



FREQUENTIS
FOR A SAFER WORLD

How electronic networking will change the way we manage disasters

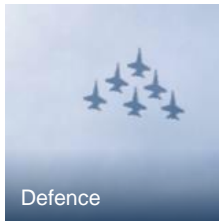
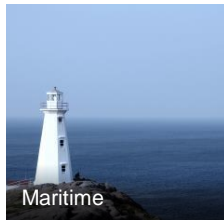
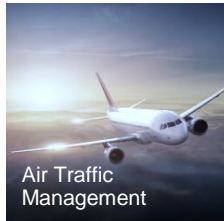
a report about trends from ongoing research
17th EΦA ROUNDTABLE Fire brigade 4.0

Overview

- Introduction – who we are
- Critical control room research strategy
- Electronic information exchange –
the common information space CIS
- Application scenario

Highly reliable communication and information solutions for a safer world

More than 65 years of innovation in safety-critical applications



We set standards

2. Research Strategy

- Global goals
- Human capabilities
- Technology supports humans
- Research projects



Frequentis Internet

www.frequentis.com

**NUMBER ONE
IN CONTROL CENTRE
SOLUTIONS**

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SOLUTIONS**

The purpose of the Control Centre Solution is
to help people to gain
**confidence of action and leadership
for managing safety-critical missions**



Human capabilities

... supported by technological elements

Human capabilities

- The capability to have a clear **understanding of the situation** ... including all relevant pieces of information
- The capability to make **sustainable decisions** ... by considering all options and their consequences
- The capability to **direct the operations** in an effective way ... by steering and monitoring all relevant actions
- The capability to **communicate** any time ... in a secure way with all relevant units also across organizations
- The capability to **collaborate** (including cross-org collaboration) ... based on a common understanding of the situation
- The capability of being **mobile** in order to provide all that for distributed organisations and a dynamically changing communication infrastructures

