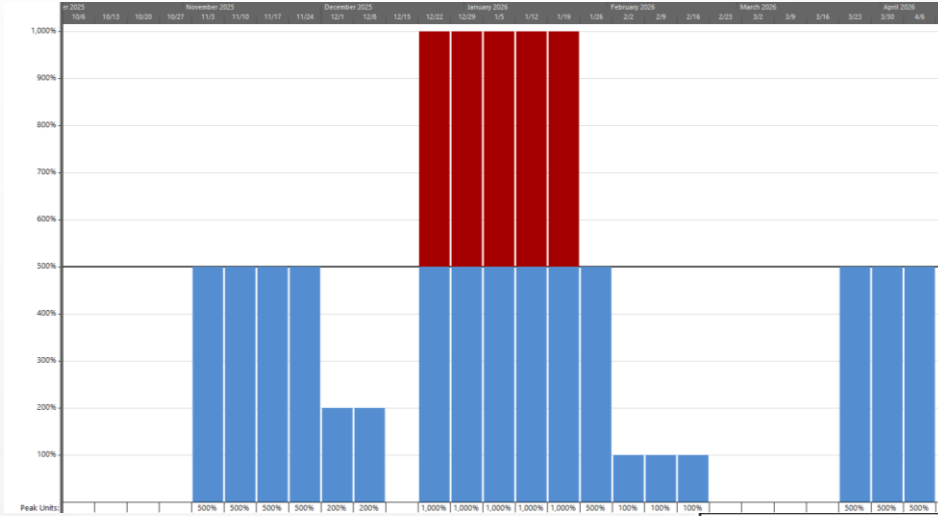
The POM+ Project - Big Kola Company – Part 2

- 2. Assume that the project is time constrained and try to resolve any over allocation 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 Com	
2		R&D	Work		R&D		500%	\$80.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Com	
3		Engineering	Work		ENG		1,000%	\$100.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Com	
4		Purchasing	Work		PURCH		200%	\$60.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Com	
5		Quality Engineers	Work		QUAL		300%	\$80.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Com	
6		Designers	Work		DESIGN		300%	\$60.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Com	
7		Legal Staff	Work		LEGAL		300%	\$120.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Com	
8		Production	Work		PROD		2,000%	\$60.00/hr	\$0.00/hr	\$0.00	Prorated	Big Kola Com	



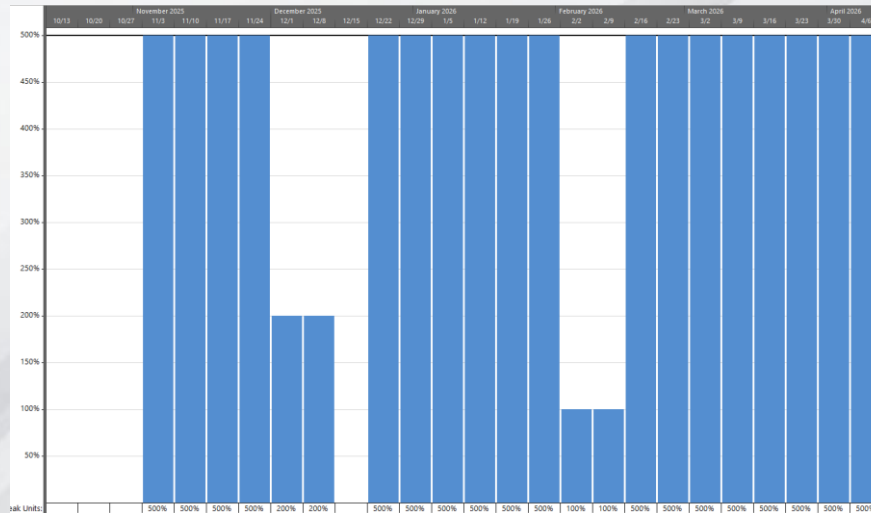
The POM+ Project - Big Kola Company – Part 2



