

PTC® Windchill® FTA

ASSESS THE RISK AND RELIABILITY OF COMPLEX SYSTEMS THROUGH VISUALIZATION AND ANALYSIS

PTC Windchill FTA (Fault Tree Analysis) offers intuitive graphical representation of fault trees and event trees plus powerful analytical tools and enterprise-wide Web access to evaluate the risk and reliability of complex processes and systems.

In applications where reliability and safety are paramount, PTC Windchill FTA provides the ability to focus on a top-level event, such as a safety issue or a critical failure, so you can mitigate its occurrence or impact. Intuitive graphical diagramming and calculation tools allow you to easily define the critical failure, its contributing events, and their logical relationships to produce a powerful mathematical model of even the most complex systems. PTC Windchill FTA also supports Event Tree construction to model the likelihood of downstream consequences.

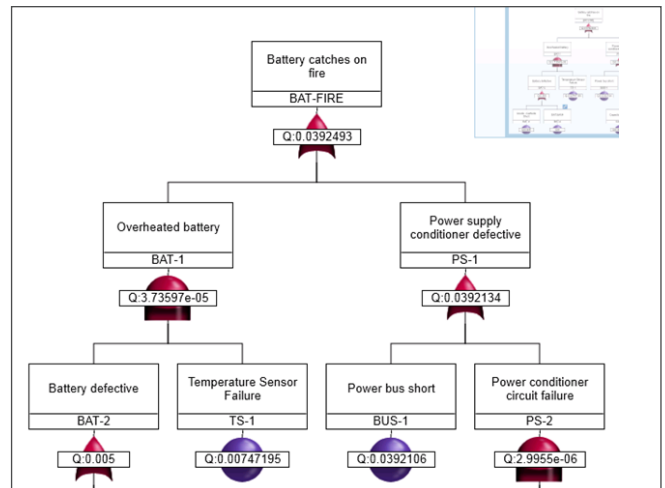
Web-based fault tree analysis available in PTC Windchill FTA enables global, enterprise-wide collaboration around risk management processes – a feature mandated by industry-wide requirements like Medical Device Risk Analysis (ISO 14971), Automotive Functional Safety Analysis (ISO 26262), and Civil Aircraft Safety Analysis (ARP4761).

Key Benefits

Leverage industry-critical functionality to meet requirements

- Pre-defined standards include
 - Global Root Cause Analysis (core to CAPA/FRA-CAS and general problem solving)
 - Global Risk Analysis for ISO14971 – a Medical Device Risk Analysis standard

- Global Functional Safety Analysis in support of ISO26262 – an Automotive Functional Safety Analysis standard
- Global Functional Safety Analysis supporting ARP4761 – a Civil Aerospace Safety Analysis
- Global Fault Tree – a common FA&D requirement
- Condition-Based Monitoring Planning



Build easy-to-navigate fault trees of complex systems with intuitive diagramming and data linking tools.

Determine the Probability of Mission-Critical Events

- Event-oriented methodology allows for both quantitative and qualitative analysis of a range of contributing factors, including hardware and software failures, human error, and environmental influences

- During quantitative analysis, each contributing event is assigned failure parameters, which are propagated up the logic tree to calculate the probability of the top event
- Statistical techniques identify the contributing event or events with the greatest impact on system performance
- Enable targeted decisions about design, maintenance, and controls to reduce the probability of failure

Intuitive Graphical Tree Construction

- Easy-to-navigate large fault tree display
- Enforce accurate tree logic
- Powerful visualization tools make each component of the fault tree easy to define, manipulate, and update
- Export a graphical view of the fault tree diagram for use in reports, presentations, or Web pages

Perform Powerful Statistical and Mathematical Calculations

- Supports dynamic gates, which account for the sequence of contributing events using an internal Markov engine
- Qualitative analysis techniques include a minimal cut set engine using logic gates to calculate and highlight minimal cut sets
- Quantitative analysis techniques provide the numeric probability of occurrence for critical events and for minimal cut sets
- Common-cause analysis techniques identify the events that cause two or more failures to occur simultaneously
- Lambda-Tau analysis allows for short mission times and varying preventive maintenance schedules
- Importance measures help you identify the event with the greatest impact on overall system reliability
- Performance-enhancing long-running task manager in the Web-based version

- Support for Multiple Distributions - to model uncertainty and/or variations
- Support for Monte Carlo Simulations - to handle large, dynamic fault trees with repeated events, transfer gates, disjoint events or groups, dependencies, imperfect maintenance, limited repair resources, and very low top-event probabilities
- Specialized gate and event logic in support of ISO 26262 in the Automotive industry
- Enhancements to common (repeated) monitors to detect latent failures across events, in support of ARP 4761 in the Commercial Aerospace vertical
- Long Running Task Manager, which provides the means to continue processing long-running fault tree calculations even when the web application is closed. Calculations take place on the server or can be farmed to multiple servers, with the ability to prioritize, stop, or delete tasks, check on task status and receive notification when tasks are complete

Features and Specifications

Easy-to-Navigate Table Format

- Convenient filter tools enable easy navigation of table even in large, complex systems
- Expand and collapse table to display and edit properties of fault tree elements

Static Gate Types

- AND, OR, Voting, XOR (Exclusive OR), NAND, NOR, NOT, Inhibit, Transfer, Remarks, Pass-Through

Dynamic Gate Types

- Priority AND, Functional dependency, Sequence enforcing, Spare

Event Types

- Basic, Spare, House, Undeveloped, Conditional

Importance Measures

- Birnbaum, Criticality, Fussell-Vesely

Common-Cause Failures

- Beta, MGL, Alpha, BFR

Calculation Methods

- Cut set summation, Cross product, Esary Proschan, Exact, Qualitative, Quantitative

Supported Calculations

- Unreliability, Unavailability, Frequency of failures, Number of failures, Cut sets

Sample Analysis Outputs

- Graphical diagram, Event importance, Minimal cut sets, Unreliability/reliability vs. time
- Unavailability/availability vs. time, Gate/event results, Failure frequency vs. time

Supports Event Library and Styles

- Store events for use in multiple fault trees or event trees
- Store entire fault tree branches, including gates and events
- Create and store styles to define visual properties for gates and events

Input and Output Data in a Variety of Formats

- Easily import from or export to commonly used formats like Microsoft Excel, Microsoft Access, XML, and plain text files
- Create reports in Microsoft Word, Microsoft Excel, Adobe PDF, and Rich Text Format (RTF)
- User-definable, wizard-driven custom graphs and reports
- Dynamically link to other PTC Windchill Quality Solutions modules, including PTC Windchill FMEA, PTC Windchill Markov, and PTC Windchill Prediction

Available Web Interface

- Available zero-client, web-based interface provides for data entry and analysis anywhere, anytime; also supports out-of-browser installation
- Fully-featured Windows functionality and familiar Windows interface look-and-feel for easy usability
- Access data and system metrics from a web-based Dashboard interface for management-level overview
- Fully customizable start page with drag-and-drop controls includes reports, tables, graphs, rich text control, insert incident, favorites, links, announcements, recent files, workflow items, etc.

Available Enterprise-Class Features

- Multi-user environment with login permissions, security features, administrator control, and audit trail functionality
- Database integration at enterprise level supports Microsoft SQL Server and Oracle
- Feature-rich FlexNet license management tool
- Integration with PTC Windchill PDMLink ensures a single, up-to-date version of the product BOM

Supported Languages

- English, French, German, Japanese, Korean, Russian, Simplified Chinese

For More Information

For the most up-to-date platform support information, please visit: PTC.com/partners/hardware/current/support.htm

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