European Union Funded Research in Industrial Safety

- A sceptic observes:

A successful research programme concludes that more research is needed

Implementation and Exploiting results does not seem to be important

Something needs to change

European Technology Platform on

Industrial Safety

Safety for Sustainable European Industry Growth

ESREL2006, Estoril

18 September 2006

ETPIS, an opportunity for a sustainable European industry growth

RESEARCH STRATEGY FOR EUROPEAN INDUSTRY SAFER AND WORLDWIDE COMPETITIVE

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RATIONALE

&

OBJECTIVES

The Facts

- **Accidents at work** in industry kill 1 person every 2 hours and injure 1 person every 5 seconds [Eurostat, 2004]
- In EU-15 in 2001, the death toll is approximately [Eurostat, 2004] 4 900 every year from a total of 7.6 million accidents (4.9 million resulted in more than 3 days of absence)
- In 2002 in new EU MS, almost 2.5 million accidents at work and 1 400 fatalities were recorded [ILO, 2004]
- Cost of accidents at work and occupational diseases in EU-15 ranges for most countries from 2.6 to 3.8% of Gross National Product (GNP). [www.ilo.org]

From [Eurostat, 2004]

Table A.10: Accidents at work by economic activity, sex, age and year. EU-15, with more than 3 days' absence.

	2000: Employment (1) (1000)	Number 2000	Incidence rate (per 100 000 workers)								Evolution of incidence rate (%)	
			1994	1995	1996	1997	1998	1999	2000	2001	1996-2000	1999-2000
All NACE branches	142 230	4 815 629										
9 NACE branches(1)	101 551	4 078 455	4 539	4 266	4 229	4 106	4 089	4 088	4 016	3 830 *	-5.0	-1.8
Males	63 042	3 252 664	5 960	5 534	5 458	5 291	5 268	5 253	5 160	4 904 *	-5.5	-1.8
Females	34 175	667 023	1 936	1 864	1 924	1 865	1 890	1 909	1 952	1 891 *	1.4	2.2
18-24 years	12 381	725 056	:	:	5 751	5 613	5 725	5 804	5 856	5 523 *	1.8	0.9
25-34 years	29 233	1 177 880	:	:	4 390	4 210	4 179	4 118	4 029	3 867 *	-8.2	-2.2
35-44 years	27 288	1 007 349	:	:	3 766	3 696	3 678	3 703	3 692	3 511 *	-2.0	-0.3
45-54 years	21 001	719 025	:	:	3 558	3 548	3 543	3 521	3 424	3 237 *	-3.8	-2.8
55-64 years	8 972	311 780	:	:	4 063	3 671	3 602	3 577	3 475	3 309 *	-14.5	-2.9
Agriculture	5 153	341 388	6 496	6 123	6 771	6 647	6 790	7 060	6 625	6 158 *	-2.2	-6.2
Manufacturing	30 057	1 328 898	5 071	4 962	4 660	4 607	4 492	4 471	4 421	4 280 *	-5.1	-1.1
Manufacture of food products; beverages and tobacco	3 377	210 141	7 360	6 920	6 557	6 550	6 323	6 264	6 223	6 174 *	-5.1	-0.7
Manufacture of textiles and textile products	2 178	56 315	:	2								
Manufacture of leather and leather products	489	13 040	:	2								
Manufacture of wood and wood products	930	91 186	:	10								
Manufacture of pulp, paper and paper products; publishing and printing	2 567	67 102	:	2								
Manufacture of coke, refined petroleum products and nuclear fuel	172	1 427	:	1								
Manufacture of chemicals, chemical products and man-made fibres	2 029	40 320	:	2								
Manufacture of rubber and plastic products	1 349	56 243	:	4								
Manufacture of other non-metallic mineral products(4)	1 160	76 791	6 518	6								
Manufacture of basic metals and fabricated metal products	4 323	361 417	8 650	9								
Manufacture of machinery and equipment n.e.c.	3 318	113 089	:	3								
Manufacture of electrical and optical equipment	3 381	89 251	:	2								
Manufacture of transport equipment	3 040	82 875	:	2								
Manufacturing n.e.c.	1 744	69 700	:	4								
Electricity, gas and water supply	1 132	17 125	:	1								
Electricity, gas, steam and hot water supply	905	11 006	:	1								
Collection, purification and distribution of water	226	6 119	:	2								
Construction	11 206	845 841	9 014	9								
Wholesale and retail repairs	21 483	542 168	2 552	2								
Hotels and restaurants(3)	5 633	213 511	4 121	3								
Transport, storage and communication(4)	8 155	449 487	6 139	5								
Land transport; transport via pipelines	3 224	190 663	5 732	5								
Water transport	89	4 333	4 933	4								
Air transport	381	13 457	5 470	4								
Supporting and auxiliary transport activities; activities of travel agencies	2 103	181 381	11 580	11								
Financial intermediation; real estate, renting and business activities	18 732	340 038	1 638	1								

