



CENARIOS[®] - Managing Nano Risks

World's First Certifiable Risk Management and Monitoring System for Nanotechnologies

Nanotechnology means fast-growing future markets and many new business opportunities. Numerous big companies and a lot of start-up companies provide many new and exciting products for industrial and consumer applications. Nanomaterials and nanoproducts offer new possibilities in product development. Adopting nanotechnology can therefore significantly improve product properties.

However, these new properties could also pose potential risks, since mid- and long-term effects of nanosized materials on human health and the environment have not been fully understood. In addition, there are many legal uncertainties, as it remains unclear to which extent nanomaterials can be treated under regulations similar to "traditional" chemicals.

To meet these new challenges, The Innovation Society Ltd. (St. Gallen, Switzerland) and TÜV SÜD (Munich, Germany) have developed CENARIOS[®], the first certifiable nano-specific risk management and monitoring system. CENARIOS[®] provides a "State-of-the Art" hazard and risk assessment, encompassing risk monitoring tools to minimise the potential risks. The system will be implemented by mid 2007 at the first industry company (Buhler PARTEC, Uzwil, www.buhlergroup.com) and can be applied in sector-independent in industry, retail and research organisations.

CENARIOS® *Certifiable Nanospecific Risk Management and Monitoring System*

What is CENARIOS® ?

CENARIOS® is the world's first certifiable risk management and monitoring system for nanotechnology.

The system was developed in 2006 to meet the particular requirements of nanotechnology risk assessment. The concept of CENARIOS® ensures that HSE-risks of products and processes are assessed according to "State-of the Art"-standards and new findings from science and technology are continuously included in the risk management process. An up-to-date evaluation will be applied and combined with a foresight element,

monitoring strategic and relevant risk areas (toxicity, regulation, consumer attitude, etc). It sets the basis for strategic decision making processes under conditions of high uncertainty.

CENARIOS® is certified and audited regularly in an independent quality standard process in which a TÜV SÜD certificate is awarded. The high-quality TÜV SÜD label testifies a foremost safety level for the risk-management system. It documents the company's great safety efforts towards customers, authorities and the public.

CENARIOS® consists of three modules. These modules provide a coherent fundament for strategy and product decisions and serve as benchmarks.

Module 1: Risk and Hazard Assessment / Risk Evaluation

provides a product- and process-related risk position-fixing

Module 2: 360° Risk Monitoring System

reveals the relevant trends in science, regulation and technology (foresight instrument)

Module 3: Issues-Management and Communication

offers tools to react quickly and reliably in critical situations

CENARIOS® provides a structured methodology for the industry and commercial enterprises to identify, analyse and assess potential risks and opportunities in products and processes. Trends relevant to the business strategy are monitored. With CENARIOS® you'll understand the current product and process risk portfolio and which technical, economic and social risks might be relevant to your company in the long-term and which measures to use in crisis management.

Although CENARIOS® was developed for nanotechnology, it is suitable for risk-assessment processes in other areas of high uncertainty and high risk dynamism (eg. biotech, mobile communication).



Nanoproducts: New properties - new risks?



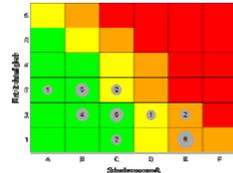
CENARIOS®
*Neue Risiken managen,
zukünftige voraussehen*

How does CENARIOS® work?

CENARIOS® combines the elements of traditional risk assessment and analysis with future-oriented risk-monitoring and communication tools and has been specifically adapted to the characteristics of new technologies (high levels of uncertainty in market, research and regulation). The modular structure guarantees connectivity of the elements in all ranks.

Module 1: Risk Assessment

Module 1 provides an updated risk portfolio of products and processes and an accurate positioning. A subsequent package of suitable measurements is developed for the reduction of the existing risks. Risks are evaluated and a comprehensive risk assessment is performed. Products and production processes are checked for health-, safety and environment risk potentials using all available data. A widespread product and process risk portfolio is developed. The methodology is particularly adapted to the uncertainty in many risk related areas of nanotechnology.



