

Why Reliability Engineering Is Important?

Fred Schenkelberg

So, what do
you do?



I'm a
reliability
engineer.



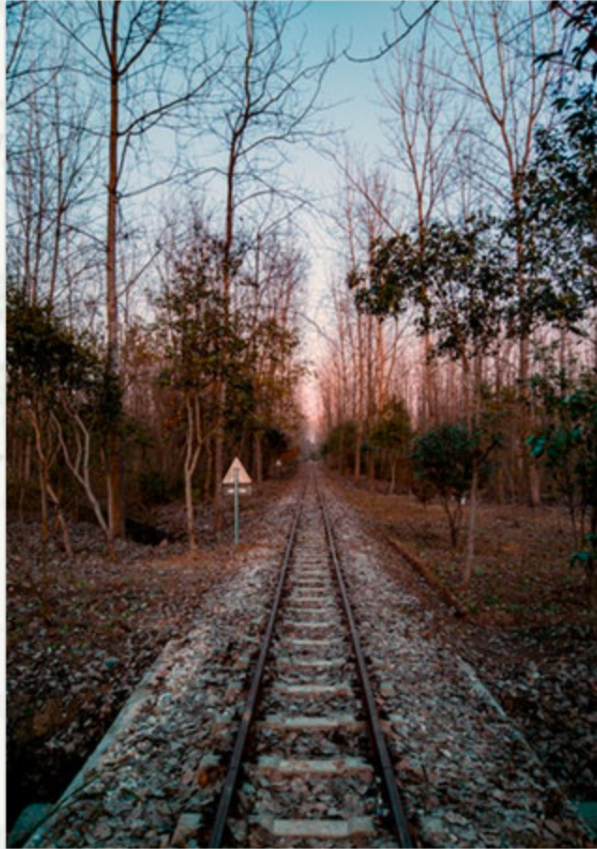


Ok... so,
what do
you do?

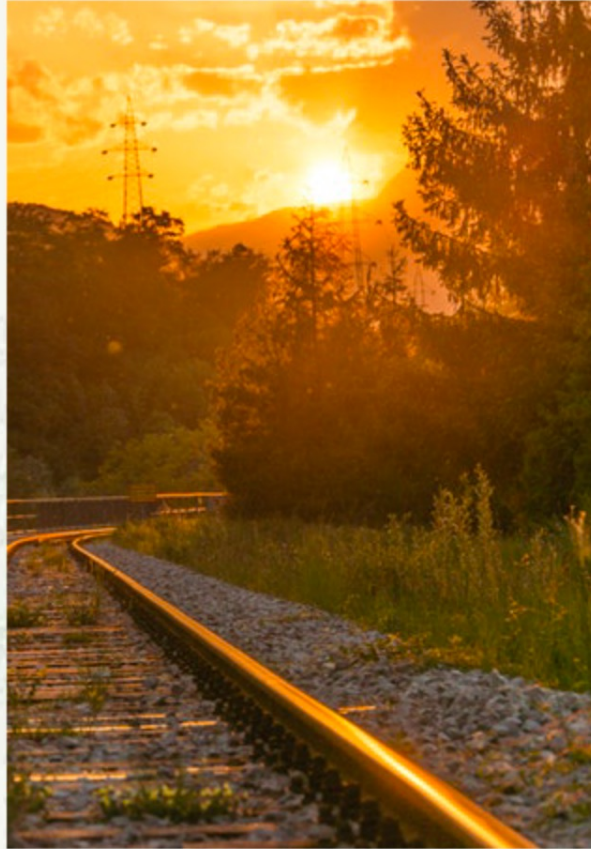
Why do you do

what you do?

