Holistic Asset
MANAGEMENT

RS ReliaSoft

DFR Essentials Suite

This Design for Reliability (DFR) Suite is competitively priced to offer significant savings over purchasing the same products individually. It provides all the necessary tools for users who focus on product design and development.

W Weibull++

Life Data Analysis	Core Reliability Tool
Powerful Models	Superior Plots/Reports

F XFMEA

FMEA and Related Analyses	Flexible Reports
Highly Configurable	Databased-Driven

B BlockSim

System Modelling and Simulation		Fault Trees
RBDs	Reliability Phase Diagrams	Markov

Weibull++

ReliaSoft Weibull++ is a complete life data analysis tool that ensure reliability, forecast warranty, and accelerate tests and reliability growth planning.

Features

- Utilises multiple lifetime distributions, warranty and degradation data analysis, design of experiment and more with a clear and intuitive interface geared toward reliability engineering.

- Offers optionally licensed features of Accelerated Life Testing for accelerated test planning and data analysis.

- Offers Reliability Growth to analyse data from both developmental testing and fielded repairable systems in order to monitor reliability improvements over time and predict failures before they occur.

Benefits

- Compare suppliers or designs based on reliability

- Ensure reliability within a specific time frame and confidence

- Make predictions and detect outliers during the useful life (or warranty) period

- Gain deeper insights with design of experiments

- Extrapolate failure times based on performance

- Use plots and other reports to effectively communicate expected performance to management

ReliaSoft

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W Weibull++

Accelerated Life Testing module

The Accelerated Life Testing module provides accelerated test data analysis and test plans for multiple stresses and constant or time varying stress profiles.
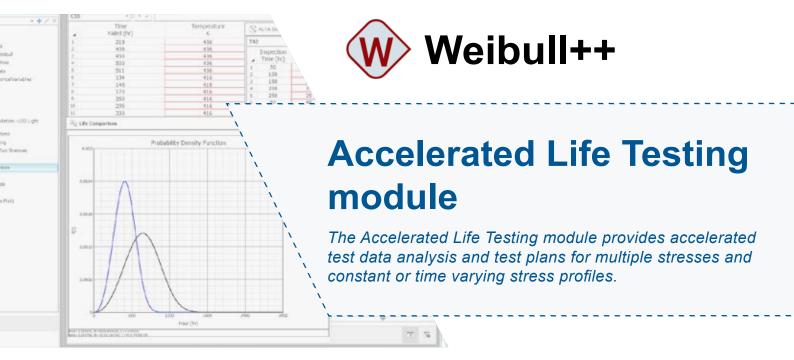
Features

- Provide complete solution for accelerated test planning and quantitative accelerated life testing data analysis.

- Design accelerated life tests and calculate necessary reliability metrics to significantly reduce test times and lower development costs.

- With the most complex accelerated test data analyses and test plans available for multiple stress types, where stress is constant or varies by time, you will be able to produce more robust designs.

Benefits

- Understand and quantify the effects of stress (or other factors) on product life

- Design accelerated tests to achieve desired objectives

- Lower development costs with improved designs

- Significantly reduce test time and produce more robust designs

- Provide clarity and support decisions with enhanced reports and plots

Accelerated Life Testing module

Two versions to support how you analyse data obtained from quantitative accelerated life tests

Accelerated Life Testing - Standard

This version is intended to be an entry-level tool for the reliability professional interested in basic quantitative accelerated life testing data analysis applications.
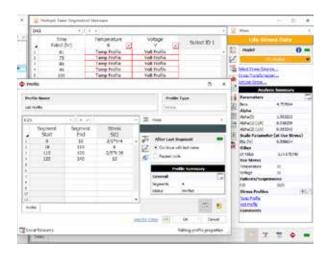
- Life-Stress Relationships supported: Arrhenius, Eyring, Inverse power law, Temp-humidity, Temp-nonthermal.

- Varying Stresses: data analysis of 1 or 2 stresses that do not vary with time.

- Cannot analyse data with indicator variables.

- Monte Carlo Data Generation is only available for supported models.

Accelerated Life Testing - PRO

This version provides advanced capabilities made possible by extensive research and development in complex quantitative accelerated life testing data analysis techniques.

- Life-Stress Relationships supported: all of the models available in Standard version as well Generalised Eyring, Proportional hazards, Generalised log-linear and Cumulative damage.

