



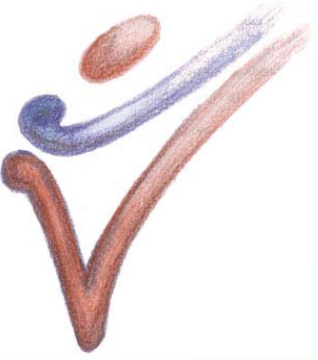
The European Lookout to Industrial Safety

*Analysing the present...
Envisioning the future*

Enrico Zio

HKARMS

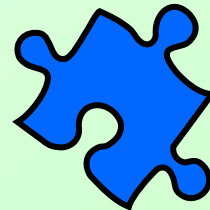
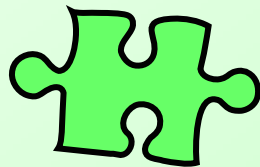
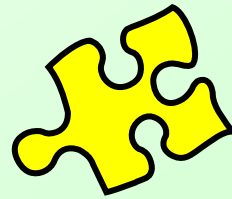
Hong Kong, 1-2 December 2005

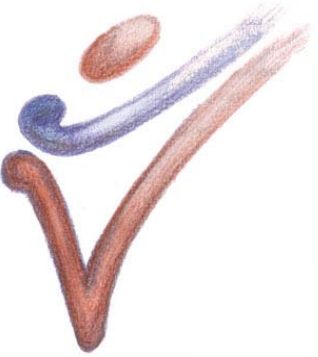


EU Industrial Safety



Present

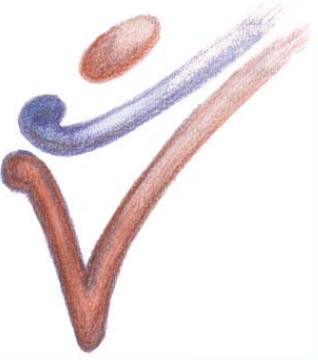




EU Industrial Safety at Present

- $7.6 \cdot 10^6$ accidents at work ($4.9 \cdot 10^6 > 3$ days absence; $4.9 \cdot 10^4$ fatalities)
- ~30 major accidents/year in "Seveso 2" industry sectors
- Accident costs ~2-4% of GNP

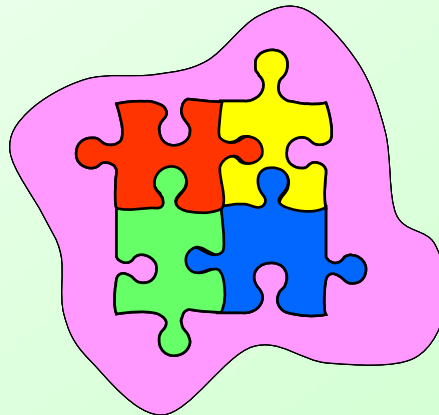


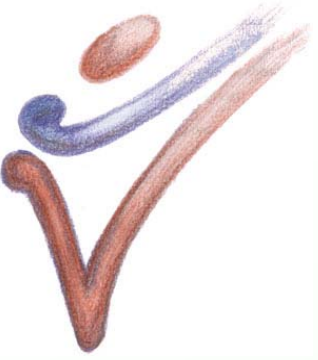


EU Industrial Safety



Future

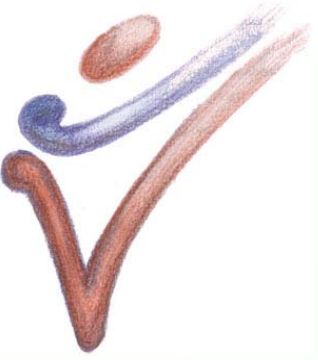




EU Industrial Safety: vision for the future (2020)

- 25% reduction in accidents
- Programmes in place to continue accident reduction at a rate $\geq 5\%$

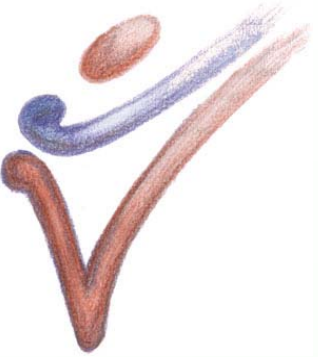




EU Industrial Safety

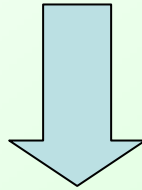
From present to future: The Roadmap





How to get to 2020?

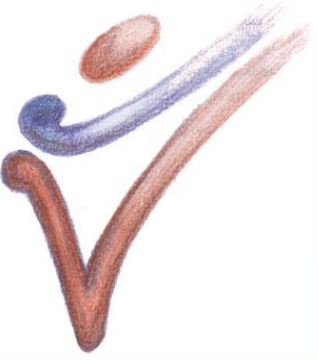
Research & Education



ETPIS

The European Technology Platform on
Industrial Safety





EU Industrial Safety

ETPIS





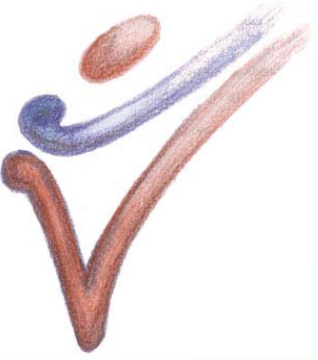
Technology Platform?

