



iNTeg-Risk

Early Recognition, Monitoring and Integrated Management
of Emerging, New Technology Related, Risks

EU-YRI



Grant agreement number: CP-IP 213345-2

The iNTeg-Risk FP 7 project (2008-2013)

Short presentation

Version of April 8, 2013



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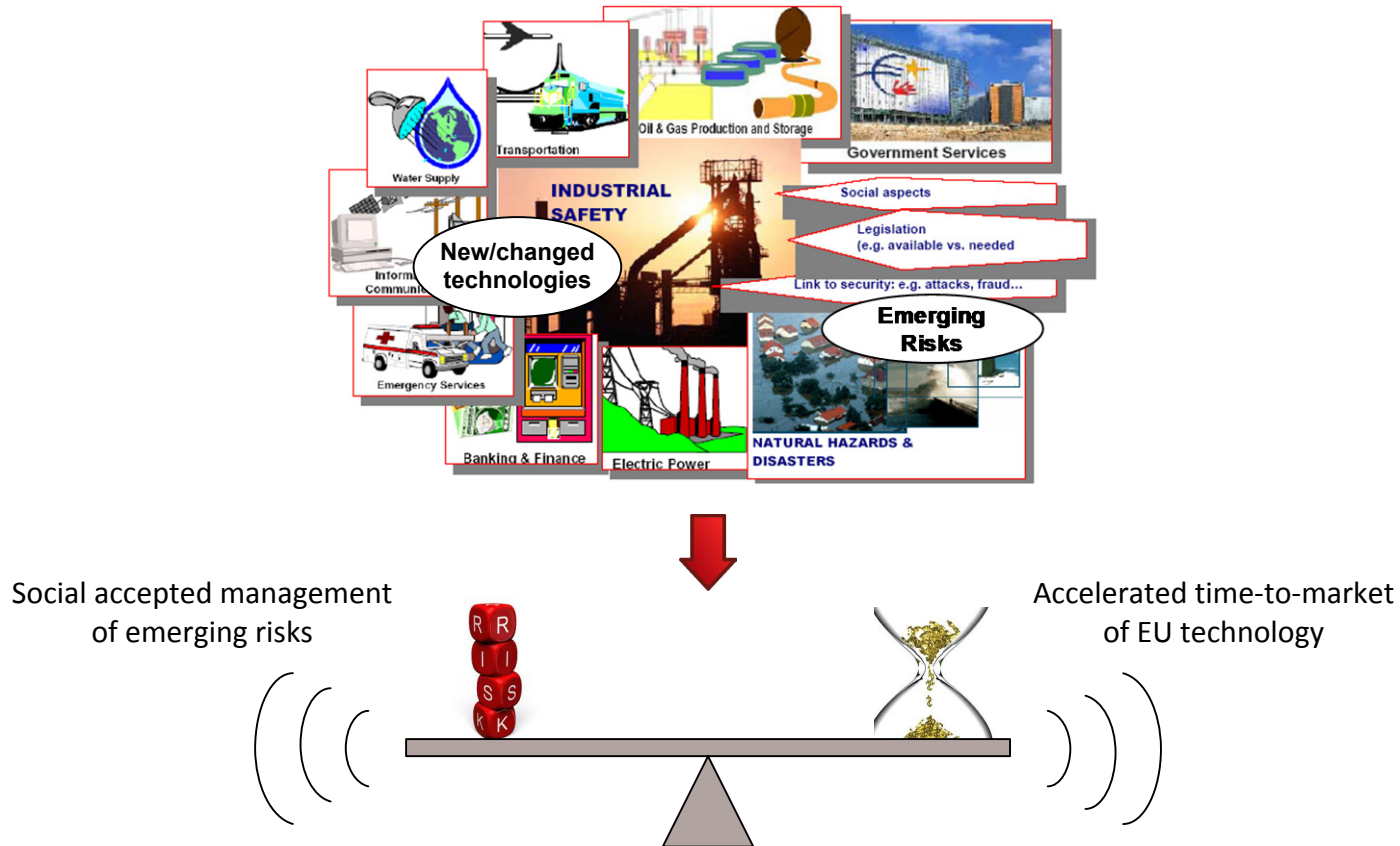
- Motivation
 - What is it about? – Challenge and solution
 - iNTeg-Risk Emerging Risk Management Framework (ERMF)
 - A 10 steps process; process for whom?
 - Terminology – emerging risk
- The iNTeg-Risk project (2008-2013)
 - Key information
 - Structure
 - Main approach
 - Case studies
- Main results
 - Overview of available material
 - Tools, methods and guidelines
 - Pre-standardization CEN Workshop Agreement (CWA) document

Example

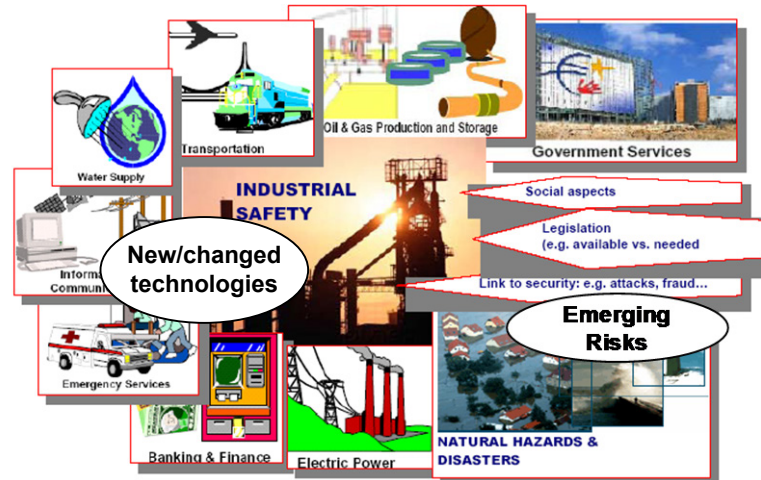


What is the challenge?

Any new or changed technology leading to potentially emerging risks need to **balance the management of the risks against the benefits** of introducing new technology to the market, including the time this takes



What is the solution? What is needed?

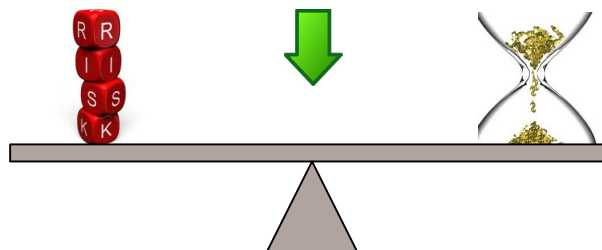


An agreed response to emerging (new technology related) risks is needed

This is the main idea behind the iNTeg-Risk project



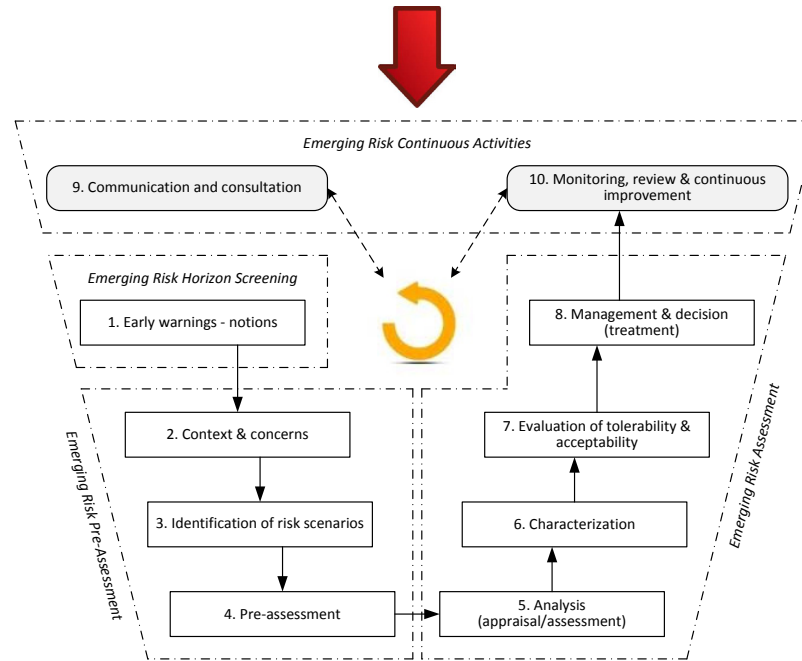
Social accepted management of emerging risks



