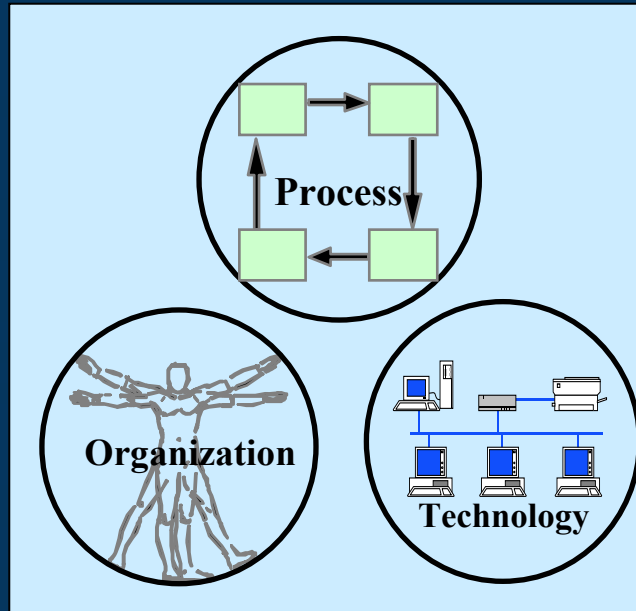# A Swedish Approach to Network Based CBRN Decision Support in Future Missions

Lars Rejnus, Johan Jenvald, Magnus Morin

Requirements & Objectives

Process

Organization

Technology

Strategies & Methods

CBRN-event management