Technological elements

Common
operational
picture

Decision
support

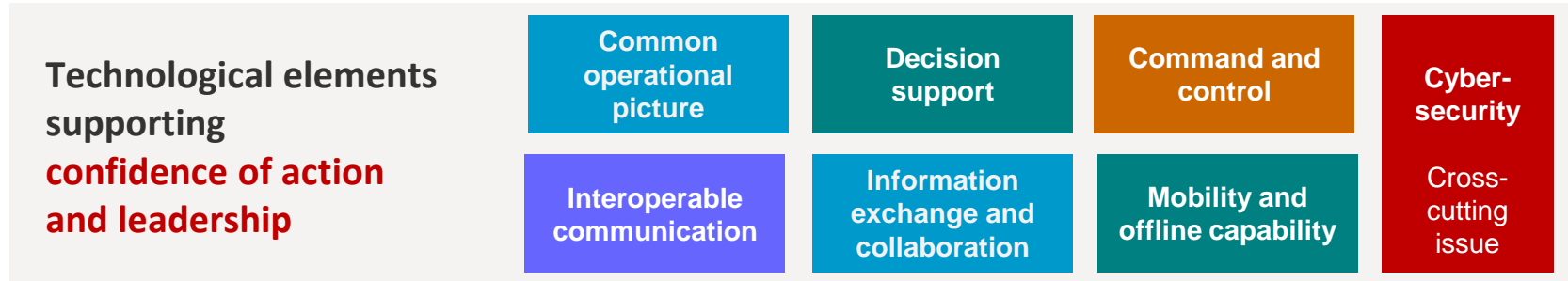
Command and
control

Interoperable
communication

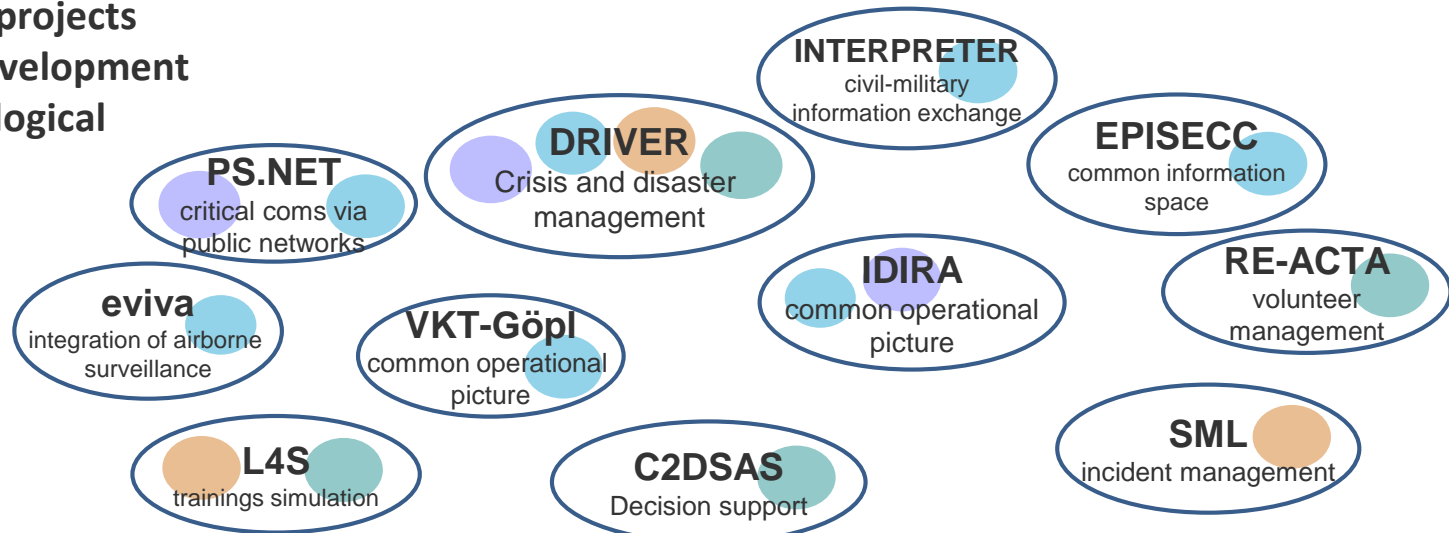
Information
exchange and
collaboration

Mobility and
offline capability

Research projects for the development of technological elements



Research projects for the development of technological elements



Programs, partners, platforms



Example: The IDIRA project

Electronic information exchange

- cross organization
- cross border, multi-language

Ad hoc networking

- establishing of the required communications after a disaster
- mashed network
- microwave links
- WIFI

<http://www.idira.eu/>



2. Electronic information exchange

- The problem of decision making within a multi-organizational, collaborative context
- The common information space
- A scenario based look into the future

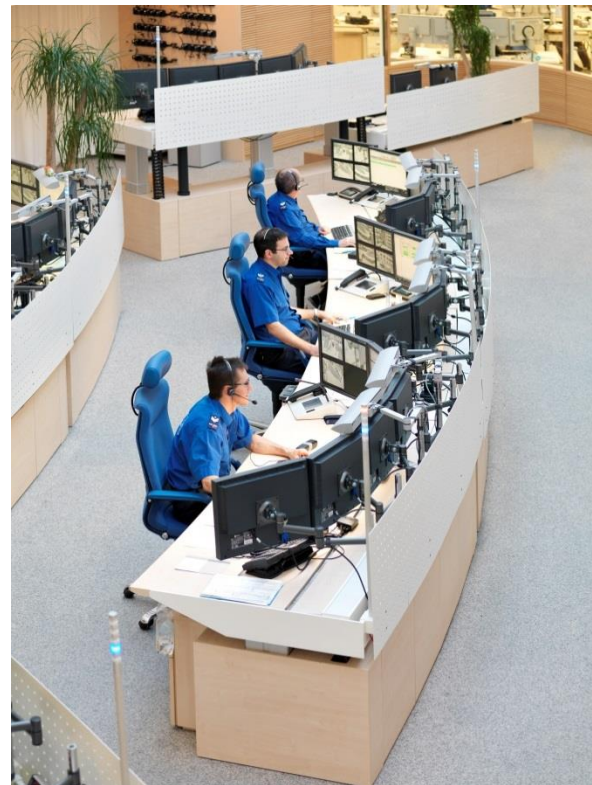
Situation awareness ...

means:

- to understand the actual situation
- to anticipate the possible future development
- to foresee corresponding hazards

... and therefore:

to have the ability to act proactively



Situation awareness and proactive action...