Accelerated time-to-market of EU technology

Agreed response – the iNTeg-Risk ERMF

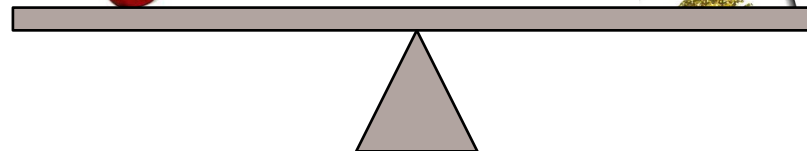
New technology related emerging risk



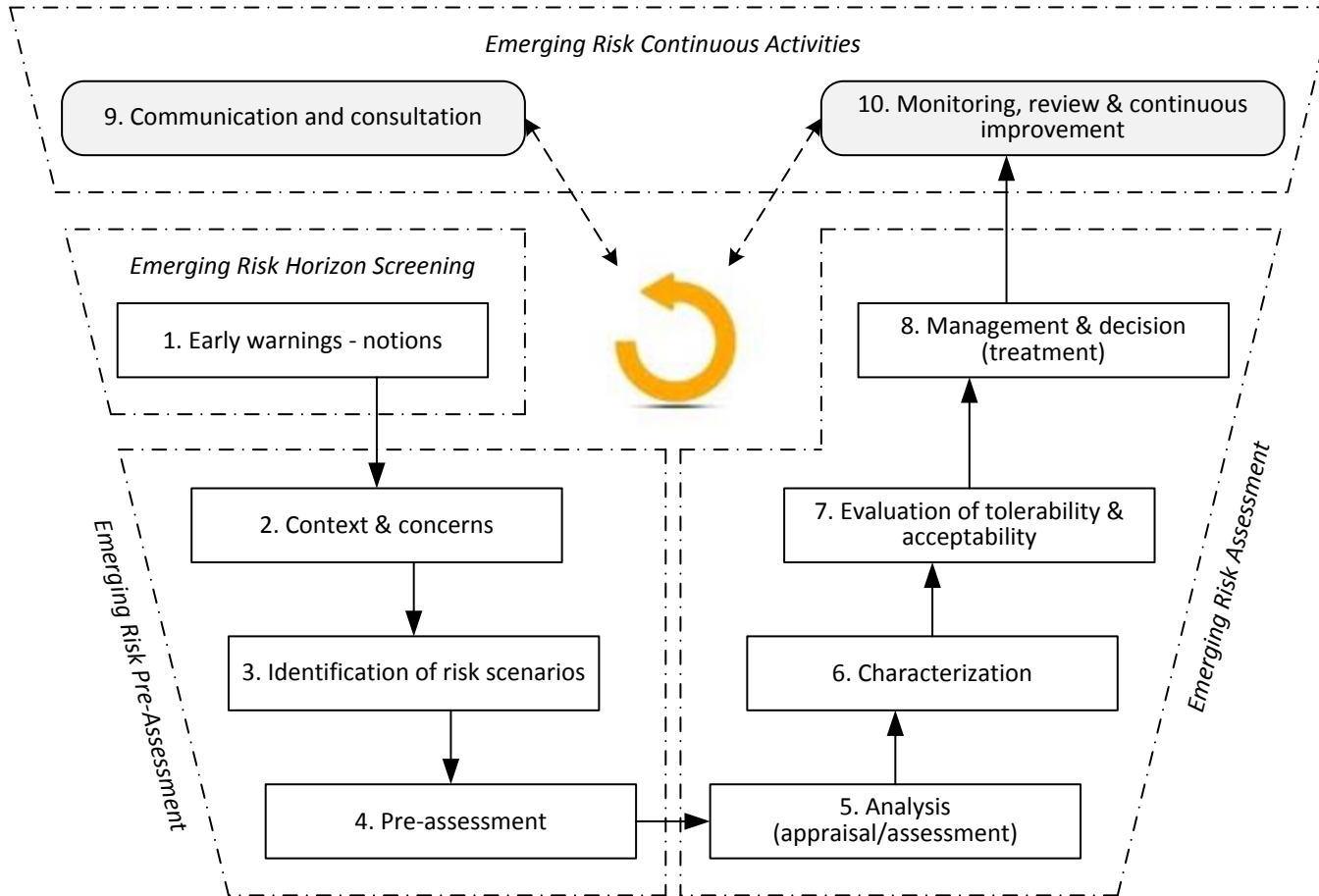
Social accepted management of emerging risks



Accelerated time-to-market of EU technology

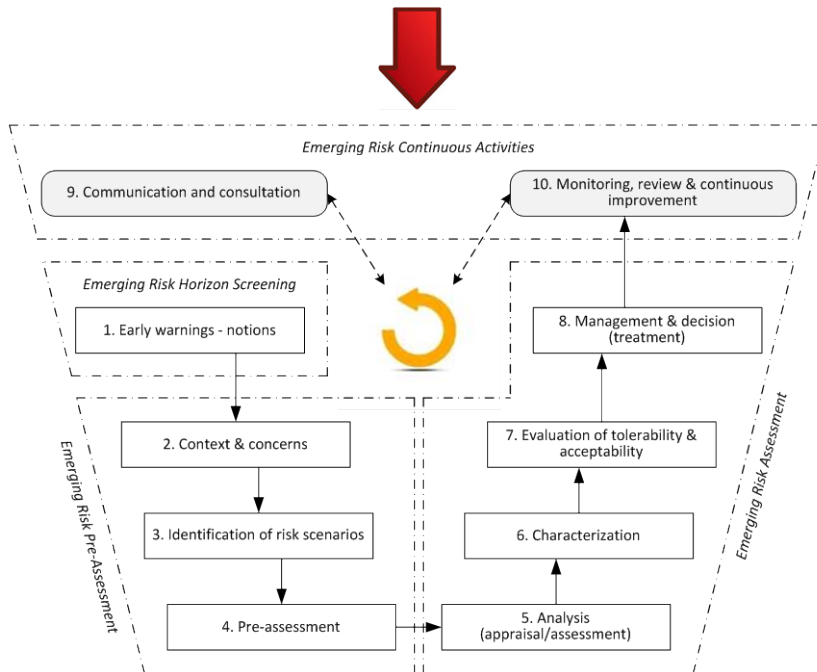


iNTeg-Risk ERMF – a 10 steps process

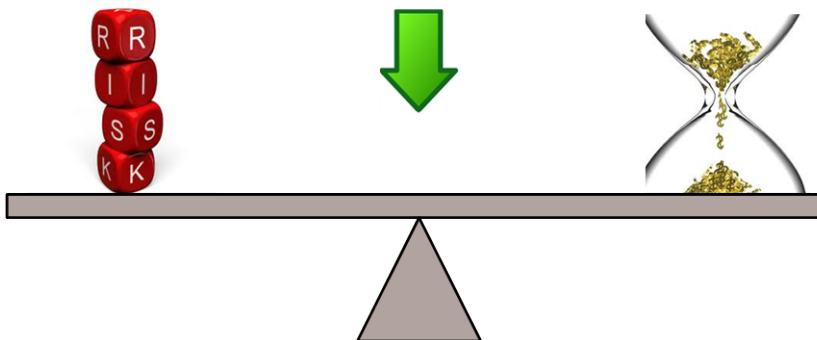


For whom is this process needed?