(1) 9 NACE branches : Agriculture, Manufacturing, Electricity gas water supply (excluded in 1994), Constr
Financial intermediation, Real estate business activities.
(2) Glass, ceramic goods, construction products.
(3) Incidence rates exclude Portugal before 1996.
(4) NACE Section I 'Transport, storage and communication' also includes Division i64 'Post and telecomm
(5) Persons in employment covered by the data on accidents.
* Provisional data for 2001 (PT = 2000 data).

NB: For some cases the gender or age is unknown, or the age is < 18 years or > 64 years. Therefore the total and the sum of categories may differ.
Source: Eurostat - European Statistics on accidents at work (ESAW)

in year 2000,
845 841 accidents in construction sector
(17.5 %, 7.7 % employees)

1 328 898 accidents in manufacturing
(27 %, 21.1 % employees)

40 320 in chemical industry
(0.84 %, 1.4 % employees)

among 4 815 629 accidents in all sectors
(more than 3 days absence)

Table A.11: Accidents at work by economic activity, sex, age and year. EU-15, fatal accidents.

Including road traffic accidents on board of any means of transport in the course of work.

	2000: Employment(1) (1000)	Number 2000	Incidence rate (per 100 000 workers)								Evolution of incidence rate (%)	
			1994	1995	1996	1997	1998	1999	2000	2001	1996-2000	1999-2000
All NACE branches	142 230	5 237										
9 NACE branches(2)	101 551	4 636	6.1	5.9	5.3	5.2	5.0	4.8	4.6	4.2*	-11.6	-4.3
Males	63 042	4 425	:	:	7.7	7.7	7.4	7.1	7.0	6.5*	-8.8	-1.4
Females	34 175	213	:	:	0.8	0.8	0.8	0.7	0.6	0.5*	-16.0	-13.4
16-24 years	12 381	412	:	:	3.8	3.7	3.6	3.4	3.3	2.6*	-14.2	-2.7
25-34 years	29 233	942	:	:	4.2	3.9	3.9	3.6	3.2	3.2*	-21.4	-10.0
35-44 years	27 286	1 153	:	:	4.7	4.9	4.6	4.3	4.2	3.7*	-7.7	-0.6
45-54 years	21 001	1 166	:	:	6.3	6.0	6.1	5.9	5.6	5.1*	-11.6	-5.3
55-64 years	8 972	717	:	:	8.7	8.9	8.1	8.0	8.0	7.5*	-3.8	0.0
Agriculture	5 153	651	14.0	13.8	12.9	12.6	12.4	13.3	12.6	11.8*	-2.1	-5.0
Manufacturing	30 057	976	4.6	4.2	3.9	4.0	3.7	3.4	3.2	3.2*	-16.7	-4.5
Manufacture of food products; beverages and tobacco	3 377	134	9.2	5.2	4.7	4.8	4.4	3.6	4.0	3.8*	-15.6	10.2
Manufacture of textiles and textile products	2 178	29	:	2.1	1.4	1.5	1.0	1.4	1.3	1.4*	-4.9	-4.9
Manufacture of leather and leather products	469	6	:	2.1	1.7	1.7	1.9	2.4	1.2	1.0*	:	:
Manufacture of wood and wood products	930	69	:	9.5	8.5	9.1	8.9	6.4	7.4	6.3*	-12.7	15.9
Manufacture of pulp, paper and paper products; publishing and printing	2 567	32										
Manufacture of coke, refined petroleum products and nuclear fuel	172	0										
Manufacture of chemicals, chemical products and man-made fibres	2 029	44										
Manufacture of rubber and plastic products	1 349	26										
Manufacture of other non-metallic mineral products(3)	1 160	113										
Manufacture of basic metals and fabricated metal products	4 323	277										
Manufacture of machinery and equipment n.e.c.	3 316	80										
Manufacture of electrical and optical equipment	3 361	69										
Manufacture of transport equipment	3 040	36										
Manufacturing n.e.c.	1 744	41										
Electricity, gas and water supply	1 132	42										
Electricity, gas, steam and hot water supply	905	35										
Collection, purification and distribution of water	226	7										
Construction	11 206	1 279										
Wholesale and retail repairs	21 463	461										
Hotels and restaurants(4)	5 633	73										
Transport, storage and communications(5)	8 155	665										
Land transport; transport via pipelines	3 224	597										
Water transport	69	10										
Air transport	361	22	7.9	6.0	5.7	4.3	5.3	4.2	5.8	3.2*	.	.
Supporting and auxiliary transport activities; activities of travel agencies	2 103	117	10.3	13.8	10.0	11.3	10.2	9.1	5.6	7.0*	-44.4	-38.9
Financial intermediation; real estate, renting and business activities	16 732	271	2.2	1.8	1.6	1.8	1.7	1.6	1.4	1.3*	-9.6	-9.6

