Establishing the Asset Criticality Ranking

Without the Asset Criticality Ranking, your reliability improvement (and work management) program is flying blind

Jason Tranter

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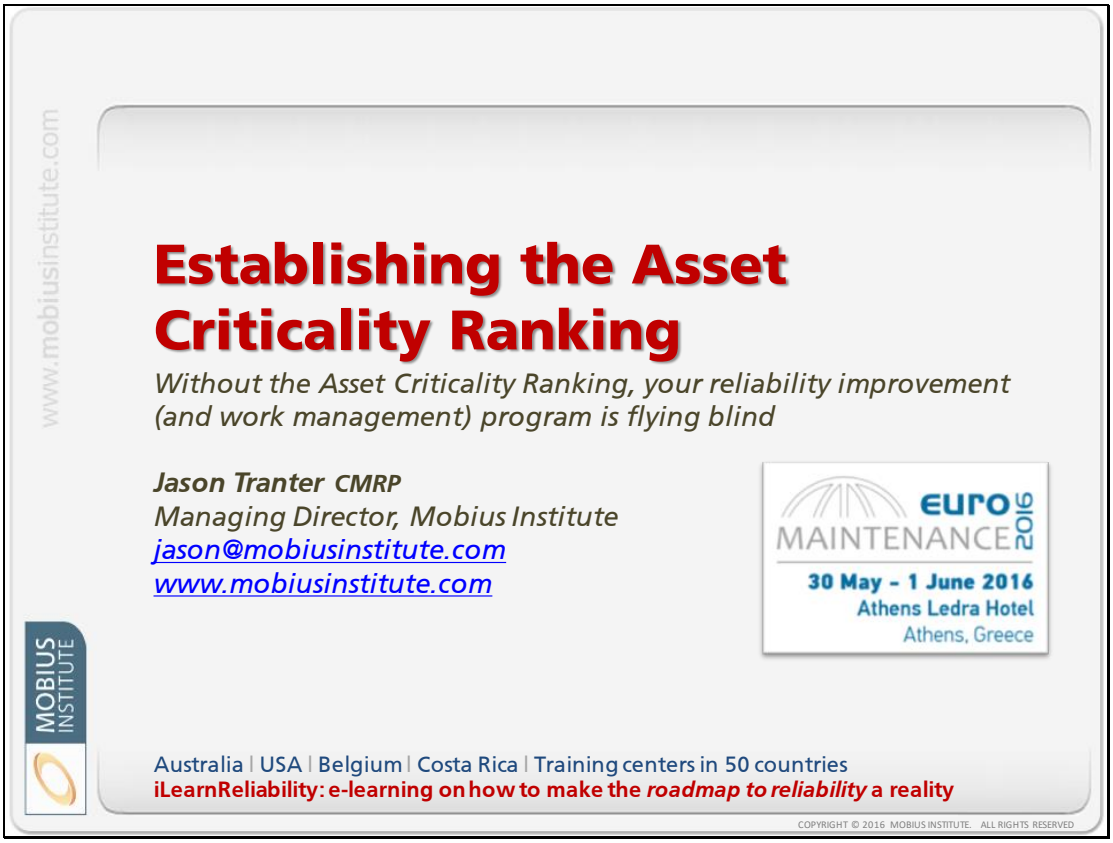
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Without the Asset Criticality Ranking, your reliability improvement (and work management) program is flying blind
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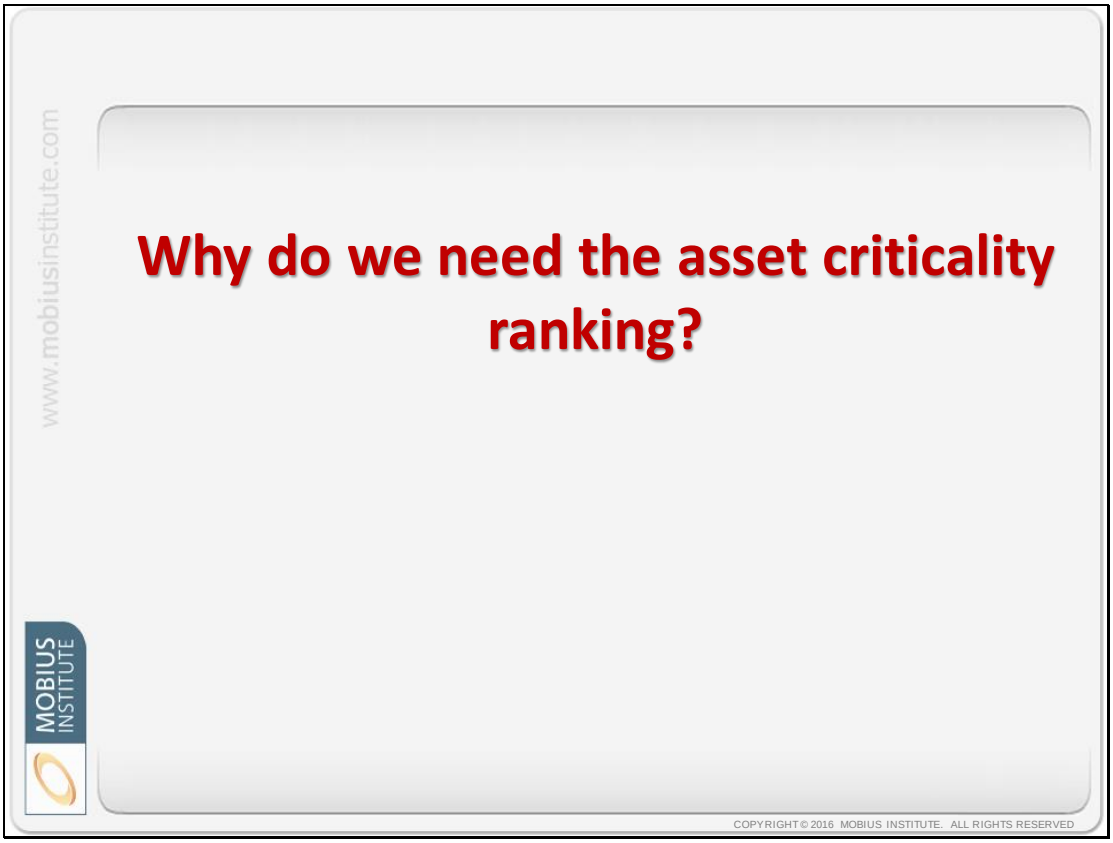
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Why do we need the asset criticality ranking?
