

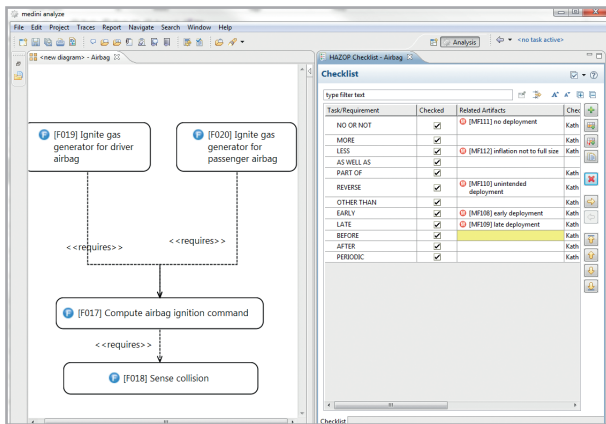
mediniTM analyze

Quality, Safety and Reliability Engineering

Main Features

- Quality analysis for product design and related processes according to SAE J1739, VDA quality handbook, etc.
- Safety analysis and design according to ISO 26262 for software-controlled safety-related functions
- Integration of architectural/functional design with quality, reliability and functional safety analysis methods
- Support of driving situation analysis, hazard and risk analysis, Fault Tree Analysis (FTA), Failure Mode and Effects Analysis (FMEA), probabilistic analysis and hardware failure metrics
- Complete end-to-end traceability
- Customizable work product/documentation generation
- Teamwork with detailed compare and merge
- Integration with IBM® Rational® DOORS, IBM® Rational® Rhapsody, Enterprise Architect, MATLAB®/Simulink®, Stateflow®, PTC Integrity, MS® Office, TortoiseSVN, IBM® Rational® ClearCase, IBM® Rational® Team Concert and others

Item Definition



- Dedicated, customizable form for the item description
- Graphical modeling of the functional architecture with functional dependencies and malfunctions
- HAZOP analysis with predefined checklists
- Initial item architecture with SysML
- Inclusion of external documents and linking to external resources via URI

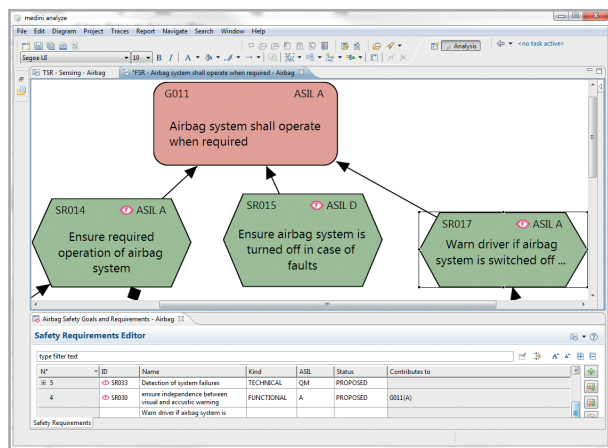
Hazard Analysis, Risk Assessment and ASIL Determination

The screenshot displays the medini analyze software interface showing a table for Hazard Analysis, Risk Assessment, and ASIL Determination. The table has columns for Location, Malfunctioning Behaviour, Hazard, Severity, Exposure, Controllability, ASIL, and Safety Goal. The data is organized into rows for different driving situations and hazards.

Location	Malfunctioning Behaviour	Hazard	Severity	Exposure	Controllability	ASIL	Safety Goal
normal road	[MF110] unintended deployment	Driver/Passenger hit by Airbag	S1	E4	C3	B	[G010] Prevent unintended deployment (ASIL D)
normal road	[MF110] unintended deployment	Driver/Passenger hit by Airbag	S1	E4	C3	B	[G010] Prevent unintended deployment (ASIL D)
any	[MF110] unintended deployment	Driver/Passenger hit by Airbag	S1	E2	C3	QM	[G010] Prevent unintended deployment (ASIL D)
country road	[MF110] unintended deployment	Driver/Passenger hit by Airbag, loss of control, potential crash	S3	E4	C3	D	[G010] Prevent unintended deployment (ASIL D)

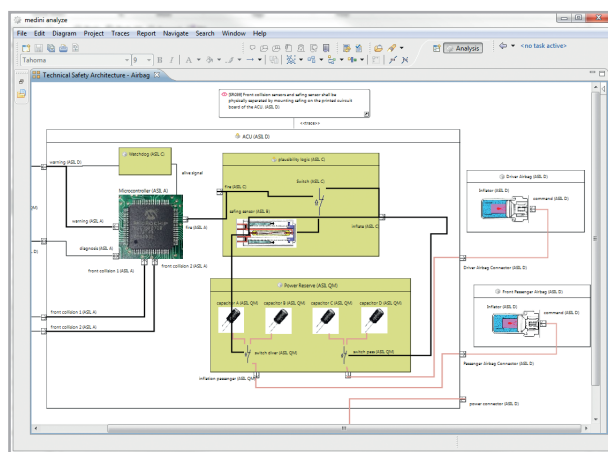
- Table-based management of driving situations and hazardous events
- Support for driving situation catalogues with drag & drop
- Matrix for easy combination of malfunctions and driving situations
- Customization with user attributes
- ISO 26262 compliant ASIL determination
- Comprehensive traceability
- Derivation of safety goals