- Strong mobilisation of actors (research, industry, regulatory and finance stakeholders, public and private) for a European long-term vision on high impact sectors of leading technologies



- Objective: industrial competitiveness and leadership





ETPIS Focus

- Occupational Health and Safety of the workers in industry



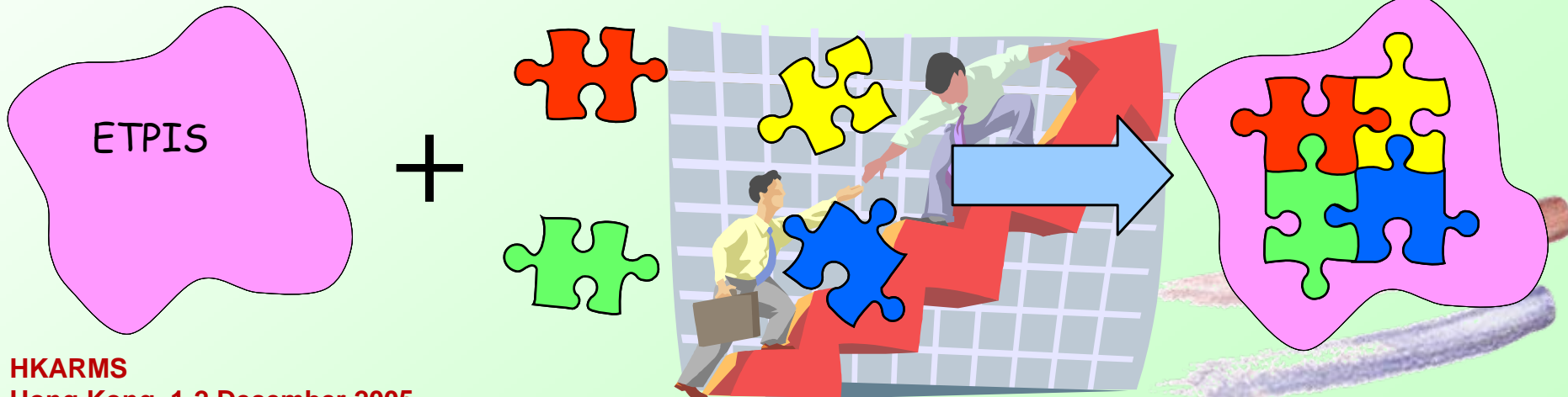
- Environmental Safety





ETPIS Scope

- Integrated and coherent treatment and management of safety in the design, production and operation of industrial products and systems
- Improved safety levels at acceptable costs
- Early safety control on emerging technologies