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Which asset is more critical?
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Which asset is more critical?
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Why do we need to know?
Should we perform a full RCM?
Which asset do we repair first?
Which spares should we keep in inventory?
Can we justify condition monitoring?
Can we justify on-line monitoring?
Can we justify acceptance testing?
Can we justify a re-design of an asset?
Should we…
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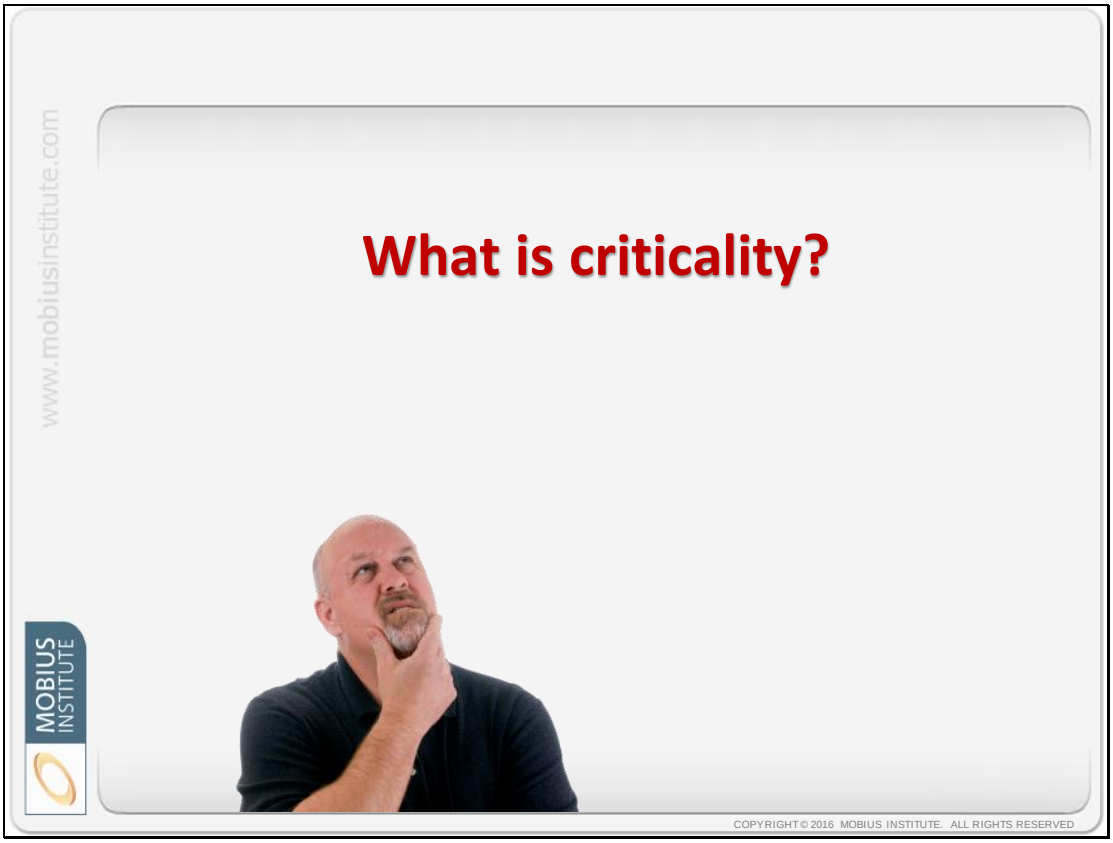
What is criticality?
