Pathways to Growth for Indian SMEs
CII – Valcon Session, Ludhiana
27th July, 2012

Maximizing Capacity Utilization

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Associate Director, Valcon India
Do you face these situations?

- Demand is stable but often we are not able to complete orders
- Overtime & Extra Shift running are often used to ‘manage demand’
- My Operators & Machines are idle some of the days but have to work extra time on other days
- There is so much Inventory but still we are not able to meet requirements

& Do you think that adding machine/plant is the only solution?
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Focusing only on ‘servicing orders’ gradually leads to inappropriate capacity utilization

Plant was designed to service a certain demand at optimum utilization:
- maximize output when demand is high
- finish plan early when demand dips
Focusing only on ‘servicing orders’ gradually leads to inappropriate capacity utilization

Plant was designed to service a certain demand at optimum utilization
- maximize output when demand is high
- finish plan early when demand dips

Even with change in demand pattern & fluctuations, working pattern doesn’t change.
Focus shifts to ‘meeting daily & month plans’ & We stop asking –
“Could we have produced more” or “Did we take too much time to complete the plan”
Are we utilizing our Capacity well?

\[ \text{Efficiency} \ (\%) = \frac{\text{Actual Output}}{\text{Effective Capacity}} \]

\[ \text{Utilization} \ (\%) = \frac{\text{Actual Output}}{\text{Design Capacity}} \]

- Management Policies
- Allowances
- Accepted Scrap
- Maintenance Time, etc.

- Operational Losses
- Process, Manpower, Asset Performance
Are we utilizing our Capacity well?

Medium & Small firms appear to be lagging in capacity utilization and need to take measures to improve

Source: 77th Business Outlook Survey, CII
So, How do we ‘lose Capacity’?

1. Policies & Standards
2. Bottleneck under-Utilization
3. Process under-Utilization
4. Capacity Imbalance
5. Capacity in-flexibility (Process, Operators & Plant)
Designed Policies & Standards often lead to capacity under-utilization which goes unnoticed

- Purchase & Spares Policy
- Inventory & Stores norms
- Manpower Policy
- Reward & Recognition Policy
- Accepted ‘standards’ of process loss, set up time, etc.
- ‘Unwritten rules’ of production, ...

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Designed Policies & Standards often lead to capacity under-utilization which goes unnoticed.

- Availability & Quality of Spares is impacted by Purchase policies
- No machines are run during lunch time
- Checks on the machine can be done only by the maintainers
- “Set up can’t be done in night shift”
- “Production shouldn’t do any quality checks”

- Purchase & Spares Policy
- Inventory & Stores norms
- Manpower Policy
- Reward & Recognition Policy
- Accepted ‘standards’ of process loss, set up time, etc.
- ‘Unwritten rules’ of production, ...

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Identification & utilization of bottleneck resource is one of the biggest challenges to capacity release.

Plant capacity can’t be more than the bottleneck’s capacity.

Estimated Capacity (pcs)

- CNC Machining: 35928
- Tempering: 38880
- Sand Blasting: 22162
- Pre-setting Inspection: 77624
- Painting: 20736

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Identification & utilization of bottleneck resource is one of the biggest challenges to capacity release

1. Inability to identify the bottleneck
2. Inadequate maintenance of bottleneck – high downtimes
3. Changing product mix leading to shifting bottlenecks
4. Management’s focus on the ‘costliest machine’ than the bottleneck
5. Bottleneck machine treated in the same way as any other machine
6. Manual or non-production activities becoming bottlenecks

Plant capacity can’t be more than the bottleneck’s capacity

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Contents

Are You Utilizing Your Capacity Well?

How Can You Improve Capacity Utilization?

Case: Unearthing Hidden Capacity at Ancillary Unit
Capacity “release” needs to be undertaken systematically & in a phased manner

**Achieving Effective Capacity**
- Operational Improvements
- Shop floor initiatives & systems implementation
- High involvement of local team members
- Localized improvements aligned to bigger objectives
- Challenging work practices

**Achieving Design Capacity**
- Management policies, designs, processes and standards changes
- Initiatives & decisions driven by senior management
- Cross functional initiatives – broad based objectives
- Challenging mindset
Causes for losing Effective Capacity could lie across many areas in operations.

