

# Reliability Engineering

Operations Leaders love it when their equipment is just humming; doing everything they need it to do and sometimes even more. Reliable equipment is a core enabler for achieving safety, production and cost goals. It frees up time to do the important work, rather than the urgent work when responding to breakdowns that jeopardise the volumes committed to your customers.

At EnterpriseIS, we help you improve the reliability of your assets through the application of sound engineering practice and improvement methodologies. We explore what success looks like for you and tailor a reliability solution to deliver your goals.



Reliable equipment is at the core of operational excellence. The goal of reliability engineering is for the equipment (or system) to perform as required for a specified period without failure. You start by understanding the current level of reliability and then pinpoint the potential areas for improvements that will improve the Overall Equipment Effectiveness (OEE).

To improve equipment availability there are numerous reliability engineering techniques that can be utilised. Some are data or evidence-based, to determine the probability of failure, such as reliability block diagrams. Some are more science based such as calculating corrosion rates. The analysis is used to either improve the maintenance strategy or to alter the equipment design.

Whether you need help with building reliability into your asset management strategies or need assistance in root cause analysis for your equipment failures, the team at EnterpriseIS can help tailor a solution to meet your needs.

Our key areas of expertise include:

### Root Cause Analysis

Some clients have had a significant equipment failure and are seeking specialist support during the investigation. They seek the assistance of EnterpriseIS to determine the root causes of these failures and corrective actions to prevent recurrence.

### Overall Equipment Effectiveness (OEE)

Some clients want to understand where their losses against nameplate capacity are occurring. They want to know how much of it is due to equipment availability, how much is due to running the plant at below design rates and how much is due to quality defects. We analyse their operating and equipment failure data to help them understand their current Overall Equipment Effectiveness (OEE) performance. We determine the greatest losses and prioritise improvement opportunities. We can also provide the on-site support to fast track the improvement projects.

### Reliability Modelling

Some clients want to understand the reliability of a component or system during design to understand the possible causes of failure. The overall system reliability is determined by our consultants using a Reliability Block Diagram methodology. The critical components within the system are identified by using the Mean Time to Failure (MTTF) data and the equipment configuration (series or parallel) to determine expected reliability. Where the calculated or actual reliability is less than desired, our consultants will recommend a solution to achieve your goals. A similar approach using Fault Tree analysis to determine the cause of overall system failures, is also available for our clients to determine their equipment

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## Equipment Criticality Analysis

Some clients want to understand which of their equipment and components are the most critical. Our consultants will perform a Failure Mode Effect and Criticality Analysis (FMECA) to determine the probability of failure and the consequence for each of these failures. This analysis is then used to determine critical spares holdings and maintenance strategies that reduce the overall business risk to an acceptable level.

## Equipment Cost Modelling

When investing in new equipment or deciding on when to replace existing equipment, many of our clients need specialist financial modelling support. EnterpriseIS will perform the Equipment Life Cycle Cost Modelling to determine the overall cost of equipment from initial purchase to disposal. The analysis can then be used to develop annual maintenance budgets and capital requirements in future years. Different scenarios can be explored to develop the lowest cost outcome over the whole life of the asset. Optimum replacement timing is determined when the overall operating and financing cost on the new equipment is less than the cost of the old.

## Defect Elimination

Some clients have systemic recurring issues that, when collated, amount to significant losses. They need these defects to be analysed, the root causes to be determined and an action plan developed to eliminate these failures. We provide the skilled specialists to

conduct the root cause analysis (RCA) and implement the defect elimination program. The result is a significant improvement in equipment uptime for the client.

## Equipment Risk Studies

Understanding and managing risk is the highest priority for all our clients. We offer support in all areas of risk management. Some clients want to identify, assess and remove process, equipment or machinery hazards. Others require a high-level risk assessment to determine their overall risk levels based on sound reliability principles.

## Specialist On-Site Support

We've embedded our Specialists within our clients' teams to provide front-line assistance in reliability engineering to fast-track improvements in equipment performance. They are supported by the EnterpriseIS leadership, systems, and improvement methodologies to deliver many times the return on investment.

Whatever your need, at EnterpriseIS we will take the time to understand what success looks like for you and tailor a reliability solution to deliver on your goals.

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