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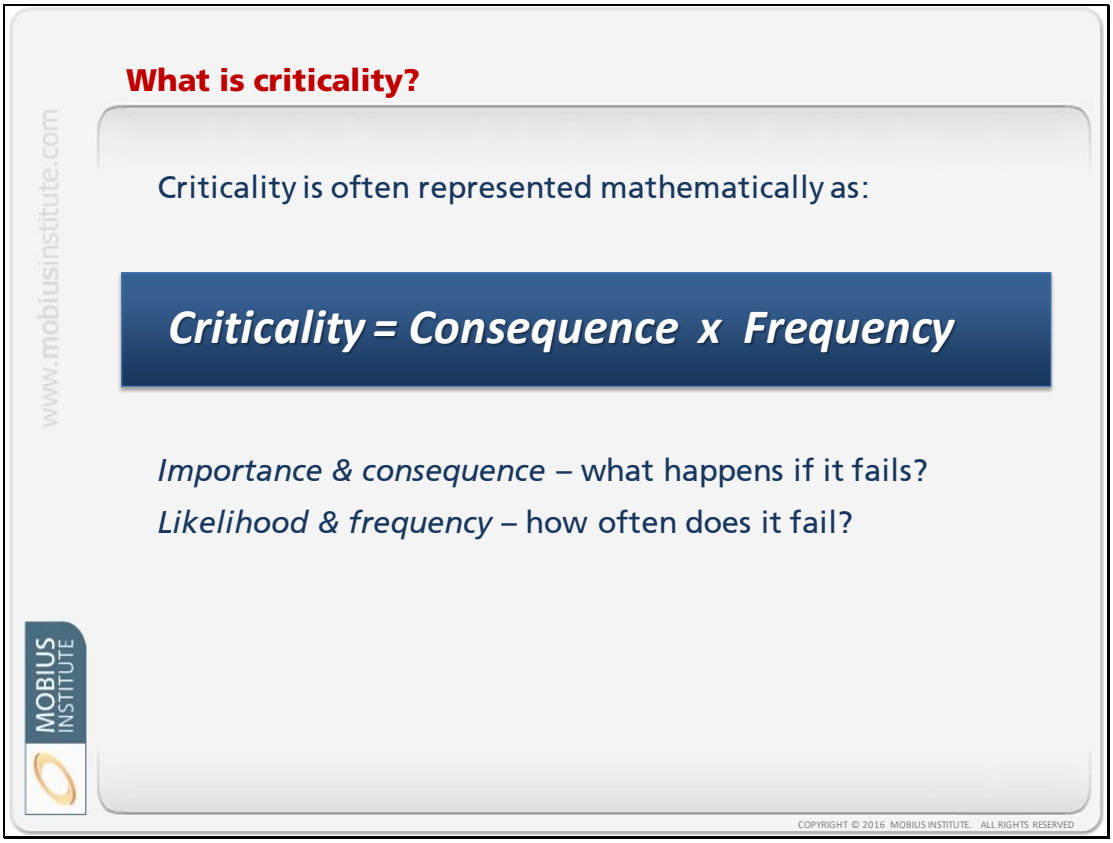
What is criticality?
Criticality is often represented mathematically as:
Criticality = Consequence x Frequency
Importance & consequence – what happens if it fails?
Likelihood & frequency – how often does it fail?