New technology related emerging risk

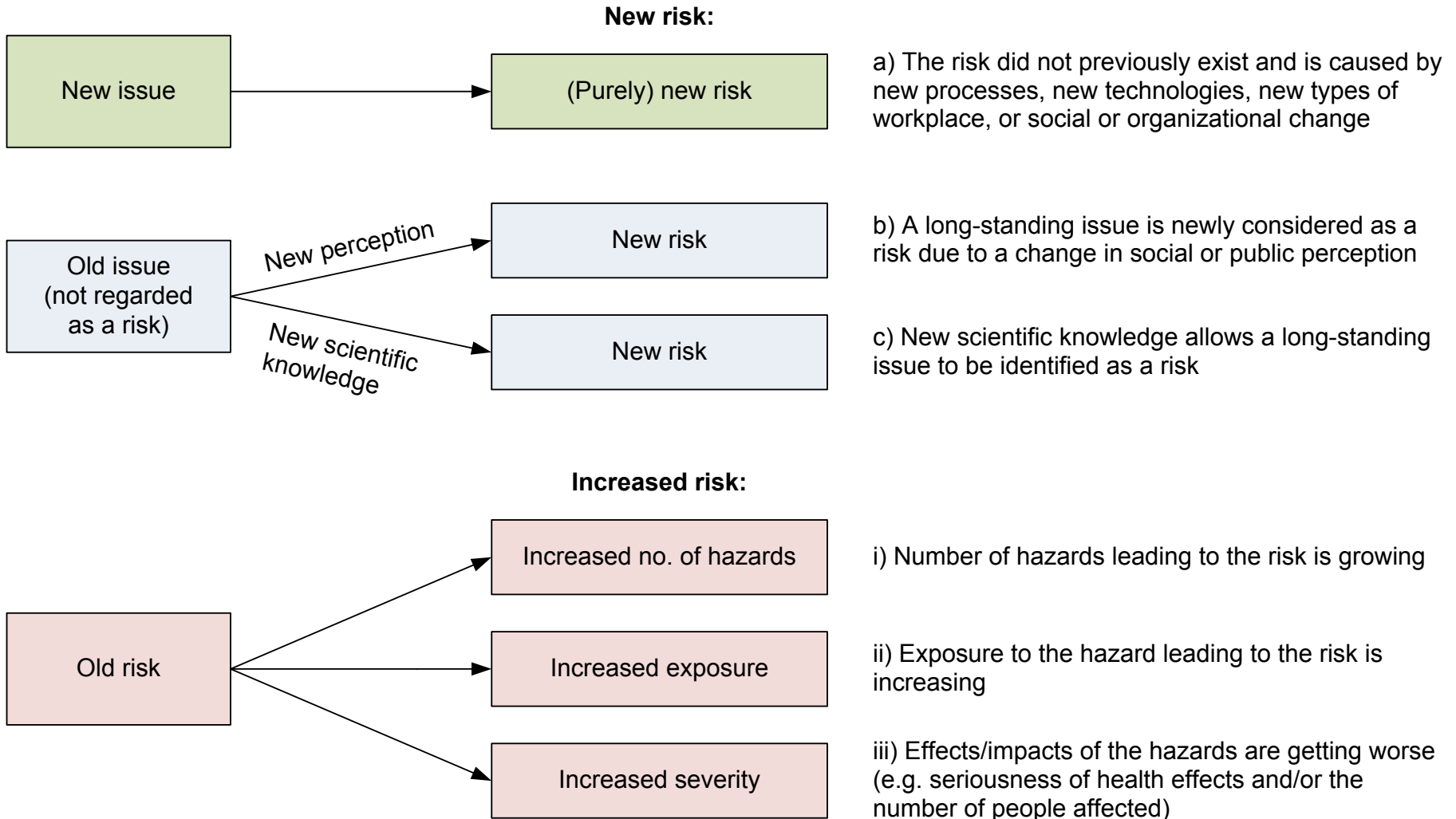


Global
EU/supranational
State/national
Regional
Municipality
Multiple site
Single site



The process is needed at all levels of concern

Terminology – what is an emerging risk?



The term "increasing" is understood as something which can represent an industry wide, regional or global challenge.

iNTeg-Risk project – key information*



Haus der Wirtschaft, Stuttgart, Germany

- 7th FP – Cooperation Programme – Theme 4; NMP**
- Initiated through: ETPIS***
- Total budget : 19.3 mill EUR
- Duration: Dec 2008 – May 2013
- Coordinator: A. Jovanovic, EU-VRi ****
- No. of partners: 87
- No. of project participants: 431
- No. of deliverables: 227



* <http://www.integrisk.eu-vri.eu/>

** NMP – Nanosciences, Nanotechnologies, Materials and New Production Technologies

*** ETPIS – European Technology Platform for Industrial Safety

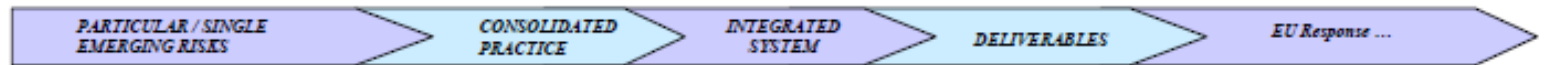
**** EU-VRi – European Virtual Institute for Integrated Risk Management