Requirement Analysis and Management



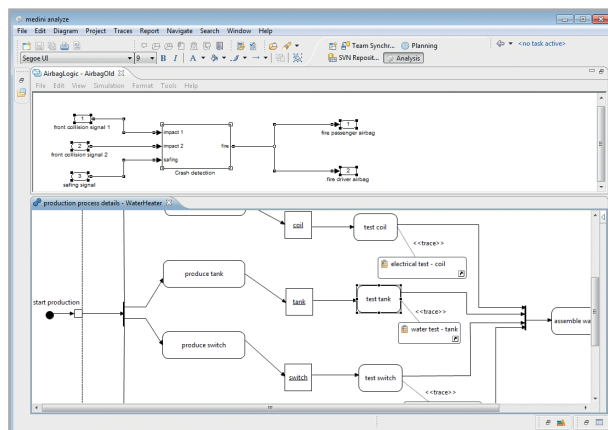
- Graphical and table editors for safety goals and requirements
- Customization with user attributes
- Capturing and management of functional and technical safety requirements
- ASIL assignment and ASIL decomposition
- Validation rules to check compliance with ISO 26262
- Allocation of requirements to system architecture, HW and SW models and to function models
- Visualization of requirement traceability on other diagrams
- Import, export and round trip from/to requirements management systems (e.g. IBM® Rational® DOORS, PTC Integrity) including custom attribute mapping

Architecture and Function Modeling (SysML)



- Graphical SysML and tabular editor for system models
- Modeling of functions and processes with activity models
- Element libraries for re-use
- Automatic update in case of library change
- Computation and visualization of the ASIL based on requirement allocation
- Import and round-trip of models from Rhapsody and Enterprise Architect
- Specification of failure modes and failure rates for elements of the system architecture
- Failure rate determination using catalogs (SN 29500, MIL-HDBK-217F, IEC 62380, incl. mission profiles)
- BOM import, restructuring by drag & drop

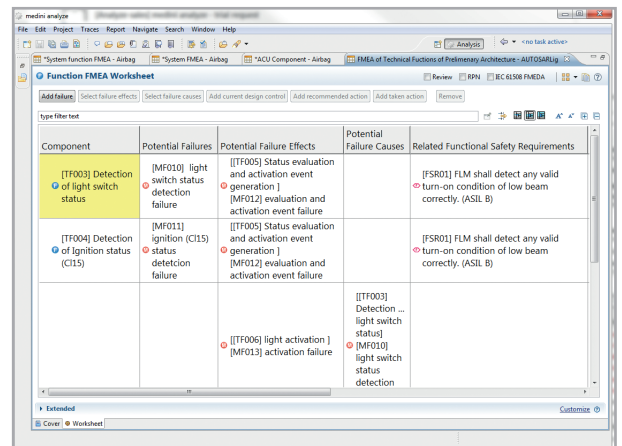
Function Behavior Modeling



- Activity modeling for behavior of functions as part of SysML modeling
- Import, round-trip and visualization of MATLAB®/Simulink® and Stateflow® models
- Allocation of Simulink® elements to elements of system model
- Traceability to requirements and to safety analysis such as FTA and FMEA
- Validation of the HW/SW mapping
- Automatic creation of FTA models from MATLAB®/Simulink® models using structural path analysis

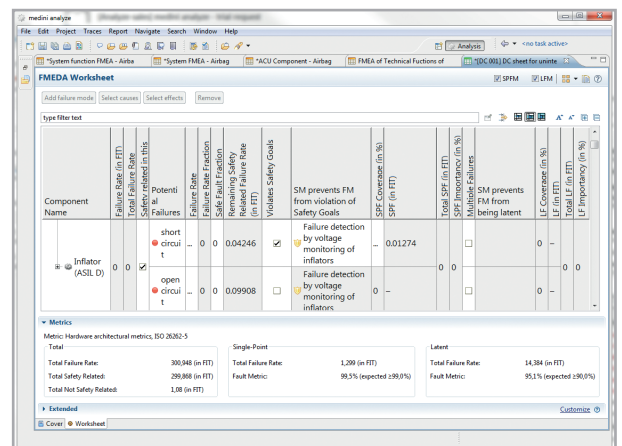
Failure Mode and Effects Analysis (FMEA)

- Standard templates for design and process FMEA
- End-to-end cause/effect chains across abstraction levels
- Automatic computation of Risk Priority Numbers (RPN)
- Customization with user attributes including formulas
- Automatic population and consistency of the table with structural elements and function elements from the architecture and process models
- Automatic inclusion of all failure modes of the structural and functional elements
- Excel and MSR-FMEA import (e.g., APIS IQ-FMEA, PLATO SCIO™)
- Connection to requirements management and task management