- Varying Stresses: can analyse data with up to 8 stresses that may vary with time and provides a utility to define and manage stress profiles. Use level stress can also be specified to vary with time.
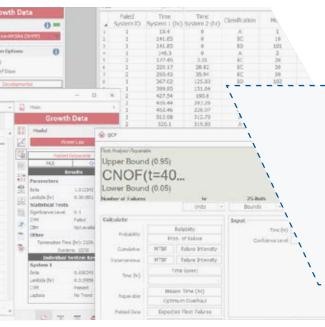
- Can analyse data with indicator variables.

- Monte Carlo Data Generation is available for all models, including those with multiple and/or time-dependent stresses.

Reliability Growth module

Reliability Growth module allows you to apply reliability growth models to analyse data from both developmental testing and fielded repairable systems.

Features

- Monitor reliability improvements over time and predict failures before they occur to evaluate the reliability growth management strategy.

- Quantify reliability growth across multiple test phases, design test plans for repairable systems and determine the test time required per system in order to demonstrate a specified reliability goal.

- Provide advanced methods for reliability growth projections, planning and management.

- For systems operating in the field, you can calculate optimum overhaul times and other results without the detailed data sets.

Benefits

- Predict failures before they occur and monitor reliability improvements over time

- Quantify reliability growth achieved with each successive design prototype

- Determine the feasibility of achieving reliability goals with a given test/fix strategy

- Use grouped (interval) data analysis to evaluate fleet warranty data in order to estimate future returns
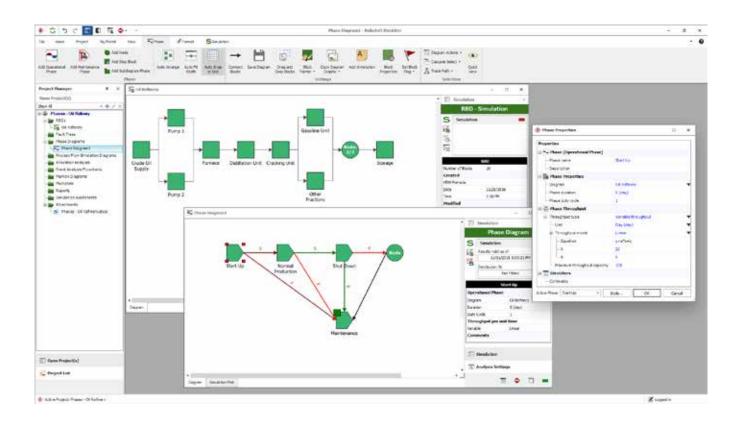
- Experiment with sample sizes using simulation tools

Reliability Growth module

Integrate repairable systems analysis with other processes

The Reliability Growth module facilitates the analysis of repairable systems data using the Crow (AMSAA) model. It allows you to get an overview of the system without having the large data requirements that would normally be required for system reliability analysis.

With the Reliability Growth module, you can track the progress of the system during development phase and then use ReliaSoft BlockSim in accordance with the already known results to gain more detailed information.

Weibull++ Software Highlights

Data types (individually or in groups)

- Complete (failure time)
- Right censored (suspension time)
- Left censored
- Interval censored
- Free-form

Distributions

(wizard to find best fit for your data)

- Weibull
- Normal and Lognormal
- Exponential
- Gamma and Generalised Gamma
- Logistic and Loglogistic
- Gumbel
- Bayesian-Weibull
- Mixed Weibull
- Competing Failure Modes (CFM)

Analysis types

- Rank Regression on X (RRX)
- Rank Regression on Y (RRY)
- Maximum Likelihood (MLE)
- Non-Linear Rank Regression

Ranking methods

- Kaplan-Meier
- Median Ranks

Confidence bounds methods

- Likelihood ratio
- Fisher Matrix
- Beta Binomial
- Bayesian (BSN)

Calculation and plot types

- Probability
- Reliability vs. Time
- Unreliability vs. Time
- Failure rate vs. Time
- pdf plot
- Contour plot
- Failures/Suspensions histogram
- Failures/Suspensions pie
- Failures/Suspensions timeline