Before Leveling within Slack

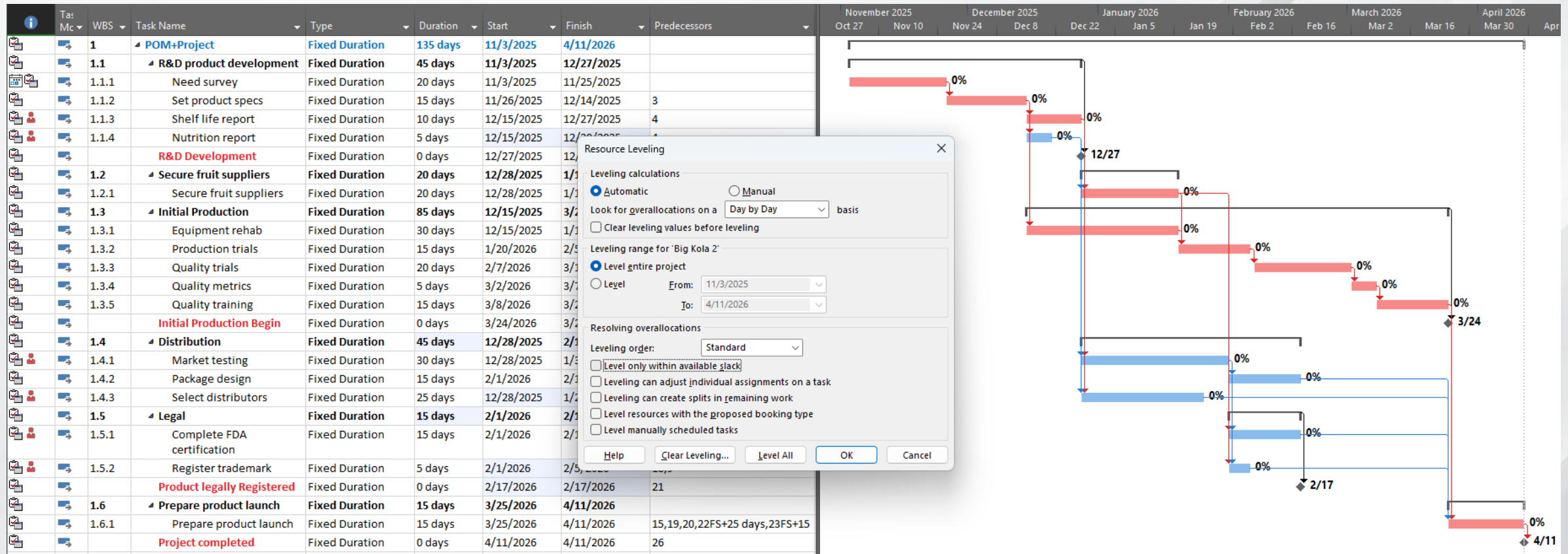
Marketing staff
Overallocated: █
Allocated: █

After Leveling within Slack



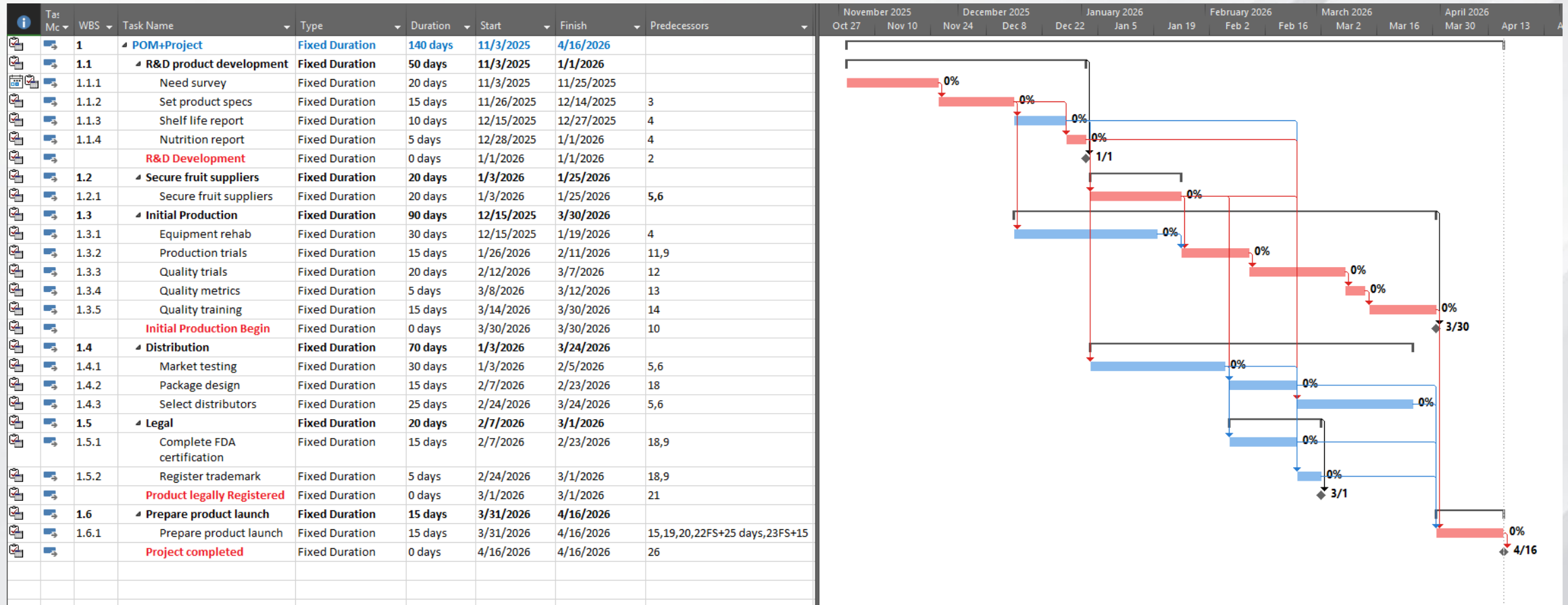
The POM+ Project - Big Kola Company – Part 2