iNTeg-Risk project – main partners *

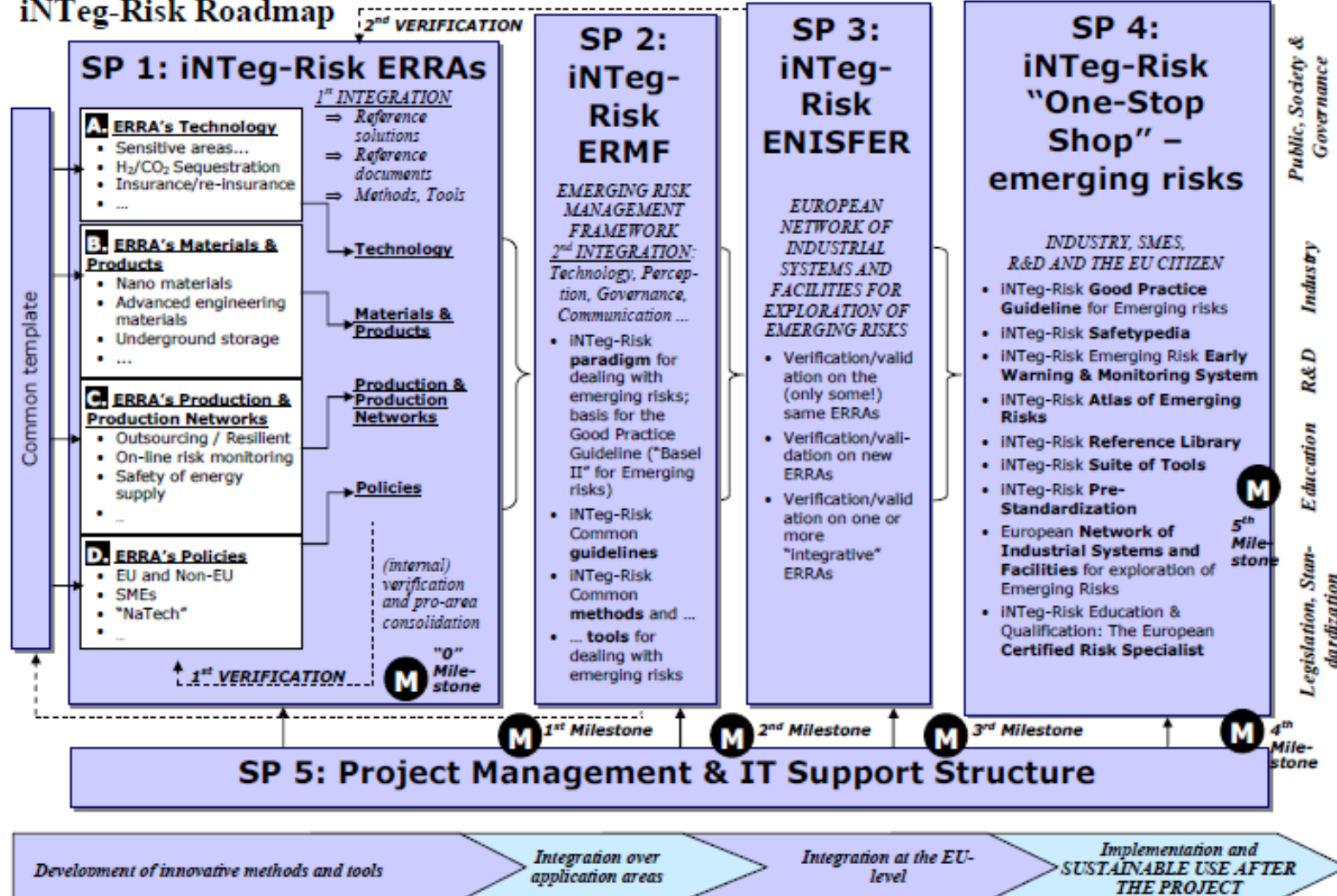
EDF	D'Appolonia	Technologica	USTUTT	Demokritos	ARPC
GDF	MIT Gmbh	GERG	LEIA	IVF	Mavionics
Definiens	DNV	BT	URL	VSB-TUO	ARMINES-CRC
MERL	COWI	Enagás	Imperial	JSI	GDS
TÜV	Pöyry	INCDPM	TU Crete	HSE-HSL	TUKE
Novineon	MOL Plc.	SWISSI	CONPRICI	JRC	FTN
R-Tech	VSH	KMM-VIN	SINTEF	CEN	EKON
Iberdrola	Swiss Re	INERIS	DTU-MAN	RIVM	SP
Atos Origin	NIS	CEA	VTT	RegLomb	STUVA
Eni Norge	Saipem	BAM	BZF	vfdb	EU-VRI

* From start-up (some changes during the project)

iNTeg-Risk project – structure



iNTeg-Risk Roadmap



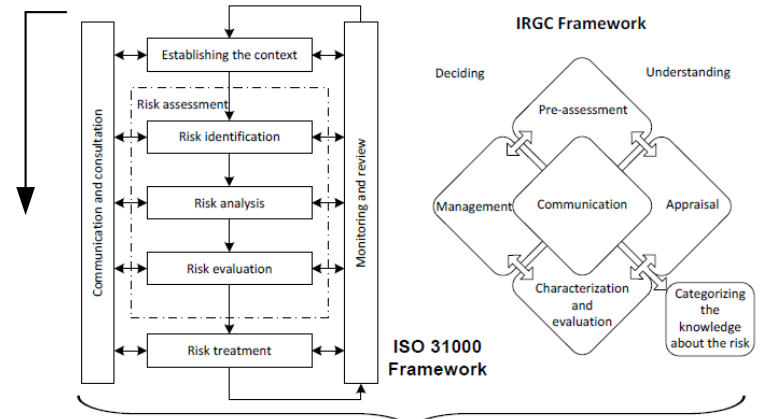
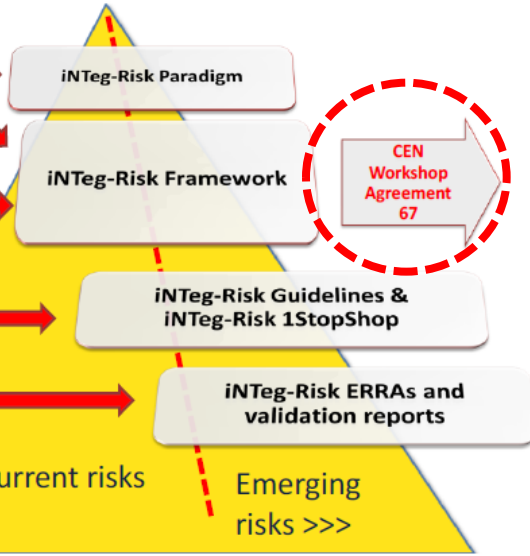
iNTeg-Risk project – main approach

Governance, policies, principles (inputs: IRGC, EU directives ...)

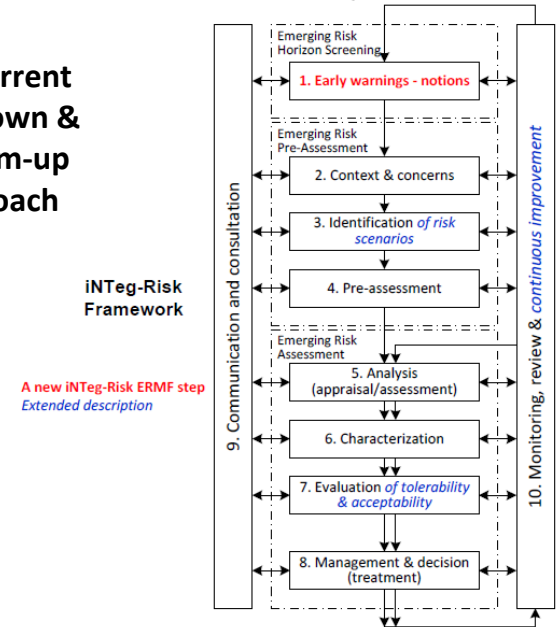
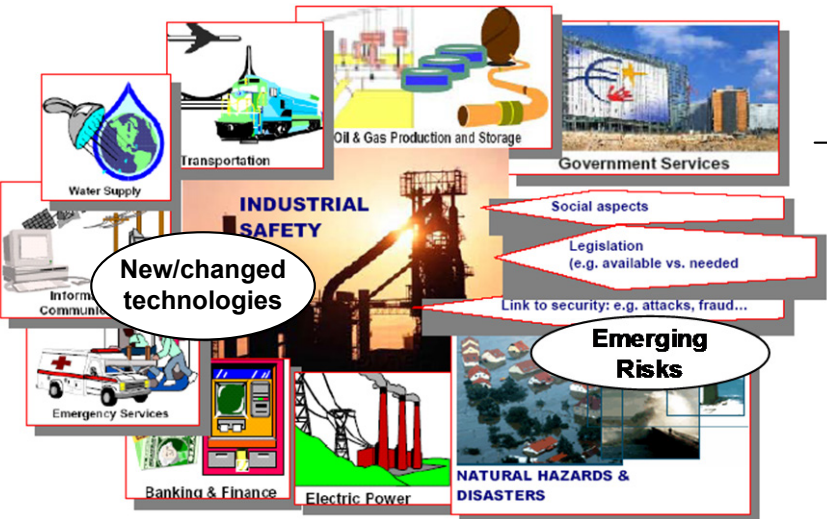
Organization, Management (inputs: ISO 31000 ...)

Methods, Tools (inputs: ISO/BS 31100, 31010, 31004 ...)