Related analyses

- Warranty analysis
  - Nevada
  - Times-to-failure
  - Dates of failure
  - Usage
  - Times-to-failure and Usage
- Degradation analysis
  - Nondestructive (Linear, Exponential, Power, Logarithmic, Gompertz, Lloyd-Lipow)
  - Destructive (Linear, Logarithmic, Lloyd-Lipow)
- Event log conversion
- Recurrent event data analysis
  - Mean cumulative function
  - General renewal process
- Non-Parametric Life Data Analysis
  - Kaplan-Meier
  - Simple actuarial
  - Standard actuarial
- Design of Experiments (DOE)
  - One Factor designs
  - Factorial designs
  - Response surface method designs
  - Taguchi Robust designs
  - Mixture designs
  - Reliability DOE

Weibull++ Software Highlights (continued)

Tests of comparison

- Data set life comparison
- Stress-Strength analysis

Data set simulation

- Monte Carlo data
- SimuMatic®

Other utilities

- Reliability test design
- Block diagrams
- Maintenance planning tool
- Non-linear equation root finder & Fit solver
- Quick Parameter Estimator
- Quick Statistical Reference

Advanced plotting tools

- Overlay plots (aka multi-plots)
- Side-by-side plots
- RS Draw® Metafile Graphics Editor
- 3D plots

Customisable reports

- Workbooks (spreadsheet and word processing modules combined)
- Function wizard

Reliability program integration

- Publish models based on data analyses and create metrics to track and display KPIs
- Extract data from XFRACAS or from an external database
- Export from the event log and maintenance planning tools with BlockSim

Available services

- Detailed user documentation
- Practical example files
- Quick tour guide
- Training for theory + software
- Professional engineering services

For more information visit:

Holistic Asset Management is the Australia and New Zealand reseller of ReliaSoft Software from HBM Prenscia Inc. These expert analysis tools are benchmarks in the reliability industry and are widely used in various industry sectors to facilitate the practical application of reliability in maintenance, asset management, product development and after sales.

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XFMEA

ReliaSoft XFMEA facilitates the FMEA/FMECA process and provides flexible data management and reporting capabilities.

Features

- Supports all types of FMEA and FMECA to achieve higher reliability, safety and customer satisfaction

- With extensive reporting capabilities, risk discovery tool and flexibility to accommodate all FMEA techniques, you can facilitate any FMEA team workshops/meetings.

- Easily links the FMEA analysis to RBDs and fault trees, and transform the FMEA findings into a representative reliability model of your system.

- Enables you to build a continuous knowledge repository of the FMEA results to be reused throughout the reliability program.

- Supports related analyses such as P-Diagrams, DVP&Rs (Test Plans), Design Reviews Based on Failure Mode (DRBFMs), Process Flow Diagrams and Process Control Plans.

Benefits

- Proactively consider potential failures, prioritise issues based on risk in order to initiate improvements early in development when modifications tend to have the greatest impact for the lowest cost.

- Highlight high risk items using Criticality Analysis or Risk Priority Number (RPN) to achieve higher reliability and safety.

- Save time and promote consistency within your organisation by reusing information and libraries from existing FMEAs.

- Identify, analyse, and improve high-risk elements by utilising charts, reports, automated e-mails, and other features to optimally use your analysis information.

ReliaSoft

XFMEA Software Highlights

FMEA standards

- AIAG and VDA 1st Edition
- SAE J1739
- IEC 60812
- ISO 14971
- VDA-4 (German automotive industry)
- MIL-STD-1629A
- Highly configurable to define your own custom profiles

FMEA types

- Design FMEA (DFMEA)
- Process FMEA (PFMEA)
- System FMEA
- FMECA
- Highly configurable to define your own custom profiles

Risk assessment methods

- Risk Priority Numbers (RPNs)
- Criticality analysis
- Alpha/Beta ratio criticality worksheet
- Quantitative Consequence Priority Numbers (QCPNs)
- Priority highlights and configurable risk ranking logic
- Multiple severity scores per effect

Integration with related analyses

- P-Diagrams
- Transfer DFMEA to PFMEA
- DVP&R and test plans
- Control plans
- Process Flow Diagrams and worksheets
- Design Reviews Based on Failure Mode (DRBFM)

Organisation and data structure

- Easy to build system configurations
- 3 Views for data entry
  - Hierarchy (Tree) view
  - Worksheet view
  - Filtered view

Easy to find and reuse data

- Browse or query to import existing data
- Use keywords to find and import existing record descriptions (including Smart Add tools)
- Copy/paste and drag/drop
- Track ancestry of each record

Tools and utilities

- Custom query utility
- Customised templates for imports, queries and reports
- Change log
- Analysis planning tool
- Links and attachments
- Find and replace
- Action alerts via e-mail, SMS text message
- Cause and effect diagrams

Predefined reports

- FMEA/FMECA worksheets
- Control plan worksheets
- DVP&R worksheets
- DRBFM worksheets
- Other tabular reports (e.g., Causes by RPN, Actions by due date, etc.)