- 3. Assume the project is resource constrained and resolve any over allocation 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 over allocation 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 over allocation 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

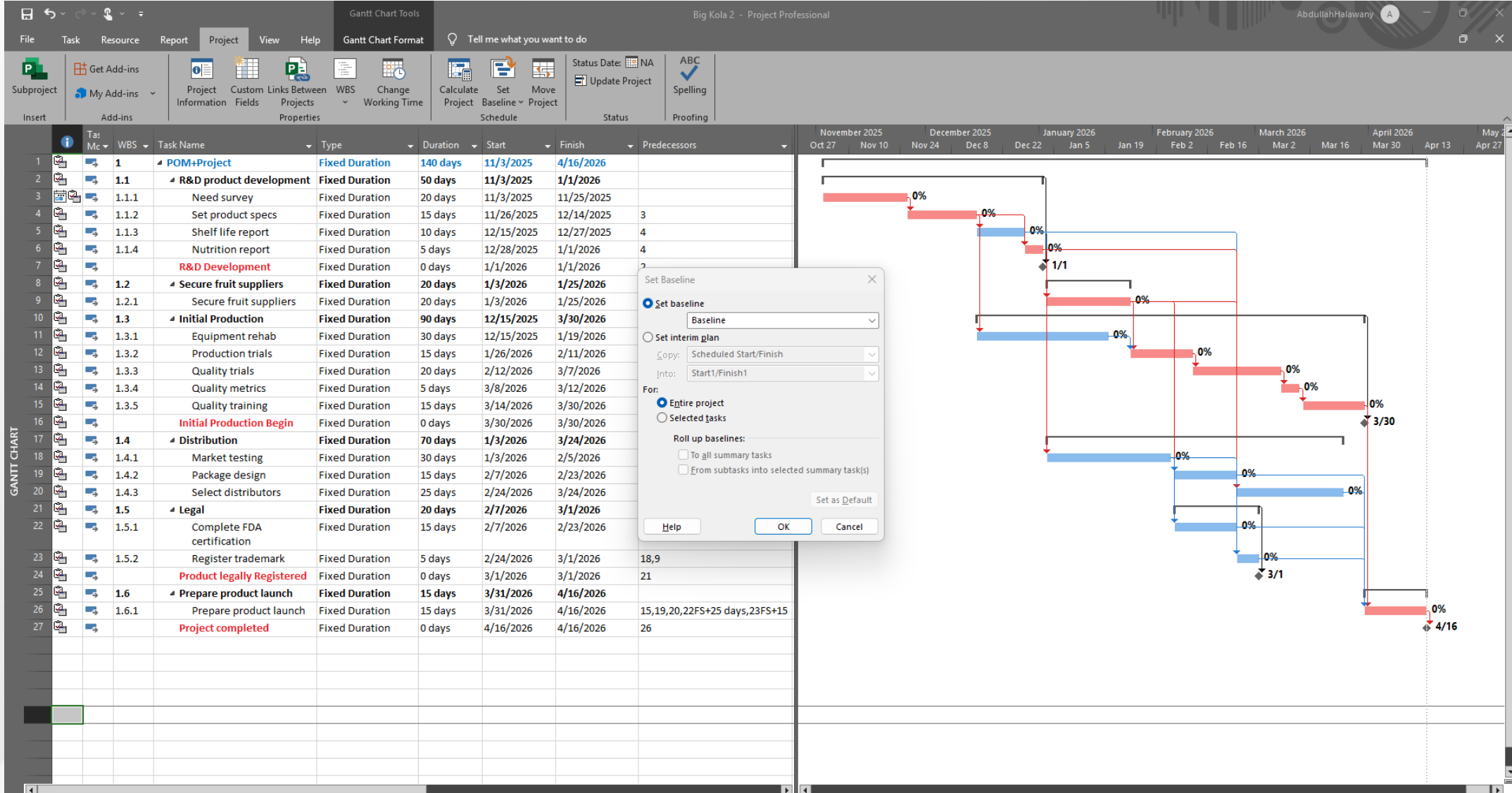
Lecture

10

The POM+ Project - Big Kola Company – Part 3

- Top management has accepted the April 16th 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