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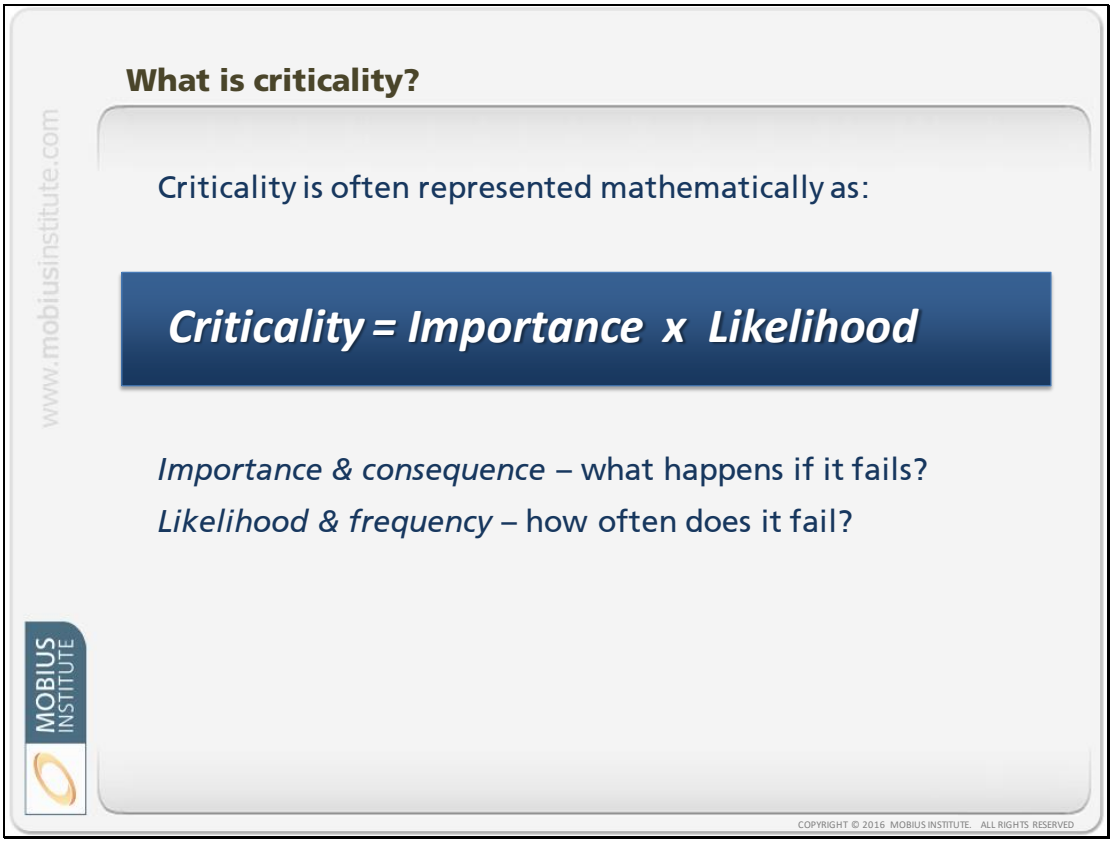
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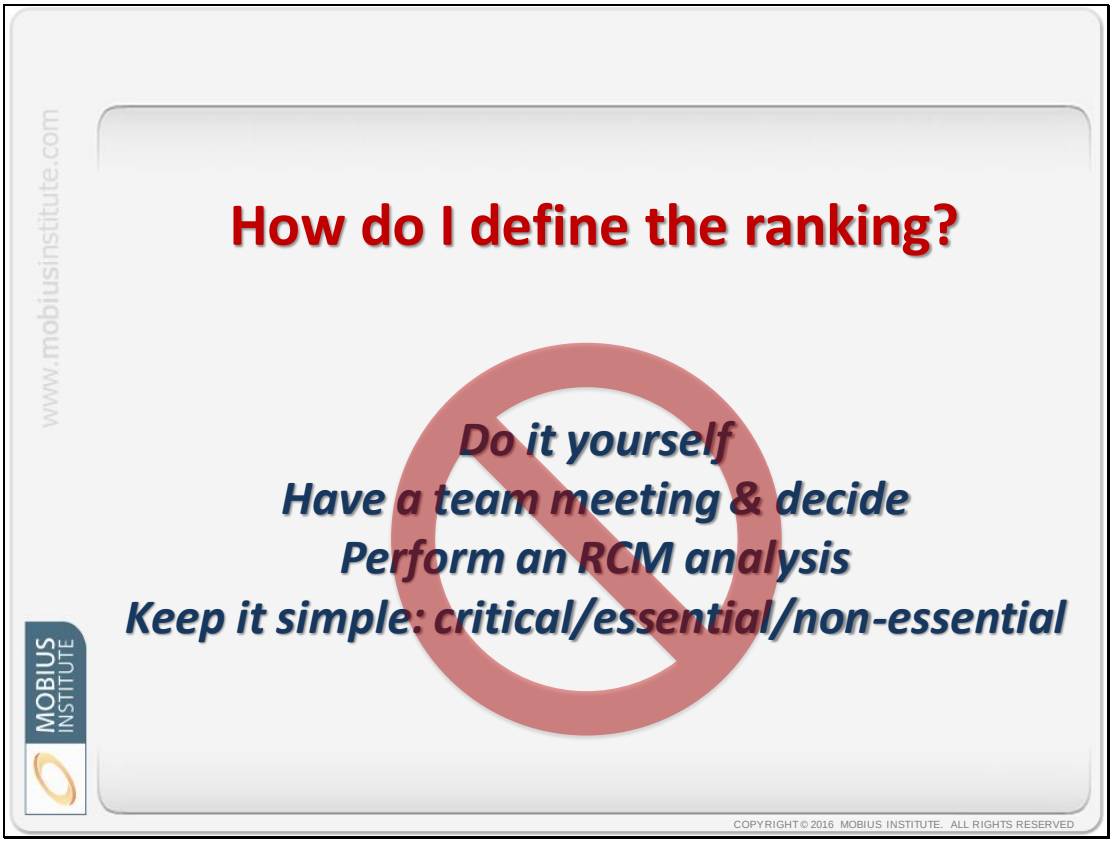
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How do I define the ranking?
Do it yourself
Have a team meeting & decide
Perform an RCM analysis
Keep it simple: critical/essential/non-essential
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How do I define the ranking?
Include all stakeholders
[maintenance, operations, safety, health, environment]
Define consequences
[with an agreed scoring/ranking system]
Assess reliability
Assess detectability
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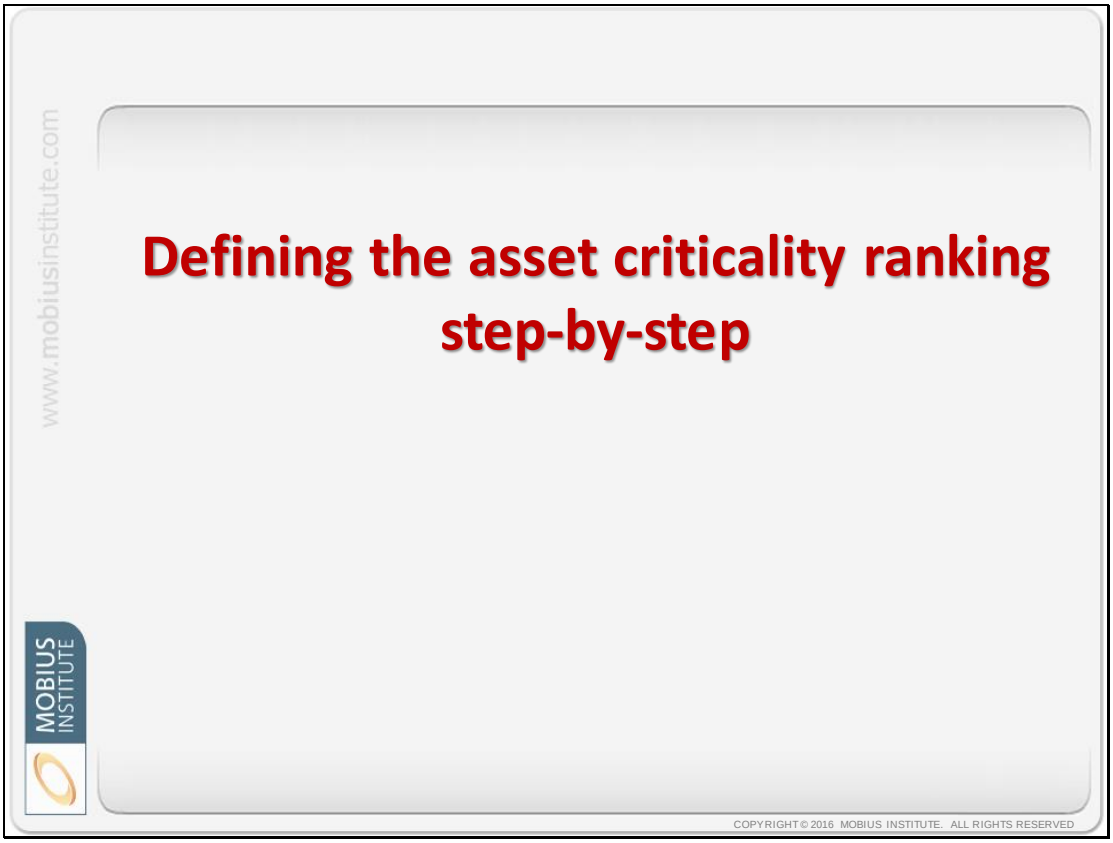