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From a WW II view to the NCD view

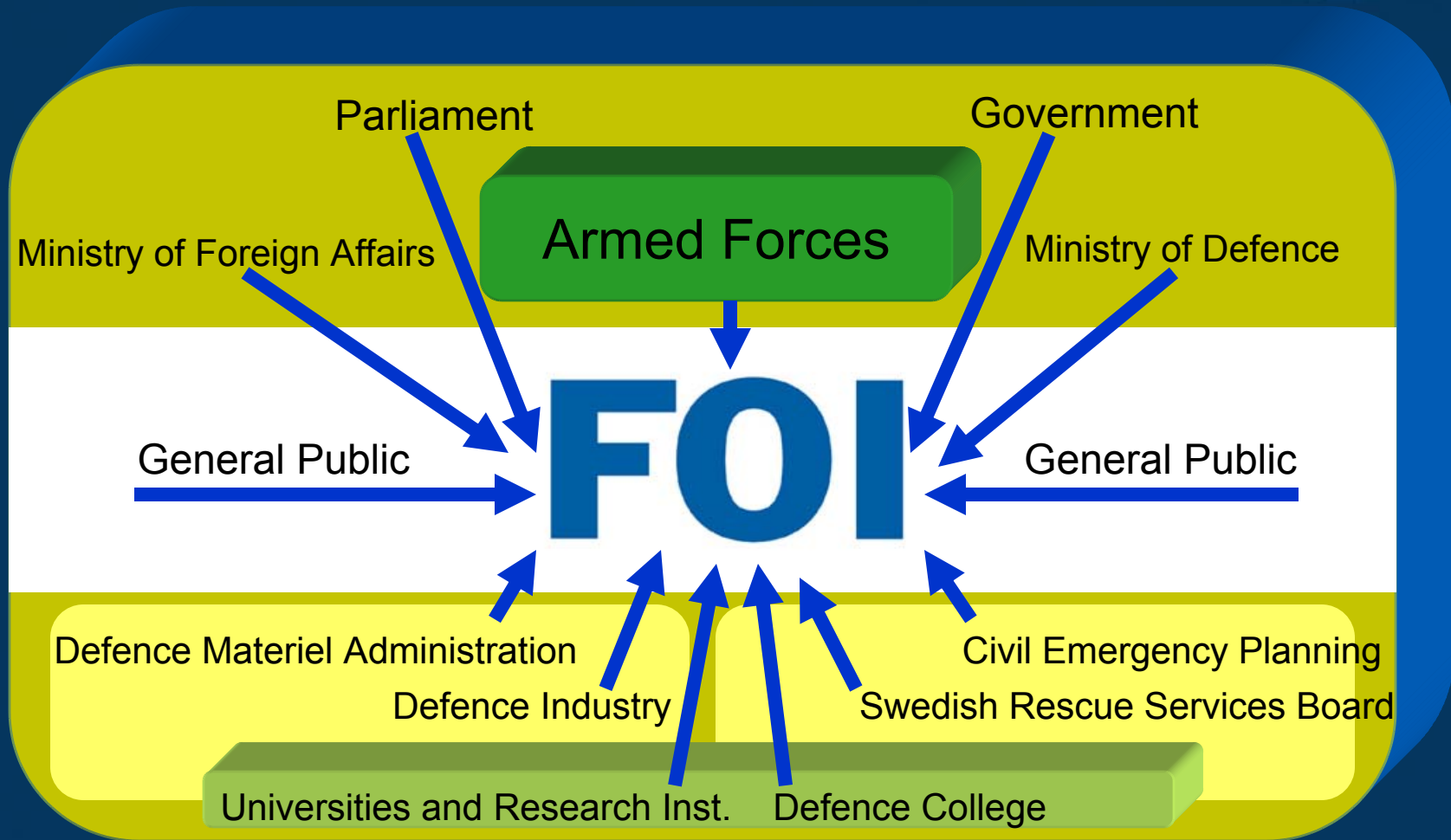# EU after the enlargement, May 1 2004
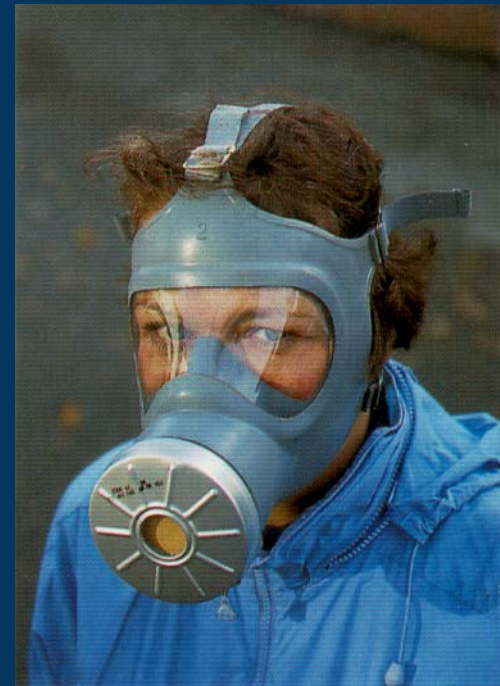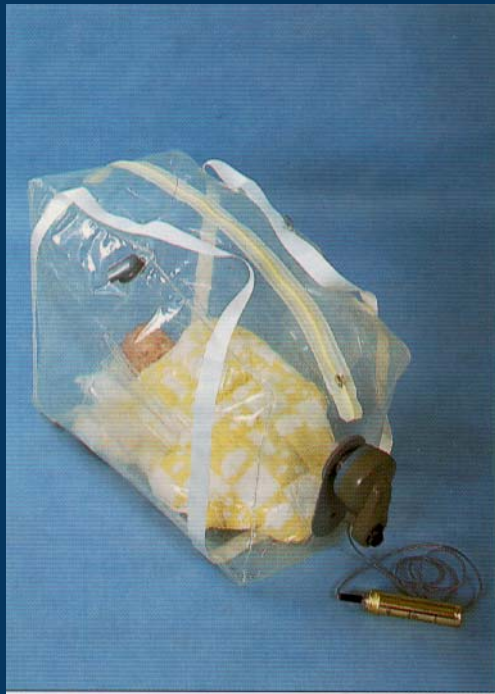
Government agency under Ministry of Defence