(1) 9 NACE branches : Agriculture, Manufacturing, Electricity gas water supply (excluded in 1994), Construction, Wholesale and retail repairs, Hotels and restaurants, Transports communications, Financial intermediation, Real estate business activities.

(2) Glass, ceramic goods, construction products.

(3) Incidence rates exclude Portugal before 1996.

(4) NACE Section I 'Transport, storage and communication' also includes Division 64 'Post and telecommunications'.

(5) Persons in employment covered by the data on accidents.

* Provisional data for 2001 (PT = 2000 data).

Source: Eurostat - European Statistics on accidents at work (ESAW)

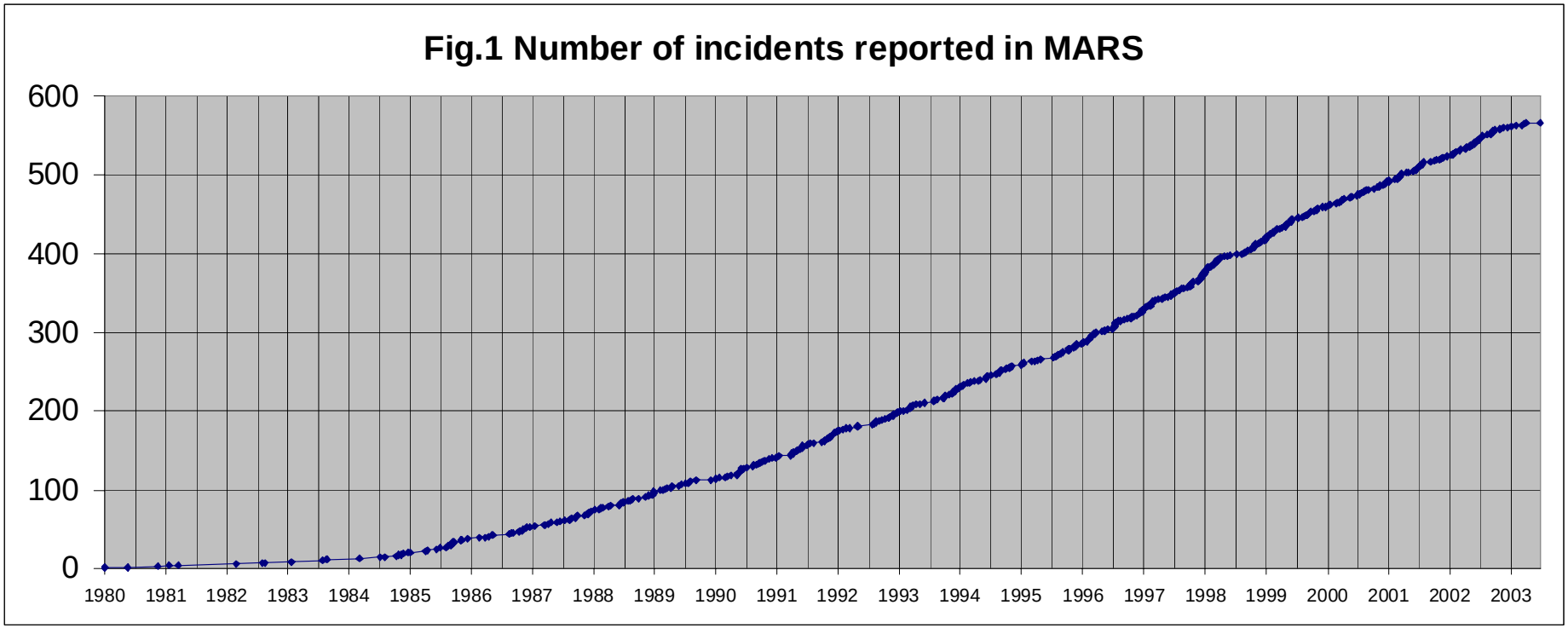
From [Eurostat, 2004]