Applications, Examples, case histories

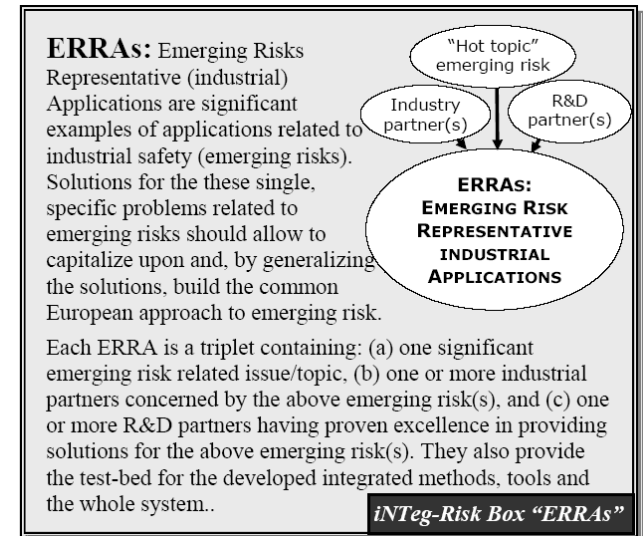


Concurrent Top-down & Bottom-up approach



iNTeg-Risk project – case studies/ERRAs

- Bottom-up approach starting with problems identified as relevant and representative – 17 case studies; so-called ERRAs (Emerging Risk Representative Applications)



- Grouped in four classes:

- Type A: New (production) technologies
- Type B: New materials and products
- Type C: New technologies & production networks
- Type D: New policies

5

3

5

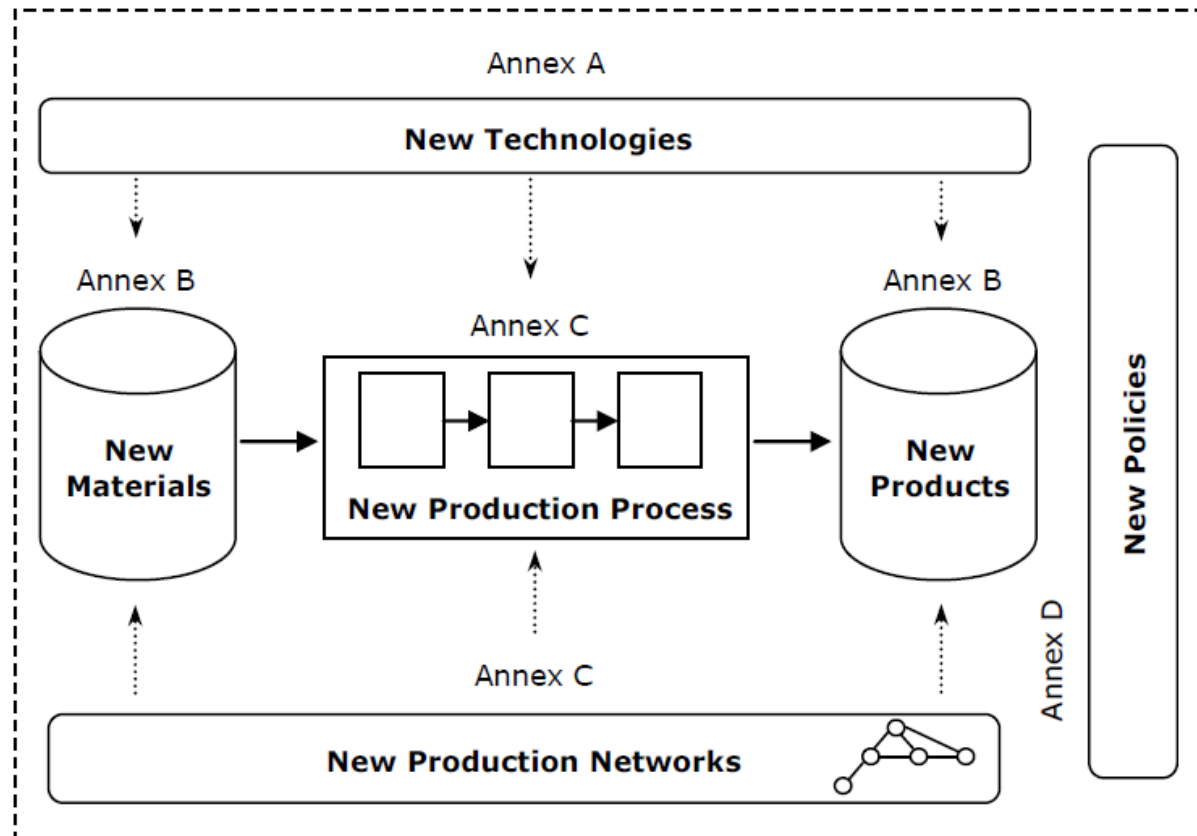
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17

- Directly or indirectly related to EU industrial innovation

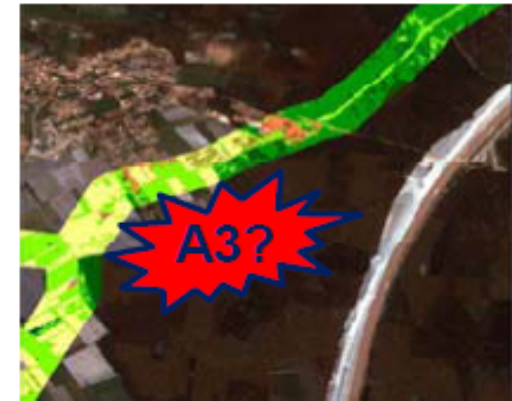
iNTeg-Risk project – case studies/ERRAs

The **relations between the ERRA types** are illustrated in the figure below, and also shows the structure of the CWA document where each ERRA group is represented in an annex.



Overview of the ERRAs (Topic A)

- A. **New (production) technologies**
- B. New materials and products
- C. New technologies & production networks
- D. New policies



Nr	Name	Responsible Partner
A	EMERGING RISKS - NEW TECHNOLOGIES	UNIBO (CONPRICI)
A1	CO₂ capture and sequestration , both technical risks and governance risk	HSE-HSL
A2	Insurance and re-insurance aspects of emerging risks including the security-related (HSSE) emerging risks of new technologies	Swiss Re
A3	Emerging risks related to the industrial use of automated and un-manned surveillance of industrial infrastructure	GDF
A4	Liquid Natural Gas (LNG) regasification in sensitive areas on-shore and offshore	D'Apollonia
A5	Safety and security of underground hubs with interconnected transportation services and shopping centers	VSH Hagerbach

Overview of the ERRAs (Topic B)



Schematische Darstellung
Versatzverfahren Big-Bag-Versatz

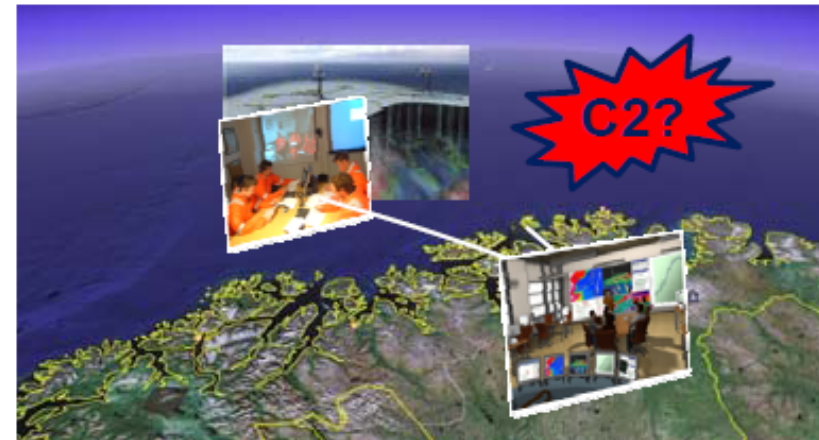


- A. New (production) technologies
- B. New materials and products**
- C. New technologies & production networks
- D. New policies

