



An efficient approach to production backlog scheduling

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Recognising and remedying production backlogs effectively

Are you suffering from production delays? The sooner you intervene, the smaller the impact will be. If you wait too long, costs and stress will quickly mount up. But how can you distinguish a real production backlog from an apparent backlog? What approach can help you to regain control of your production schedule?

What is a real production backlog?

An order seems to be delayed as soon as it is completed late on a workstation. Yet that does not automatically mean it will be delivered late. Sometimes there is plenty of time downstream.

Are you blindly focusing on the planned completion date for every station? That is when **apparent backlogs** arise. Orders seem critical, but in reality they are not. The result is unnecessary overtime, weekend work and frustrated employees.

You should therefore always assess a **production backlog broadly**, looking right across the chain, not at each individual station. It is the only way to get insight into the real risks in your schedule.

How to calculate scheduling backlogs

There is a simple formula that can quickly show you whether an order is at risk:

Backlog = required lead time - time remaining until delivery date

- Backlog ≤ 0 ? the order can still be ready on time, no action required
- Backlog > 0 ? the order is at risk, action required

The required lead time consists of:

1. Remaining process time for the order itself
2. Waiting time because of prior orders that are a higher priority

Calculating waiting time

You can calculate the waiting time by:

- Determining the outstanding workload per station
- Dividing this workload by the expected throughput (outflow)
- Choose the station with the longest waiting time: this is the dominant station

The dominant station determines the actual backlog. The times for the other stations are essentially masked by the dominant station and need not be considered further.

Example: calculating a production backlog

Order X still has to go through stations A, B and C. The process time for this is 1 day.

- Station A: 35 hour workload, throughput 7 hours/day $\Rightarrow$ 5 days
- Station B: 70 hour workload, throughput 7 hours/day $\Rightarrow$ 10 days
- Station C: 96 hour workload, throughput 16 hours/day $\Rightarrow$ 6 days

Station B is the dominant one and therefore determines the waiting time.

- **Total lead time** = 1 day + 10 days = 11 days
- **Remaining time until delivery date** = 8 days
- **Backlog** = 11 - 8 = 3 days

If there is no intervention, this order will be late. This can only be remedied by taking action at station B.

For an order that only goes through A and C, station C may be dominant. Depending on the routing, there may be more than one dominant station.

Where and how to make adjustments

The first step is always to address the dominant station. Then check the other stations again.

Possible actions to reduce a production backlog:

- Deploy extra capacity by using overtime, temporary staff or shorter breaks
- Rearrange work to parallel workstations or temporarily outsource
- Insert rush shipments to reduce lead time
- Consult with the customer, e.g. about partial deliveries

The choice depends on the severity of the delay, the flexibility of your processes and what you have agreed with the customer.

Clear agreements keep the production backlog small

Small backlogs can quickly grow into major capacity problems. Detect them early and respond immediately.

Daily reports showing current backlogs and dominant stations provide insight for everyone. More importantly, define in advance what actions will be taken if a particular backlog occurs. This allows you to respond quickly and consistently.

Real-world example: the **Scania** truck factory in Zwolle. There the backlog is continuously displayed in a visible way. Once production is 12 trucks behind (about 50 minutes), everyone works one more hour the next day. This keeps the backlog manageable and prevents production delays.

Improve your production planning efficiently

A production backlog often arises at workstations with little spare capacity. A simple calculation allows you to see which orders are at risk. The dominant station indicates where you need to intervene.

By making backlogs visible on a daily basis and agreeing on corrective actions in advance, you can prevent small delays from developing into long-term capacity problems.

Conclusion

Production delays are inevitable, but you can make them manageable. Calculating lead times, global schedule assessment and clear commitments can help you to control the production schedule. This prevents stress, unnecessary overtime and dissatisfied customers.

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