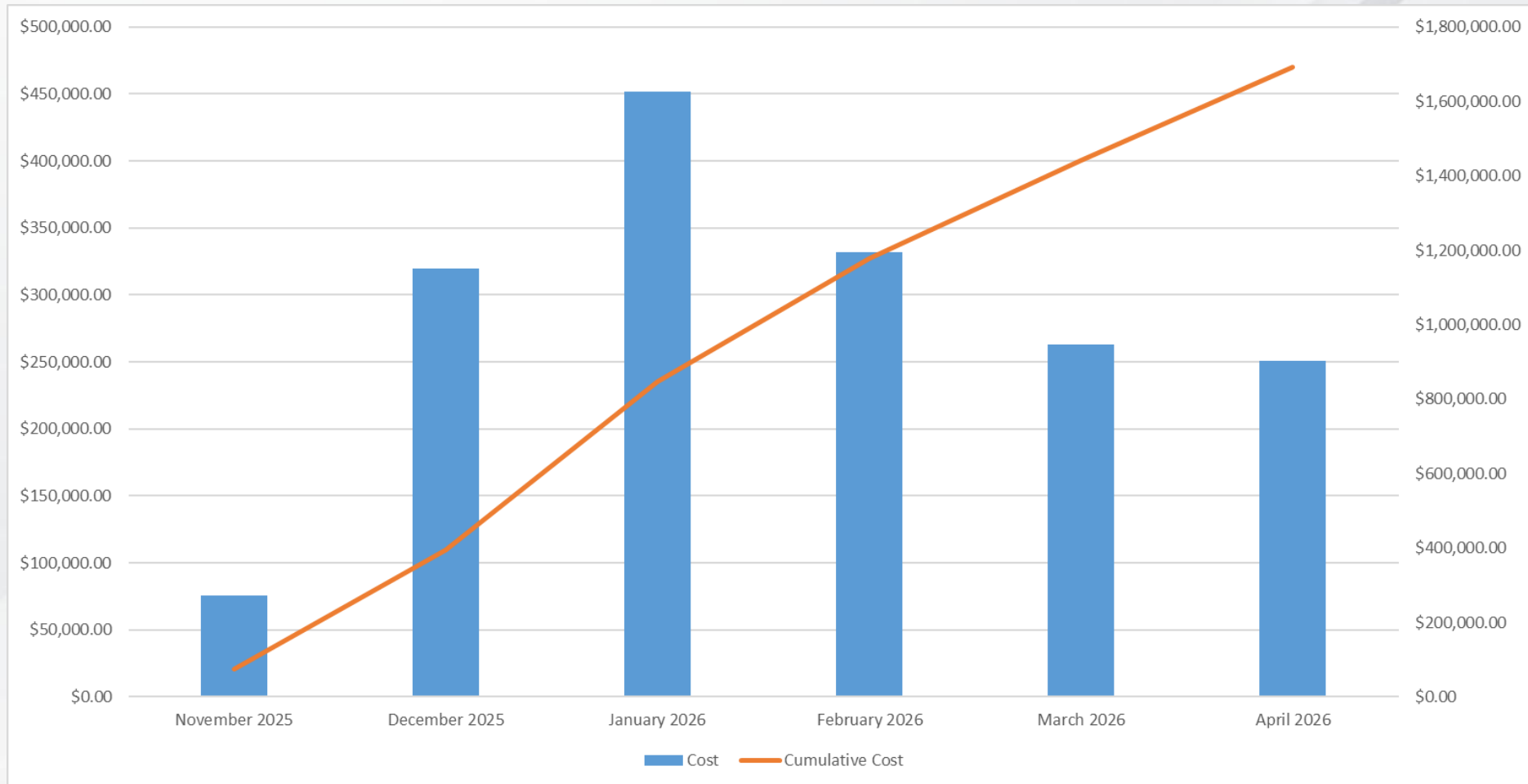


The POM+ Project - Big Kola Company – Part 3

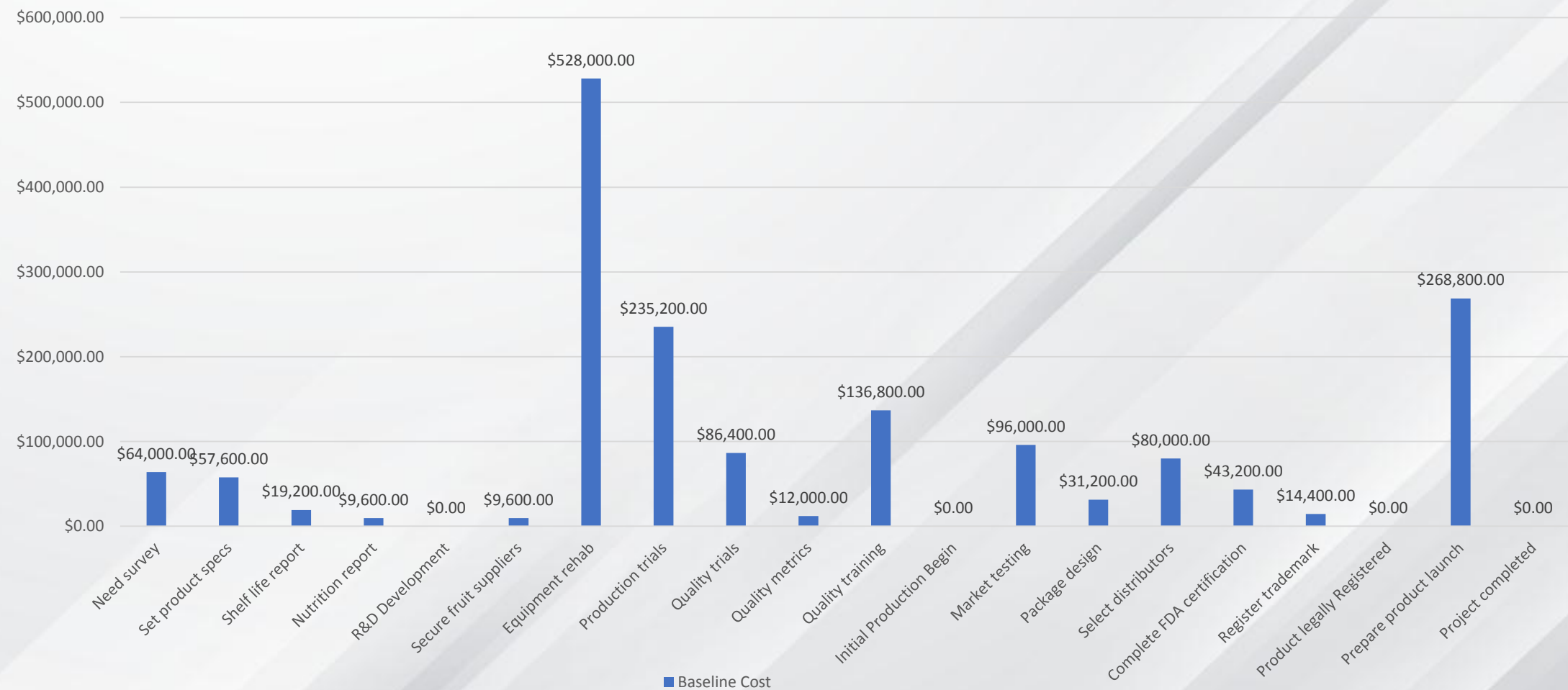
Task ID	WBS	Task Name	Type	Duration	Start	Finish	Predecessors	Early Start	Early Finish	Late Start	Late Finish	Resource Names	Cost
1		POM+Project	Fixed Duration	140 days	11/3/2025	4/16/2026		11/3/2025	4/16/2026	11/3/2025	4/16/2026		\$1,692,000.00
1.1		R&D product development	Fixed Duration	50 days	11/3/2025	1/1/2026		11/3/2025	1/1/2026	11/3/2025	1/1/2026		\$150,400.00
1.1.1		Need survey	Fixed Duration	20 days	11/3/2025	11/25/2025		11/3/2025	11/25/2025	11/3/2025	11/25/2025	Marketing staff[5	\$64,000.00
1.1.2		Set product specs	Fixed Duration	15 days	11/26/2025	12/14/2025	3	11/26/2025	12/14/2025	11/26/2025	12/14/2025	R&D[400%],Mark	\$57,600.00
1.1.3		Shelf life report	Fixed Duration	10 days	12/15/2025	12/27/2025	4	12/15/2025	12/27/2025	12/21/2025	1/1/2026	R&D[300%]	\$19,200.00
1.1.4		Nutrition report	Fixed Duration	5 days	12/28/2025	1/1/2026	4	12/15/2025	1/1/2026	12/28/2025	1/1/2026	R&D[300%]	\$9,600.00
		R&D Development	Fixed Duration	0 days	1/1/2026	1/1/2026	2	1/1/2026	1/1/2026	4/16/2026	4/16/2026		\$0.00
1.2		Secure fruit suppliers	Fixed Duration	20 days	1/3/2026	1/25/2026		1/3/2026	1/25/2026	1/3/2026	1/25/2026		\$9,600.00
1.2.1		Secure fruit suppliers	Fixed Duration	20 days	1/3/2026	1/25/2026	5,6	1/3/2026	1/25/2026	1/3/2026	1/25/2026	Purchasing	\$9,600.00
1.3		Initial Production	Fixed Duration	90 days	12/15/2025	3/30/2026		12/15/2025	3/30/2026	12/21/2025	3/30/2026		\$998,400.00
1.3.1		Equipment rehab	Fixed Duration	30 days	12/15/2025	1/19/2026	4	12/15/2025	1/19/2026	12/21/2025	1/25/2026	Engineering[1,00	\$528,000.00
1.3.2		Production trials	Fixed Duration	15 days	1/26/2026	2/11/2026	11,9	1/26/2026	2/11/2026	1/26/2026	2/11/2026	Production[1,500	\$235,200.00
1.3.3		Quality trials	Fixed Duration	20 days	2/12/2026	3/7/2026	12	2/12/2026	3/7/2026	2/12/2026	3/7/2026	Quality Engineer:	\$86,400.00
