CONFERENCE OMAINTEC 2018 EXHIBITION

INTERNATIONAL OPERATIONS & MAINTENANCE CONFERENCE
IN THE ARAB COUNTRIES

UNDER THE THEME
"MANAGING MAINTENANCE WITHIN INDUSTRY 4.0"
CONICIDE WITH THE 16TH ARAB MAINTENANCE EXHIBITION

Preventive Maintenance Optimisation

Tom Svantesson

Maintenance strategies are suggested and decided by:…

- The manufacturers recommendations
- The “Case of one!” – one failure
- The experience from the maintenance technicians
- A structured analysis process – RCM, FMECA, RBI

- - Or the Preventive Maintenance Optimization process

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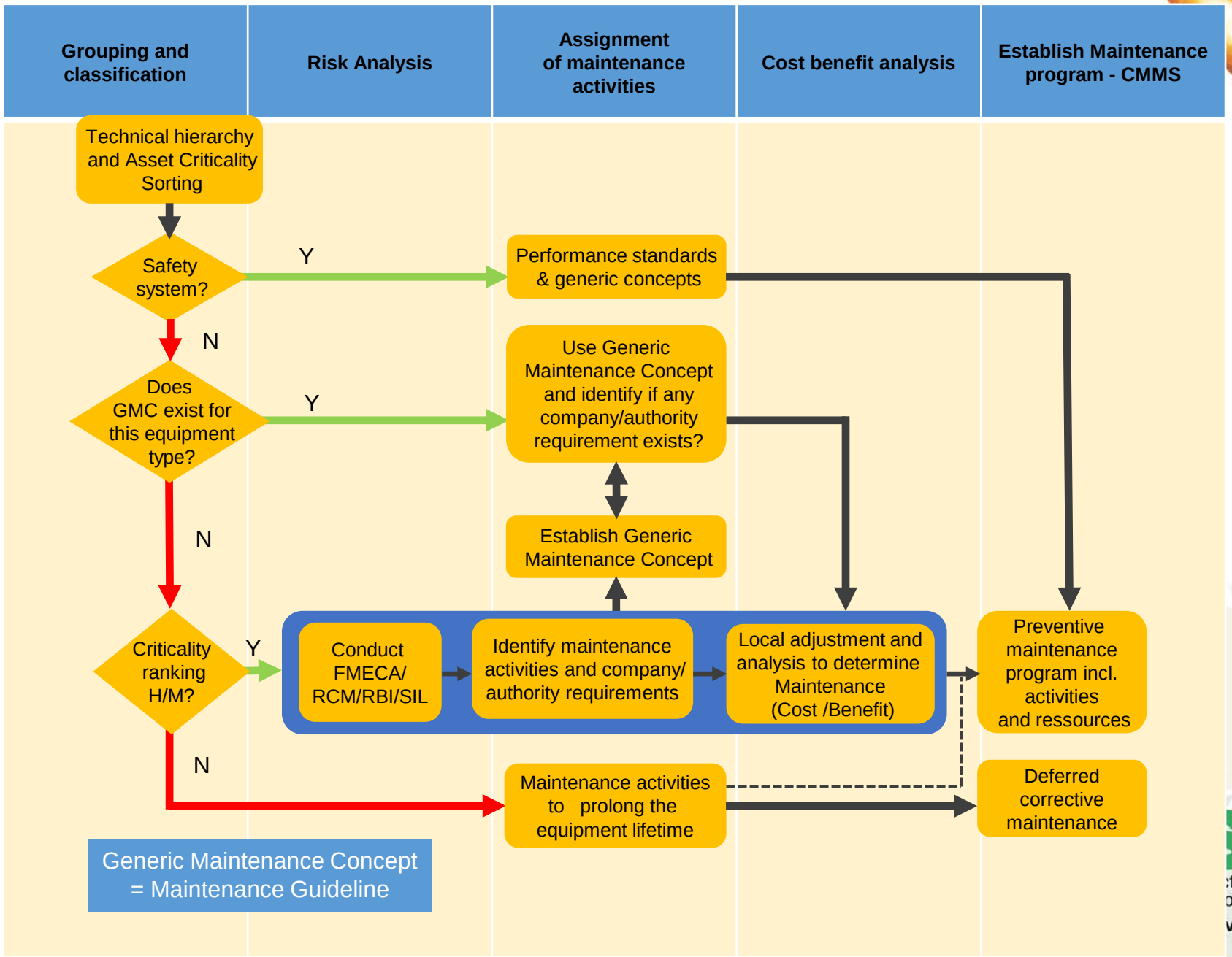
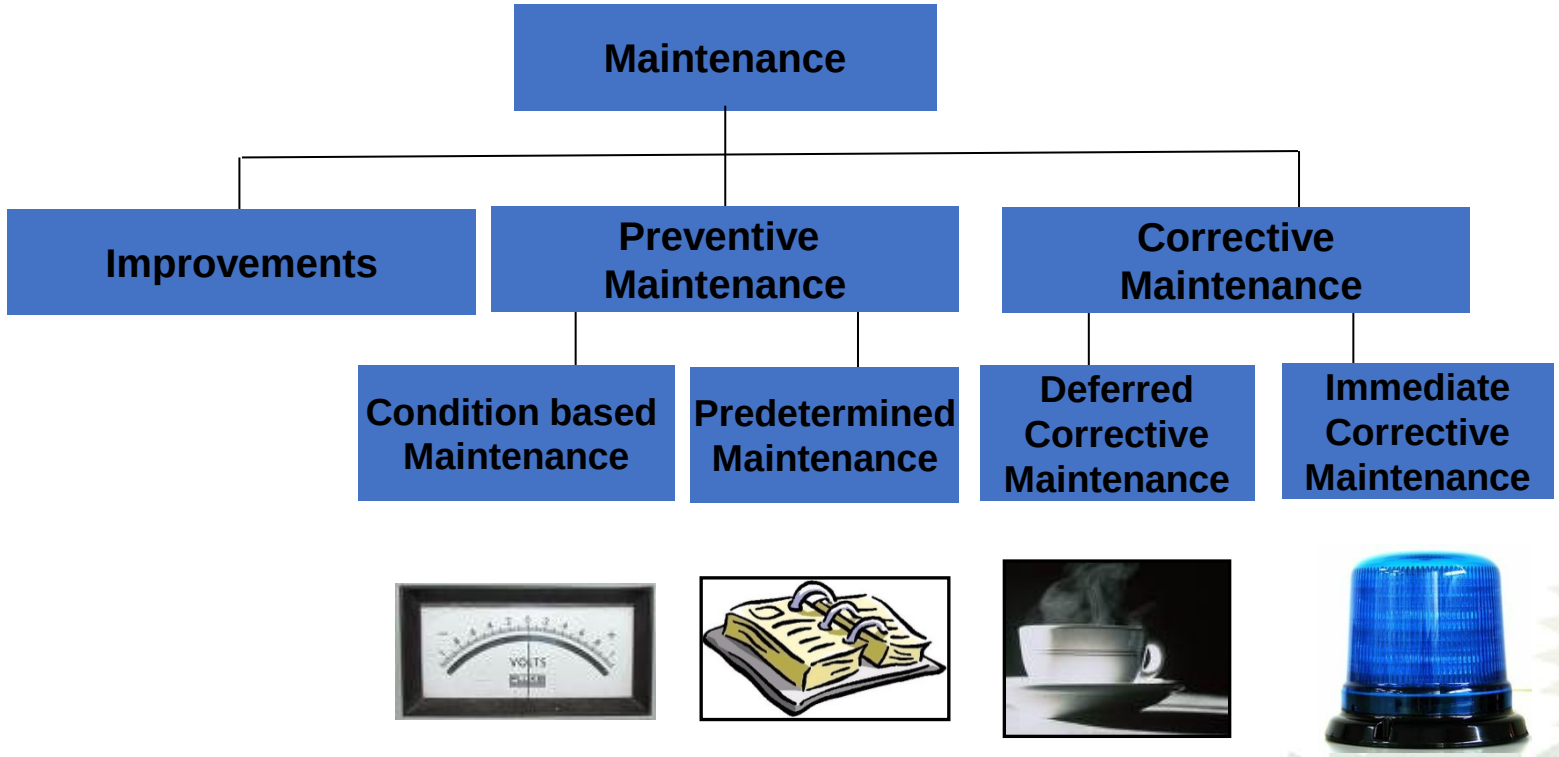
Asset Criticality Sorting