- **Not Produced**
  - No Plan Situation
  - No Material
  - No Manpower
  - Asset Downtime

- **Produced but lower output**
  - Produced at Lower Rate
  - Rejected/Reworked
  - Flow Interruption

- **Produced but couldn’t move out**
  - Wrong Production

Output Loss
Multiple initiatives may be required to improve Capacity Utilization – the right ones need to be identified & prioritized.
Multiple initiatives may be required to improve Capacity Utilization – the right ones need to be identified & prioritized.
Supplier Performance improvement focuses on working closely with them to improve reliability

- Equipment Capability
- Process Stability
- Quality Systems
- Quality Audits

- Capacity Assessment
- Planning & Scheduling Systems
- Flexibility

- Supporting Processes Adequacy
- Skill of People
- Simplicity of Processes
An ‘Integrated Planning’ model, customized for the company helps in ensuring uninterrupted production to plan.
A Planned Maintenance program implements maintenance systems after equipment classification.

**PLANNED MAINTENANCE**

- **Reliability Centric Maintenance**
  - Most Critical Equipment
  - Critical Equipment
  - Non-critical Equipment

- **Proactive Maintenance**
  - Improvement maintenance (proactive)
  - Predictive maintenance
  - Preventive maintenance
  - Routine maintenance

- **Run to Fail**
  - Breakdown or Corrective maintenance
Flow Improvement would look at extended value stream and eliminate interruptions

**Value Stream for Industrial Segment**

- **Overproduction**
  - Over planning to address poor yields

- **Correction Waiting**
  - Mold Rework
  - High Inventory
  - Waiting for complete mold information

- **Waiting Inventory Correction**
  - Many iterations in customer requirement
  - Waiting periods for complete customer reqmt.

- **Correction Waiting**
  - Deco Rework
  - High Inventory between intermediate processes
  - Waiting for material from plant

- **Waiting Inventory Correction**
  - Mold Rework
  - High Inventory
  - Waiting for complete mold information

- **Correction Waiting**
  - Many iterations in resorting
  - High rework on resorting
  - High inventory

- **Correction Conveyance Inventory**
  - QA/ PDI rework
  - High material movement within w/h
  - High Inventory

**SUPPLIER DEVELOPMENT**

**PLANNING IMPROVEMENT**

**PLANNED MAINTENANCE**

**SKILL DEVELOPMENT**

**QUALITY IMPROVEMENT**

**FLOW IMPROVEMENT**

**PRODUCTIVITY IMPROVEMENT**
Situation: The ancillary unit was ‘losing sales’ every month though analysis indicated sufficient ‘effective capacity’.

The Effective Capacity was identified to be 25500 pcs per day based on bottleneck capacity.

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There was a steady demand of 20000 pcs per day from the OEM every month.

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The average daily output was however consistently below the effective capacity of the bottleneck

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Analysis of the bottleneck output indicated that they were utilized only to the extent of ~72%

Utilization of Bottleneck

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Analysis: Ineffective Maintenance systems and Inadequate focus on bottleneck were leading to high capacity losses

3 hours (14% time) was being lost in Sand Blasting repetitive breakdowns everyday

Breakdown Maintenance being practised; checklists do not include ‘critical checks’

Incomplete loading of Sand Blasting unit

Delays by operators between sand blasting cycles

All Planning & Scheduling being done for CNC machine – NOT the bottleneck

Management focused on maximizing output of CNC machine – the costliest investment

For a simple process, a zig-zag layout used leading to multiple handling and stage inventories

Potential for reducing the sand blasting cycle time by 11% identified

Many Quality Circles working but none focused on improving sand blasting output
A roadmap was designed for ~25% increase in actual output & subsequently moving towards Design Capacity

- Reduce & re-establish Sand Blasting cycle time
- Simplify layout into a flow
- Design Planning model around sand blasting utilization
- Plant goals’ alignment to utilization maximization
- Align team objectives to improve bottleneck output

- Design & Implement a Planned Maintenance system
- Simple automations to reduce Operator delays
- Reduce Minor Stoppages by Autonomous Maintenance
- Visual systems to improve loading of bottleneck
- Reduce loading & unloading time by use of fixtures
Thank You