1.3.4		Quality metrics	Fixed Duration	5 days	3/8/2026	3/12/2026	13	3/8/2026	3/12/2026	3/8/2026	3/12/2026	Quality Engineer:	\$12,000.00
1.3.5		Quality training	Fixed Duration	15 days	3/14/2026	3/30/2026	14	3/14/2026	3/30/2026	3/14/2026	3/30/2026	Quality Engineer:	\$136,800.00
		Initial Production Begin	Fixed Duration	0 days	3/30/2026	3/30/2026	10	3/30/2026	3/30/2026	4/16/2026	4/16/2026		\$0.00
1.4		Distribution	Fixed Duration	70 days	1/3/2026	3/24/2026		1/3/2026	3/24/2026	1/8/2026	3/30/2026		\$207,200.00
1.4.1		Market testing	Fixed Duration	30 days	1/3/2026	2/5/2026	5,6	1/3/2026	2/5/2026	1/8/2026	2/11/2026	Marketing staff[5	\$96,000.00
1.4.2		Package design	Fixed Duration	15 days	2/7/2026	2/23/2026	18	2/7/2026	2/23/2026	3/14/2026	3/30/2026	Designers[300%],	\$31,200.00
1.4.3		Select distributors	Fixed Duration	25 days	2/24/2026	3/24/2026	5,6	1/3/2026	3/24/2026	3/2/2026	3/30/2026	Marketing staff[5	\$80,000.00
1.5		Legal	Fixed Duration	20 days	2/7/2026	3/1/2026		2/7/2026	3/1/2026	2/12/2026	3/12/2026		\$57,600.00
1.5.1		Complete FDA certification	Fixed Duration	15 days	2/7/2026	2/23/2026	18,9	2/7/2026	2/23/2026	2/12/2026	3/1/2026	Legal Staff[300%]	\$43,200.00
1.5.2		Register trademark	Fixed Duration	5 days	2/24/2026	3/1/2026	18,9	2/7/2026	3/1/2026	3/8/2026	3/12/2026	Legal Staff[300%]	\$14,400.00
		Product legally Registered	Fixed Duration	0 days	3/1/2026	3/1/2026	21	3/1/2026	3/1/2026	4/16/2026	4/16/2026		\$0.00
1.6		Prepare product launch	Fixed Duration	15 days	3/31/2026	4/16/2026		3/31/2026	4/16/2026	3/31/2026	4/16/2026		\$268,800.00
1.6.1		Prepare product launch	Fixed Duration	15 days	3/31/2026	4/16/2026	15,19,20,22FS+25 days,23FS+15	3/31/2026	4/16/2026	3/31/2026	4/16/2026	Quality Engineer:	\$268,800.00
		Project completed	Fixed Duration	0 days	4/16/2026	4/16/2026	26	4/16/2026	4/16/2026	4/16/2026	4/16/2026		\$0.00