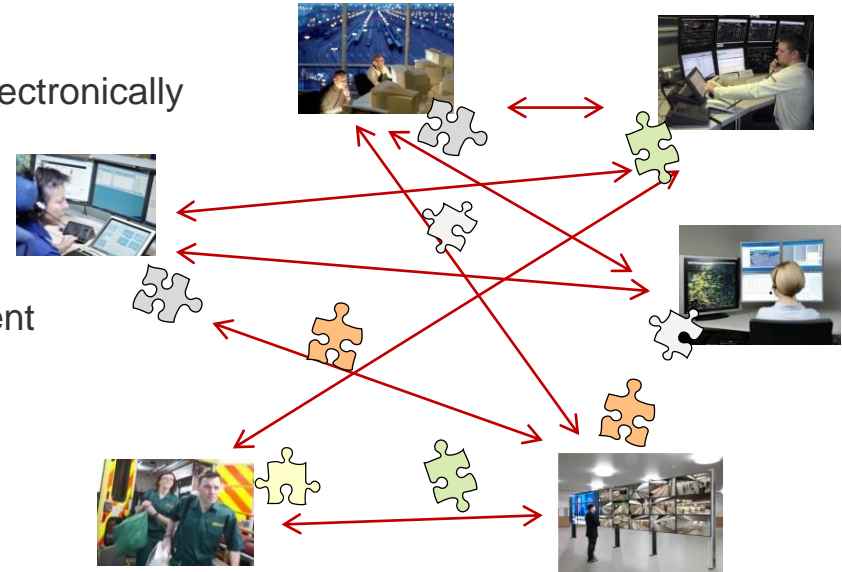
have become difficult because of:

- the dependencies on complex infrastructures
- the inter-dependencies of infrastructures and the possibility of cascading effects
- the high dynamics
- the high number of stakeholders
 - emergency organisations
 - public authorities
 - special services
 - infrastructure operators
 - NGOs
 - citizens
 - companies



The challenge

- information is distributed among the stakeholders
- collaboration is only partially established and sometimes not formalized
- information sharing and management is often done with inappropriate means
 - liaison officers, paper, email, fax, phone, www, whiteboards
- information in these formats
 - cannot be processed (associated and integrated) electronically
 - is not geo-referenced
 - can hardly be quality-assured
 - is often not up-to-date
 - cannot be filtered automatically and is not transparent



The consequences

- damage happens although it could have been avoided
- inappropriate assignment of resources
- criticism from the public
 - press
 - citizens
- social media leverage this effect dramatically
 - citizens are connected to a crisis situation “in real time” via social media
 - citizen expectation is that the authorities make use of all this information for their decision making “in real time”
 - criticism becomes multiplied (up to the extreme of “shitstorms”)



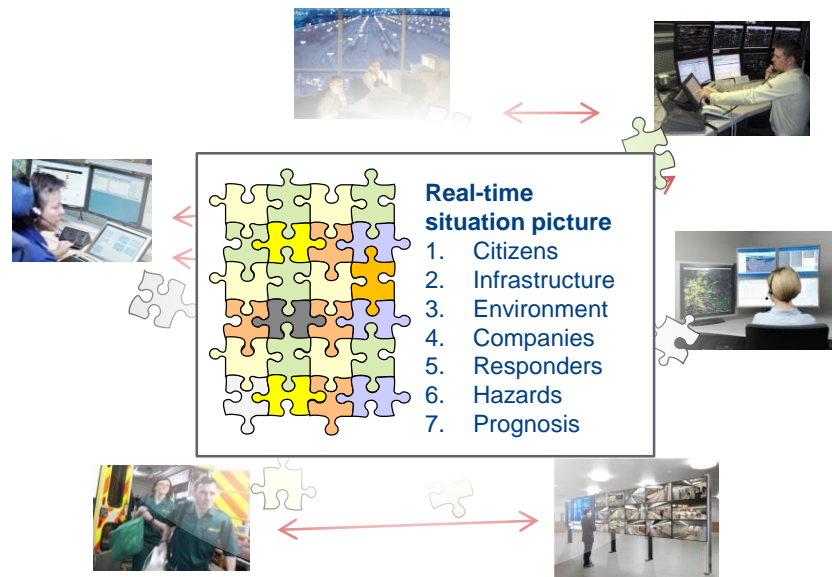
The desire

Sharing of decision-relevant pieces of information

- in real time – so they are up-to-date
- in a secure way – confidentiality, integrity and authenticity are ensured
- in a machine-readable way

These pieces of information can be

- put together to a meaningful picture
- matched to the information needs of the recipient
- visualised in an appropriate format