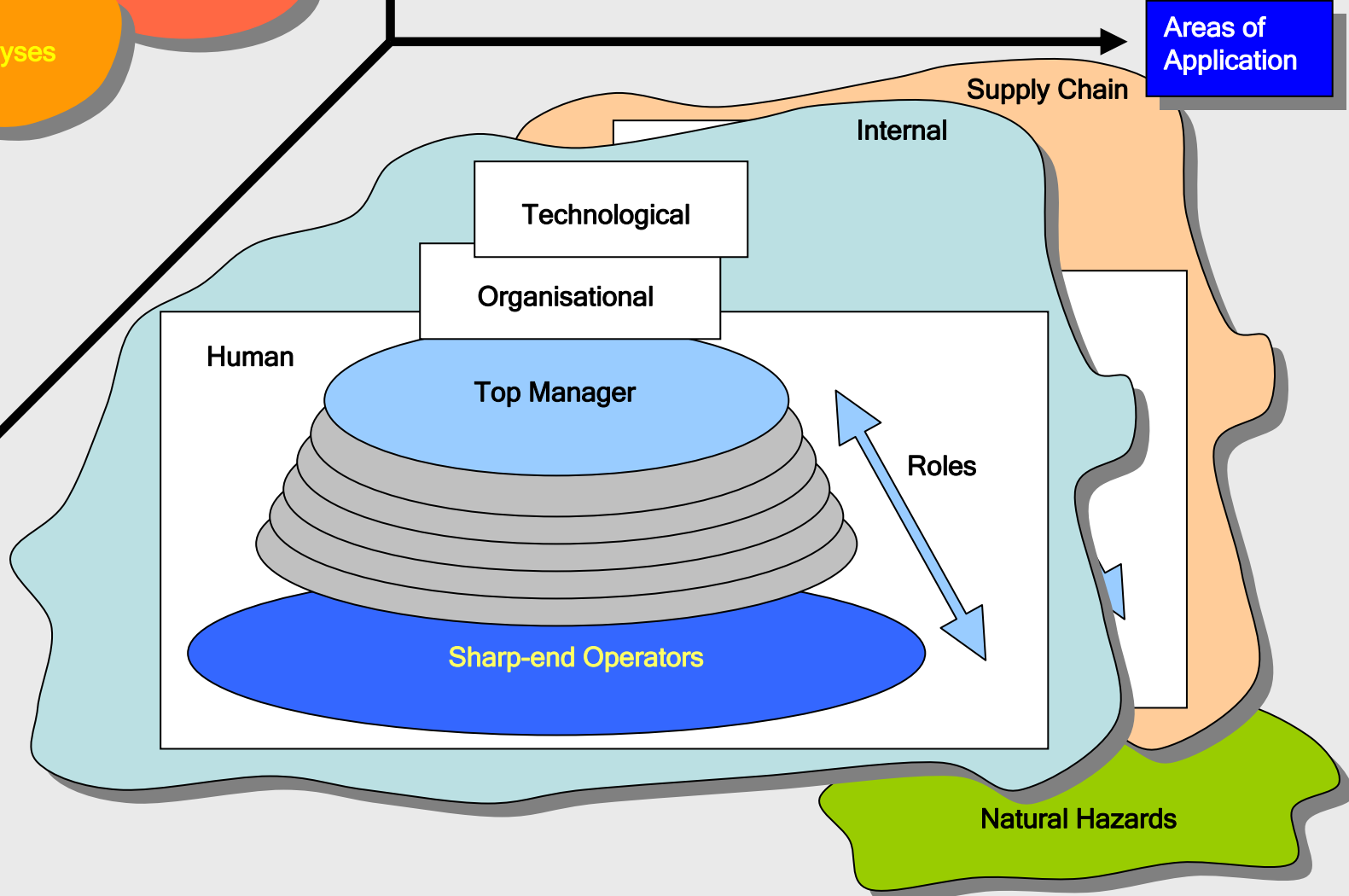


Safety Actions

- 1 **Design**
 - 2 Exploration & Drilling
 - 3 Construction
 - 4 Commissioning
 - 5 Operation
 - 6 Modifications, Maintenance & Repair
 - 7 Decommissioning
- } **Operational**