The POM+ Project - Big Kola Company – Part 3

Baseline Cost
\$1,692,000.00

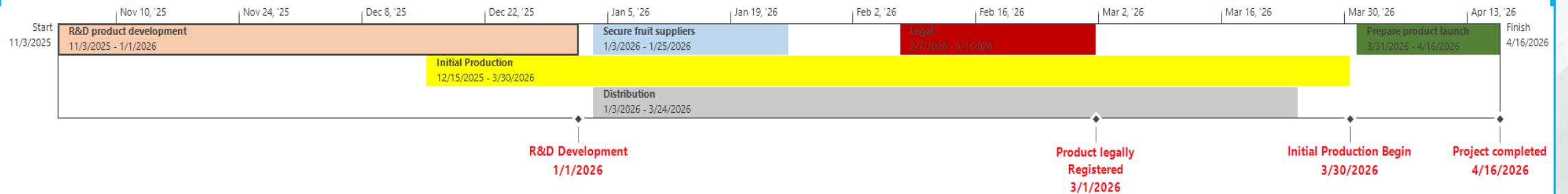


The POM+ Project - Big Kola Company – Part 3



Lecture 10

Timeline



Lecture

10

The POM+ Project - Big Kola Company – Part 4

- Assume that today is February 8, 2026, 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 are the CPI and SPI of the project?
 - 4. What is the forecasted cost at completion (EAC_f)?
 - 5. What is the estimated date of completion?

Lecture
10

The POM+ Project - Big Kola Company – Part 4

Status Report February 8, 2026

Task Name	Actual Start	Actual Finish	Actual Duration
Need survey	11/3/2025	11/29/2025	22 days
Set product specs	11/30/2025	12/20/2025	18 days
Shelf-life report	12/23/2025	1/4/2026	10 days
Nutrition report	1/7/2026	1/11/2026	4 days
Equipment rehab	12/23/2025	NA	23 days