in year 2000,
1 279 fatal accidents in construction (24.4 %)
976 fatal accidents in manufacturing (18.6 %)
44 fatal accidents in chemical industry (0.84 %)

among 5 237 fatal accidents in all sectors

The Facts

- Major Accident Reporting System : ~ 30/year



Statistics relating to Seveso Directive

The Facts

- Toulouse Ammonium Nitrate disaster on 21st September 2001 resulted in:
  - 1 500 million € of damage,
  - 27 000 homes and 1 300 companies damaged,
  - 30 people killed (21 on site with 10 employees and 11 sub-contractors, 9 off-site),
  - 2 242 were injured (officially), and 5 000 persons have been treated for acute stress...
- This disaster has upset the public, traumatised an industrial city and led the politicians to close down the AZF plant (450 direct jobs) and the SNPE phosgene related activities (492 jobs, 600 sub-contracting jobs).

Existing risks and …….Need for safe innovation

Several examples

- Safe use of hydrogen as an energy carrier (urban bus with gaseous H2, cars with LH2 or Fuel Cells)

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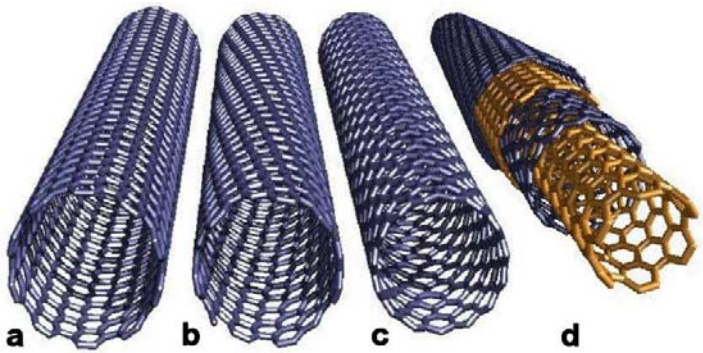
- Safe use of nanomaterials, nanoparticles



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ETP Industrial Safety
The scope

- **Occupational health and safety of the workers in industry**
- **Environmental safety**
  - **prevention of major accidents with off-site consequences**
  - **protection of the environment**