Total staff: 1220 Scientists: 860

7.5 million respirators available for the Swedish people since 1994

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Main objectives for CBRN protection

- **Situational awareness**

- **Decision support**

- **Agile response**

- **Increased Military – civilian co-operation**

- **NATO gateways**

2003   2005   2007   > 2014

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The Demonstrator Approach

- **Investigation of current CBRN functions**

- **Prediction of key drivers for techniques and society - 2014**

- **Business modeling used by a CBRN specialist team to describe and develop future CBRN services**

- **Information exchange with other demonstrator projects**

- **A test bed used to visualize and verify both updated and new services with focus on the operational aspects from an end user point of view**
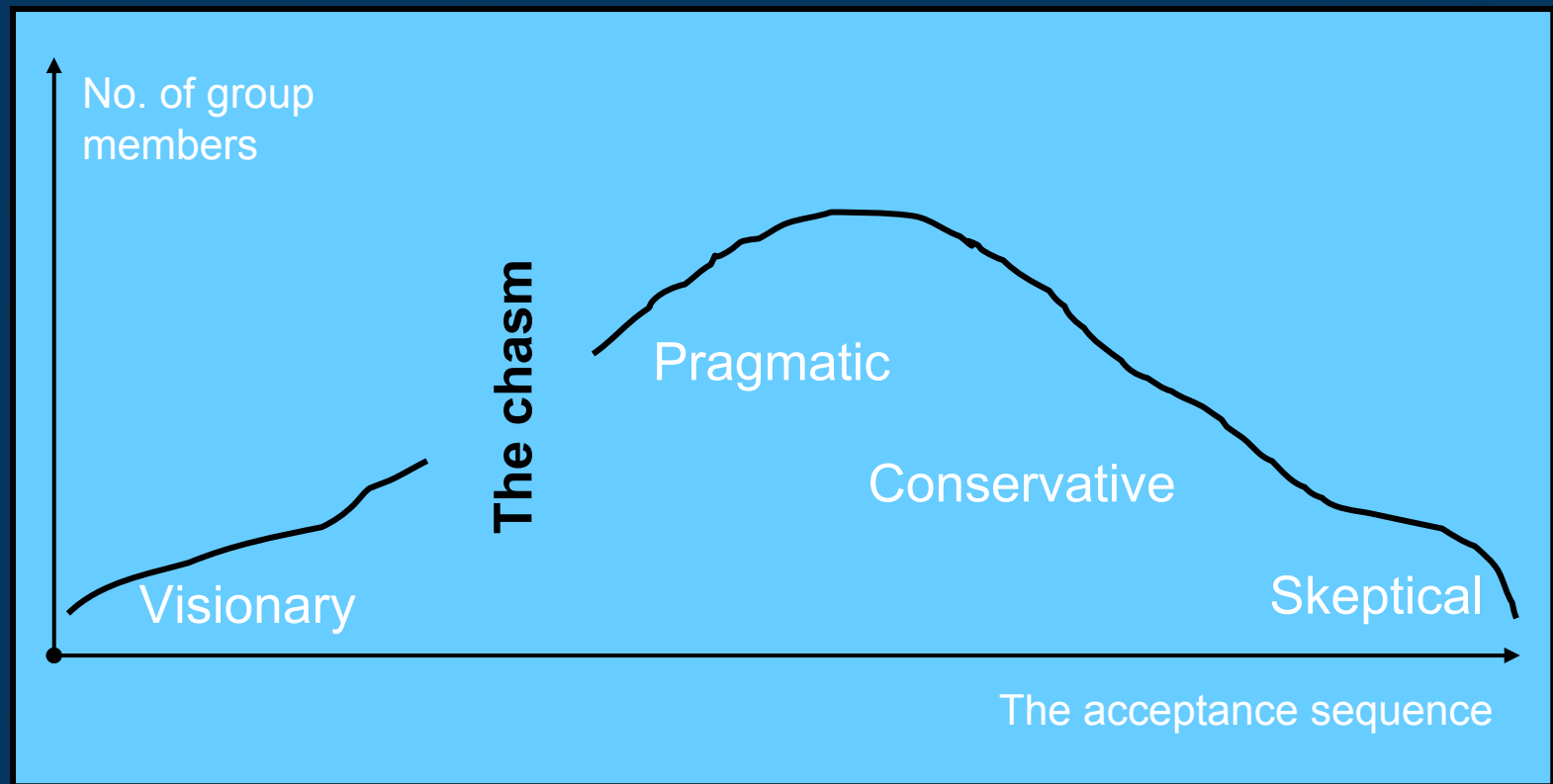
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Key domains for investigation