Graphical Charts

- Bar charts (e.g., Top 10 failure modes by RPN, top 5 effects by severity, etc.)

- Pie Charts (e.g., Actions by status, Controls by type, etc.)
- % Reduction in RPN
- Occurrence/Severity Matrix
- FMEA/FMRA dashboards

Import types

- Microsoft Excel® - build and manage custom templates for import/export
- Import from RCM++, MPC and XFRACAS

File output

- Microsoft Excel® and Microsoft Word®
- Easily export to *.pdf, *.rtf or *.html from Word or Excel

Reliability program integration

- Use published models to define the reliability characteristics of items
- Work with a Failure Modes and Reliability Analysis (FMRA) that is synchronised with BlockSim
- Use FMEA data to build fault trees in BlockSim
- Share system configuration and failure mode data with XFRACAS
- Import data from an MPC analysis
- Push calculated/ simulated reliability and availability to metrics

Available services

- Detailed user documentation
- Practical example files
- Quick tour guide
- Training for theory + software
- Professional engineering services

For more XFMEA information visit:

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BlockSim

ReliaSoft BlockSim provides a comprehensive platform for system reliability, availability, maintainability and related analyses that allows you to model the most complex systems and processes using RBDs, FTA or Markov diagrams.

Features

- Offers optionally licensed features for Process Flow to upstream maintenance optimisation for any processes and chemical industries.

- Offers optionally licensed features for Event Analysis to model and run complex analyses for any probabilistic or deterministic scenario.

- Facilitates a wide variety of analyses for both repairable and non-repairable systems.

Benefits

- Identify critical components (or failure modes) and determine the most effective ways to improve system performance through design improvements and/or maintenance planning.

- Use simulation to obtain estimated performance metrics that can facilitate decision-making in variety of areas, such as scheduling planned maintenance, planning for spares, identifying bottlenecks in production throughput, estimating life cycle costs.

- Identify vulnerabilities in a system and determine the most effective ways to reduce risk.

- Enhance your maintenance optimisation and simulation modelling using process flow diagrams

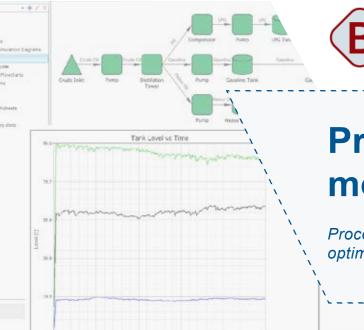- Make crucial decisions easier with life cycle cost analysis

BlockSim

Process Flow module

Process Flow module upstreams maintenance optimisation for any processes and chemical industries.

Features

- Models the reliability and maintainability of equipment and analyses multiple flow types within the system.

- Using simulation approach you are able to choose the best scenario and make confident evidence-based decisions.

- Offers complete solution for process design changes, where you can create and simulate various flow models to improve processes, increase efficiency, and reduce costs.

- Can be used for the visual design and optimisation of any technical processes such as chemical plants, Oil & Gas facilities, power stations, complex manufacturing operations and biological processes such as water treatment.
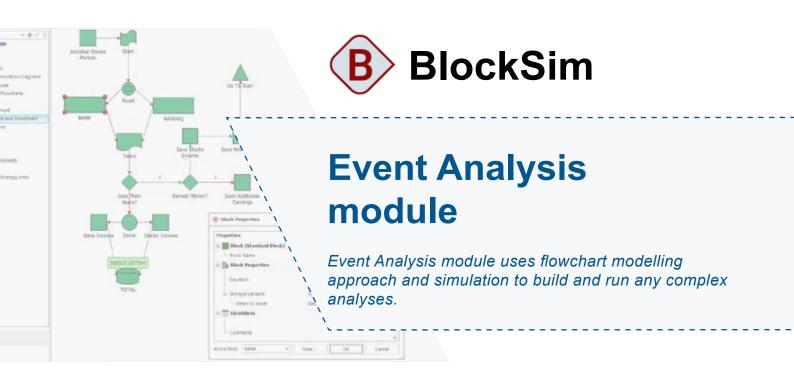
Benefits