ISSUE ORIENTED, MULTISECTORIAL BENEFICES

Safety for Sustainable European Industry Growth

ETP Industrial Safety Objectives

- To gain ‘Safety for the Sustainable Growth of all European Industry’ by reducing the number of accidents & supporting safe technological & method innovation (i.e. 25% reduction in accidents by 2020 together with Programs to be in place by 2020 to continue accident reduction at a rate of 5% per year or better based on the overall TP’s vision).
  > impact on cost of manpower, availability of production systems
- To bridge the different aspects of "industrial safety" (Occupational health & safety of the workers plus environmental safety including prevention of major accidents & protection of the environment).
  > impact on cost for managing and reporting
- To facilitate and accelerate the breakthrough for progress in industrial environmental, health & safety (EH&S) via a co-ordinated, integrated research & implementation process.
  > impact on the efficiency of basic safety research
- To valorise, exploit and implement the results.
  > usefulness of the research

ETPIS and the future of industry

ETPIS

- Provides expertise for the design of safe integrated industrial systems (equipment and organisation) with benefice for the employers and the employees
- Contributes to the integration of safety constraints required by diverse regulations and standards (workers, machinery, hazardous plants, energy, transport…)
- Contributes to develop a safety culture, proactive attitudes towards safety and improves the risk communication

A major output

The Strategic Research Agenda

A collaborative work to establish the roadmap to reach the Vision

Preparation of the SRA

Openness and transparency

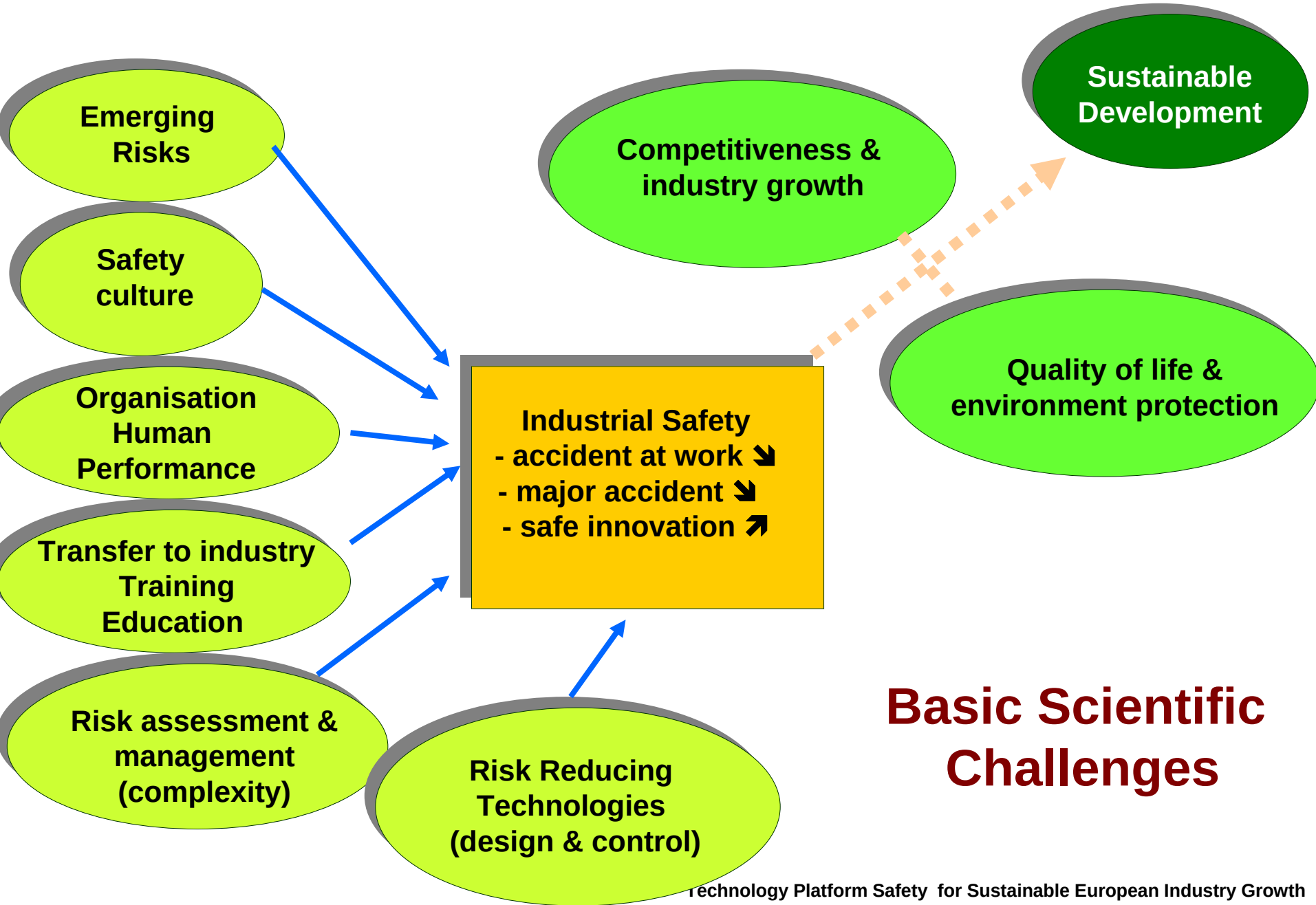
- **all 4 draft versions available on the website for free contribution**
- **2 major open workshops**
- **ranking and prioritisation using Milan Workshops and the expertise of the FG leaders attentive to the industry and society expectations**