- **Simulation models**

- **New virtual reality models for training and education**

- **Information retrieval from the Web (external database)**

- **Wireless consumer products and services**

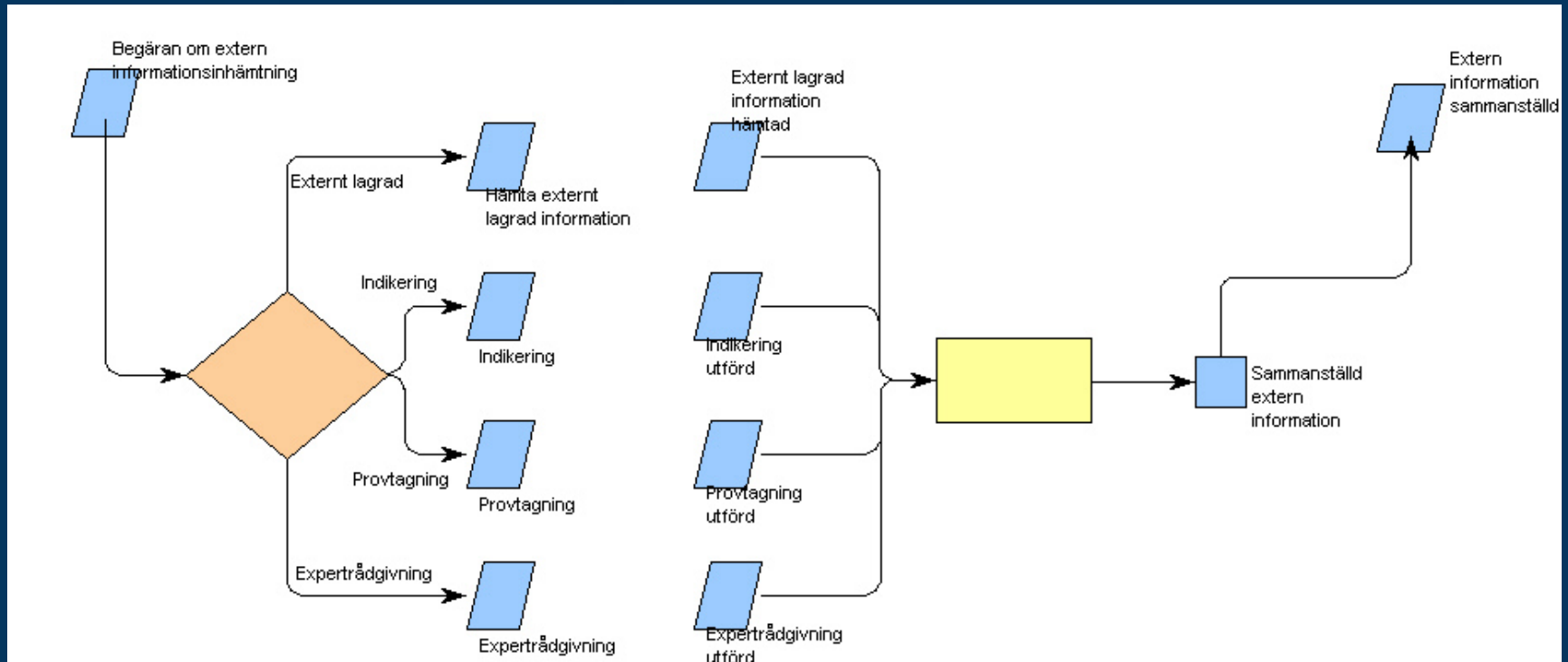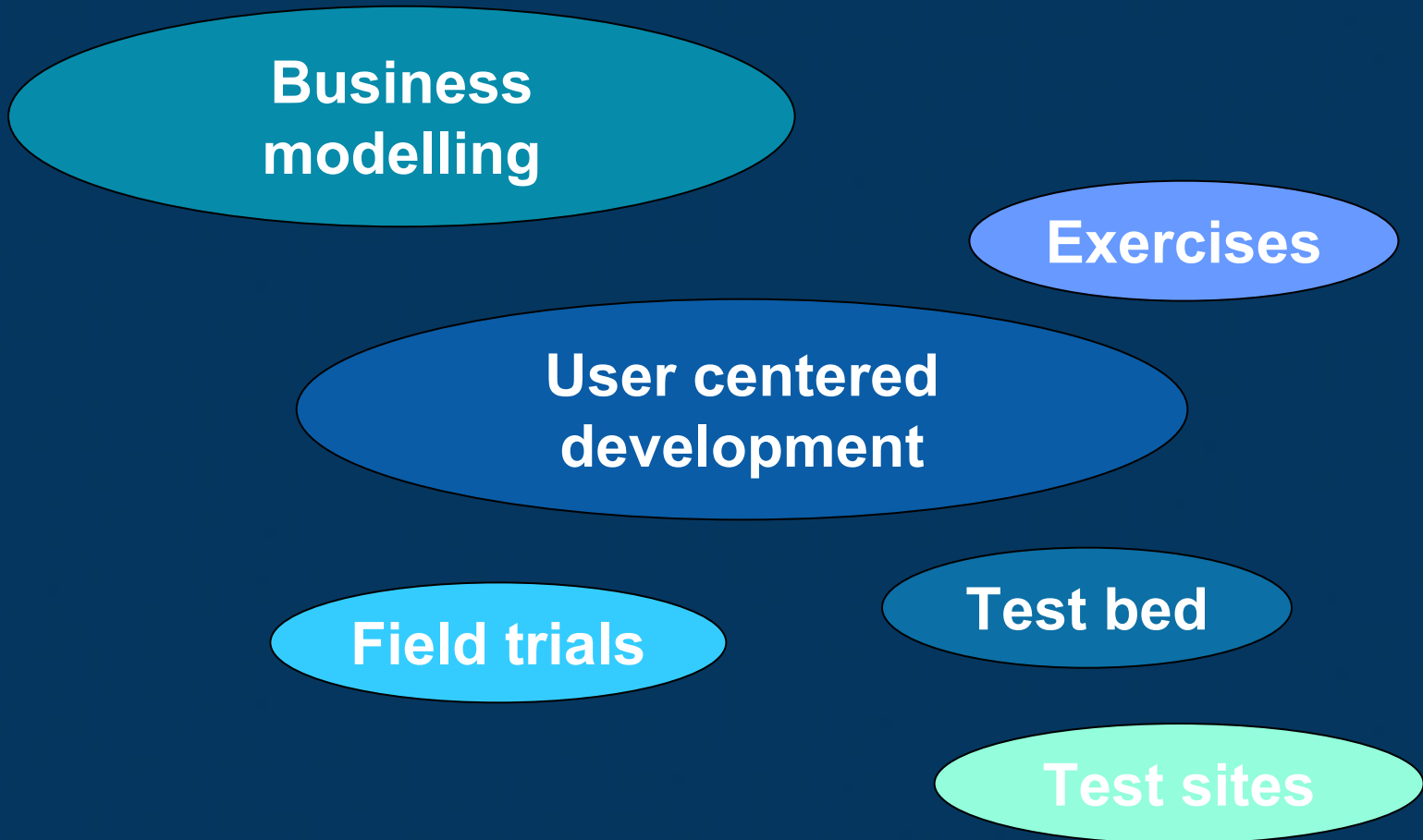- **Shared situation awareness**

- **Presentation modeling**

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Acceptance of trends and innovations

No. of group members

The chasm

Visionary

Pragmatic

Conservative

Skeptical

The acceptance sequence

Adapted from Moore (1995)