Module 2: 360° Risk Monitoring System

Module 2 provides a comprehensive outlook on strategically relevant developments and therefore provides a competitive edge. Future risk areas are monitored in order to anticipate strategically relevant risks. It includes risk related trends in health, occupational safety and the environment. Scientific, societal and legal trends as legislation, liability claims, media coverage, public perception etc. are analysed and evaluated. Furthermore, specific developments in technology and market trends are monitored.



Module 3: Issues Management and Communication

Risk communication plays a crucial role in crisis management. Tools for crisis prevention are created and measures (documentation, trainings and workshops, etc) for professional crisis management are provided. This module bases on the data of modules 1 and 2 and provides the necessary tools for optimal crisis management.



Certification

CENARIOS® includes a criteria index based on TÜV SÜD standards with requirements towards employees, risk assessment and risk management (risk communication and issues management). The certificate for CENARIOS® is given by the certification authority of TÜV SÜD according to their standards and it is verified periodically. The certification process ensures that internal communication is optimised and that the risk management system is continuously improved.

How can your company benefit from CENARIOS®?

CENARIOS® provides a high-quality State-of-the-Art risk management and monitoring system, which

- gives you a precise portfolio of product and process risks in your company
- provides a catalogue of measurements to minimise risks
- reveals strategy-relevant trends in science, technology, safety and society, providing an outlook on future developments.
- supports you in reducing liability risks and in increasing legal compliance
- is a pro-active foresight instrument
- helps you demonstrating responsible care

You get the decision-relevant know-how to minimise risks while taking opportunities. It ensures the State-of-the-Art of science and technology of your safety and risk management system and the early identification and elimination of potential risks.

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What is the value of a TÜV SÜD certificate?

The TÜV SÜD certificate is based on an approved and science based criteria catalogue of safety requirements. The CENARIOS® certificate is a seal of approval which

- comprises a certified and well-standardised process to increase product and process safety
- defines a reliable standard for the safety of products and processes
- documents a company's efforts and investments in product and process safety towards customers, suppliers and authorities
- significantly reduces potential liability risks

Where can CENARIOS® be implemented?

CENARIOS® was developed in 2006 and is currently implemented at Buhler PARTEC, an international nanotechnology company (system will be operatively working by mid 2007 / 1. Concept certification). The system is applicable to other industries, especially:

- **Producers** of engineered nanomaterials (chemical, pharmaceutical & engineering industry)
- **Processing industries** (textile-, colour- & lacquers-, plastics-, cosmetics-, electronics-, packaging and food industries, car manufacturers, medical applications)
- **Retail- and wholesale** companies offering nanoproducts
- **Universities and research organisations**, which are using nanomaterials in laboratories

Of course, the individual modules „Risk Assessment“, „Risk Monitoring“ and „Issues Management / Communication“ can be implemented in other sectors than nanotechnology (e.g. biotech, communication, etc.).

The Innovation Society Ltd., St.Gallen (Switzerland)

The Innovation Society Ltd. (www.innovationsociety.ch) is an international leading nanotechnology consulting firm. We support our clients from industry, business and insurance sectors with risk management, regulation and communication services. The company is also advising governmental bodies in developing regulatory concepts and measures (e.g. Swiss Actionplan 2006-2009: "Risk-Management of engineered nanomaterials").

TÜV SÜD, Munich (Germany)

TÜV SÜD (www.tuev-sued.de) is a major international service group operating in the INDUSTRY, MOBILITY and PEOPLE business segments. With 11,000 employees, we are represented at over 600 locations. Our teams of specialists are engaged in optimizing technology, systems and know-how, and thus act as process partners, enhancing the competitive strength of our customers throughout the world.

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