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Defining the asset criticality ranking step-by-step
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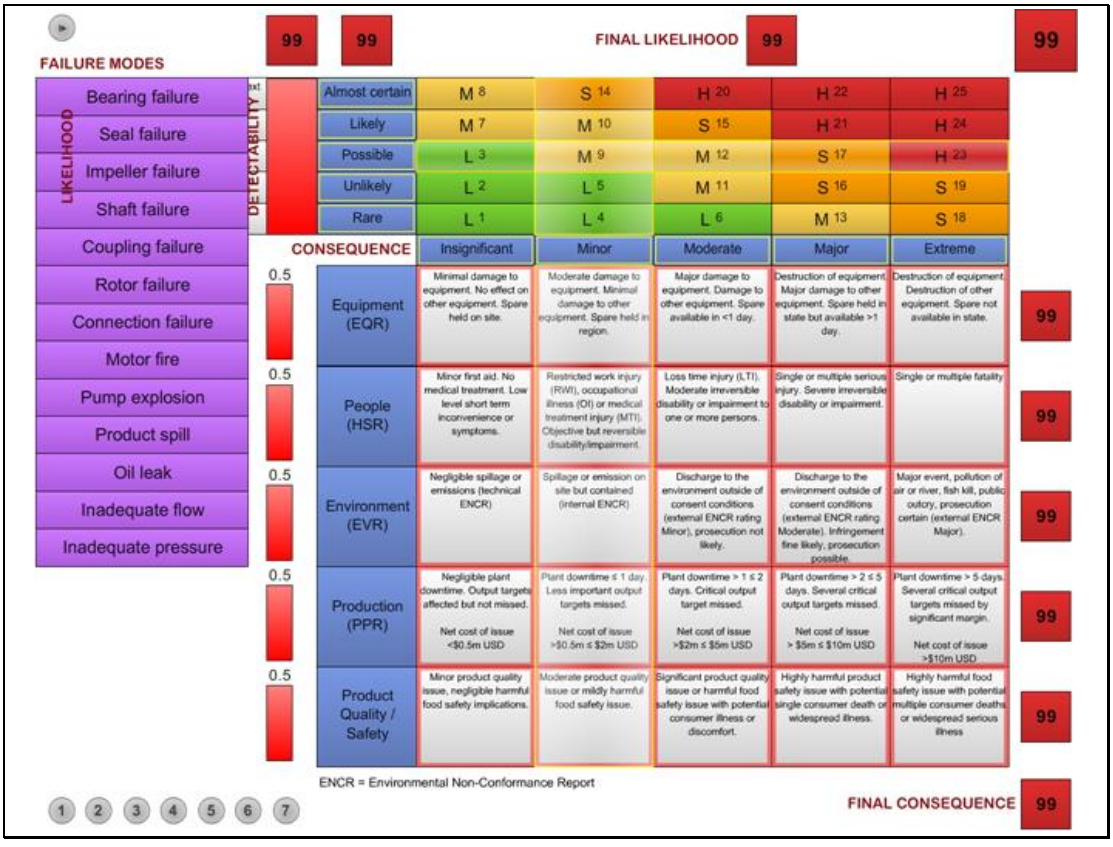
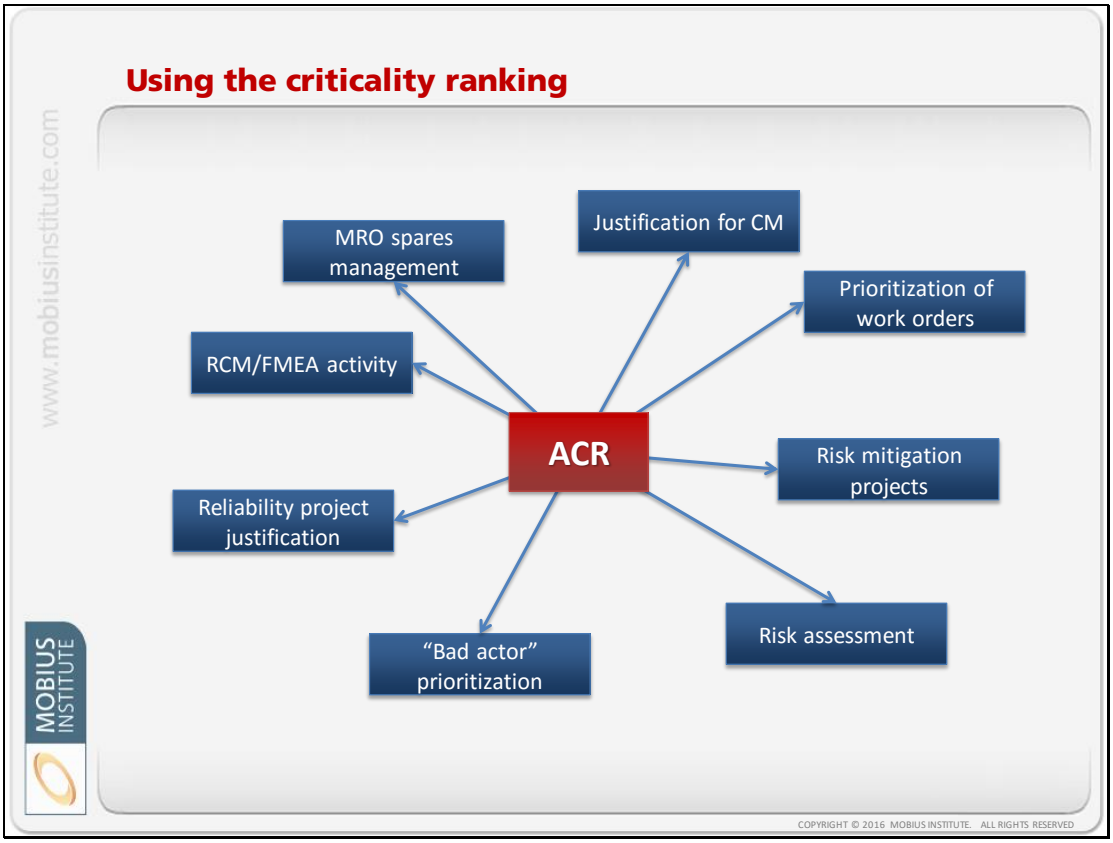

FAILURE MODES
LIKELIHOOD
Bearing failure
Seal failure
Impeller failure
Shaft failure
Coupling failure
Rotor failure
Connection failure
Motor fire
Pump explosion
Product spill
Oil leak
Inadequate flow
Inadequate pressure
DETECTABILITY
99
99
FINAL LIKELIHOOD
99
99
Almost certain
Likely
Possible
Unlikely
Rare
M 8
S 14
H 20
H 22
H 25
M 7
M 10
S 15
H 21
H 24
L 3
M 9
M 12
S 17
H 23
L 2
L 5
M 11
S 16
S 19
L 1
L 4
L 6
M 13
S 18
CONSEQUENCE
Insignificant
Minor
Moderate
Major
Extreme
0.5
Equipment (EQR)
Minimal damage to equipment. No effect on other equipment. Spare held on site.