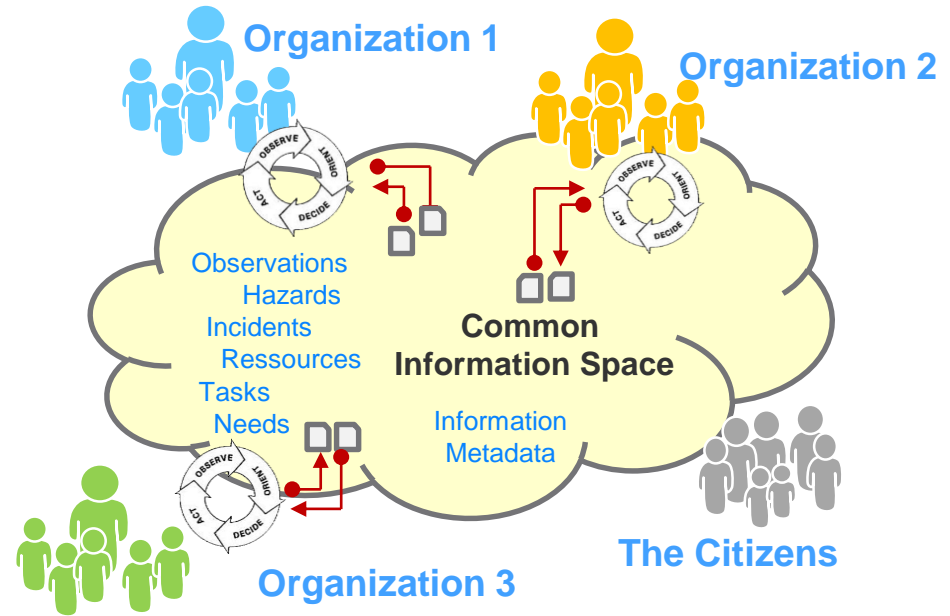
Solution concept from the european security research

Common Information Space

Offers the capability of pro-active action in a crisis situation through a better decision-basis

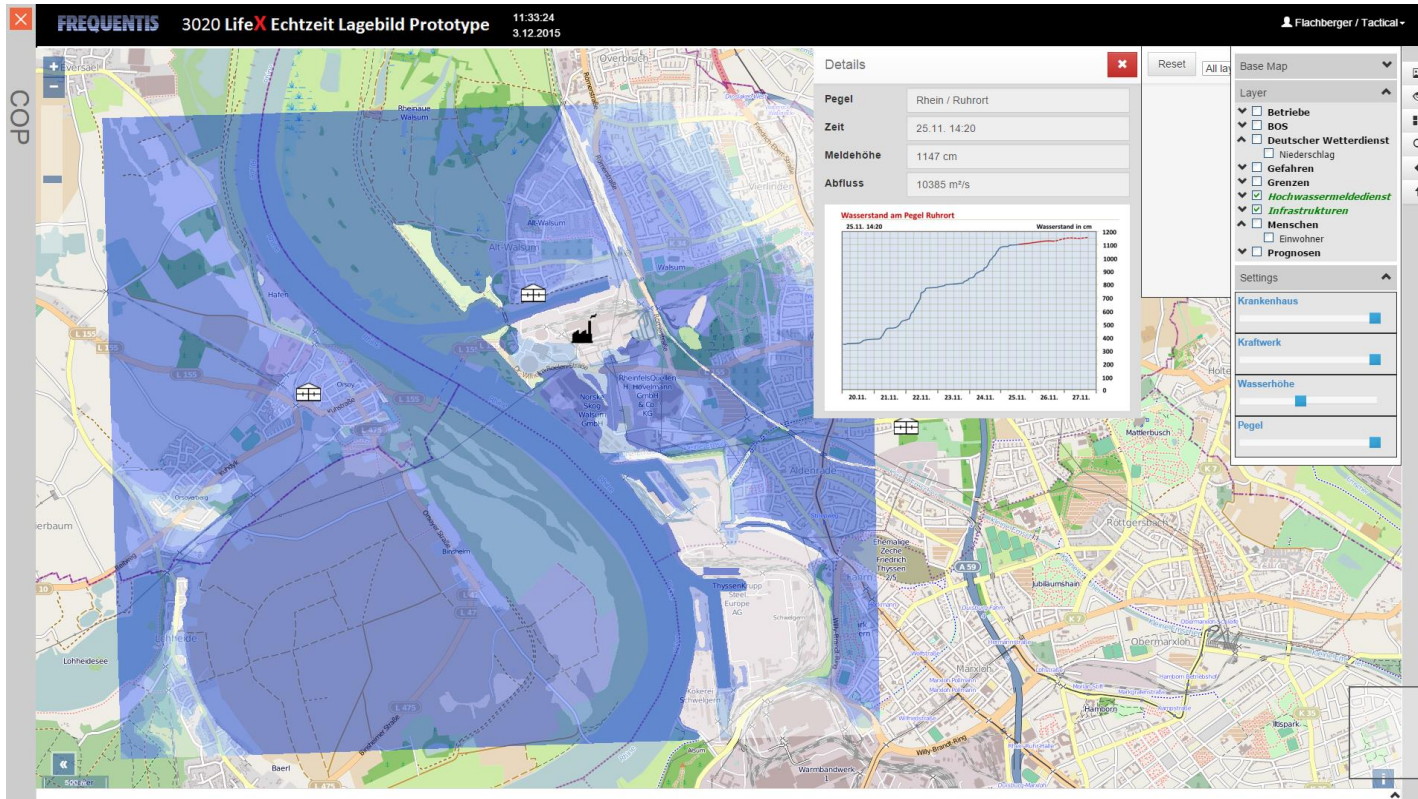
- electronic information exchange
- real-time situation picture
- detection of possible cascading effects
- quality assurance of data
- geo and time reference

