



Designing, Trialing & Implementing a Downtime Monitoring System

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Be clear about the outcomes

- Basic project management
 - State the project
 - Develop the objectives
- Our primary objective was to be able to add another SKU range to a line by improving the line efficiency.

Outcomes to consider

- Real time feedback on the plant floor - meaningful to the operators, trusted & motivating.
- As unobtrusive as possible
- Integration with production scheduling
- Ad-hoc reporting
- Management Accessibility
- Different reporting needs

Outcomes to consider cont...

- Portability of the design
- Dedicated or shared infrastructure
- Hardware integration - automatic access to reason codes and production modes
- Functional integration - integrate non down time related activity.
- Exit point losses in \$ terms

Workshop

- Involve operators, supervisors, management, maintenance, QA and the integrators.
- Agree how each stakeholder will interact with the system.
- Agree on the measures - precisely how they will be calculated.
- Keep working until all the stakeholders can see the benefits - and “buy in”.

Measures

- **OEE - Overall Equipment Effectiveness**
 - Well accepted methodology
 - Well documented and understood
- **AU - Asset Utilisation**
 - very high level KPI

Overall Equipment Effectiveness

- *OEE* is a function of *plant availability*, *plant performance* and *quality*.
- i.e. $OEE = PA\% \times PP\% \times Quality\%$

OEE

Six loss areas	OEE Category	Comment
Breakdowns	Downtime loss	Equipment failure
Setups & adjustments	Downtime loss	Changeover
Short stops/idling	Speed loss	Numerous causes
Reduced speed	Speed loss	Product dependent
Startup rejects	Quality loss	Production pre QA clearance
Production rejects	Quality loss	Losses while in production mode

Total available operating time = time the plant is open and available for use. For Lidcombe 24hrs/day 7 days/ week 52 weeks/year

Planned Production Time = Total available operating time – Planned shutdown

Planned shutdown = Breaks, Scheduled maint., training & meeting time, no orders, cleaning,

Operating Time = Planned production time – Down time

Downtime = setup/shutdown, breakdowns, product changeover, product & packaging shortage

Net Operating Time = Operating time – Speed loss

Speed loss time = Running @ less than rated speed

Fully Productive time = Net operating time – Quality loss

Quality Loss time = packaging unsaleable product.

Plant availability

Plant availability is the ratio of operating time to planned production time.

Planned Production Time = Total available operating time – Planned shutdown

Planned shutdown
= Breaks, Scheduled maintenance, cleaning, training & meeting time

Operating Time = Planned production time – Down time

Downtime =
setup/shutdown, breakdowns, product changeover, product & packaging shortage

Plant performance

Plant performance is the ratio of the actual plant production rate to the nominal production rate.

$$\frac{\text{Actual plant production rate}}{\text{Nominal plant production rate}} \times 100$$

Net Operating Time =
Operating time – Speed loss

Speed loss time
= Running @
less than rated
speed

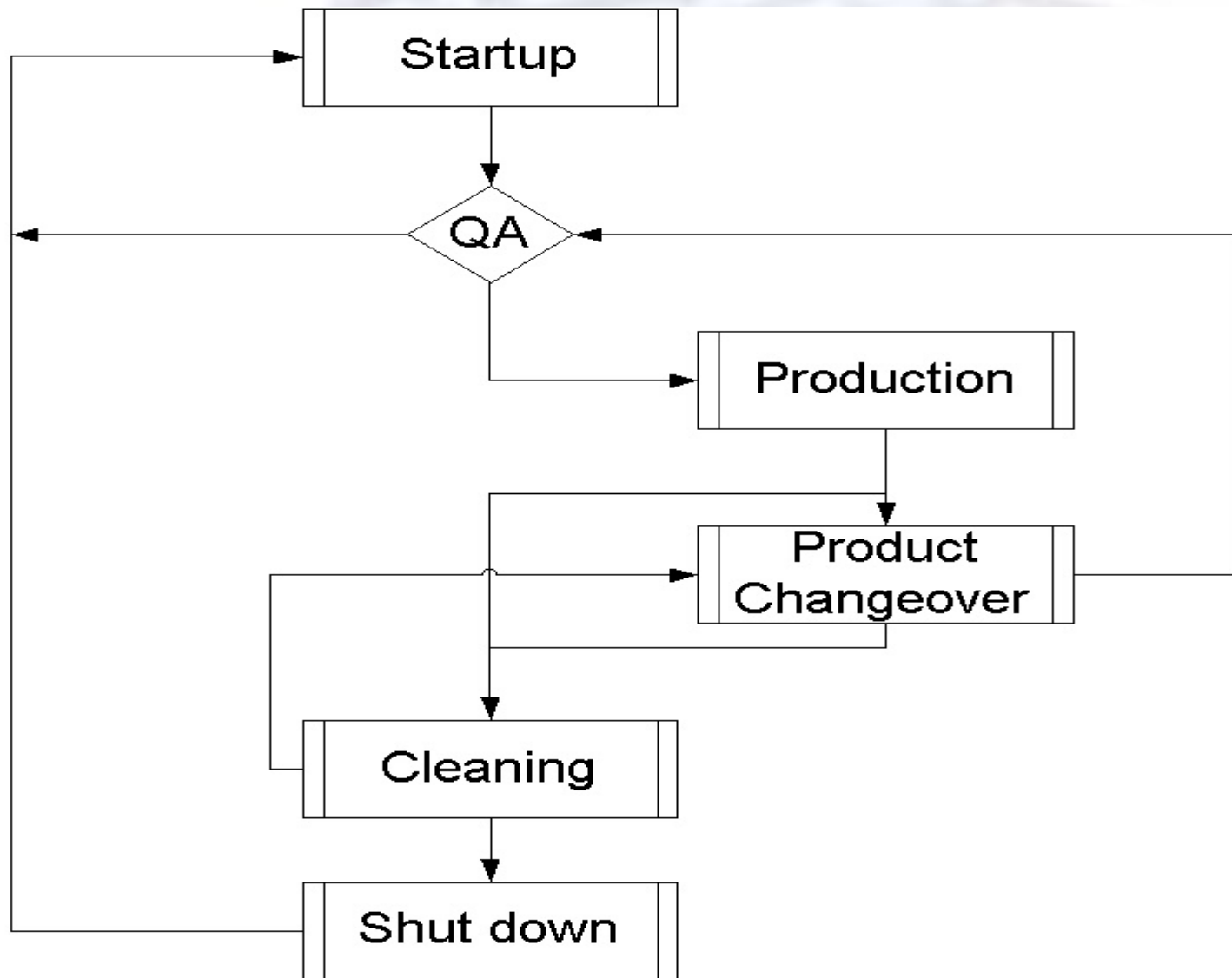
Quality

Quality is the ratio of the number of good units produced to the total number of units produced.

$$\frac{\text{Total number of good units produced}}{\text{Total number of units produced}} \times 100$$

Fully Productive time = Net operating time – Quality loss	Quality Loss time = packaging unsaleable product.
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The importance of modes



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Asset Utilisation

- The ratio of actual output to the output that could be achieved if a plant ran at its maximum capacity for 365 per year while producing 100% quality product.

In Summary...

- Be clear about both the outcomes you are chasing, and the size of the prize.
- Work with people who have delivered the kinds of outcomes you are seeking.
- Workshop the deliverables in agonising detail
- Don't believe in fairies!..it is 99% hard work - no effort, no result.

Thank you

- Questions?