Areas of Application



Sources of Hazard

Safety Management

Training

Safety Analyses

Operational

Areas of Application

Supply Chain

Internal

Technological

Organisational

Human

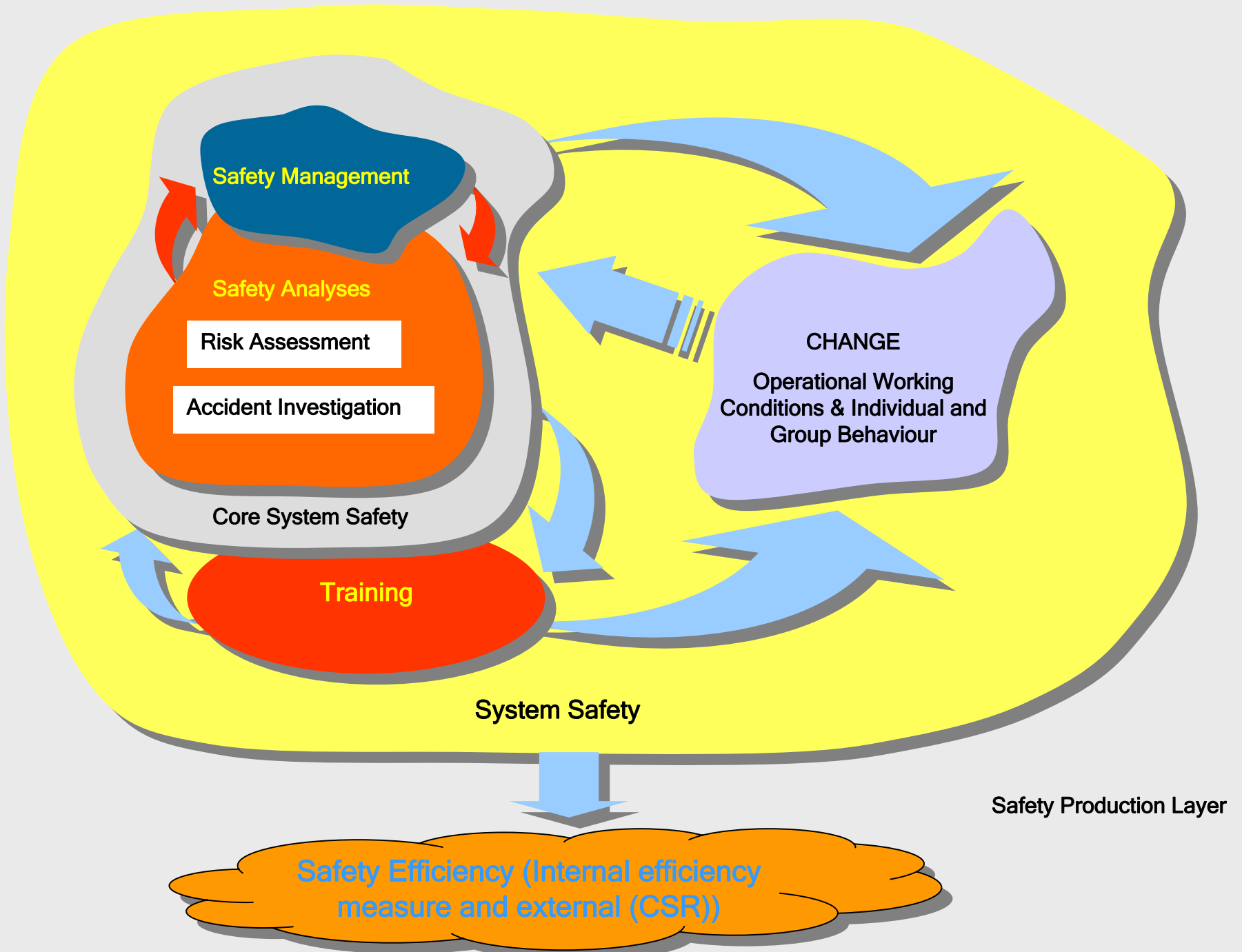
Top Manager

Roles

Sharp-end Operators

Natural Hazards

Sources of Hazard



Safety Management

Safety Analyses

Risk Assessment

Accident Investigation

Core System Safety

Training

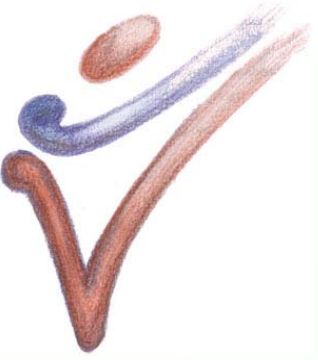
CHANGE

Operational Working
Conditions & Individual and
Group Behaviour

System Safety

Safety Efficiency (Internal efficiency
measure and external (CSR))

Safety Production Layer



EU Industrial Safety

ETPIS: Research

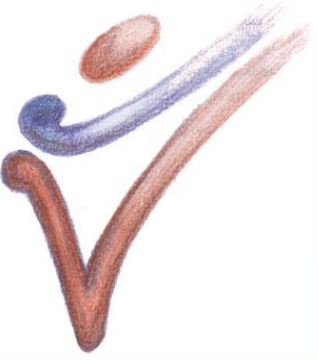




Research Objectives

- Relevance (real needs, costs/benefits)
- Quality (audit, approval, review, live testing and feedback from stakeholders)
- Applicability and use (benefit judgment and valorisation, also SMEs)
- Safety Management & Audit