Maintenance types
– EN 13306:2017



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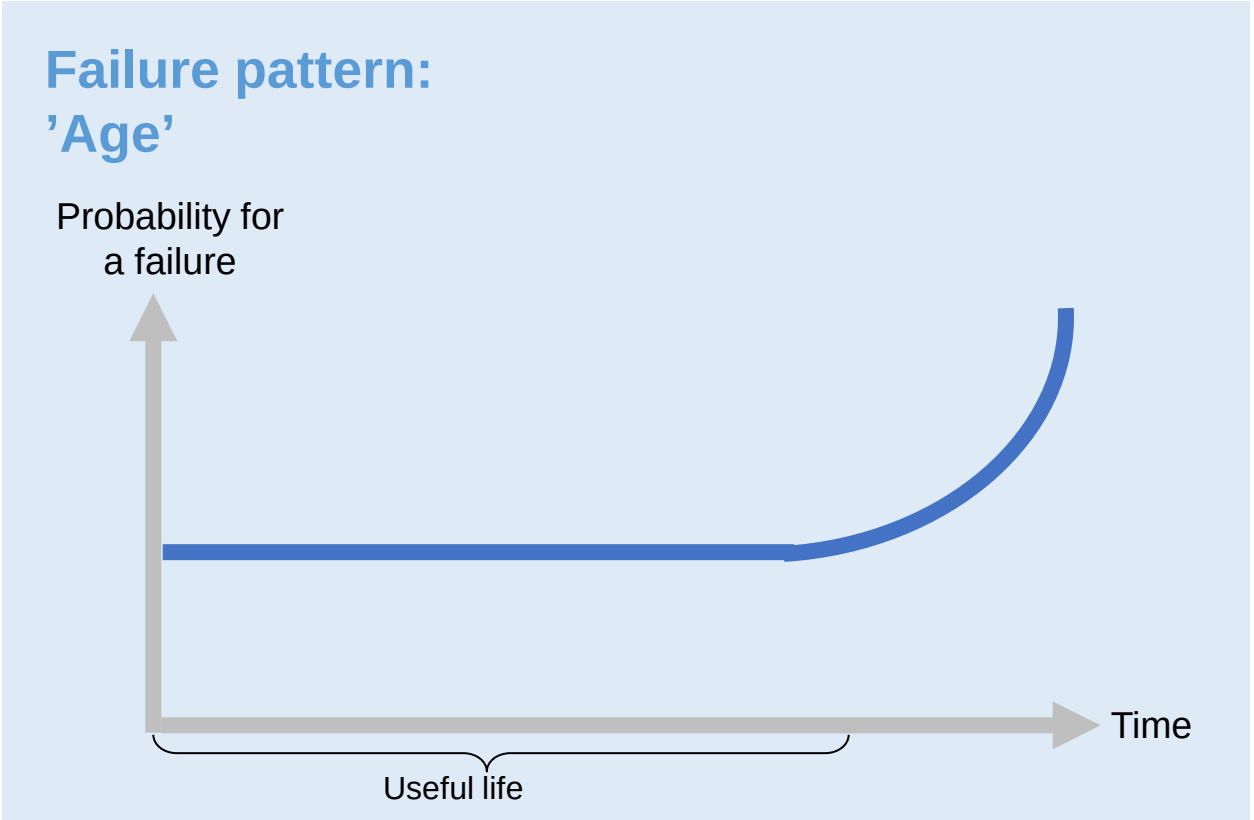
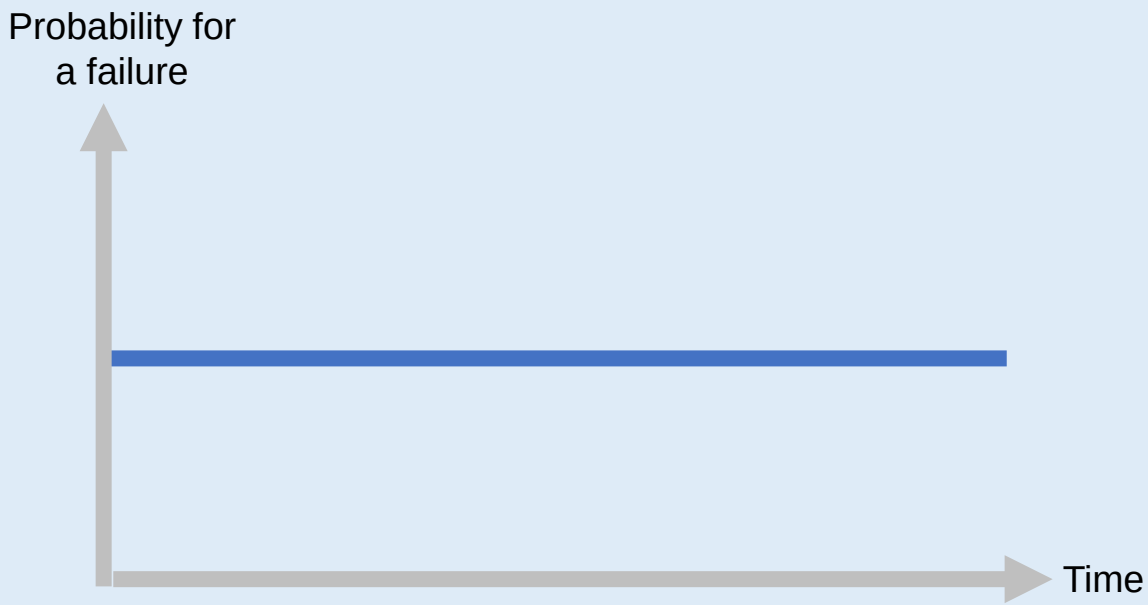
Failure pattern



