

Model-based Risk Analysis with RIAL: Controlled Risk is Acceptable Risk



RIAL for KnowEnterprise®

Overview



Many of today's technical systems introduce risks to their users or even to the public. It is therefore essential to identify the sources of those risks, to evaluate their potential consequences and to take appropriate counter measures to keep them within an acceptable level. Industries in safety-critical domains such as avionics, railways or medical systems are used to provide explicit evidence in order to certify their systems.



RIAL is an extension of KnowEnterprise® that supports **Model-based Risk Analysis**. Model-based Risk Analysis with RIAL...

- **improves communication** among stakeholders by making risk-related argumentation visual through various diagramming techniques as well as by the capability to generate concise high-quality documents for specific target-communities via KnowDocs™
- **supports early "what if" analysis** by automatic calculations and inferences of frequencies, probabilities, loss costs, tolerable failure rates and similar risk-related figures
- **enables reuse** across multiple systems and projects by providing mechanisms to build-up libraries of causes, consequences, counter measures, system components and similar risk-related concepts.

RIAL is tightly integrated with other modelling languages such as standard SysML and UML as well as with KnowEnterprise's Motivation-, Organization-, (multi-lingual) Vocabulary-, Process-, Requirements-, Specification-, Testing-, Project-, and Documentation-Views. RIAL includes a model library containing a multi-lingual safety vocabulary, safety-relevant document references as well as boiler-plate document generation templates.

Functionality of *RIAL for KnowEnterprise*[®]

Risk Modeling	<ul style="list-style-type: none"> • Modeling of hazards as well as their causes and consequences • Modeling of counter measures to reduce probabilities and losses • Modeling of functions, systems, roles, connections and related safety requirements • Modeling of responsibilities of organizations acting in different roles • Configurable cause/effect diagrams, risk matrix, system definition diagrams, and system usage diagrams • Nested risk models with different parameters • Systematic and random failures 									
Supported Techniques	<ul style="list-style-type: none"> • Support of HAZOP: Hazard documentation with causes, accidents, counter measures, detection mechanism, dormancy and more • Support of ETA: event trees supporting "parallel" and "exclusive" operators to model consequences of risks • Support of FMEA/FTA: cause trees supporting "and" and "or" operators to model causes of risks 									
Automatic Calculations	<ul style="list-style-type: none"> • Automatic calculation of event frequencies and probabilities (quantitative and qualitative) • Automatic calculation of losses and severities (quantitative and qualitative) • Automatic calculation of risks (quantitative and qualitative) • Automatic generation of risk matrix with ALARP region and positioning of unmitigated and mitigated risks • Automatic generation of "traffic light" tables to get a quick overview on the most critical risks and their causes • Automatic calculation of tolerable functional failure rates (TFFRs) on functions, systems, roles and connections • Automatic SIL attribution of functions, systems, roles and connections • Automatic calculation of responsibilities of organizations acting in different roles • Automatic detection of common cause failures • Highly configurable risk model 									
General Features	<ul style="list-style-type: none"> • Integrated plausibility check to support model consistency • Generation of comprehensive, yet highly customizable documentation via KnowDocs • Includes boiler-plate document templates and configurations • Comes with dedicated multi-lingual safety vocabulary and document references • Extensive parametrization of calculation model, including configurable measurement units • Configurable automatic numbering system for hazards, causes, accidents, counter measures, systems, functions, and safety requirements • Multi-language support • Dedicated browser for risk-related concepts • Comes with User's Guide and comprehensive example model 									
Requirements	PTC Integrity Modeler [®] V8.2 or higher, KnowEnterprise V2.3 or higher as well as Microsoft Word 2010 or higher									
Contact	<table border="0" style="width: 100%;"> <tr> <td style="width: 40%;">KnowGravity Inc.</td> <td style="width: 20%;">Phone</td> <td style="width: 40%;">+41 44 43 42 000</td> </tr> <tr> <td>Hohlstrasse 534</td> <td>Internet</td> <td>www.knowgravity.com</td> </tr> <tr> <td>CH-8048 Zürich</td> <td>E-Mail</td> <td>info@knowgravity.com</td> </tr> </table>	KnowGravity Inc.	Phone	+41 44 43 42 000	Hohlstrasse 534	Internet	www.knowgravity.com	CH-8048 Zürich	E-Mail	info@knowgravity.com
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