20/10/2004 Brussels

for orientation and creation of Focus Groups
60 participants

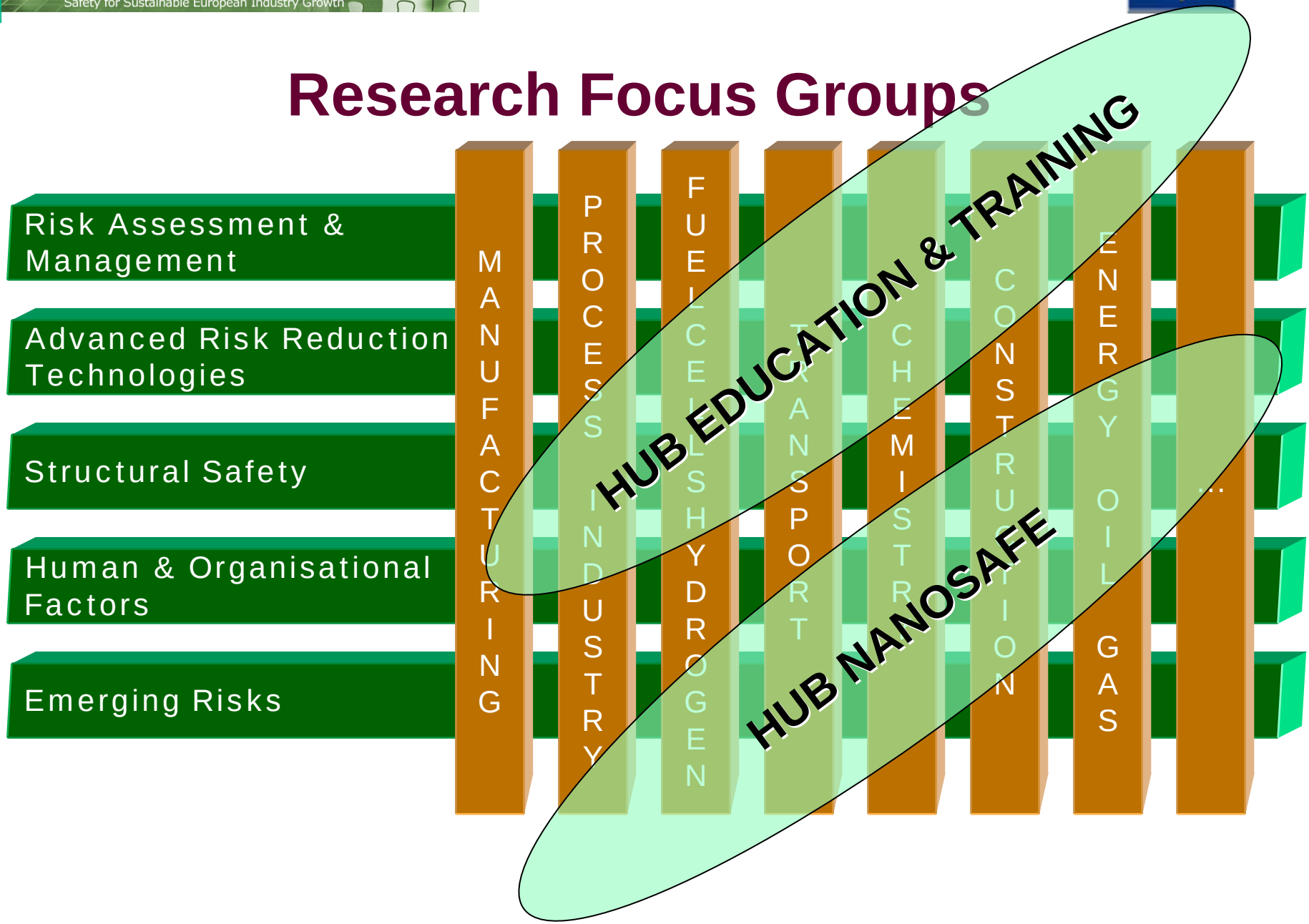
1-2/12/2005 Milan

revision of the SRA (content & priorities)
130 participants



Basic Scientific Challenges

Research Focus Groups



FG Leaders (1/2)

Risk assessment and management

- Ståle Selmer Olsen, DNV, NO
- Fabio Bagnoli, D'Appolonia S.p.A., IT

Advanced risk reduction technologies

- Daniel Podgórski, Central Institute for Labour Protection - (CIOP-PIB), PL
- Jan Meulenbrugge, TNO Built Environment & Geosciences, NL

Structural safety

- Carlos Guedes Soares, Instituto Superior Tecnico (IST), PT
- Mustafa Koçak, GKSS Research Center, GE

FG Leaders (2/2)

Human and organisational factors

- Simone Colombo, Politecnico di Milano, IT
- Patrick Lainé, Electricité de France, FR

Emerging risks

- Aleksandar Jovanovic, ZIRN - Univ. Stuttgart, GE
- Raija Koivisto, VTT, FI

Hub education and training

- Rosa Nomen, IQS, ES
- Dirk Oberhagueman, ESMG GmbH, GE

Hub NanoSafe

- Frédéric Schuster, CEA, FR

Implementing the SRA

Collecting needs and expectation

Producing and sharing results

Operating ETPIS to defragment R&D

Identify and collect needs
to improve industrial safety

Prepare and share the Roadmap
for industrial safety

- Risk assessment and management methods
