

# Sharing practice: OEM prescribed maintenance

Peter Kohler / Andy Webb

# Overview

1. OEM introduction
2. OEM maintenance: pros and cons
3. OEM maintenance: key message
4. Tools to help
5. Example
6. Takeaway thoughts
7. Summary

# What is an OEM?

Types of  
Original  
Equipment  
Manufacturer

Prime system

Commercial off-the-shelf

Component

All have responsibilities under *Work Health and Safety* legislation and the *Rail Safety National Law*

# OEM maintenance: pros & cons

## Pros

Provides a quick basis for building a maintenance plan

Supports basic reliability performance

## Cons

Unlikely to balance cost, risk, performance

May not consider failure consequence: may not address *safety*

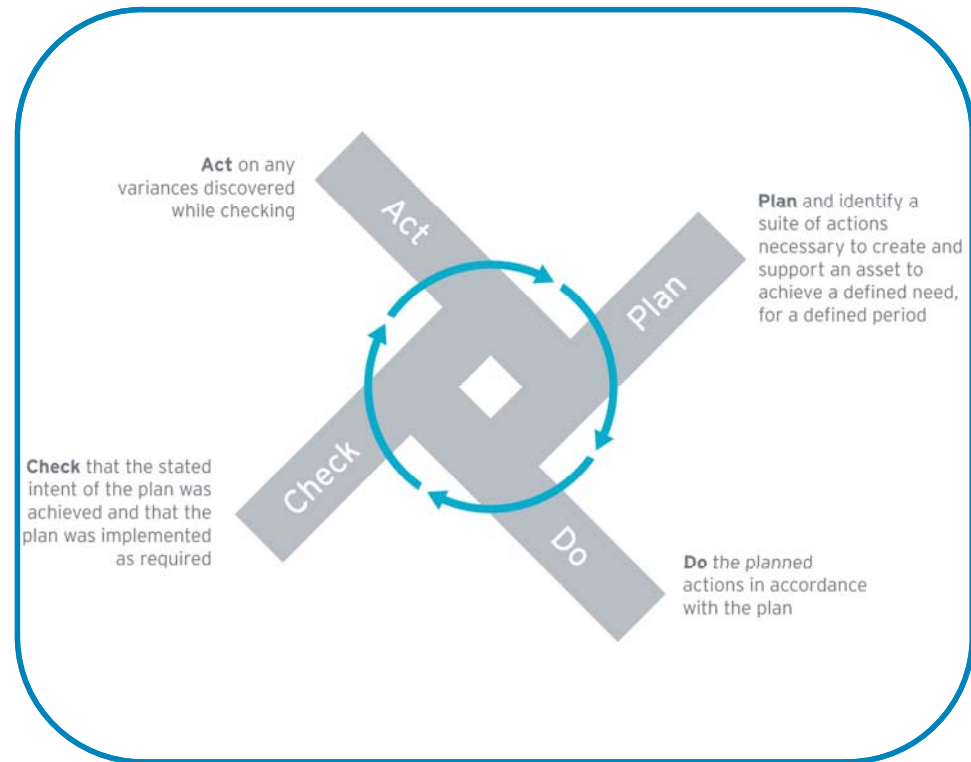
May not consider the asset's environment

Not necessarily efficient for the user

# OEM maintenance: key message

## Good basis but...

- Continual improvement drives **you** to review initial maintenance plan
- **You** need to understand failure consequence on **your** railway to ensure safety