Ex.: Light bulb, Capacitators, Tube walls, Pneumatical cylinders

Failure pattern

Component failure pattern: ’Random’



Ex.: Rotating equipment, control systems

Criticality matrix
– Probability MTBF x consequence

High Criticality

Consecuence Level	Production Availability	Production Reliability	Safety	Quality Regulatory - Environmental - requirements	Quality GxP requirements	Quality Internal requirement, SOP	Cost £ (If not maintained)	Frequence Classes - Probability		
								MTBF 3 yrs - 10 yrs	MTBF 1 yrs til 3 yrs	1 MTBF Under 1 year
3	Large reduction in output – more than 25%	Loss of more than one batch or equivalent	Fatality, disabled or LTA	Deviation not accepable			5.000 and above	H	H	H
2	Middle reduction in output – 5 - 25%	Loss of more than 50% of a batch or equivalent	None or low LTA	Deviation acceptable with documented deviation report			2.000 - 5.000	L	H	H
1	No/Low reduction in output – 0 - 5%	Loss of 10% - 50% of a batch or equivalent	No injuries	No violation of requirements			0 - 2.000	L	L	H

Low Criticality

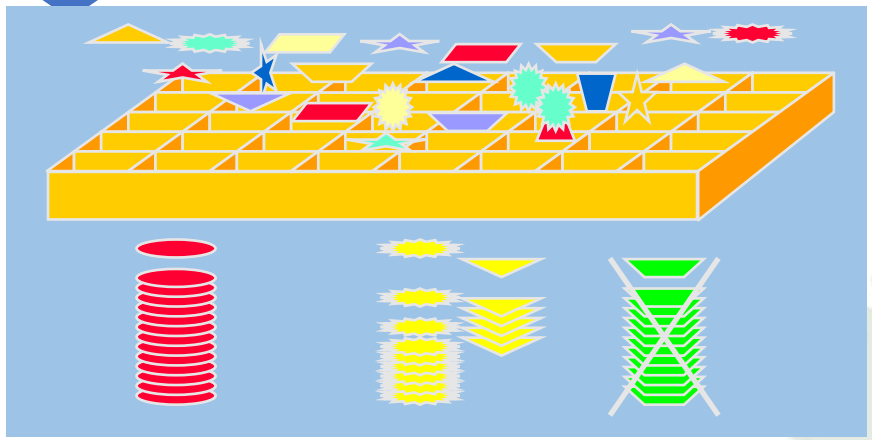
Criticality Sorting
– And input to planning