- Solve problems and find the best scenario

- Improve design and optimise any technical processes

- Model the most complex systems with multiple and various flows

- Identify bottleneck to achieve maximum performance

- Make confident evidence-based decisions with highly intuitive graphical interface

BlockSim

Event Analysis module

Event Analysis module uses flowchart modelling approach and simulation to build and run any complex analyses.

Features

- Model and run complex analyses for any probabilistic or deterministic scenario and optimise the results needed for further analysis.

- Develop ideas, workflows and estimate results of interest with a familiar and intuitive flowcharting concept.

- Track real-time values and evaluate equipment's behaviour over time with reliability or availability results by using sensitivity analysis.

Benefits

- Use flowchart simulation to model complex scenarios and forecast performance under a variety of different design and usage scenarios

- Perform sensitivity analysis to evaluate how key inputs will affect the results

- Automatically estimate optimum values by performing multiple simulation runs with different variables

- Wide range of applications for risk/safety analysis, complex reliability modelling, decision making, maintenance planning, optimisation, operational research and logistics, etc.

- Design and build your own analyses without having to write any code

BlockSim Software Highlights

Reliability Block Diagrams (RBDs)

- Series, Parallel and Complex
- k-out-of-n
- Standby
- Load sharing
- Subdiagrams
- Multi blocks and Mirrored blocks

Fault Trees

- AND and OR Gates
- Voting Gates (k-out-of-n)
- Inhibit Gates
- NOT, NAND and NOR Gates
- Standby configurations using:
    - Standby Gates
    - Priority AND Gates
    - Sequence Enforcing Gates
- Load Sharing Gates
- Subdiagrams
- Utility to trace a subdiagram to the top node

Analytical diagrams

- Exact system reliability equation
- Minimal Cut Sets
- Metrics:
    - Reliability and probability of failure
    - Conditional reliability
    - Conditional probability of failure
    - Reliable life (aka warranty time)
    - BX% life
    - Mean life
    - Failure rate
- Plots:
    - Reliability/Unreliability vs. Time
    - pdf
    - Failure Rate vs. Time
    - Reliability importance plots

Simulation diagrams

- Duty cycles

- Maintenance durations
- Restoration factors
- Direct & indirect maintenance costs
- Spare Parts availability
- Maintenance crew logistics
- State change triggers
- Batch simulation
- Metrics:
    - Mean and point availability
    - Mean and point anavailability
    - Reliability and probability of failure
    - Mean time to first failure
- Plots (for system and/or block):
    - Point reliability
    - Point availability
    - Mean availability
    - Costs
    - Up/Down timeline
    - Block or system downtime
    - Expected failures
    - Expected downing events
    - Criticality metrics (RS FCI)
    - Block bubble plot
    - Crew metrics
    - Spare part metrics
- Throughput analysis
    - Throughput
    - Block excess capacity
    - Block backlog and backlog processed
- Maintenance planning

Phase diagrams

- Maintenance phases
- Node and stop blocks
- Varying throughput
- Subdiagrams

Process Flow module

- Analysis of continuous throughput
- Multiple types of flows

Event Analysis module

- Easy to build flowchart models
- Equation building utilities
- Simulation results (in Excel®-compatible spreadsheet and or directly in the flowchart)
- Sensitivity analysis
- Optimisation

Markov diagrams

- Discrete
- Continuous

System improvement tools and reports

- Allocation analysis
- Optimum replacement
- FRED reports
- Overlay plots (aka Multi-plots)
- Synthesis workbooks (spreadsheet and word processing modules combined)

Reliability program integration

- Use models created from analyses performed in other ReliaSoft applications
- Build RBDs or Fault Trees from data in XFMEA/RCM++ or Lambda Predict
- Use BlockSim diagrams to simulate response data for Weibull++
- Publish models based on diagram analyses and create metrics to track and display KPIs

Available services

- Detailed user documentation
- Practical example files
- Training for theory + software
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