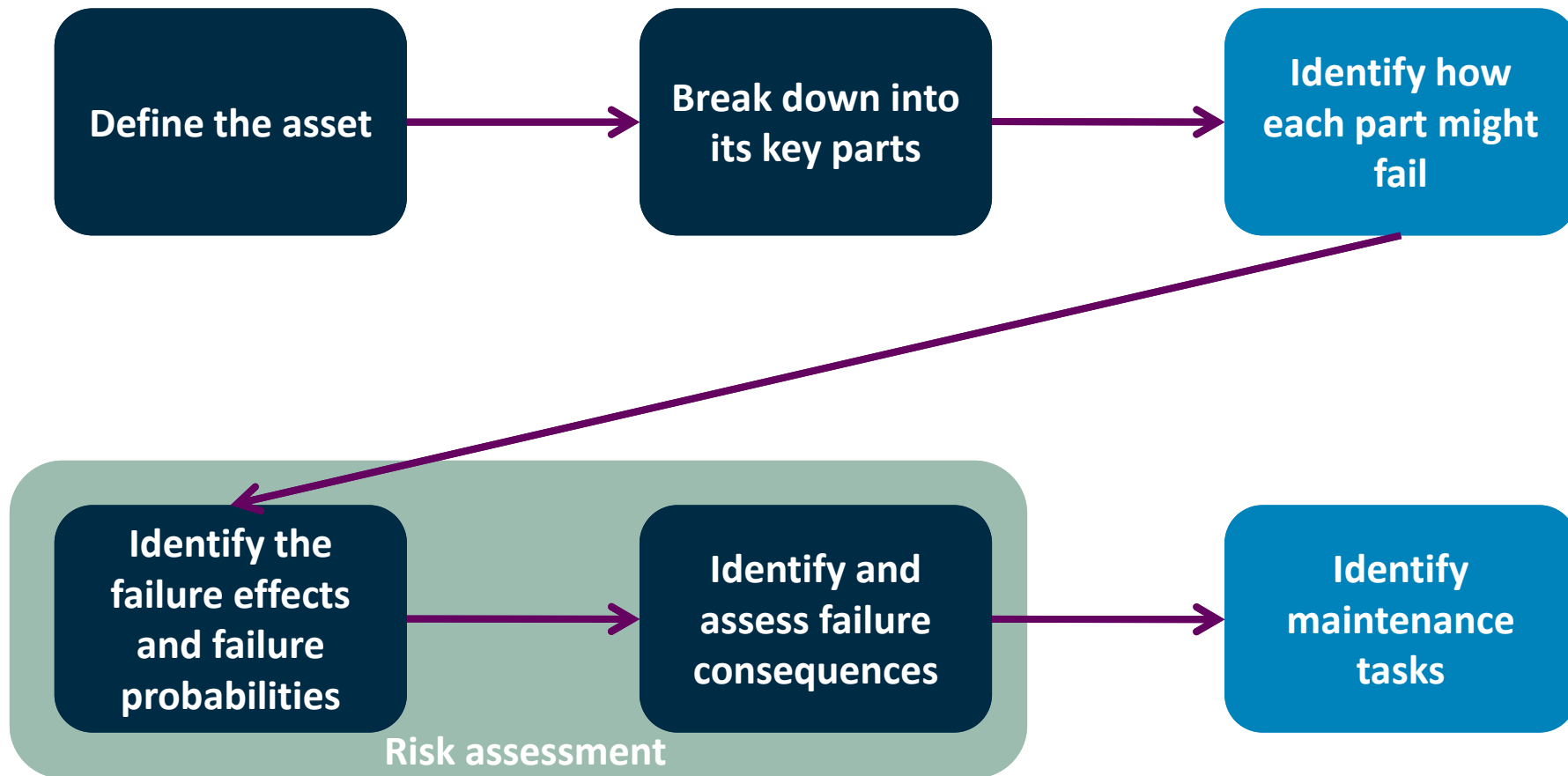
Source: Asset Management concept model,  
Asset Management Council

# Moving forward

- Tools already exist to help us
- FMECA:
  - a systematic way of assessing failure modes and their consequences
  - enables the build up of effective maintenance tasks to address known failure modes
  - IEC 60812: Application guide – Failure mode effects analysis