The POM+ Project - Big Kola Company – Part 4

WBS	Task Name	Baseline Duration	Duration	Start	Finish	Actual Start	Actual Finish	Actual Duration	BCWS	BCWP	Remaining Cost	CV	CV%	SV	SV%	CPI	SPI	ACWP	EAC	Baseline Cost
1	➤ POM+Project	140 days	148 days	11/3/2025	4/26/2026	11/3/2025	NA	43.17 days	\$982,080.00	\$555,200.00	\$1,136,800.00	(\$8,320.00)	-1%	(\$426,880.00)	-43%	0.99	0.57	\$563,520.00	\$1,717,355.62	\$1,692,000.00
1.1	➤ R&D product development	50 days	58 days	11/3/2025	1/11/2026	11/3/2025	1/11/2026	58 days	\$150,400.00	\$150,400.00	\$0.00	(\$8,320.00)	-6%	\$0.00	0%	0.95	1	\$158,720.00	\$158,720.00	\$150,400.00
1.1.1	Need survey	20 days	22 days	11/3/2025	11/29/2025	11/3/2025	11/29/2025	22 days	\$64,000.00	\$64,000.00	\$0.00	(\$6,400.00)	-10%	\$0.00	0%	0.91	1	\$70,400.00	\$70,400.00	\$64,000.00
1.1.2	Set product specs	15 days	18 days	11/30/2025	12/20/2025	11/30/2025	12/20/2025	18 days	\$57,600.00	\$57,600.00	\$0.00	(\$11,520.00)	-20%	\$0.00	0%	0.83	1	\$69,120.00	\$69,120.00	\$57,600.00
1.1.3	Shelf life report	10 days	10 days	12/23/2025	1/4/2026	12/23/2025	1/4/2026	10 days	\$19,200.00	\$19,200.00	\$0.00	\$0.00	0%	\$0.00	0%	1	1	\$19,200.00	\$19,200.00	\$19,200.00
1.1.4	Nutrition report	5 days	4 days	1/7/2026	1/11/2026	1/7/2026	1/11/2026	4 days	\$9,600.00	\$9,600.00	\$0.00	\$9,600.00	100%	\$0.00	0%	0	1	\$0.00	\$0.00	\$9,600.00
	R&D Development	0 days	0 days	1/11/2026	1/11/2026	NA	NA	0 days	\$0.00	\$0.00	\$0.00	\$0.00	0%	\$0.00	0%	0	0	\$0.00	\$0.00	\$0.00
1.2	➤ Secure fruit suppliers	20 days	20 days	1/12/2026	2/3/2026	NA	NA	0 days	\$9,600.00	\$0.00	\$9,600.00	\$0.00	0%	(\$9,600.00)	-100%	0	0	\$0.00	\$9,600.00	\$9,600.00
1.2.1	Secure fruit suppliers	20 days	20 days	1/12/2026	2/3/2026	NA	NA	0 days	\$9,600.00	\$0.00	\$9,600.00	\$0.00	0%	(\$9,600.00)	-100%	0	0	\$0.00	\$9,600.00	\$9,600.00
1.3	➤ Initial Production	90 days	91 days	12/23/2025	4/8/2026	12/23/2025	NA	24.62 days	\$716,160.00	\$404,800.00	\$593,600.00	\$0.00	0%	(\$311,360.00)	-43%	1	0.57	\$404,800.00	\$998,400.00	\$998,400.00
1.3.1	Equipment rehab	30 days	30 days	12/23/2025	1/27/2026	12/23/2025	NA	23 days	\$528,000.00	\$404,800.00	\$123,200.00	\$0.00	0%	(\$123,200.00)	-23%	1	0.77	\$404,800.00	\$528,000.00	\$528,000.00
1.3.2	Production trials	15 days	15 days	2/4/2026	2/21/2026	NA	NA	0 days	\$188,160.00	\$0.00	\$235,200.00	\$0.00	0%	(\$188,160.00)	-100%	0	0	\$0.00	\$235,200.00	\$235,200.00
1.3.3	Quality trials	20 days	20 days	2/22/2026	3/16/2026	NA	NA	0 days	\$0.00	\$0.00	\$86,400.00	\$0.00	0%	\$0.00	0%	0	0	\$0.00	\$86,400.00	\$86,400.00
1.3.4	Quality metrics	5 days	5 days	3/17/2026	3/22/2026	NA	NA	0 days	\$0.00	\$0.00	\$12,000.00	\$0.00	0%	\$0.00	0%	0	0	\$0.00	\$12,000.00	\$12,000.00
1.3.5	Quality training	15 days	15 days	3/23/2026	4/8/2026	NA	NA	0 days	\$0.00	\$0.00	\$136,800.00	\$0.00	0%	\$0.00	0%	0	0	\$0.00	\$136,800.00	\$136,800.00
	Initial Production Begin	0 days	0 days	4/8/2026	4/8/2026	NA	NA	0 days	\$0.00	\$0.00	\$0.00	\$0.00	0%	\$0.00	0%	0	0	\$0.00	\$0.00	\$0.00
1.4	➤ Distribution	70 days	71 days	1/12/2026	4/4/2026	NA	NA	0 days	\$100,160.00	\$0.00	\$207,200.00	\$0.00	0%	(\$100,160.00)	-100%	0	0	\$0.00	\$207,200.00	\$207,200.00
1.4.1	Market testing	30 days	30 days	1/12/2026	2/15/2026	NA	NA	0 days	\$96,000.00	\$0.00	\$96,000.00	\$0.00	0%	(\$96,000.00)	-100%	0	0	\$0.00	\$96,000.00	\$96,000.00
1.4.2	Package design	15 days	15 days	2/16/2026	3/4/2026	NA	NA	0 days	\$4,160.00	\$0.00	\$31,200.00	\$0.00	0%	(\$4,160.00)	-100%	0	0	\$0.00	\$31,200.00	\$31,200.00
1.4.3	Select distributors	25 days	25 days	3/7/2026	4/4/2026	NA	NA	0 days	\$0.00	\$0.00	\$80,000.00	\$0.00	0%	\$0.00	0%	0	0	\$0.00	\$80,000.00	\$80,000.00
1.5	➤ Legal	20 days	21 days	2/16/2026	3/11/2026	NA	NA	0 days	\$5,760.00	\$0.00	\$57,600.00	\$0.00	0%	(\$5,760.00)	-100%	0	0	\$0.00	\$57,600.00	\$57,600.00
1.5.1	Complete FDA certification	15 days	15 days	2/16/2026	3/4/2026	NA	NA	0 days	\$5,760.00	\$0.00	\$43,200.00	\$0.00	0%	(\$5,760.00)	-100%	0	0	\$0.00	\$43,200.00	\$43,200.00
1.5.2	Register trademark	5 days	5 days	3/7/2026	3/11/2026	NA	NA	0 days	\$0.00	\$0.00	\$14,400.00	\$0.00	0%	\$0.00	0%	0	0	\$0.00	\$14,400.00	\$14,400.00
	Product legally Registered	0 days	0 days	3/11/2026	3/11/2026	NA	NA	0 days	\$0.00	\$0.00	\$0.00	\$0.00	0%	\$0.00	0%	0	0	\$0.00	\$0.00	\$0.00
1.6	➤ Prepare product launch	15 days	15 days	4/9/2026	4/26/2026	NA	NA	0 days	\$0.00	\$0.00	\$268,800.00	\$0.00	0%	\$0.00	0%	0	0	\$0.00	\$268,800.00	\$268,800.00
1.6.1	Prepare product launch	15 days	15 days	4/9/2026	4/26/2026	NA	NA	0 days	\$0.00	\$0.00	\$268,800.00	\$0.00	0%	\$0.00	0%	0	0	\$0.00	\$268,800.00	\$268,800.00
	Project completed	0 days	0 days	4/26/2026	4/26/2026	NA	NA	0 days	\$0.00	\$0.00	\$0.00	\$0.00	0%	\$0.00	0%	0	0	\$0.00	\$0.00	\$0.00

