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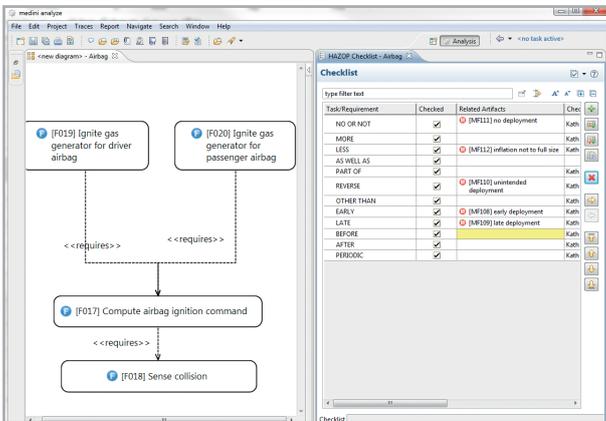
- Dedicated, customizable form for the item description
- Graphical modeling of the functional architecture with functional dependencies and malfunctions
- HAZOP analysis with predefined checklists
- Initial item architecture with SysML
- Inclusion of external documents and linking to external resources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

### Hazard Analysis, Risk Assessment and ASIL Determination

- 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
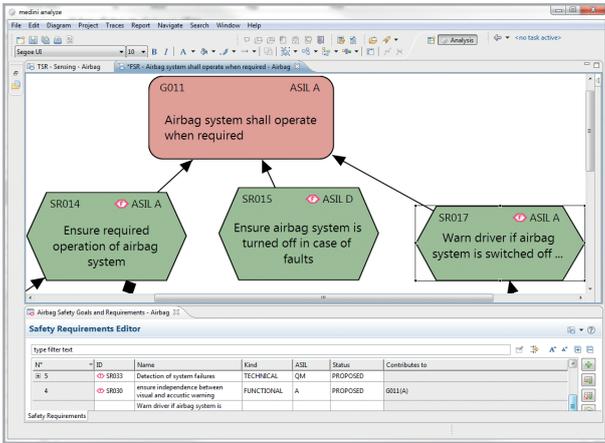
- Graphical and table editors for safety goals and requirements
- Customization with user attributes
- Capturing and management of functional and technical safety requirements
- ASIL assignment and ASIL decomposition
- Validation rules to check compliance with ISO 26262
- Allocation of requirements to 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)
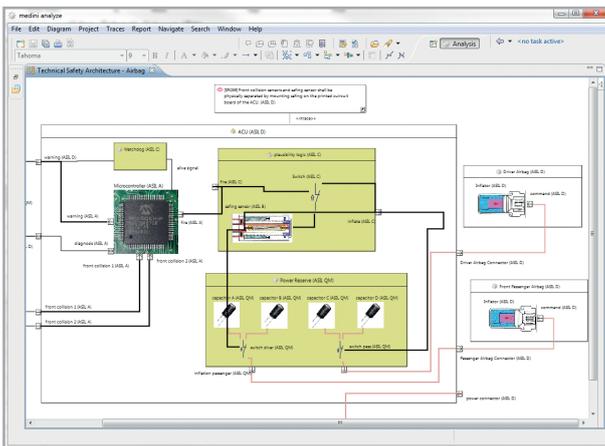
- Graphical SysML and tabular editor for system models
- Modeling of functions and processes with activity models
- Element libraries for re-use
- Automatic update in case of library change
- Computation and visualization of the ASIL based on requirement allocation
- Import and round-trip of models from 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
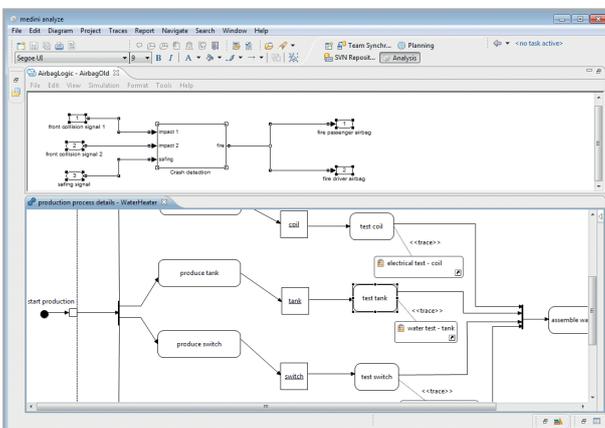
- Activity modeling for behavior of functions as part of SysML modeling
- Import, round-trip and visualization of MATLAB®/Simulink® and Stateflow® models
- Allocation of Simulink® elements to elements of system model
- Traceability to requirements and to safety analysis such as FTA and FMEA
- Validation 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
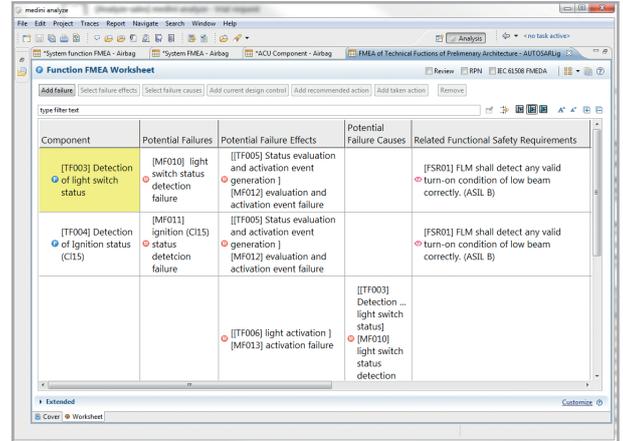
FMEDA and ISO 26262 Part 5 Hardware Metrics

