Pulse

IBM SolutionsConnect 2013

Planning For the Future

Understanding the Importance of Whole of Life Planning and Dynamic Life Cycle Costing

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IBM

What We Will Cover

- Asset life cycle planning
- Systematic approach to asset life cycle planning
- Maximo asset life cycle planning
- Questions
- Key Points to Take Home

Introduction & Overview

Companies are facing one of the most challenging economic environments in over 50 years

- To gain the confidence of investors, there is a need to accurately forecast and control expenditure
- Maintenance represents over 30% of expenditure – costs are also the most volatile
- Looking for ways to control and reduce maintenance costs

What is Asset Management?

"Good asset management maximises value-for-money and satisfaction of stakeholders expectations."

http://www.iso55000.info

Involves coordinating and optimising:

- planning
- asset selection
- acquisition/development
- utilisation
- care (maintenance)
- disposal or renewal

When it comes to assets; we undertake immediate planning and short-term planning (5 years).

Asset management is also long-term planning for the future (20 years +).

A System Approach to Asset Life Cycle Planning

Future asset costs for long term planning requires:

Understanding of:

- The asset
- Maintenance, renewal and replacement tasks
- Asset condition
- Asset risk

A System Approach to Asset Life Cycle Planning

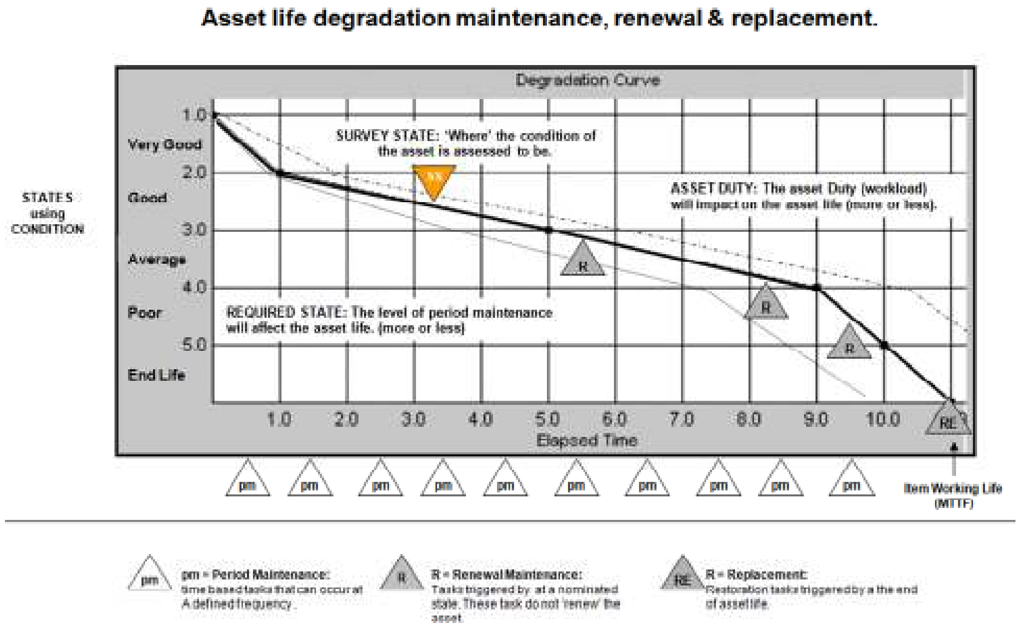
Understand the asset:

- **Asset criticality**
  How important is the asset to the business?

- **Asset duty**
  What are the asset duty levels?

- **Design life**
  What is the asset design life?

- **Service life**
  What is the actual asset life (history) and service duty?



A System Approach to Asset Life Cycle Planning

Understand the maintenance, renewals and replacement tasks:

- **Maintenance tasks**
  - *statutory & regulatory requirements*
  - *PM maintenance*
  - *Frequency, labour, materials,*

- **Renewal tasks**
  - *Planned intervention point*
  - *No. of life interventions*

- **Replacement Tasks**
  - *End of service life replacement*

A System Approach to Asset Life Cycle Planning

Understand the asset condition:

- **Assess condition**
  - *Physical inspection*
  - *Age based on service life*
  - *Duty based on tonnage, cycles, hours*
- **Condition score**
  - *Planned intervention point*
  - *No. of life interventions*
- **Residual life**
  - *Remaining service life*

Rail Defect Type – SQUAT (SQ)