Moderate damage to equipment. Minimal damage to other equipment. Spare held in region.
Major damage to equipment. Damage to other equipment. Spare available in <1 day.
Destruction of equipment. Major damage to other equipment. Spare held in state but available >1 day.
Destruction of equipment. Destruction of other equipment. Spare not available in state.
99
0.5
People (HSR)
Minor first aid. No medical treatment. Low level short term inconvenience or symptoms.
Restricted work injury (RWI), occupational illness (OI) or medical treatment injury (MTI). Objective but reversible disability/impairment.
Loss time injury (LTI). Moderate irreversible disability or impairment to one or more persons.
Single or multiple serious injury. Severe irreversible disability or impairment.
Single or multiple fatality
99
0.5
Environment (EVR)
Negligible spillage or emissions (technical ENCR)
Spillage or emission on site but contained (internal ENCR)
Discharge to the environment outside of consent conditions (external ENCR rating Minor), prosecution not likely.
Discharge to the environment outside of consent conditions (external ENCR rating Moderate). Infringement fine likely, prosecution possible.
Major event, pollution of air or river, fish kill, public outcry, prosecution certain (external ENCR Major).
99
0.5
Production (PPR)
Negligible plant downtime. Output targets affected but not missed.
Net cost of issue <$0.5m USD
Plant downtime ≤ 1 day. Less important output targets missed.