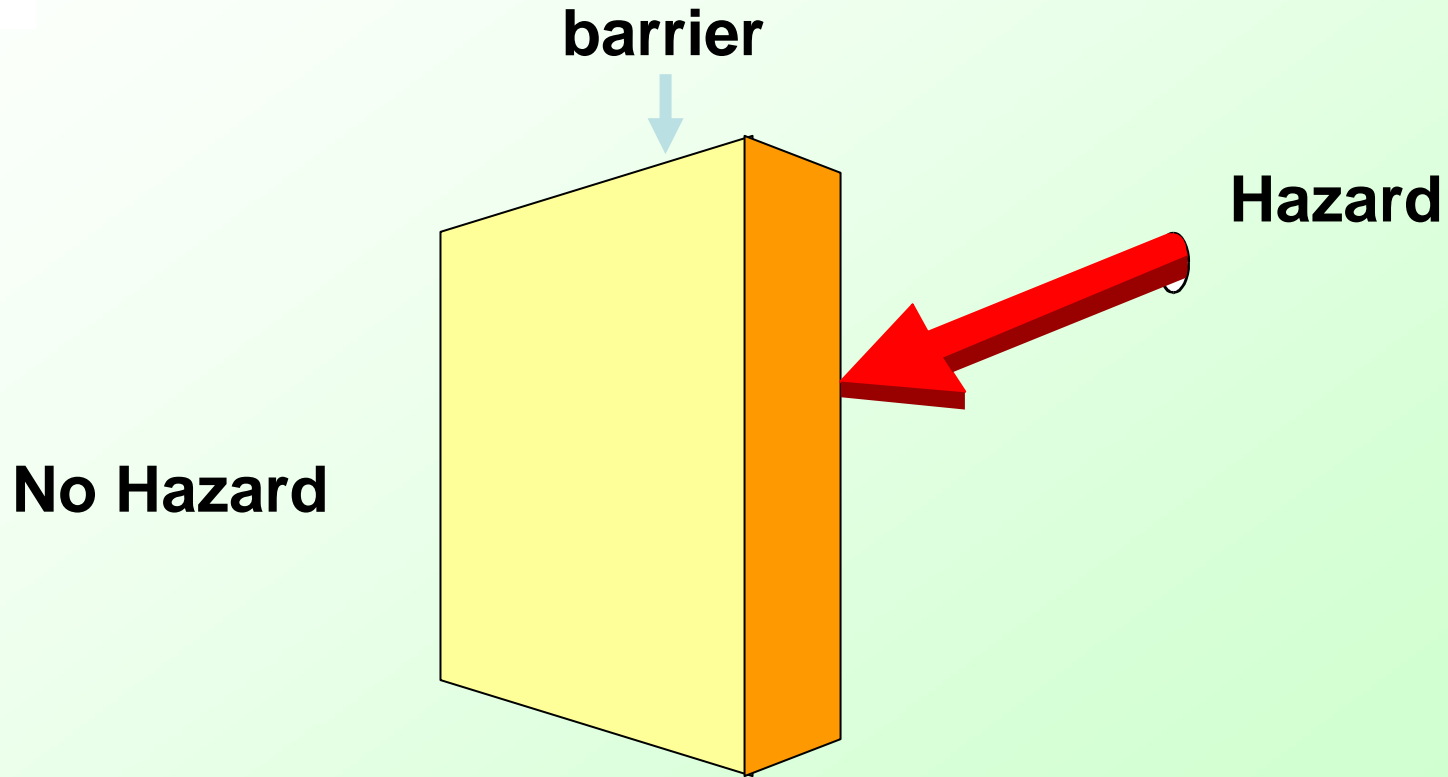
Research Concepts

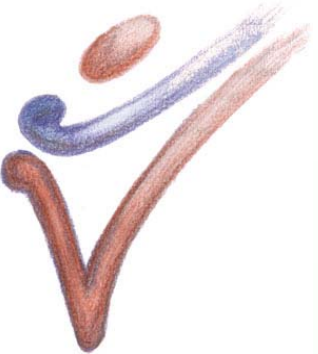




SAFETY:

The 'parmesan' cheese model



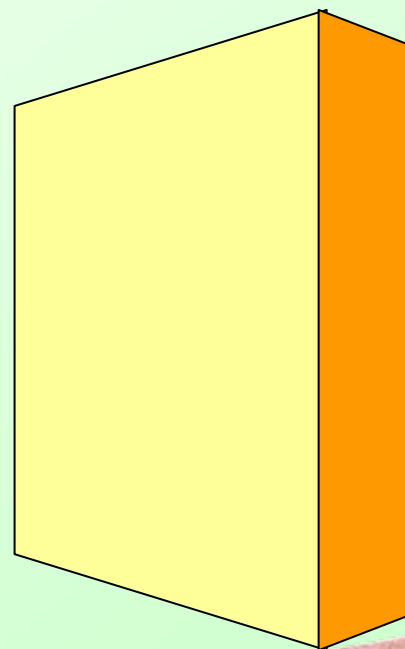
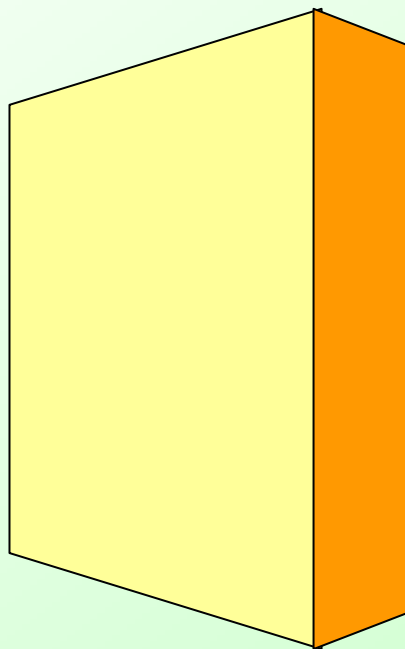
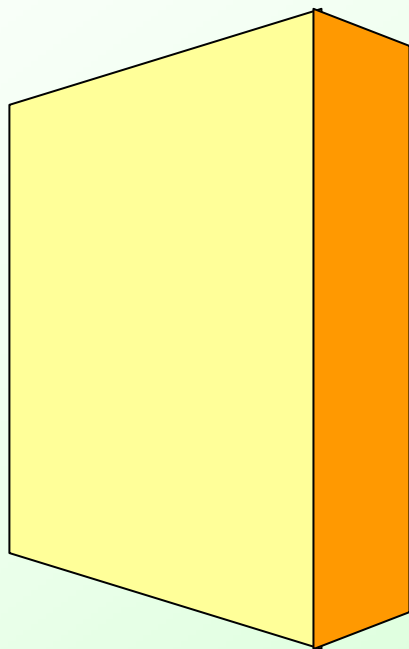


