



CONSTRUCTION MATERIALS MANAGEMENT (COTM 5293)

2. MATERIALS REQUIREMENT PLANNING

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Presentation outline

- What is MRP?
- Example on MRP
- Reorder Point Planning
- MRP Report

Planning (*Reminder from previous lecture*)

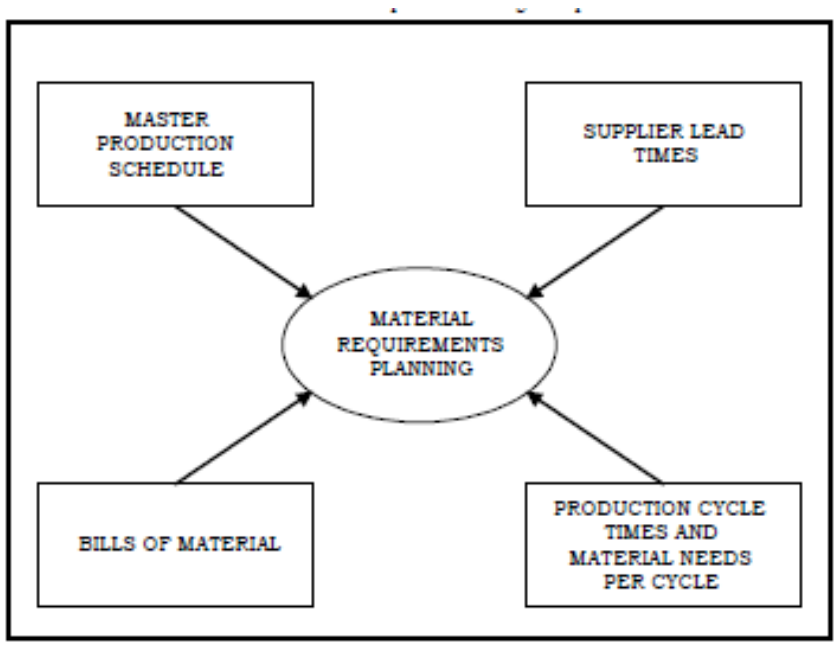
- *Materials planning includes quantifying, ordering and scheduling. Planning especially in terms of increasing productivity, profit, and facilitating the timely completion of construction projects . Hence, productivity will suffer if the material planning process is not executed properly.*

What is Materials Requirement Planning?

- Material Requirements Planning is a time phased priority-planning technique that calculates material requirements in terms of quantity and schedule its supply to meet demand across all products and parts in one or more plants.
- The function of material planning department/unit is therefore to plan for the future procurement of all the required materials as per the production schedule. At the time of material planning, the budget allocated for the materials will also be critically reviewed, for better control.

MRP systems use four pieces of information to determine what material should be ordered and when :

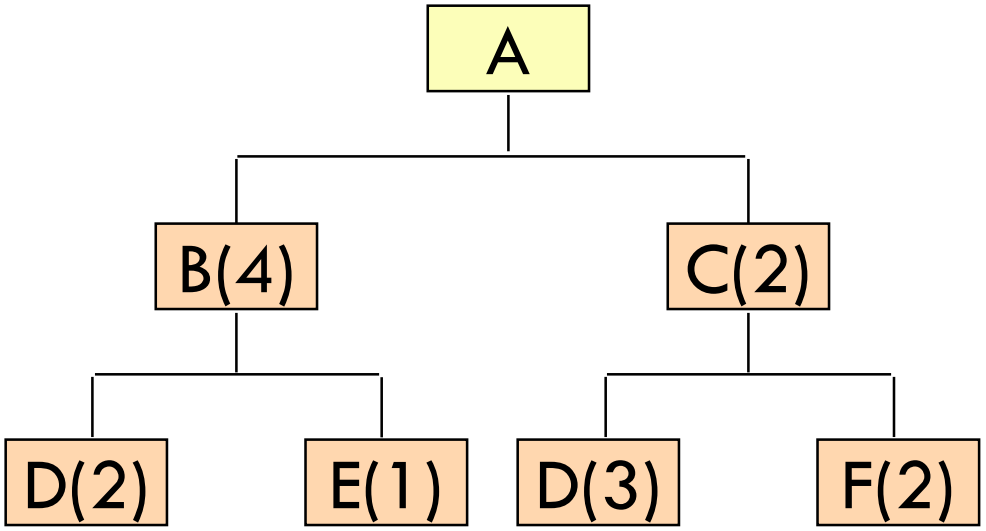
- the master production schedule, which describes when each product is scheduled to be manufactured;
- bill of materials, which lists exactly the parts or materials required to make each product;
- production cycle times and material needs at each stage of the production cycle time; and,
- supplier lead times.