- Advanced risks reduction technologies
- Structural safety
- Human and organisational factors
- Emerging risks
- HUB Education, training, transfer to industry
- HUB Nanosafety
- HUB Transport systems and tunnels
- HUB Large scale experiment facilities (NEXIS)

Co-ordination of national ressources

For a given research topic

1) Identify the teams in each MS
2) Define joint research programme with the teams in each MS
3) Obtain national funding with the credibility of ETPIS
4) Share the results at the European level
5) Support from the ETPIS

> Most of the resources are at national level

National Platforms Industrial Safety

- **National platforms already exists in...**
  - France : www.ftpis.fr
  - Italy : www.ptisi.eu
  - Poland : www.kpk.gov.pl/ppt
  - Spain : www.leia.es/PESI/
- **Iniatives under construction in...**
  - Finland (contact VTT)
  - Greece (contact Demokritos)
  - Germany (contact ZIRN)
  - UK (contact HSE)
  - Portugal (contact IST)

Perspectives (1/2)

- Influence the preparation of the 7th Framework Programme of the EC (2007-2013) to introduce « industrial safety » topics

  Work Programme : Nanosciences, Nanotechnologies, Material and new production technologies (NMP)
  - *New Production*
  - *Integration of technologies for industrial applications*

Perspectives (2/2)