SAFETY: Multiple Barriers

Redundancy

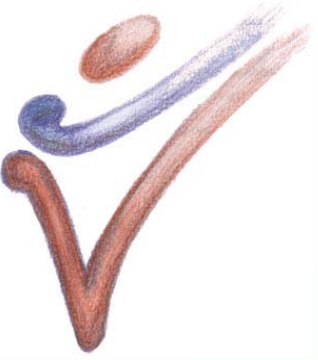
Training

Safety Reviews



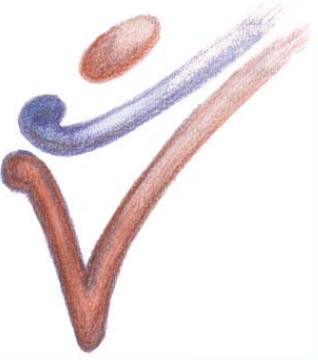
**No
Hazard**

Hazard

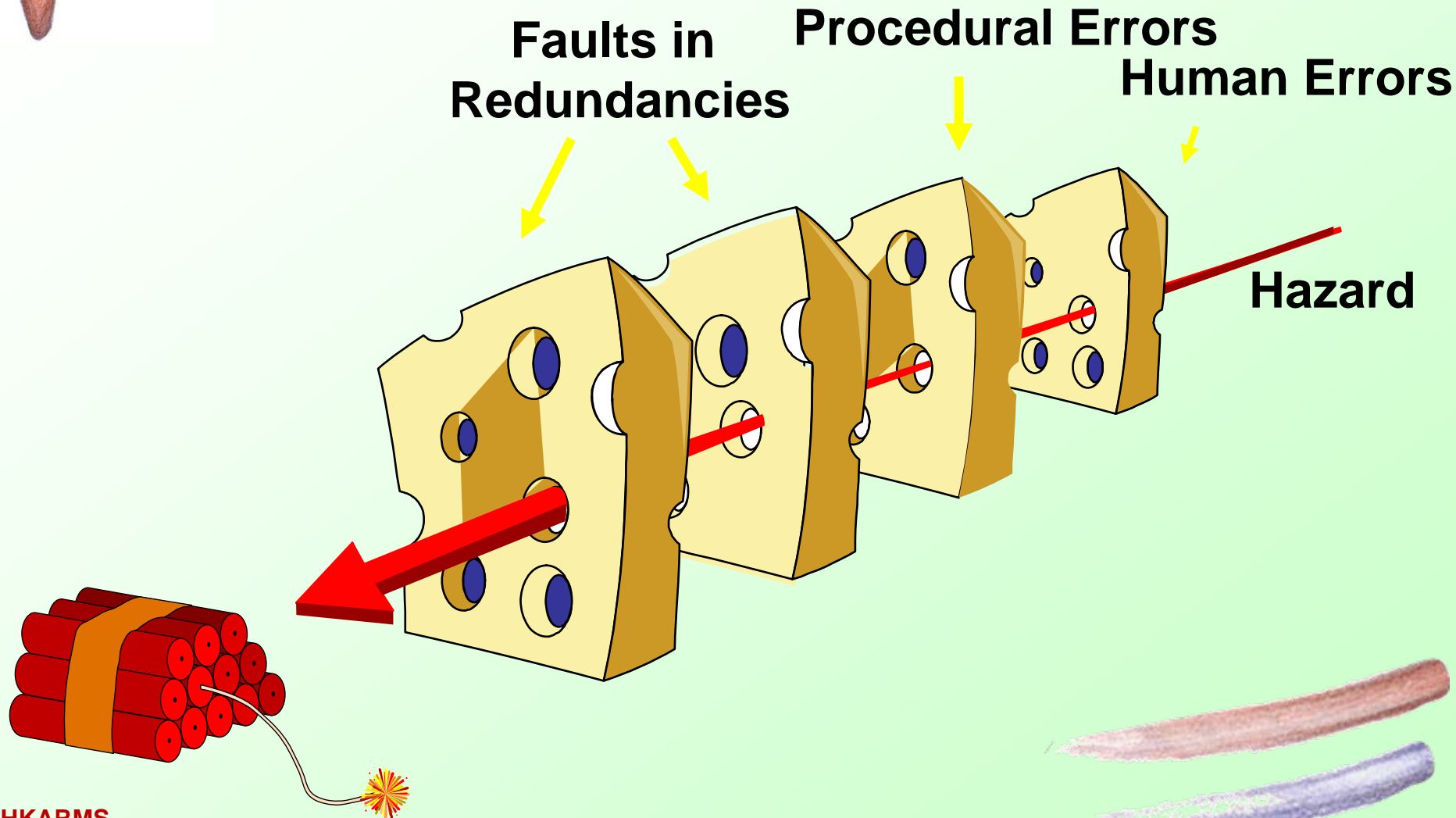


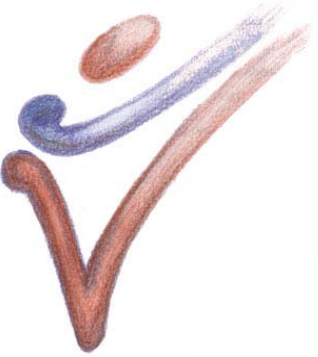
Redundancy: Example





The 'swiss cheese' model

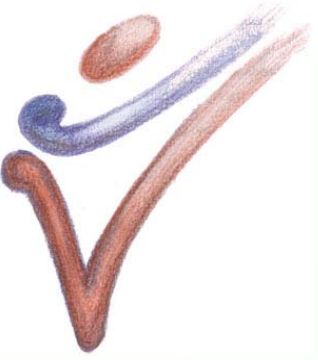




Research Contents

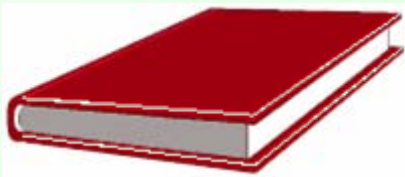
- Technological improvement (inherently safer design, flexible plants, industrial parks, nano-production...)
- Risk assessment and management (quantitative risk assessment, costs/benefits analysis, multiple barriers approaches)
- Human and organisational factors (VR)
- Safety culture: knowledge dissemination and transfer





EU Industrial Safety

ETPIS: Education

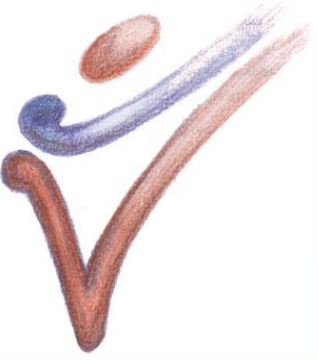




Education

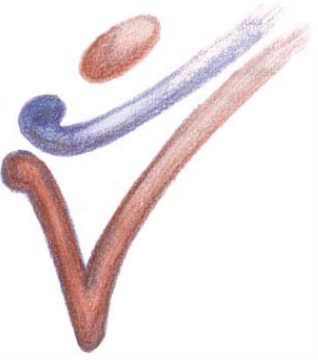