Nr	Name	Responsible Partner
B	EMERGING RISKS - NEW MATERIALS AND PRODUCTS	EU-VRI
B1	Public health and medical issues related to monitoring of emerging risks in production, storage and transport of nano-materials on industrial scale in small and medium enterprises (SMEs)	Novineon
B2	Emerging risks related to advanced storage technologies for hazardous materials (including H₂)	BAM
B3	Emerging risks related to development and use of advanced engineering materials , composite materials	KMM-VIN

Overview of the ERRAs (Topic C)

- A. New (production) technologies
- B. New materials and products
- C. New technologies & production networks**
- D. New policies



Nr	Name	Responsible Partner
C	New technologies & production networks	SINTEF
C1	Challenges to safety posed by outsourcing of critical tasks – in oil, gas, petrochemical and construction industries	DTU
C2	Remote operation in environmentally sensitive areas	SINTEF
C3	On-line risk-monitoring and assessment of emerging risks in conventional industrial plants – monitoring of risks beyond the design/regulatory basis	BZF
C4	Atypical, one-of-the-kind major hazards/scenarios (post-Buncefield implications) and their inclusion in the normal HSSE practice	HSE-HSL
C5	Security of energy supply and related emerging risks	JRC

Overview of the ERRAs (Topic D)

- A. New (production) technologies
- B. New materials and products
- C. New technologies & production networks
- D. New policies**



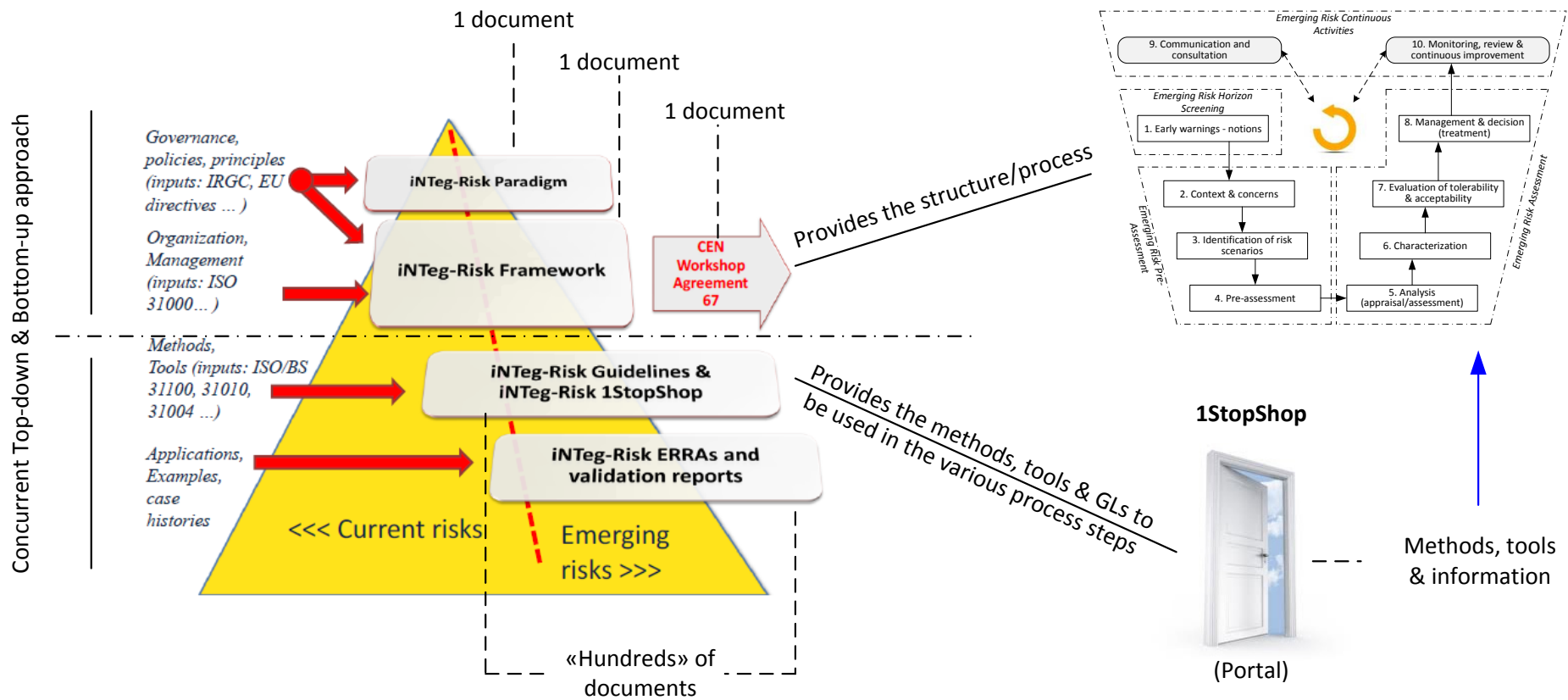
Nr	Name	Responsible Partner
D	EMERGING RISKS - RELATED POLICIES	R-Tech
D1	Definition of KPIs for emerging risks for selected industry case studies, including CSR aspects of emerging risks	DNV
D2	Integrated approach on emerging risks related to the implementation of European safety legislation on SMEs and its application on companies working in Distributed Energy Resources (DER)	LEIA
D3	Emerging risks related to interaction between natural hazards and technologies at community level	INERIS
D4	Emerging risks related to hazardous substances, impact on public health and relations with REACH and GHS	RIVM

CWA document – other cases

- In the CWA document Annex A-D, corresponding to ERRA Groups A-D, the following cases have been used as examples:
 - Hydraulic fracturing
 - Carbon nanotubes
 - Drilling in Arctic
 - Nano-regulation
- In addition, Annex H consists of a sample list of emerging risks, which overlaps with the 17 ERRAs



Results: Overview of available material



iNTeg-Risk 1StopShop – tools/methods/etc.

1StopShop



(Portal)