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Process Development using Business modeling tool

Co-evolution activities

Business modelling

Exercises

User centered development

Field trials

Test bed
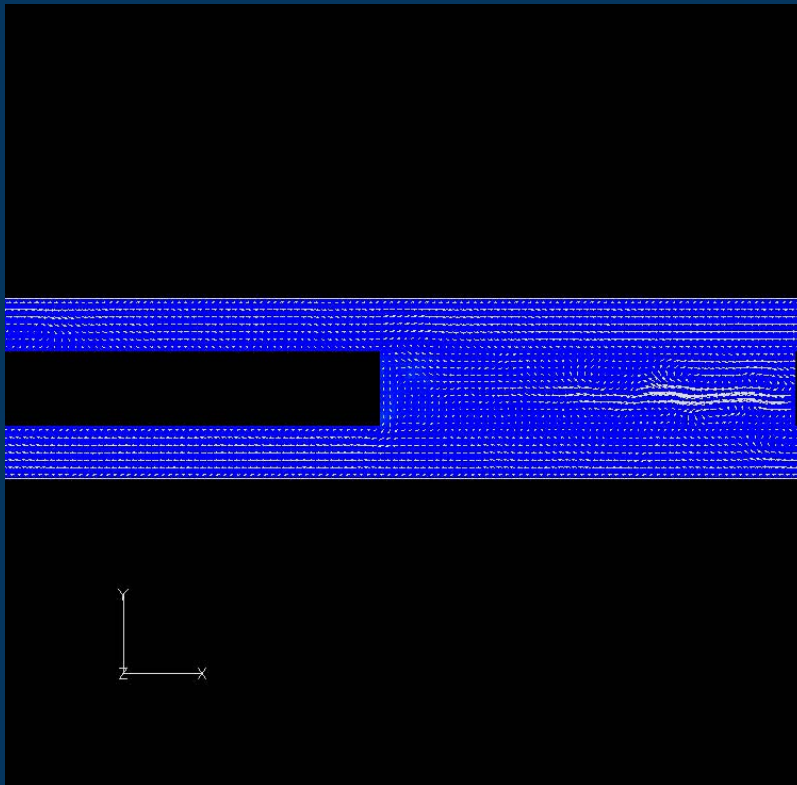
Test sites

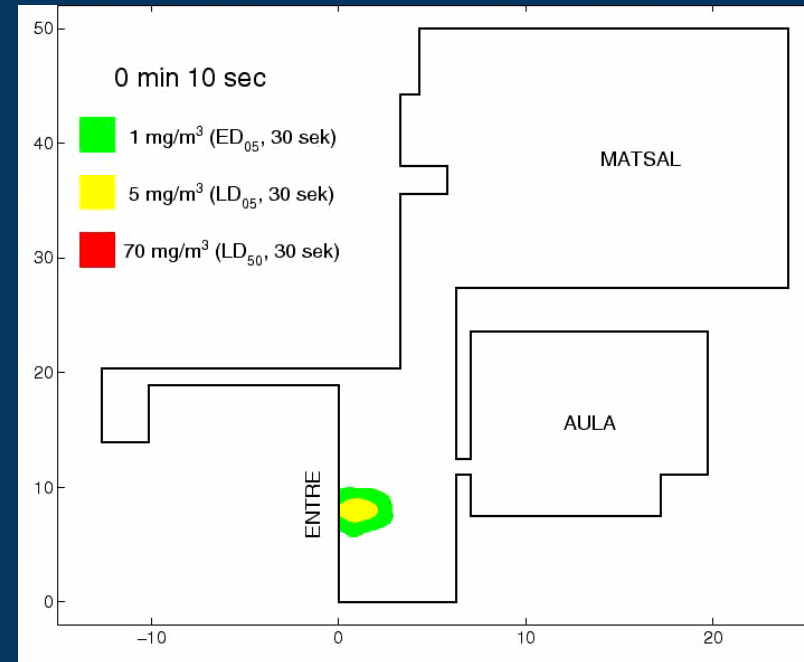**FOI** Division of NBC Defence

Test bed approach
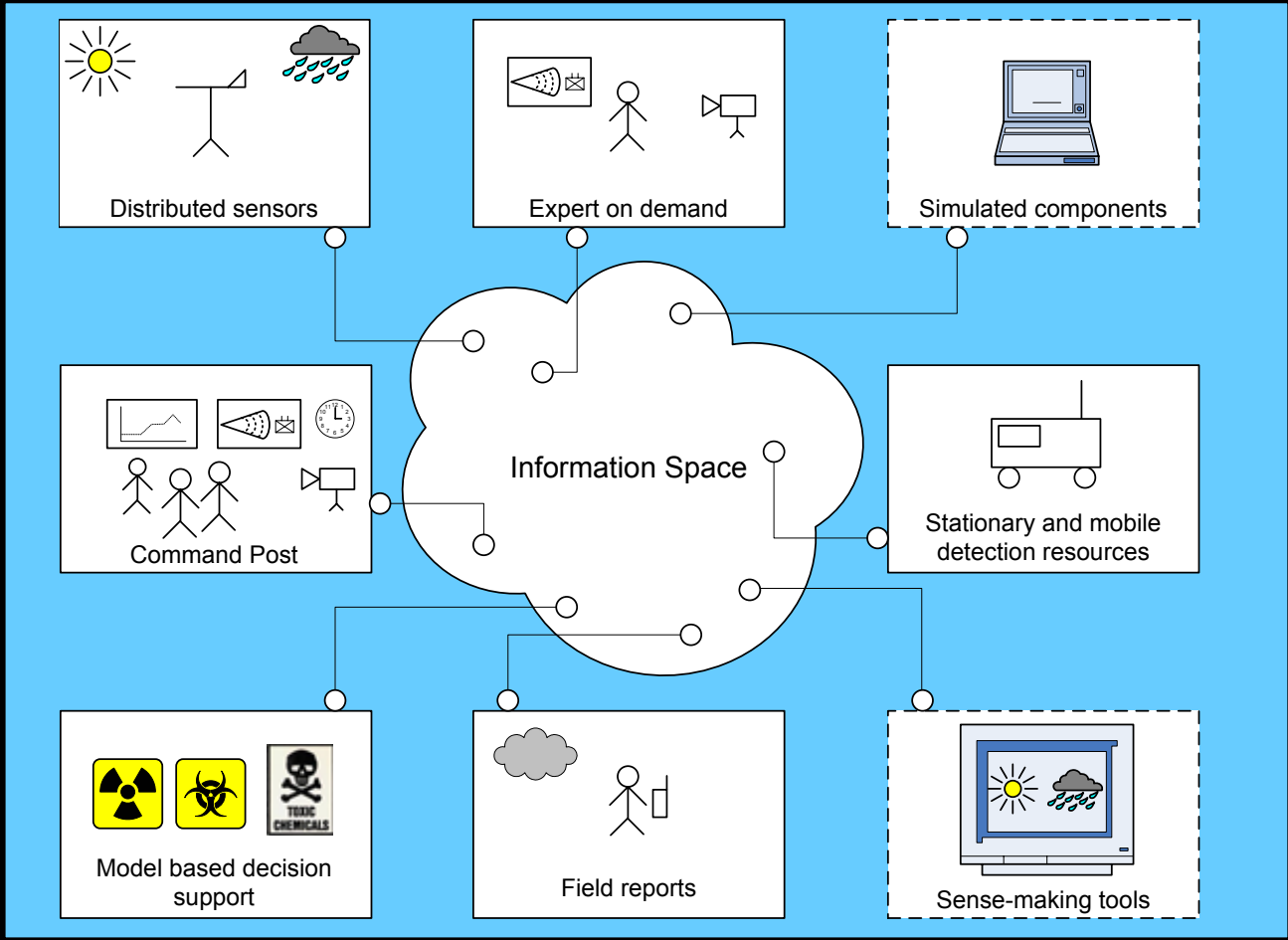
Small scale dispersion models
Simulation based on real air flow