Net cost of issue >$0.5m ≤ $2m USD
Plant downtime > 1 ≤ 2 days. Critical output target missed.
Net cost of issue >$2m ≤ $5m USD
Plant downtime > 2 ≤ 5 days. Several critical output targets missed.
Net cost of issue > $5m ≤ $10m USD
Plant downtime > 5 days. Several critical output targets missed by significant margin.
Net cost of issue >$10m USD
99
0.5
Product Quality / Safety
Minor product quality issue, negligible harmful food safety implications.
Moderate product quality issue or mildly harmful food safety issue.
Significant product quality issue or harmful food safety issue with potential consumer illness or discomfort.
Highly harmful product safety issue with potential single consumer death or widespread illness.
Highly harmful food safety issue with potential multiple consumer deaths or widespread serious illness
99
ENCR = Environmental Non-Conformance Report
1 2 3 4 5 6 7
FINAL CONSEQUENCE
99


Using the criticality ranking
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MRO spares management
Justification for CM
Prioritization of work orders
RCM/FMEA activity
ACR
Risk mitigation projects
Reliability project justification
"Bad actor" prioritization
Risk assessment
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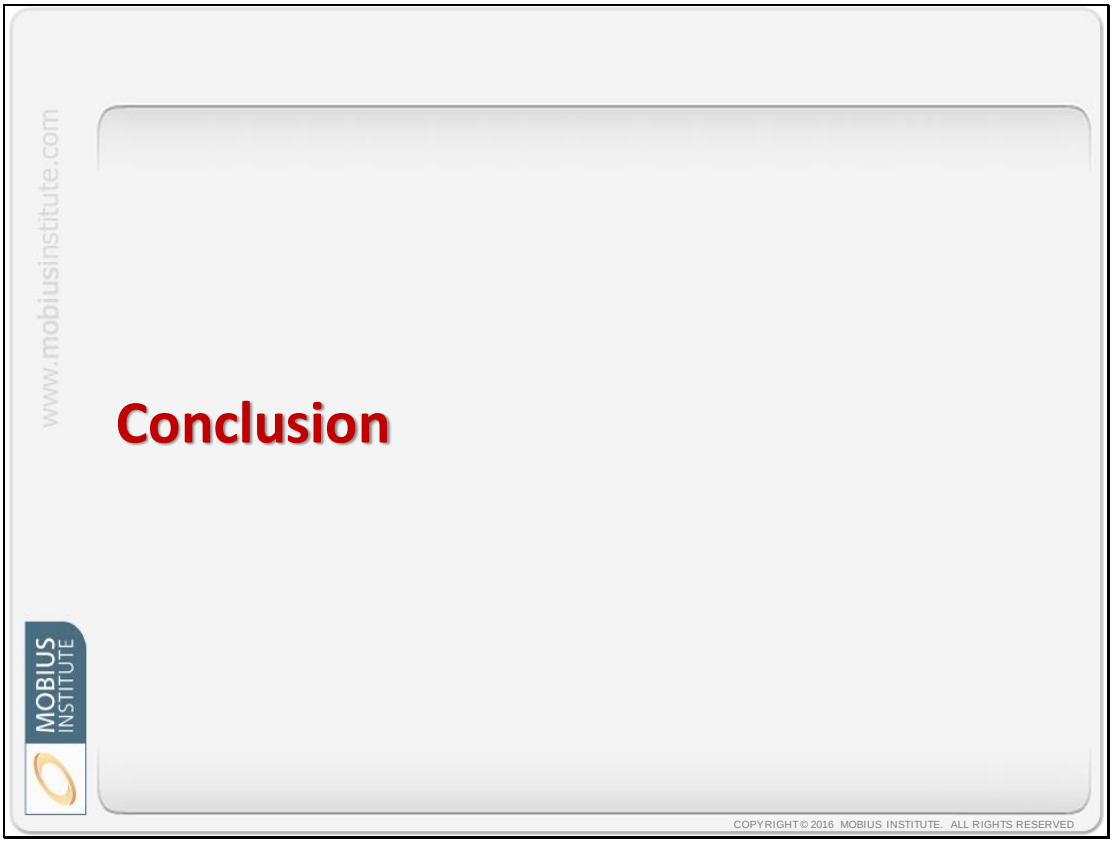
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Conclusion
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Conclusion

- The asset criticality ranking is very important.
- With the right approach you can define it and put it to good use.
- I hope you have found this presentation helpful.

Thank you!

That concludes this presentation.

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