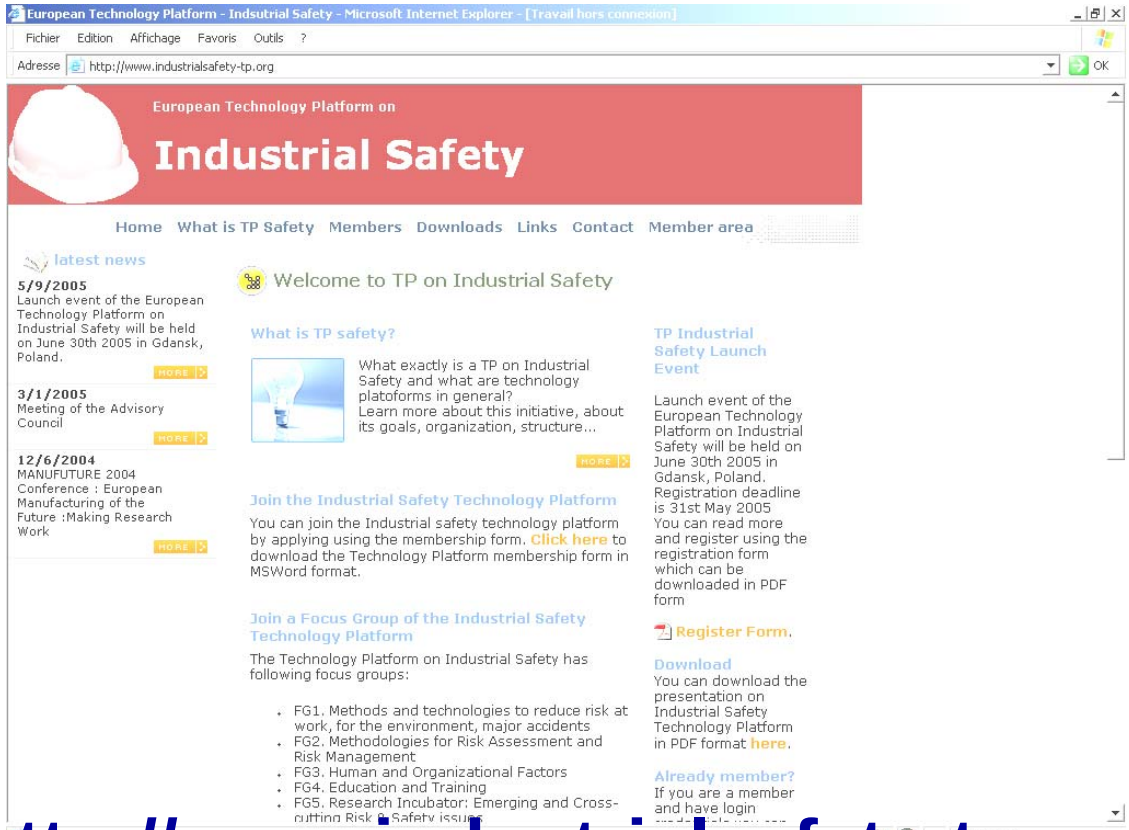
- To present the SRA of ETPIS in **each Member State** thanks to the national platforms and influence the national priorities on industrial safety research
  > Obtain national R&D programmes on Industrial Safety

- To coordinate the research effort between the Member States
  Contact person : E. Gainza (LEIA)

- To coordinate the interaction with other ETPs
  Contact persons : A. Jovanovic (ZIRN Univ. Stuttgart) & C. Soares Guedes (IST)

Create a favourable climate

- **Education and culture**
  - Promote prudent behaviours at work and increase awareness for safety issues
- **New governance framework**
  - Introduce comprehensive risk governance, explain benefits while considering risks
- **Develop transdisciplinary approaches**
  - Promote system solutions for complex safety issues using transdisciplinary capacities
- **Coordinate the use of existing testing and large scale facilities for safety research**
  - Enable the creation of up-to-date experimental infrastructures and provide a global service offer concerning large-scale experiments (to be coordinated with ESFRI)



http://www.industrialsafety-tp.org

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