Failure modes fron the undocumented experience

Failure modes recorded in failure records – Corrective maintenance

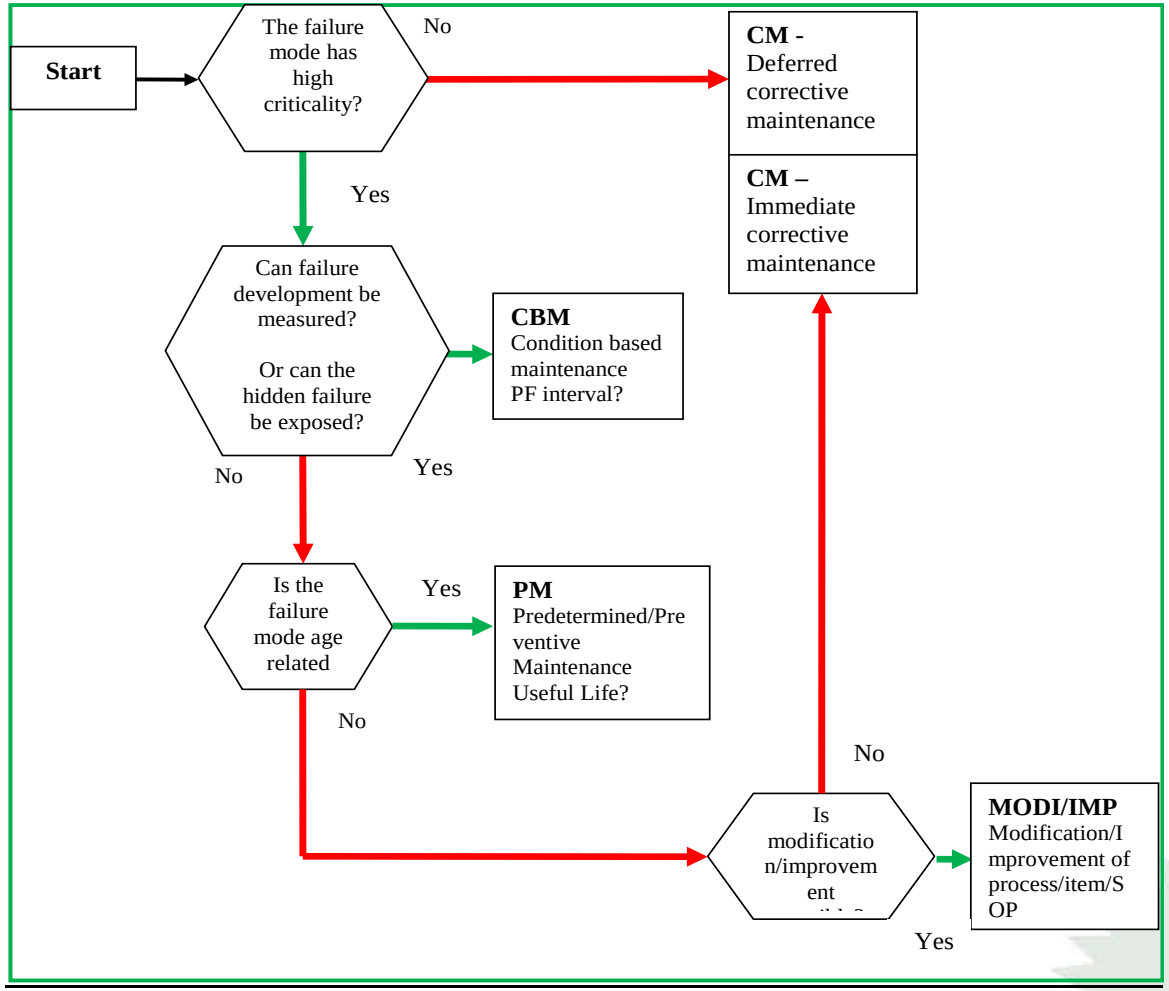
Failure modes recorded in existing preventive maintenance plan

Failure modes recorded in quality and safety records



Decision tree –

To decide the maintenance strategy for a failure



The process for Preventive Maintenance Optimisation

Define scope of assets

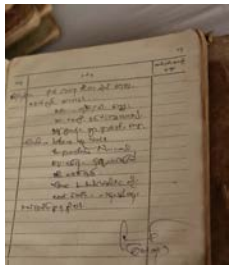
Training in the PMO process

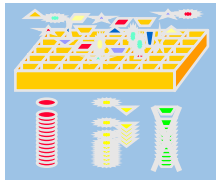
Collect recorded failure modes

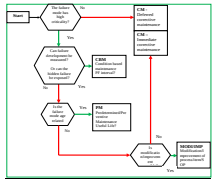
Criticality sorting of failure modes (FMECA)

Mainte-nance strategy decision

CMMS implemen - tation







Training of the planning team members – 1 day

Practice on site

Follow up and evaluation of the results

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Case studies:…

Pharmaceutical site – Research and development, production and admin facilities:

Review of the programme for HVACs.

The starting point was a filter replacement every 6 month for all the 400 assets regardless of the assets` criticality.
The PMO project replaced the existing preventive maintenance (PM) strategy to Condition Based Maintenance by measuring the filter degradation

Pay-back time for the project was 3 months, an increased service and compliance level for the production and much easier planning process for the maintenance activities.