Reliability Tasks



Modeling

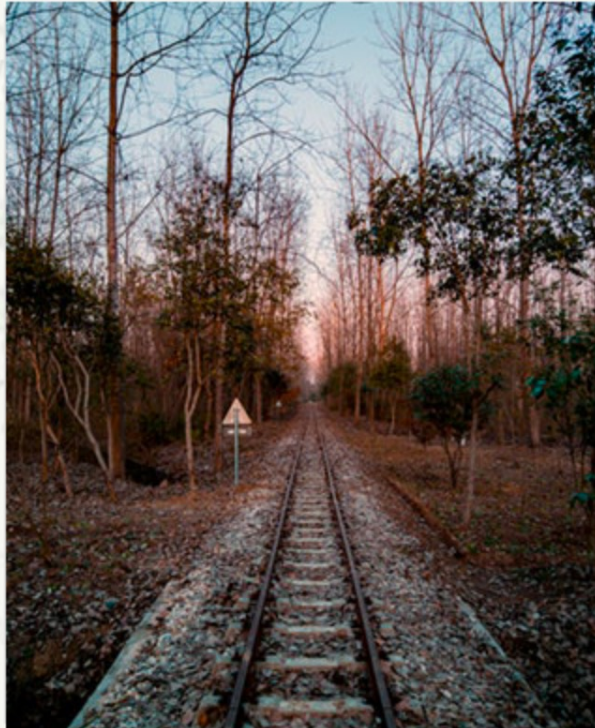


Testing



Analysis

Reliability Modeling



Generally to support 'what if' type analysis or to explore options

Reliability Block Diagrams

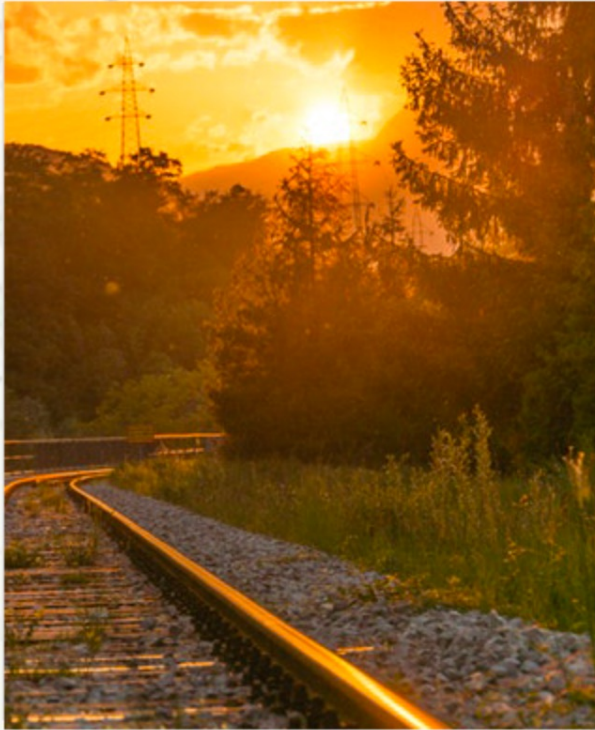
Fault Tree Analysis

Physical of Failure models

Acceleration factors

System reliability models

Reliability Testing



Do you test to learn something?

Environmental

Stress testing

HALT

ALT

Reliability Analysis



got data?

Test results

Comparisons

Optimization

Field data

Warranty data

These are tasks...

so, what?

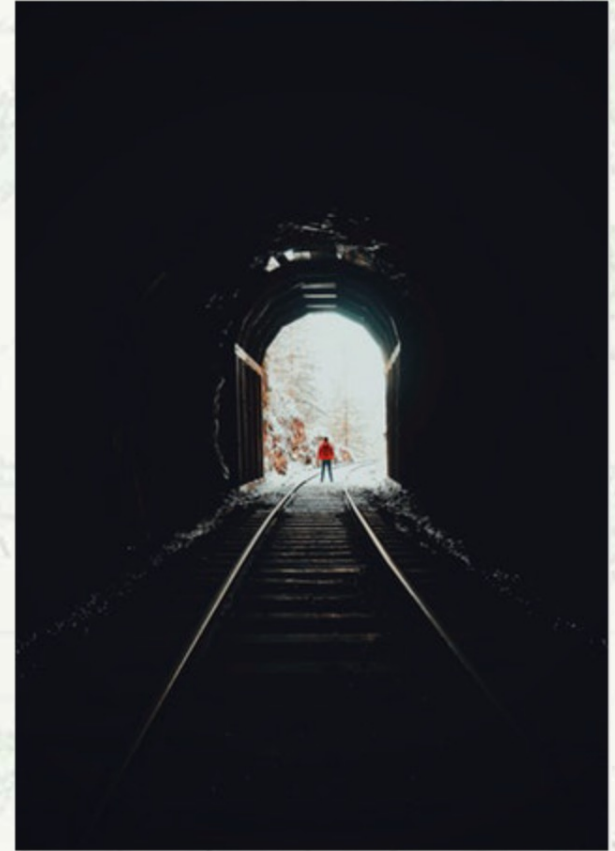
Reliability Outcomes



Warranty



Customers



Society

Reliability & Warranty



See WarrantyWeek.com

Warranty Expense v Profit

Field failures have a cost beyond warranty

Business objectives

Warranty is not the entire
motivation, is it?