Subway station

Public hall

0 min 10 sec

- 🟩 1 mg/m³ (ED₀₅, 30 sek)
- 🟨 5 mg/m³ (LD₀₅, 30 sek)
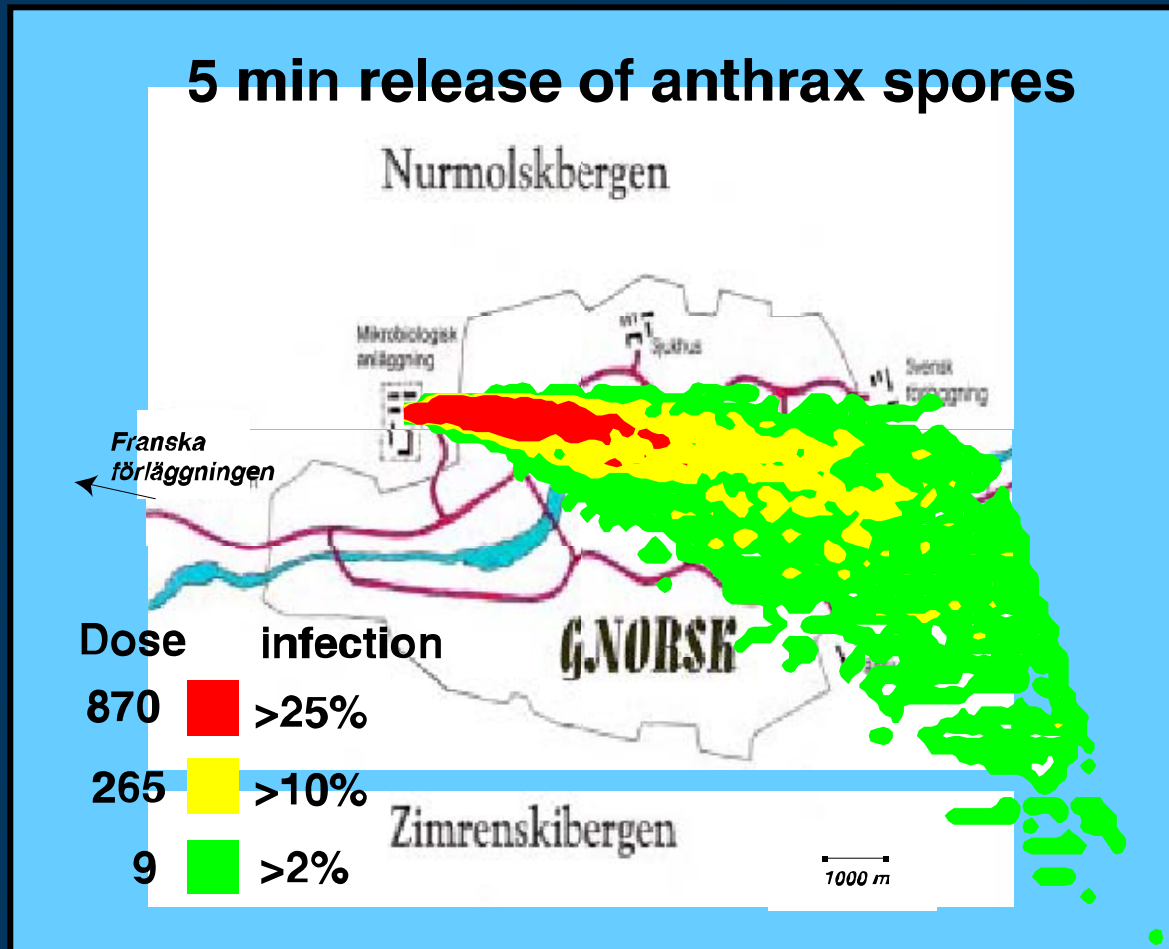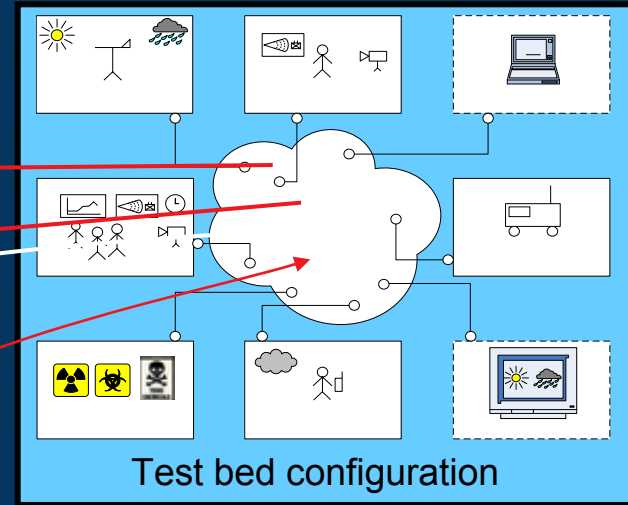- 🟥 70 mg/m³ (LD₅₀, 30 sek)

MATSAL

AULA

ENTRE

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Dose and probability for infection
Example

5 min release of anthrax spores

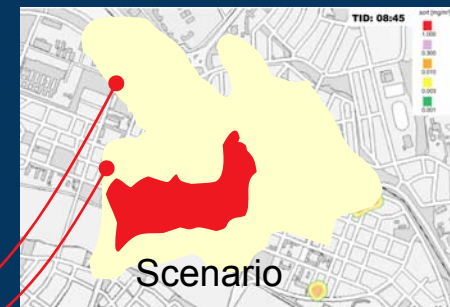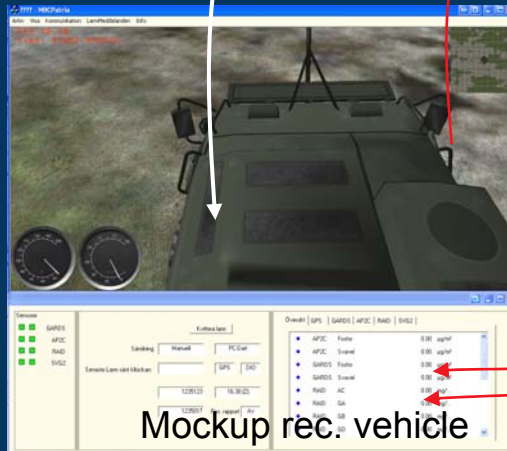| Dose		infection
870	🟥	>25%
265	🟨	>10%
9	🟩	>2%

Virtual reality MCP for education, training
and validation of models for inverted simulation, source- and disperse prediction

Prognosis

Test bed configuration

GPS, Agent, konc, wind etc.

