CPIM PRODUCTION® & INVENTORY MANAGEMENT

# Detailed Scheduling and Planning

## Session 6
## Detailed Capacity Planning – Part 1

# Capacity Determination Exercise

- 10 x 8-hour shifts per normal week
- 5 machines, 1 operator per machine
- Operator breaks 1 hour per shift
- Scheduled maintenance 3 hours per machine per week

| Week ▶ | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Available time in hours per machine | 80 | *64 | 80 | 80 | 80 | 80 |
| Actual machine hours (setup + run) | 240 | 200 | 280 | 320 | 260 | 280 |
| Maintenance time in machine hours | 15 | 12 | 18 | 15 | 15 | 15 |
| Standard hours produced | 220 | 160 | 240 | 280 | 220 | 220 |

* Note: Week 2 was a four-day week

# Capacity Determination – Answers (1)

Q1: Theoretical capacity = 400 machine hours per normal week (available time x 5 machines)

Q2: Demonstrated capacity = 230 standard machine hours per normal week (using 200 as the adjusted output in week 2)

Q3: Availability of machines per week = 96.25% (100% minus [3 hours out of 80])

Q4: Availability of machine time per shift (operator constrained) = 87.5% (7 hours out of 8)

Q5: Utilization factor on work center master = 78.75% (87.5% x 90%)

# Answers (2)

Q6: Planned utilization for capacity rating = 75.8% approx. (96.25% x 78.75% - the answers from Q3 and Q5)

Q7: Actual utilization = 68.1% approx. (1580 hours used out of 2320 possible)

Q8: Actual efficiency = 84.8% approx. (1340 hours produced from 1580 hours worked)

Q9: Rated capacity = 258 hours per normal week approx. (400 x 75.8% x 85%)

Q10: For discussion

# Answers (3)

What should be done now?

- Check whether the measurements are still required
- Calculate actual utilization and efficiency for each week and match to recorded events in the operating log
  - Note: exceeded 258 hours output in week 4
- Decide whether to make adjustments to planned utilization and/or efficiency