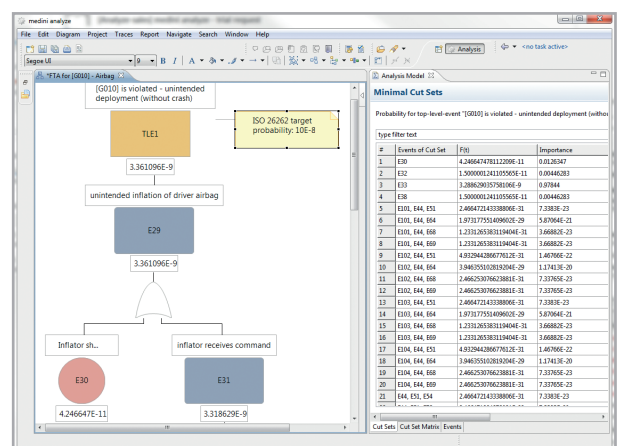
FMEDA and ISO 26262 Part 5 Hardware Metrics

- FMEDA with Safe Failure Fraction (SFF) computation
- Calculation of Single Point Fault Metric (SPF) and Latent Fault Metric (LF)
- Safety element out of context support
- Automatic synchronization of failure mode and failure rate data from architecture model
- Failure rate distribution over children
- Specification of cause/effect chains and automatic calculation of failure rates
- Extensible catalog of safety mechanisms according to part 5 of ISO 26262
- Default SPF/LF coverage for safety mechanisms
- Rich validation and consistency checks
- Traceability of safety mechanisms to requirements and SW/HW implementation

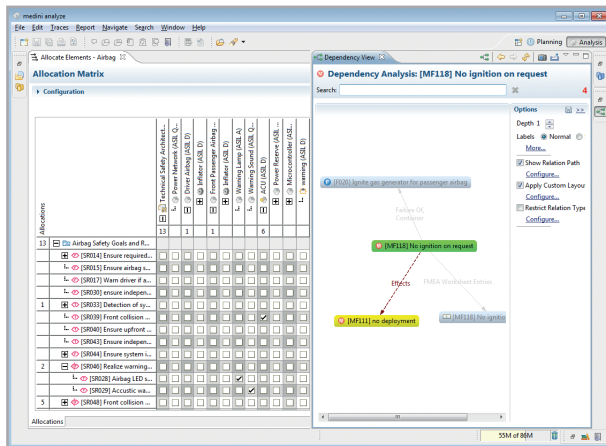


Fault Tree Analysis (FTA)

- Graphical editor for quantitative and qualitative FTA
- Automatic layout and support to handle large fault trees by multiple diagrams
- Creation of events and subtrees by drag & drop of architecture elements or failure modes from architecture model
- Determination and evaluation of minimal cut-sets to find out their probability
- Importance measures such as Birnbaum, Fussell-Vesely, Criticality
- Seamless navigation from cut-sets to elements of the system design
- Automatic re-calculation of probabilities after design changes

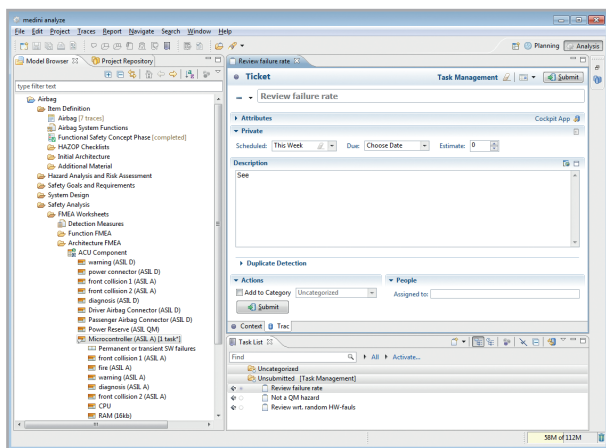


Sophisticated Traceability



- Definition of typed and untyped traces between information elements of any type within medini analyze
- Definition of traces using trace-matrix or by quick-trace functionality
- Navigation via traces to related elements in other models
- Visualization of traced elements at any diagram
- Filters and hierarchies to support the usage even of large trace matrices
- Impact analysis by graphical visualization of traces (customizable dependency viewer)

Team Work and Integrated Task Management



- Project compare with two-way and three-way difference analysis
- Project merge functionality for team collaboration
- Integration with configuration management systems (TortoiseSVN, IBM® Rational® ClearCase, PTC Integrity, etc.)
- Management of model versions, support of team synchronization
- Integration with issue tracking systems (e.g., Bugzilla, Trac, RTC, Redmine, Jira, Microsoft® Outlook)
- Creation of tasks/comments for arbitrary model elements
- Navigation from tasks to elements and vice versa
- Context visualization for active tasks
- Documentation of all decisions at the tasks
- Scheduling, user assignment, e-mail notification

Licensing

- Attractive product tailoring due to individually licensable components
- Dongle and network floating licenses
- Trial licenses on request

System Requirements

- Supported platforms: Microsoft® Windows 7/8/10 (32- and 64-bit versions)
- Required disc space: 500 MB
- Recommended memory size: 4 GB



ANSYS medini Technologies AG
www.ansys.com
medini-information@ansys.com
+49 30 3480770