Example of MRP Logic and Product Structure Tree

Given the *product structure tree* for "A" and the lead time and demand information below, provide a materials requirements plan that defines the number of units of each component and when they will be needed.

Product Structure Tree for Assembly A



Lead Times

A	1 day
B	2 days
C	1 day
D	3 days
E	4 days
F	1 day

Demand

Day 10	50 A
Day 8	20 B (Spares)
Day 6	15 D (Spares)

First, the number of units of “A” are scheduled backwards to allow for their lead time. So, in the materials requirement plan below, we have to place an order for 50 units of “A” in the 9th week to receive them in the 10th week.

	Day:	1	2	3	4	5	6	7	8	9	10
A	Required										50
	Order Placement									50	



LT = 1 day

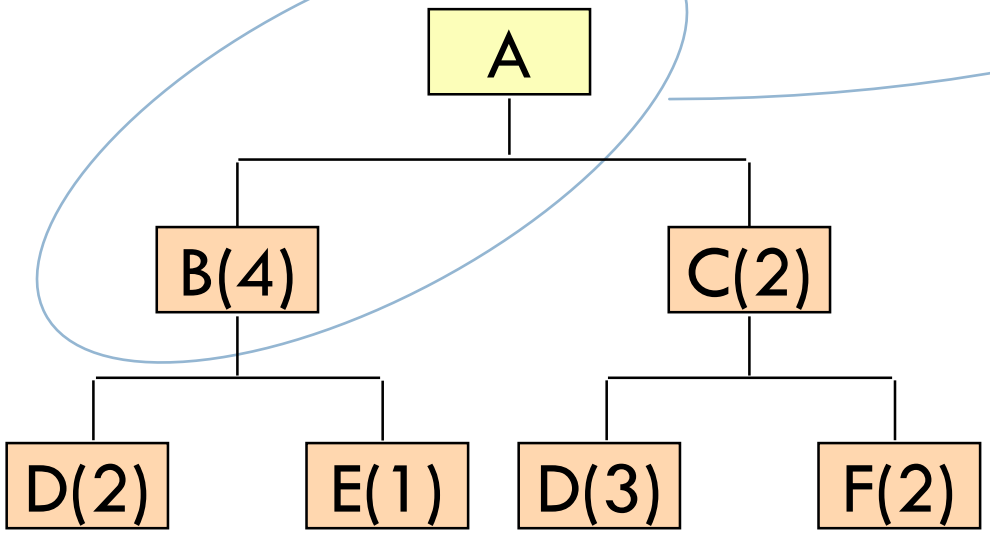
Next, we need to start scheduling the components that make up “A”. In the case of component “B” we need 4 B’s for each A. Since we need 50 A’s, that means 200 B’s. And again, we back the schedule up for the necessary 2 days of lead time.

	Day:	1	2	3	4	5	6	7	8	9	10
A	Required										50
	Order Placement									50	
B	Required								20	200	
	Order Placement						20	200			

LT = 2

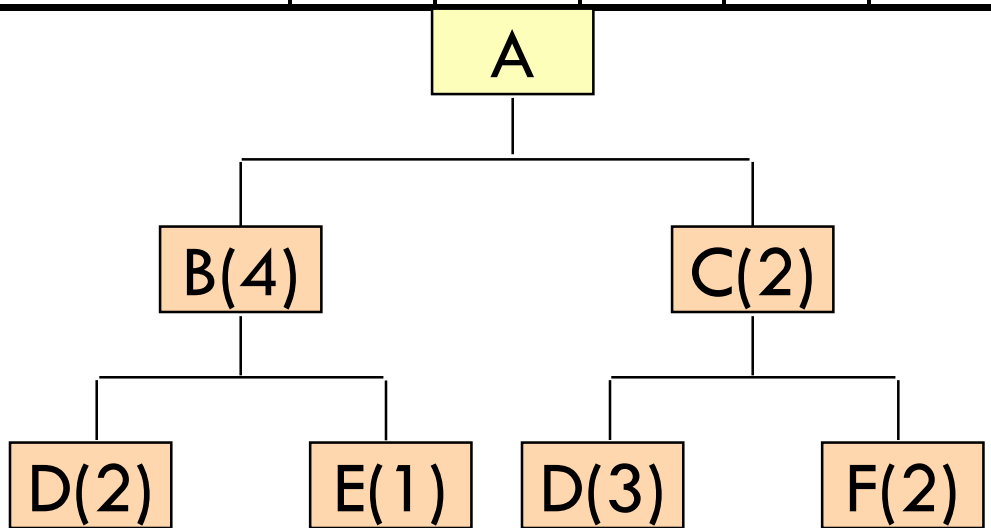
Spares

4x50=200



Finally, repeating the process for all components, we have the final materials requirements plan:

	Day:	1	2	3	4	5	6	7	8	9	10
A	Required										50
LT=1	Order Placement									50	
B	Required								20	200	
LT=2	Order Placement						20	200			
C	Required									100	
LT=1	Order Placement								100		
D	Required						55	400	300		
LT=3	Order Placement			55	400	300					
E	Required						20	200			
LT=4	Order Placement		20	200							
F	Required								200		
LT=1	Order Placement							200			



Part D: Day 6

40 + 15 spares

Reorder Point Planning

Reorder Point Planning

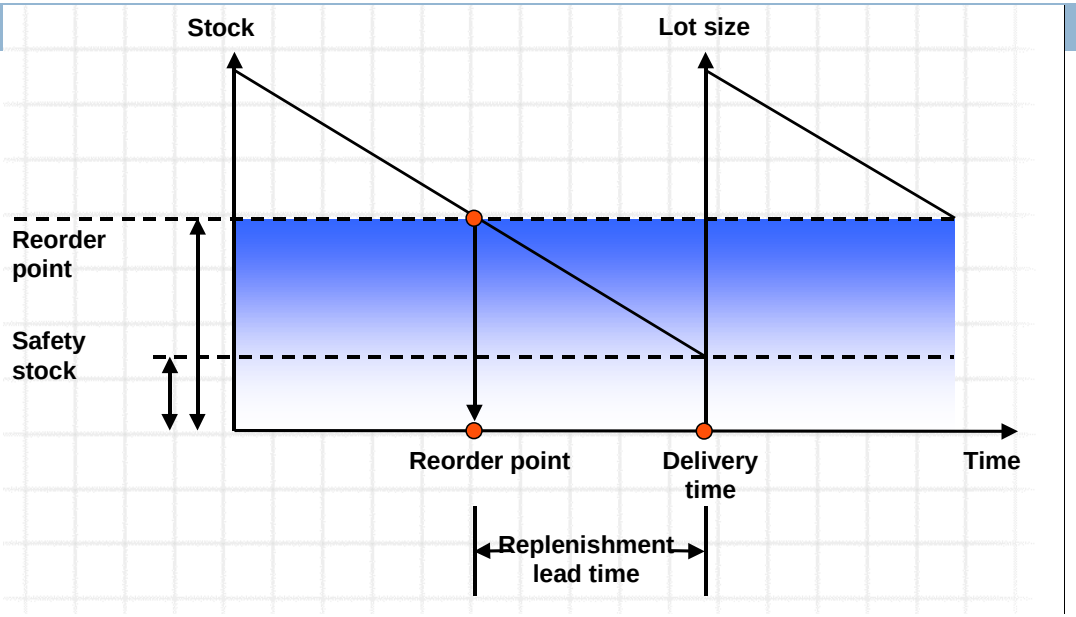
- Variables >
  - ✓ Safety Stock
  - ✓ Expected average material consumption
  - ✓ Replenishment Lead time
- Types
  - ✓ Manual
  - ✓ Automatic
  - A Manual Reorder Point Planning

    Input
    - ✓ Reorder Point
    - ✓ Safety stock
  - B Automatic Reorder Point planning

    System Calculates
    - ✓ Reorder Point
    - ✓ Safety stock

Re-order point planning

- The manual reorder point procedure uses the MRP indicator VB.
- The reorder point procedure is based on a comparison between the warehouse stock and the reorder point. If the available warehouse stock is less than the reorder point, the system initiates requirements calculation.



- The reorder point comprises the expected average material requirements during the replenishment lead time and the safety stock. The following values have to be taken into account when the reorder point is defined:
  - The safety stock.
  - Prior consumption or future requirements.
  - The replenishment lead time.
- The safety stock is used to cover unplanned excess consumption during the replenishment lead time and additional requirements in the case of delivery hold-ups.

Material Requirements Planning System

- Based on a master production schedule, a material requirements planning system:
  - ✓ Creates schedules identifying the specific parts and materials required to produce end items.
  - ✓ Determines exact unit numbers needed.
  - ✓ Determines the dates when orders for those materials should be released, based on lead times.

Primary MRP Reports

- **Planned orders** to be released at a future time.
- **Order release notices** to execute the planned orders.
- **Changes in due dates** of open orders due to rescheduling.
- **Cancellations or suspensions** of open orders due to cancellation or suspension of orders on the master production schedule.
- **Inventory status data.**

Secondary MRP Reports

- **Planning reports,** for example, forecasting inventory requirements over a period of time.
- **Performance reports** used to determine agreement between actual and programmed usage and costs.
- **Exception reports** used to point out serious discrepancies, such as late or overdue orders.

Thank you