- 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
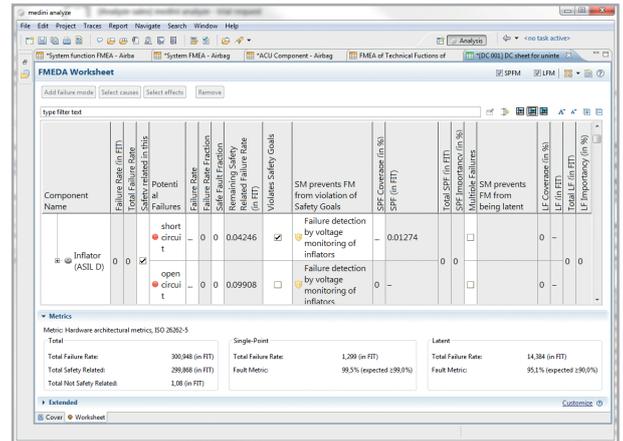

Fault Tree Analysis (FTA)

- 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
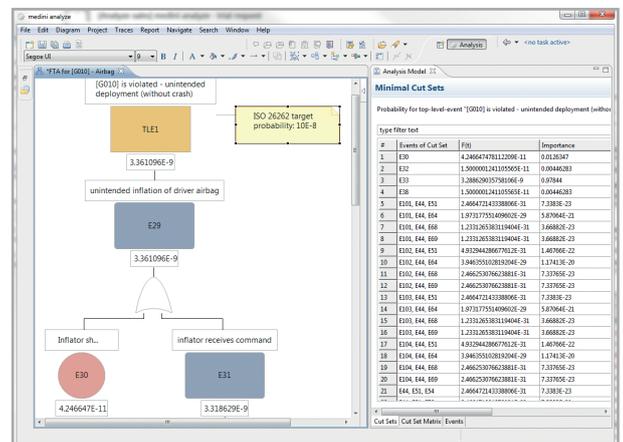
Sophisticated Traceability
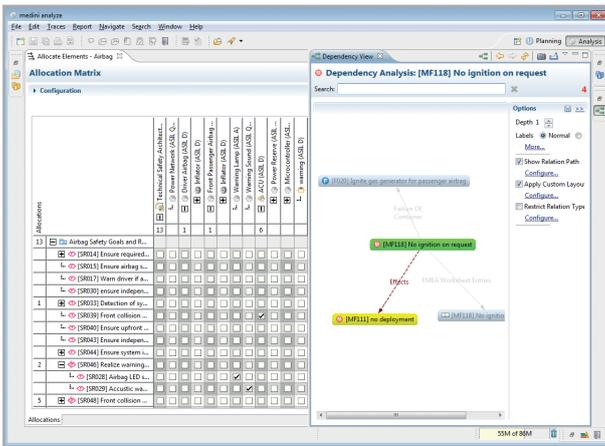
- Definition of typed and untyped traces between information elements of any type within medini analyze
- Definition of traces using trace-matrix or by quick-trace functionality
- Navigation via traces to related elements in other models
- Visualization of traced elements at any diagram
- Filters and 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
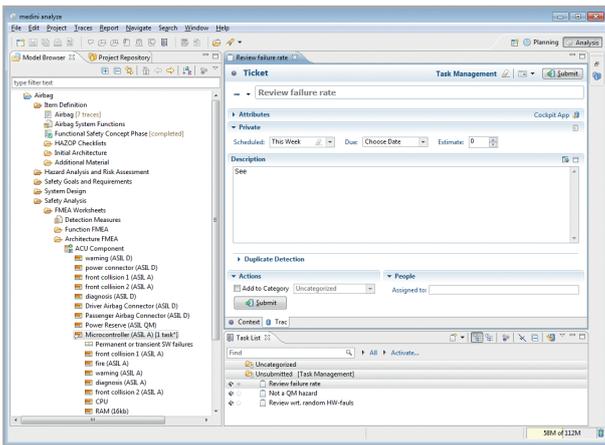
- Project compare with two-way and three-way difference analysis
- Project merge functionality for team collaboration
- Integration with configuration management systems (TortoiseSVN, IBM® Rational® ClearCase, PTC Integrity, etc.)
- Management of model versions, support of team synchronization
- Integration 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®

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