Description of SQUAT (SQ) Ref:CT-20320.1	Squats are surface or near surface defects and initiate either at the crown of the rail head or at the gauge corner, Squats located at the gauge corner are usually also associated with gauge corner cracking (GCC). Squats appear as dark spots or "bruises on the running surface of rail. Each Squat consists of two main sub-surface cracks, a leading one that propagates in the direction of train travel, and a trailing one that propagates in the opposite direction. The leading crack is usually several times longer than the trailing crack. Squats develop mainly in shallower curves and tangent track, mainly in head hardened rails. Squats are often located in Turnouts or at Signals. A squat is distinguishable from a wheel burn, as a wheel burn usually affects both rails. Under certain conditions, Squats may lead to the initiation of Transverse Defects (TD) or multiple transverse defects TDM. Squats may have underlying transverse defects that cannot be detected by conventional Ultrasonic testing techniques (manual or automated). This is because large squats can prevent the ultrasonic sound beam from reaching the transverse defect (acoustic shadow). The depression in the rail surface due to squats also increases the impact loading, leading to degradation of the track structure.				
Defect Limits (Ref: Section 2.14.3 CETS 2)	Depression depth < 0.5 mm / Length ≤70 mm		Depression depth ≥ 0.5 mm & ≤ 0.75 mm / Length >70 mm	Depression depth > 0.75 mm / Visible head widening or cracking	
Category	Small (S)		Medium (M)	Large (L)	
Squat Photo					
Condition Scale	1	2	3	4	5
Condition Description	No squats visible/Asset is in Perfect/Excellent Condition	Squats visible, less than kk mm & not visible TD/TDM/GCC	Squats visible, < kk mm & evidence of minor TD/TDM/GCC	Major Squat < 70mm, evidence of bruises, leading to TDM/GCC	Multiple Squats > 70mm, visible > 1m length of rail surface & TDM/GCC
Required Action	Regular Inspection	Frequent Monitoring & PM (Grinding) required	Continuous monitoring, Report on condition & describe growth with Photo proof	NDT testing, condition report and related defects and recommendations of any CM	Prioritise action for replacement

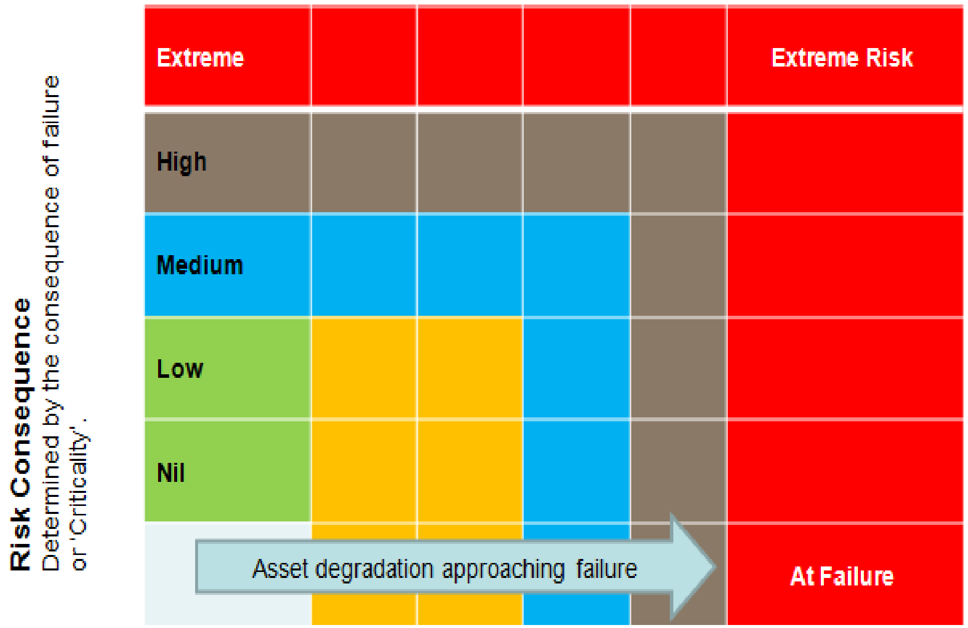
Note: Please Refer to Rail Condition Assessment Table for more details on Condition Criteria.