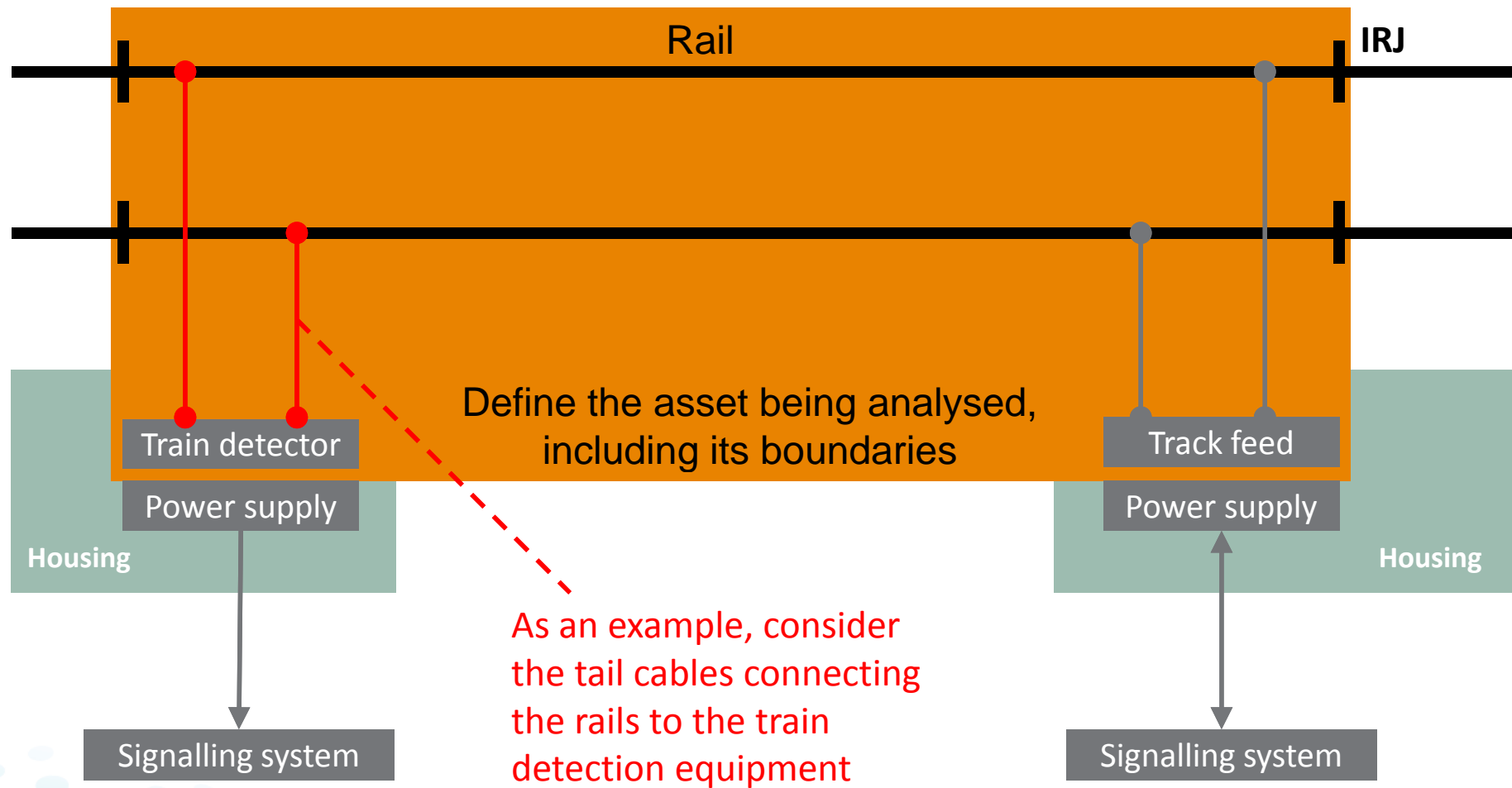


# FMECA process overview



Simplified diagram: refer to *Sharing practice* paper for more detail of the FMECA process

# Sample FMECA – track circuit





# Develop a FMECA (simplified example)

## Scenario 1: Consider the track circuit tail cable – on low use sidings

Function	Sample failure mode	Sample failure effect	Failure Rate	Sample consequence	Criticality	Sample maintenance tasks
To connect the rails electrically to the train detector (track relay)	Fails to connect electrically (eg open circuit)	Track circuit shows occupied when clear	Low	Minor delay to traffic Manual operation mode	Low	Analyse causes, leading to a task frequency for: Examine cable connections Examine cable for damage Ensure cable securely fastened
	Fails to isolate electrical circuit	Track circuit shows occupied when clear	Low	Minor delay to traffic Manual operation mode	Low	Analyse causes, leading to a task frequency for: Examine cables for damage Insulation test cables
		Track circuit shows clear when occupied	Very low	Slow speed collision	Medium	Analyse causes, leading to a task frequency for: Examine cables for damage Insulation test cables



# Develop a FMECA (simplified example)

## Scenario 2: Consider the track circuit tail cable – on a high use passenger main line

Function	Sample failure mode	Sample failure effect	Failure Rate	Sample consequence	Criticality	Sample maintenance tasks
To transfer electrical energy from the rails to the train detector (track relay)	Fails to transfer electrical energy (eg open circuit)	Track circuit shows occupied when clear	<del>Low</del> Medium	<del>Minor</del> Delay to traffic Manual operation mode	<del>Low</del> Medium	Analyse causes, leading to an <b>increased</b> task freq for: Examine cable connections Examine cable for damage Ensure cable securely fastened
	Fails to isolate electrical circuit	Track circuit shows occupied when clear	<del>Low</del> Medium	<del>Minor</del> Delay to traffic Manual operation mode	<del>Low</del> Medium	Analyse causes, leading to an <b>increased</b> frequency for: Examine cables for damage Insulation test cables
		Track circuit shows clear when occupied	Very Low	<del>Slow-speed collision</del> Passenger train collision, potential fatalities	Medium Very High	Analyse causes, leading to an <b>increased</b> frequency for: Examine cables for damage Insulation test cables



# Takeaways

- Do you understand how your assets fail?
- Do you understand the consequence of failure modes?
- Can you improve your knowledge of how assets fail?
- Are there systems for recording defects and failures?
- Do you know your critical assets?
- Will you try a FMECA on your critical assets?
- How can today assist you in maintenance planning?



# Summary

OEM may provide a good initial base for planning maintenance but ...

Safe assets need you to:

Understand how they fail on your railway

Understand failure consequences on your railway

Plan maintenance activities to mitigate against asset failure