Mockup rec. vehicle

Scenario

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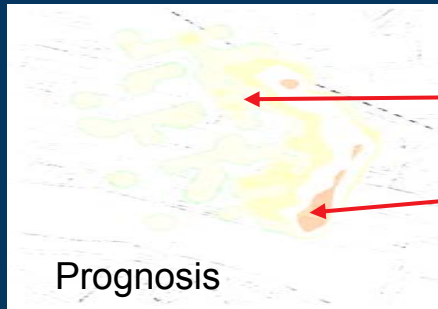
Low cost driving simulator for the NBC-rec. vehicle

■ **Simple, easy to use driving simulator for concept evaluation, demonstration, basic training etc.**

■ **Build with gaming- and enter-tainment technology**

■ **Good enough!**

Virtual reconnaissance vehicle

Virtual reconnaissance
using GPS, GARDS, AP2C, RAID, SVG2

Assessment

- **Live exercise**

- **Event-based, time-synchronized model**

- **Multimedia presentation**

- **Computer-supported After-Action Review**

- **Assessment tools**

Information retrieval from the Web
storage, extraction and analysis

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Wireless consumer products and services

Shared situation awareness

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C2 exercise – Example

Today

Future

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Conclusions

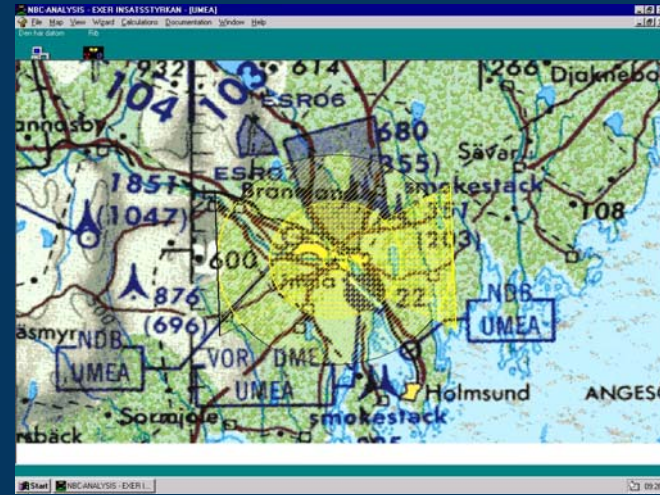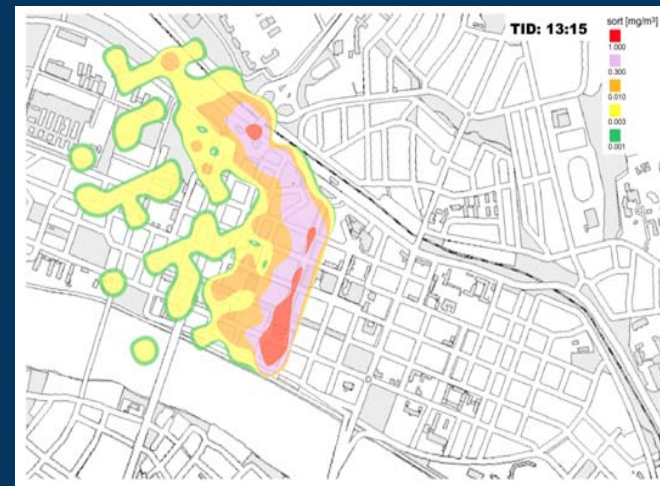## The way ahead with the CBRN Demonstrator

Changing threats

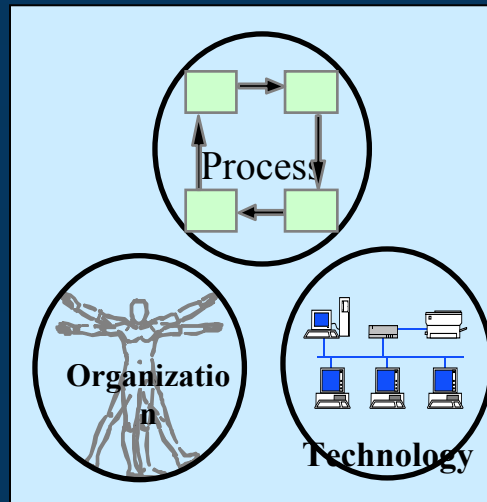**Network Centric Defence paradigm**

Trends and key drivers for the future

2014 Vision

Situational awareness
Decision support
Agile response
Increased Military – civilian co-operation

Develop new knowledge

Process

Organization

Technology

Business modeling
User engagement
Test bed development
Exercises
Training – virtual reality
-Simulation models
-Virtual reality models for training and validation
-Information retrieval from the Web
-Wireless consumer products and services
-Shared situation awareness
-Presentation modeling
-Visualization

Requirements & Objectives

Strategies & Methods

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I will thank
The Swedish Armed Forces www.mil.se
&
The Swedish Defence Administration www.fmv.se

for granting this work

lars.rejnus@foi.se

Comments?
Questions?
Suggestions?

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Increased military - civilian co-operation

- **The CBRN issues is of common concern**

- **The civil society's ability to manage a CBRN incident must be supported**

- **In the early phase of a military attack on our country, the society has to rely on the civilian responding organizations for protection and aid**