Lecture
10

The POM+ Project - Big Kola Company – Part 4

- $SPI = EV/PV = \$555,200.00 / \$982,080.00 = 0.57$
- $CPI = EV / AC = \$555,200.00 / \$563,520.00 = 0.99$

SPI	CPI
0.57	0.99

Name	Remaining Cost	Baseline Cost	Cost Variance	EAC	ACWP	BCWS	BCWP	Finish
POM+Project	\$1,136,800.00	\$1,692,000.00	\$8,320.00	\$1,717,355.62	\$563,520.00	\$982,080.00	\$555,200.00	4/26/2026

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.

Lecture

10

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.

Lecture

10

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.

Lecture

10

How Task Types Change Your Schedule

Work: Total Resource Hours required to Complete the task (Hours)

Duration: Number of Days to complete the task (Days)

Units: Number of Resource (Hours/Day) required to Complete the Task

Here's a handy table to help keep all the moving parts of the scheduling formula in mind.

Lecture
10

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>

Lecture

10

Project Resources And Time Management: Latest Developments

- The field is shifting fast toward AI-augmented planning, data-driven resourcing, and human-centered time practices.
- Artificial intelligence (AI) is revolutionizing how project managers handle **resource allocation and time management**, especially in distributed and hybrid teams.

Lecture

10

AI for Resource Optimization in Project Management

- **Data-driven allocation:** AI analyzes skills, availability, and workload across multiple locations to recommend the best resource assignments.
 - *Example:* A global IT project uses AI to match cybersecurity experts in Europe with urgent tasks while balancing workloads for developers in Asia.
- **Predictive issue detection:** AI forecasts bottlenecks, overallocations, or risks before they occur.
 - *Example:* In a construction project, AI predicts that a shortage of skilled electricians will delay milestones, prompting managers to hire contractors early.

Lecture

10

Advanced Strategies Enabled by AI

Skills-based allocation: AI ensures tasks are assigned to the most qualified person, not just the next available.

Scenario modeling: Managers can simulate “what-if” situations (e.g., losing a resource, shifting deadlines) to see impacts instantly.

Dynamic prioritization: AI continuously reorders tasks based on changing dependencies and deadlines.

Resources

Project Management

The Managerial Process

Fifth Edition

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Thank You