- Various levels of education and training programmes to increase industrial safety (VR)
- Early risk information and sensitisation in the education system





Early risk information and sensitisation ...

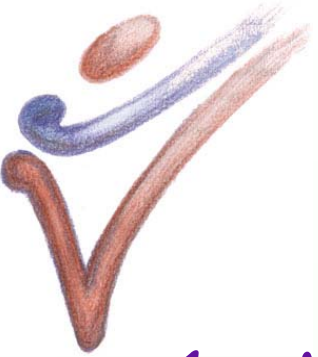




EU Industrial Safety

ETPIS: Focus Groups

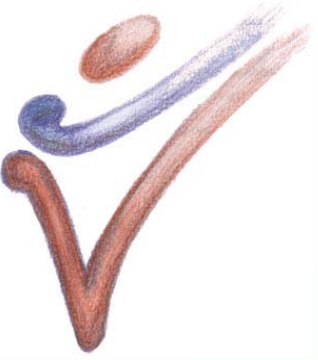




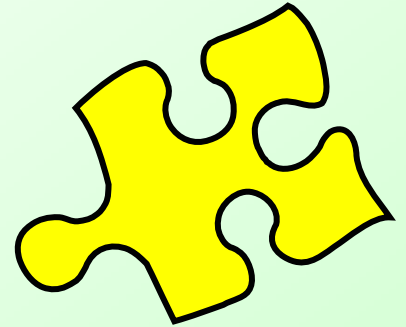
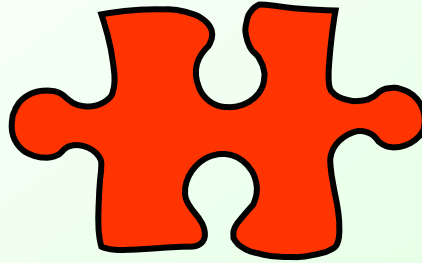
Research Actions: The Focus Groups

1. Methods and technologies to reduce risks at work, for the environment, major accidents
2. Methodologies for risk assessment and risk management
3. Human and organisational factors
4. Education and training
5. Emerging and cross-cutting risk and safety issues
6. Structural safety
7. Research hubs (e.g. nanosafety)

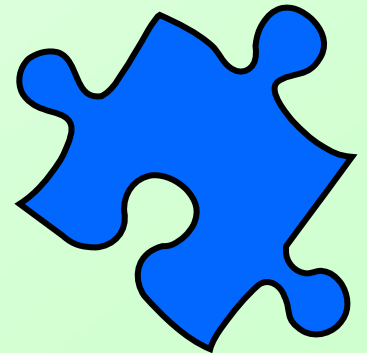
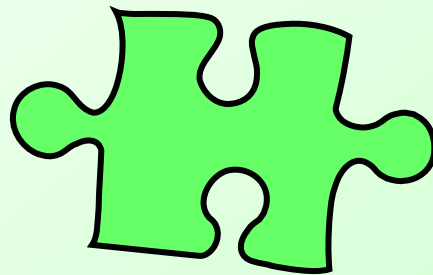