iNTeg-Risk 1StopShop

My Analyses
Go to new or list of performed analyses

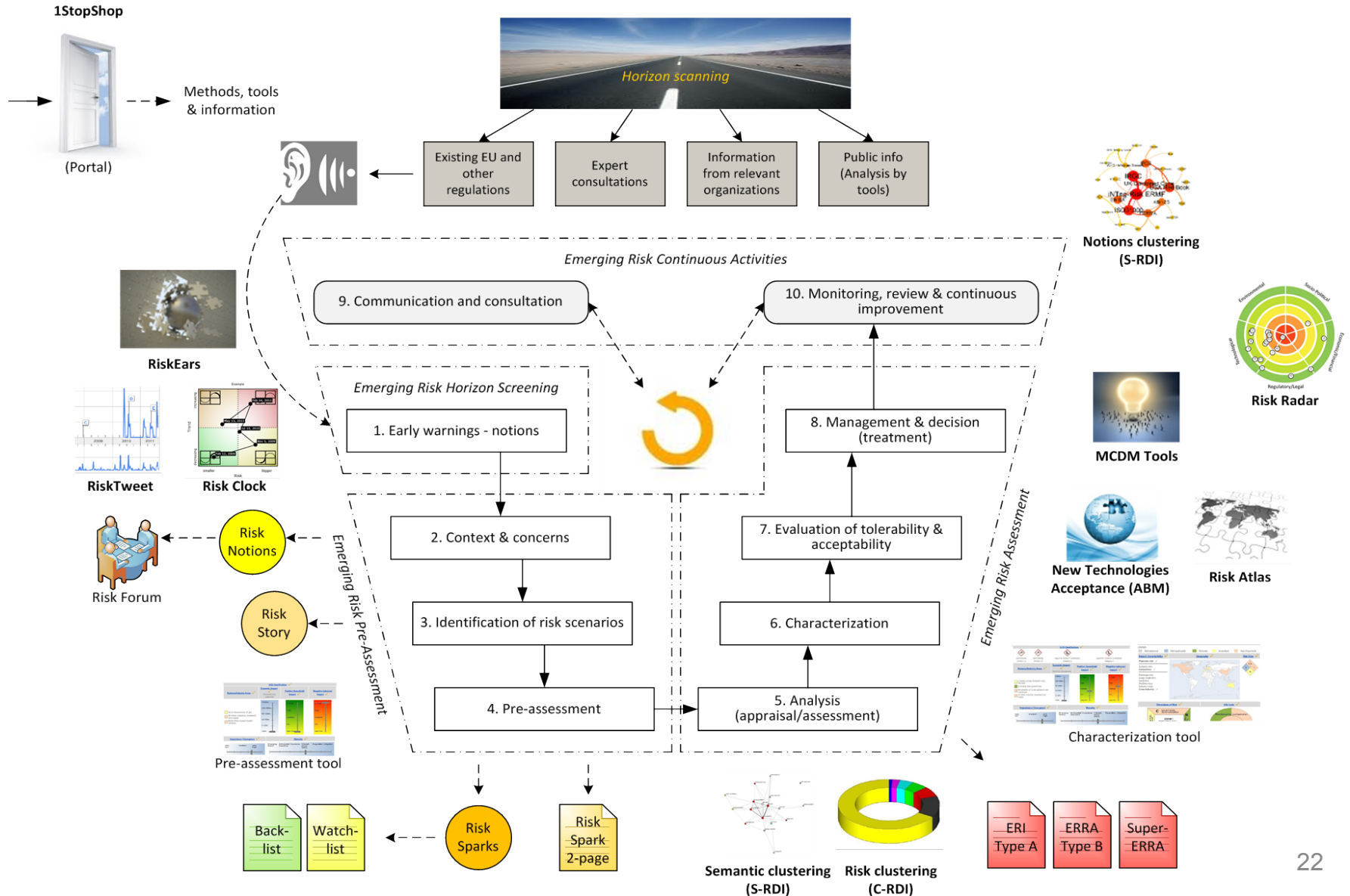
Risk Radar	Tools
	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p>RiskEars Emerging Risk Early Warning & Monitoring System » Risk Clock » Risk Tweet</p> </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p>Risk Atlas Risk Atlas is an implementation of Web GIS over the internet enabling visualization of emerging risk knowledge to be displayed as information layers over maps in 2D and 3D.</p> </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p>MCDM TOOLS Multi-Criteria Decision Making (MCDM) application for aiding decision making process</p> </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p>New Technologies Acceptance (ABM) Application implements agent-based modeling (ABM) for predicting how New Technology will be accepted among population. End result can show acceptance value and volatility of New Technology acceptance.</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p>Notion Clustering (S-RDI) Application based on Semantic Clustering. Result, graphic representation, is computed based on similarity score calculated by overlap of properties + semantic similarity of descriptions of notions.</p> </div>

<p>① Geomagnetic storms - impacts</p> <p>② Cyber vulnerability</p> <p>③ Terahertz technology</p> <p>④ Fracking</p> <p>⑤ Occupy Wall Street</p> <p>⑥ Health risks - new hazardous substances</p> <p>⑦ Smart grids</p> <p>⑧ Geothermie</p> <p>⑨ Wärme von unten/Hitze von unten</p> <p>⑩ Tiefengeothermie/Geothermiekraftwerk</p>	<p>⑪ Misuse of / resistance to antibiotics</p> <p>⑫ Space debris</p> <p>⑬ LNG re-gasification in sensitive areas</p> <p>⑭ London Riots</p> <p>⑮ Increasing losses on wind turbines</p> <p>⑯ Genetically modified organisms</p> <p>⑰ Erdwärme</p> <p>⑱ Tiefengeothermie</p> <p>⑲ Geothermal power and energy</p> <p>⑳ Erdwärme/Geothermie/geothermisch/eler</p>
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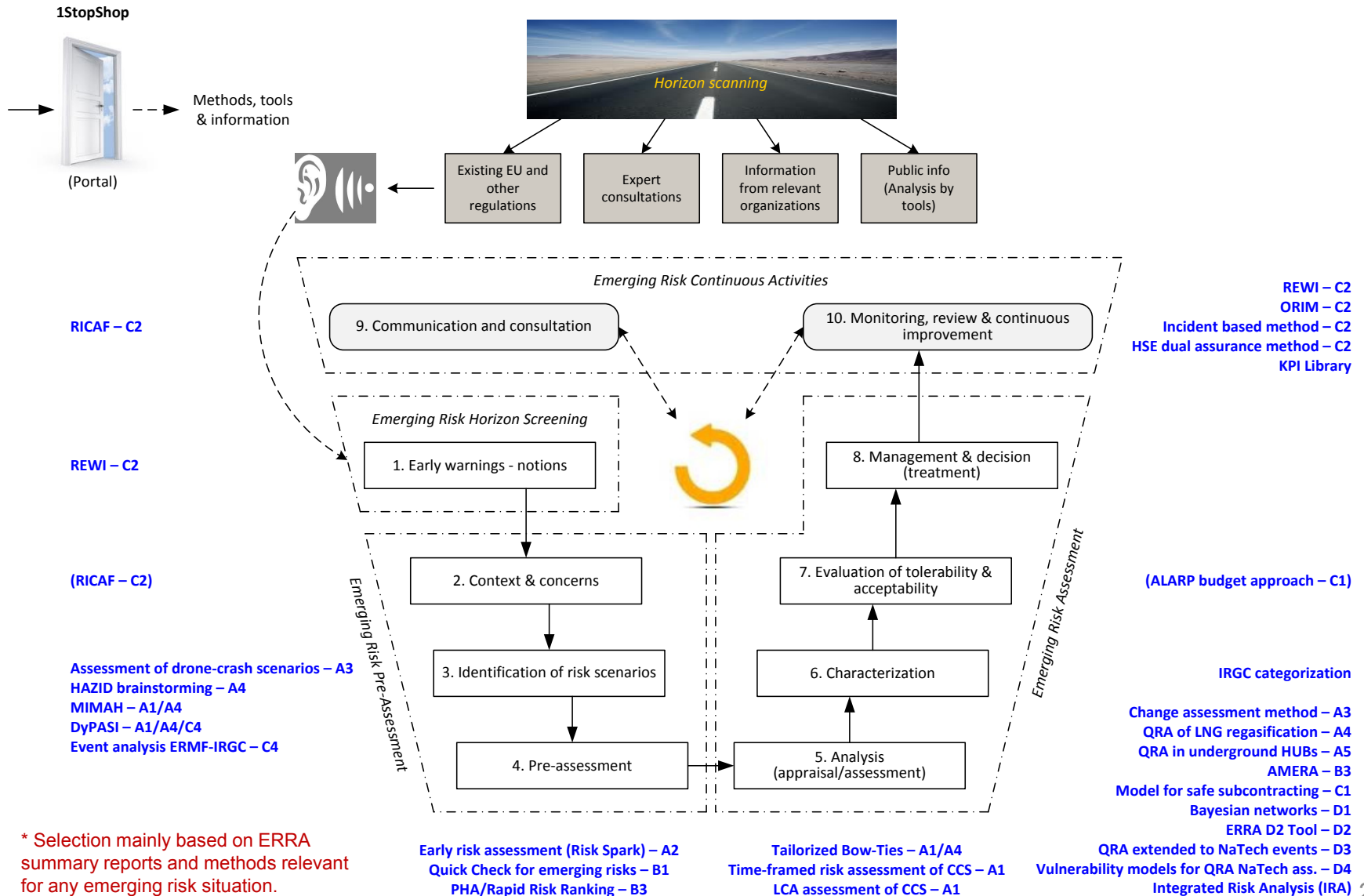
Background tools