A System Approach to Asset Life Cycle Planning

Understand the asset risk:

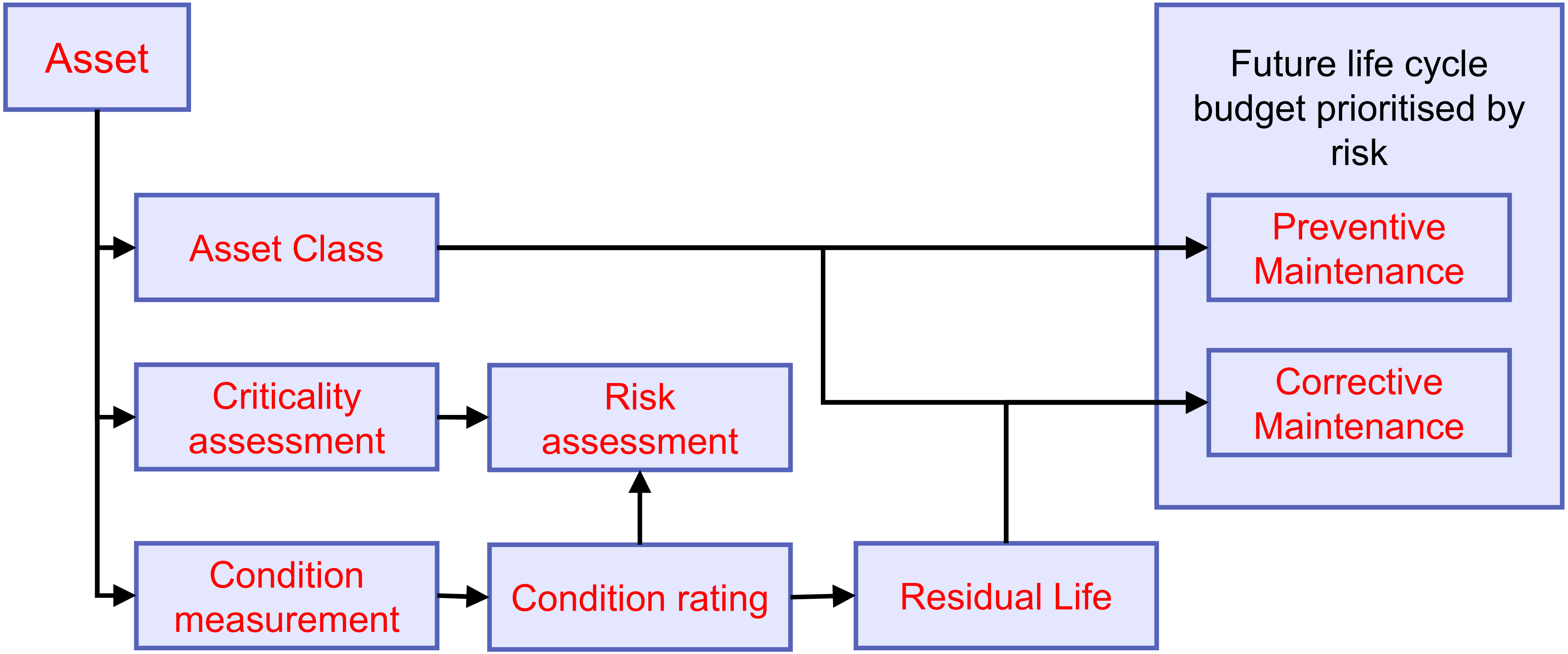
- **Consequence of failure**
  - *Determined by asset criticality and rated to be the impact on the required levels of service that an asset is required to deliver*

- **Probability of failure**
  - *Determined by the remaining residual life of an asset as it ‘degraded’ to failure.*



Risk Likelihood
Determined by the condition and residual life of the asset.
‘As an asset ages the probability of failure increases.

A System Approach to Asset Life Cycle Planning



MAXIMO Asset Life Cycle Planning Solution

- Master Data
- Preventative Maintenance Strategies
- Forecasting
- Resource Allocation
- Visual Planning

Key Points to Take Home

Risk Management	Understand the future impact of maintenance decision made today. Identify risks within the thousands of equipment and components under management.
Maintenance Strategy Optimisation	Continually review the maintenance strategy to provide the lowest cost per tonne or hour. Immediately see the impact of changing strategy.
Resource forecasting	Understand the forward requirement for components, labour and resources based on the long term maintenance plan.
Economic life determination	Optimise the life cycle cost and determine the most economic disposal point for assets.
Equipment evaluation	Analyse and benchmark Cost per Hour, Cost per Tonne, Discounted Cash Flow, Discounted CPT …
Forecasting & Budgeting	‘Real’ zero based maintenance budgeting – costs, availability, resources, productivity.