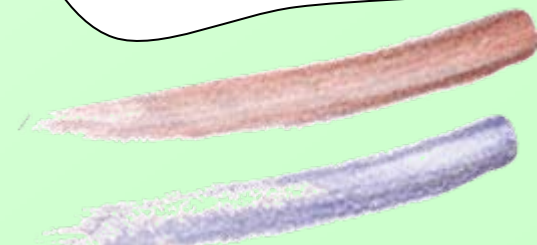
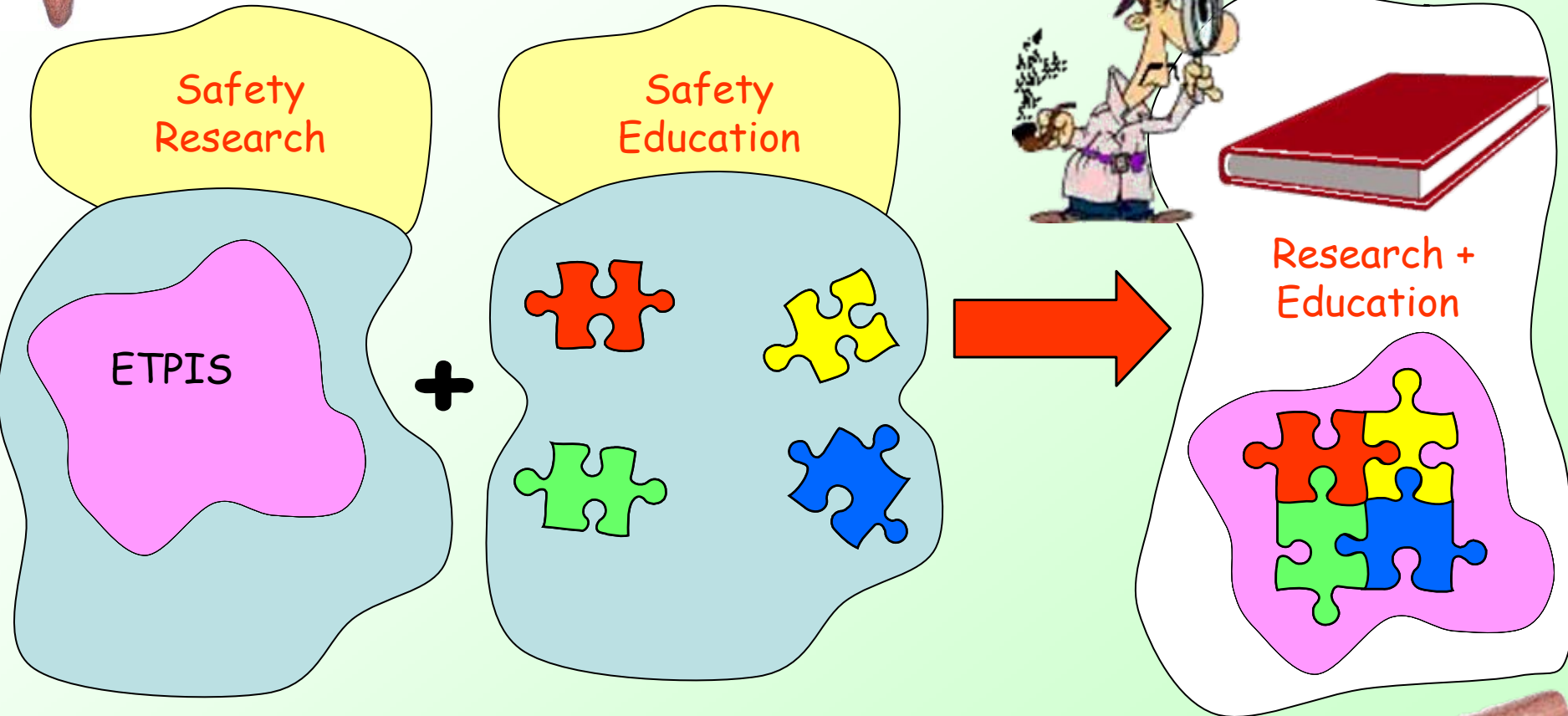
Conclusions

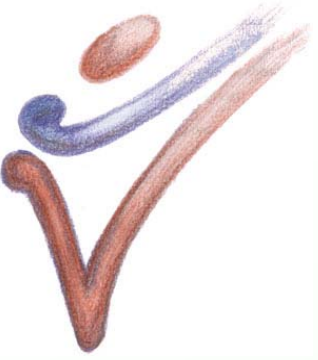


The challenge is out



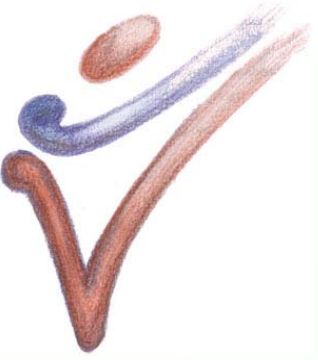
Future developments





Thanks for your patience





Contact

ETPIS

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