	<p>Safetypedia Information about the emerging risks and background information</p>
	<p>KPI Library KPIs (Key Performance Indicators) collected and stored in the KPI Library</p>
	<p>MethodsMart & Glossary General; Failure Analysis; Application-oriented and Alternative Methods</p>
	<p>Education Education system for professional and academic education</p>
	<p>ENISFER Competences (persons & capacities) for dealing with emerging risks</p>
	<p>Survey Tool Tool for broad access of information/opinions in the project</p>

Overview of the main tools

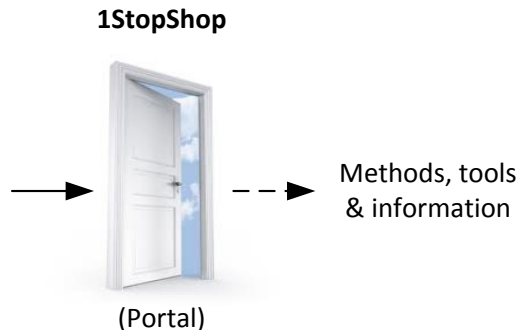






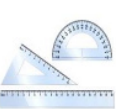

Overview of selected methods*



* Selection mainly based on ERRA summary reports and methods relevant for any emerging risk situation.

Overview of other methods



Background tools	
 <p>Safetypedia Information about the emerging risks and background information</p>	 <p>Education Education system for professional and academic education</p>
 <p>KPI Library KPIs (Key Performance Indicators) collected and stored in the KPI Library</p>	 <p>ENISFER Competences (persons & capacities) for dealing with emerging risks</p>
 <p>MethodsMart & Glossary General; Failure Analysis; Application-oriented and Alternative Methods</p>	 <p>Survey Tool Tool for broad access of information/opinions in the project</p>

General Methods

Bayesian Analysis	General Statistical Functions	Qualitative Risk Analysis
Brainstorming	Human reliability analysis	Quantitative Risk Analysis
Checklists	Markov analysis (IEC 61665)	Rapid Risk Ranking/Screening
Decision Tree	Method of Steuer	Scenario Analysis
Delphi Techniques	Missing values	Signal Processing
Environmental Risk Assessment	Monte Carlo	Structured or Semi-Structured Interviews
Formal Safety Assessment (FSA)	MOSAR	SWIFT
	Probabilistic Safety Assessment	

Failure analysis Methods

Bow Tie Analysis	Dynamic Event Tree Analysis Method	HACCP
Cause and Consequence Analysis	Event tree analysis	LOPA
Cause and Effect Analysis	Failure mode and effect analysis (IEC 60812) // Failure mode, effect and criticality analysis (IEC 60812)	Preliminary hazard analysis
Consequence/Likelihood Matrix		Root Cause Analysis
Digraph/Fault Graph		MIMAH
Dynamic Event Logic Analytical Methodology	Fault tree analysis (IEC 61025)	DYPASI

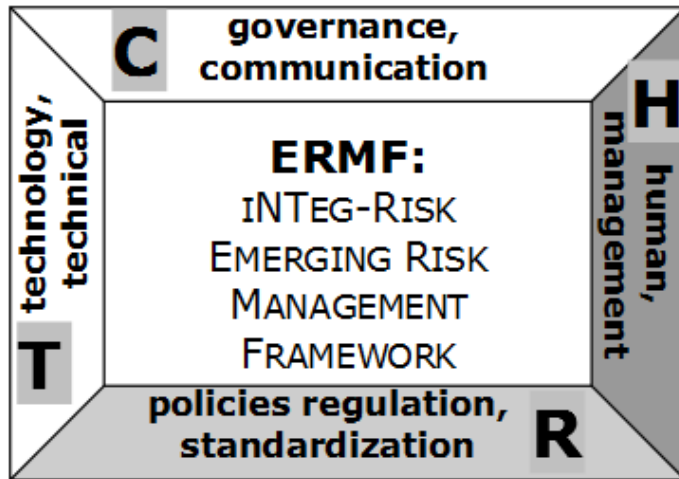
Application-oriented Methods

Business Impact Analysis	Hazard and operability studies (HAZOP) (IEC 61882)	Risk-based inspection (RBI)
Chemical Exposure Index	Reliability centred maintenance (IEC 60300-3-11)	Safety Management
Fire and Explosion Index		Organization Review

Alternative Methods

Analytic Hierarchy Process (AHP)	Hierarchical Trade-offs	Multilayer Perceptron (neuronal network)
Conjunctive Method	"Intelligent" Analysis components	Parametric Method
Cross-Impact Balance Analysis	Kohonen Feature Map (neuronal network)	Precautionary vs. Evidence-Based Approaches
Disjunctive Method	Lexicographic Method	Psychometric paradigm
Distance from Target	Linear Assignment Method	Scenario Planning
Dominance	Management Oversight Risk Tree	Simple Additive Weighting Method (SAW)
Eigenvector Method	MAXIMAX	Sneak Circuit Analysis
ELECTRE	MAXIMIN	STEM
Elimination by Aspects	Method of Geoffrion	SWOT Analysis
Fuzzy C-Means	Morphological analysis	TOPSIS
Fuzzy Kohonen network	Multi Attribute Decision Making	Utility Function
Fuzzy Rule Base	Multi Criteria Decision Making	Weighted Product
Global Criterion Method		
GO method		
Goal Programming		

Overview of guidelines etc.



Complementary guidelines covering all dimensions of risk (T-C-H-R) and issues like security, environment, etc.

Handbook issues:

- Uncertainty handling
- Data mining
- NaTech, common and systemic factors, including security
- Human factors in its organizational context
- Environmental impact assessment

Guidelines:

- Emerging risks pre-assessment
- Emerging risks appraisal
- Emerging risks management
- Emerging risks related to policies and regulatory frameworks
- Environmental issues
- Risk governance and culture

CEN WS67 CWA document – "the quintessence"

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Managing emerging technology-related risks

Haupt-Element

Élément central

ICS:

Descriptors:

Document type: CWA
Document subtype:
Document stage:
Document language: E

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phase\CEN WS 67_CWA Draft - Managing emerging technology-related risks.doc STD Version 2.5a

iNTeg-Risk project – more information

Early Recognition, Monitoring and Integrated Management of Emerging, New Technology Related, Risks

iNTeg-Risk

EU-VRI

Grant agreement number: CP-IP 213345-2

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- Key Highlights
- RiskRadars

iNTeg-Risk RiskTicker

08/Apr/13 12: Relations Refineries - Earthquakes

L1: Kashima Oil Co. Ltd. - Kashima, Ibaragi
L2: M 4.8 - Apr 7 2013, Japa

L1.Capacity: 210000 bpd
L2.Magnitude: 4.8
Distance: 47.051 km
Risk index: 210000 e^{-4.8}/(47.051¹⁰⁰⁰) = 5.423

Most used terms cloud

analysis (93)

iNTeg-Risk
Early Recognition, Monitoring and Integrated Management of Emerging, New Technology related Risks

Risk - we care!

News

[SHB/Promis-LINGUA course on Intercultural Management & Communication](#)

April 17, 2013

The course 'Business Communication and Management of Intercultural Differences' will take place on April 17, 2013 in Stuttgart, Germany. The course stresses the importance of cultural differences and multilingual issues for the success of collaboration with partners from other cultural background, particularly in international projects. The course is organized to promote the results of the [PROMIS-Lingua](#) project among SMEs. [more](#)

Check out the project web for more information (<http://www.integrisk.eu-vri.eu/>)



In particular the project video