Reliability & Customers



Do you celebrate failures?

Your customers want the item to work

Failures do happen

Yet, what is lost when an item fails?
for the customer?

Reliability & Society



In a world of scarcity

Raw materials

Manufacturing talent and capacity

Scrap and waste

Landfills

Transport capacity

Benefit of functioning item

How do we connect
tasks to outcomes?

Reliability Engineering



Decisions

What Fails

When Fails

Reliability & Decisions



How does reliability
performance become created?

Product concept and strategy

Detailed design and materials

Supplier process stability

Assembly methods

Transportation, installation...

Maintenance

Decommissioning

What will fail?



Are you surprised by what fails? Should you be?

If you know what will fail:

- you can sort out if that failure is acceptable or not

- you can design away from failure

- you can consider alternative approaches

When will it fail?



Estimated time to failure for those failure mechanisms we understand

Will the product last long enough?

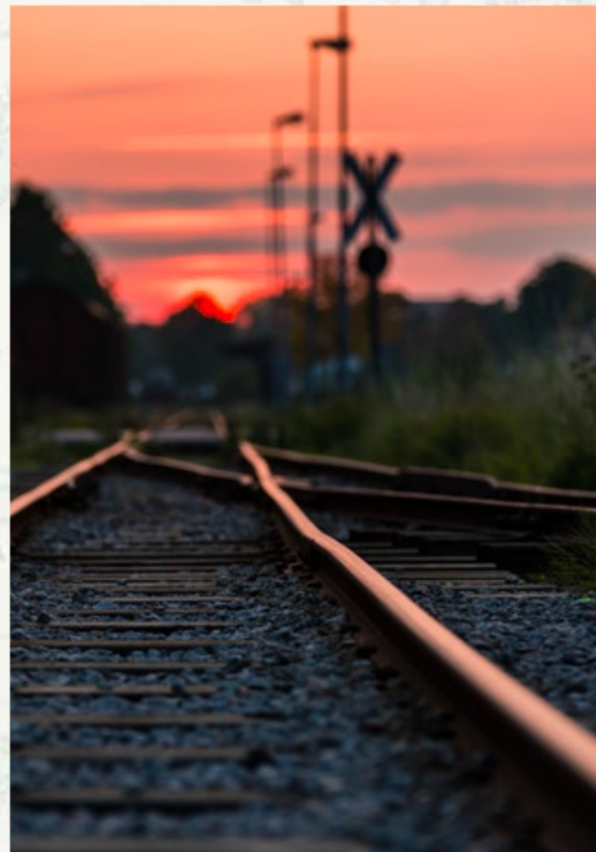
Impact on warranty expenses

To bad we don't know this
for individual items

Is this of

value?

What do you do?



Expertise

Leadership

Advocate

Reliability Expertise



You are like a consultant, really you are. It's all about influence.

Statistics

Testing

Modeling

Failure Analysis

Failure Mechanisms

Leadership

Reliability Leadership



You have to take charge of the topic. Show the way.

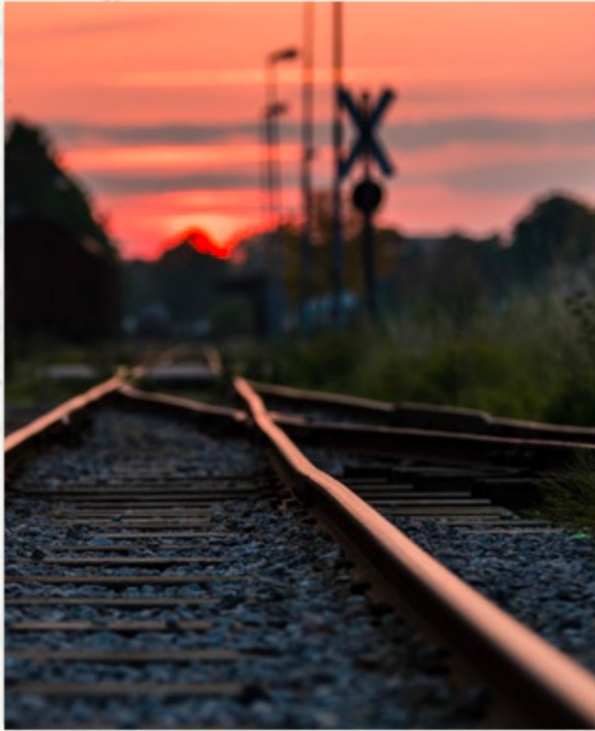
We are one of the few positions that works:

across the entire product life-cycle

across the entire organization

with all suppliers and customers

Reliability Advocate



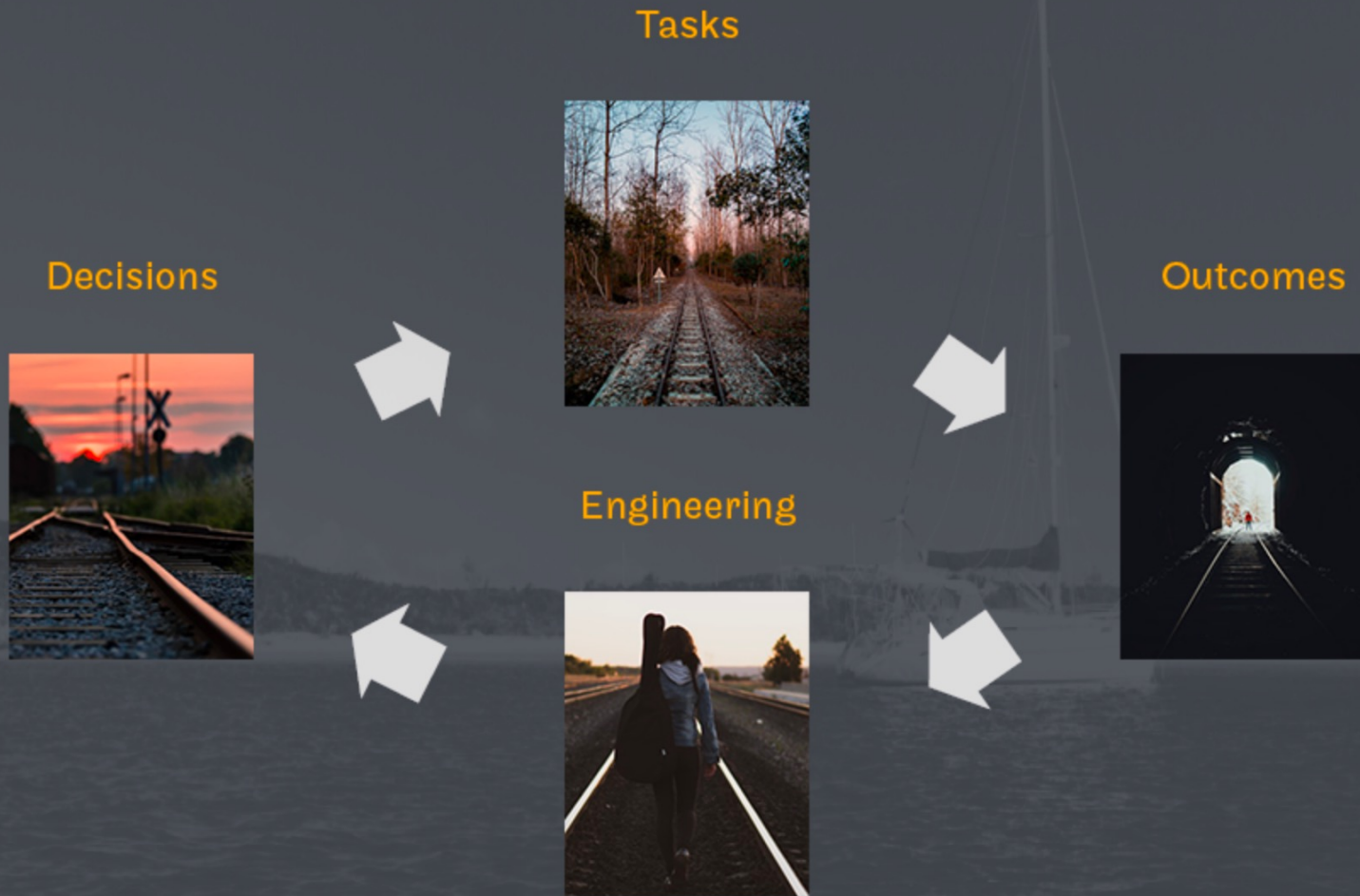
Hey, someone has to speak up about reliability performance of our products and systems

You can structure the discussion and decisions on behalf of the customer.

How do you explain

what you do
and why?

In Summary



More Information

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Railway images from Pexels

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