Case studies:…

Oil and Gas – Upstream facility
The existing PM programme was reviewed by the PMO process. The cost for PM activities was reduced while maintaining - and for some units even - reducing the cost for corrective maintenance.
The result was an annual saving on 600.000 US$.

Fossil fired power plant.
The PMO process was used on a critical ID fan which went through an overhaul every 3 years. After reviewing the data and the components condition, the decision was to extend the overhaul to every 5 years leading to a saving on 150,000 EUR plus the value of production.

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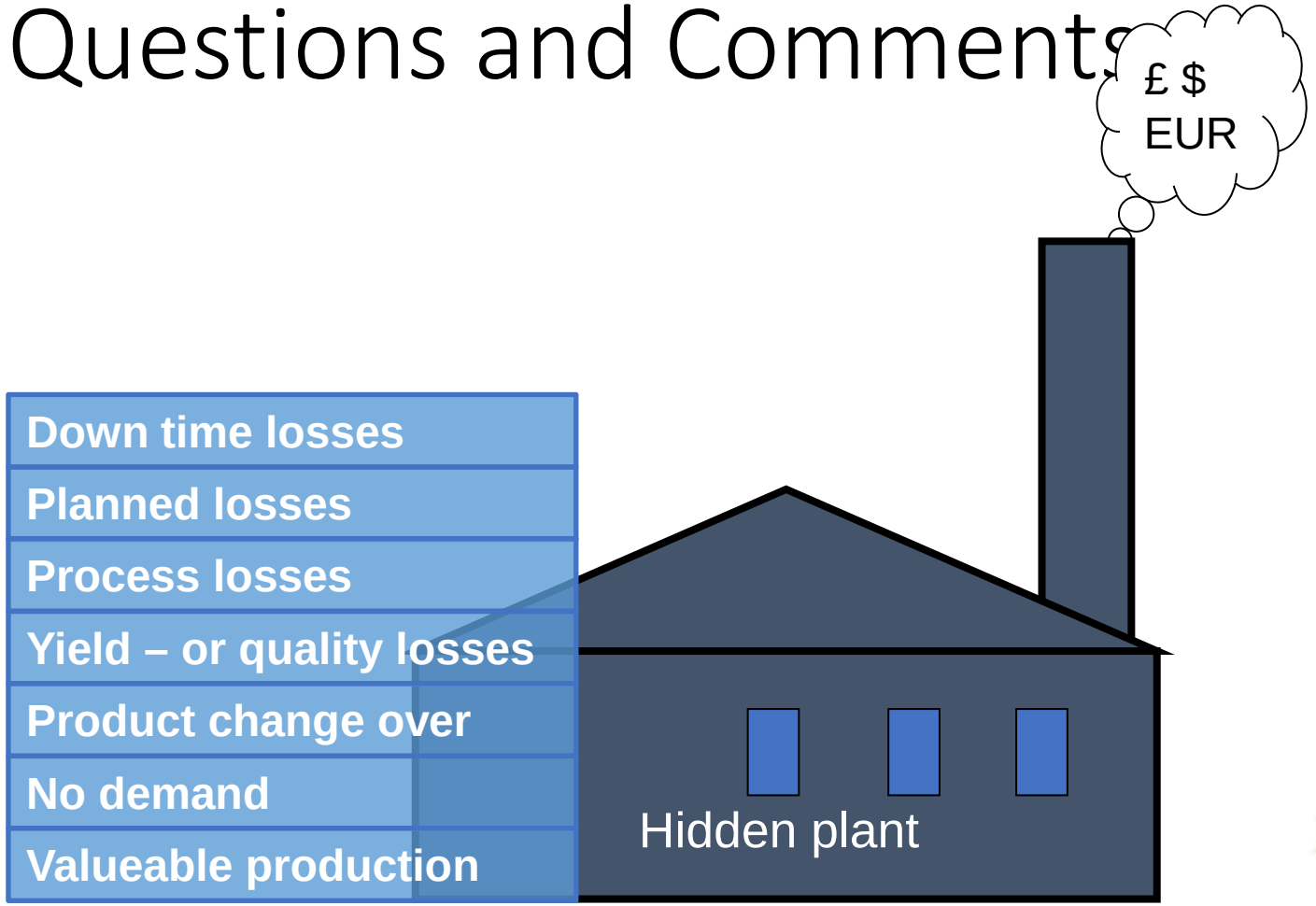
Questions and Comments



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