<https://www.episecc.eu/>



3. Application Scenario

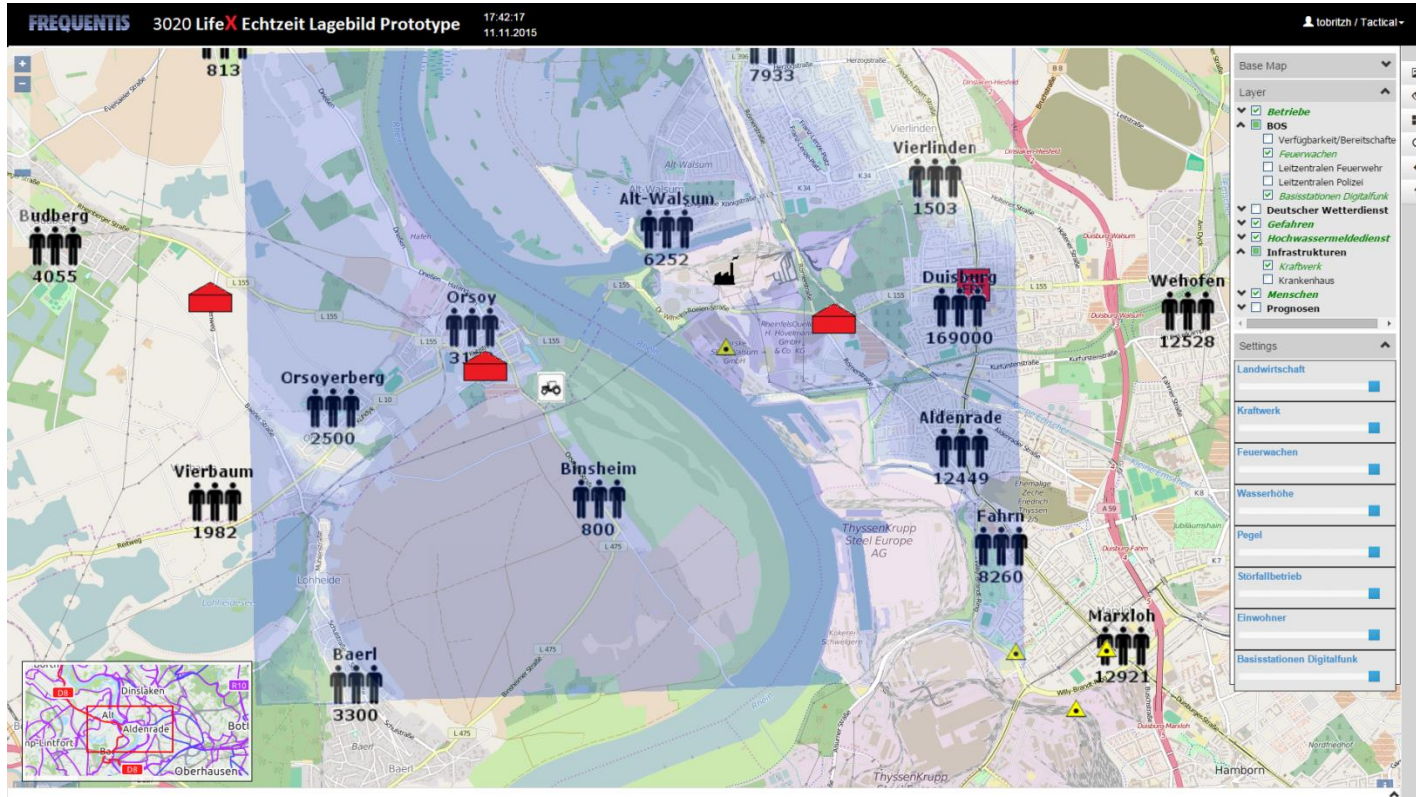
Screenshot 3020LifeX COP



Flood Situation:

- river level „Rhein Ruhrort“
- flood levels over land
- hospitals
- power stations

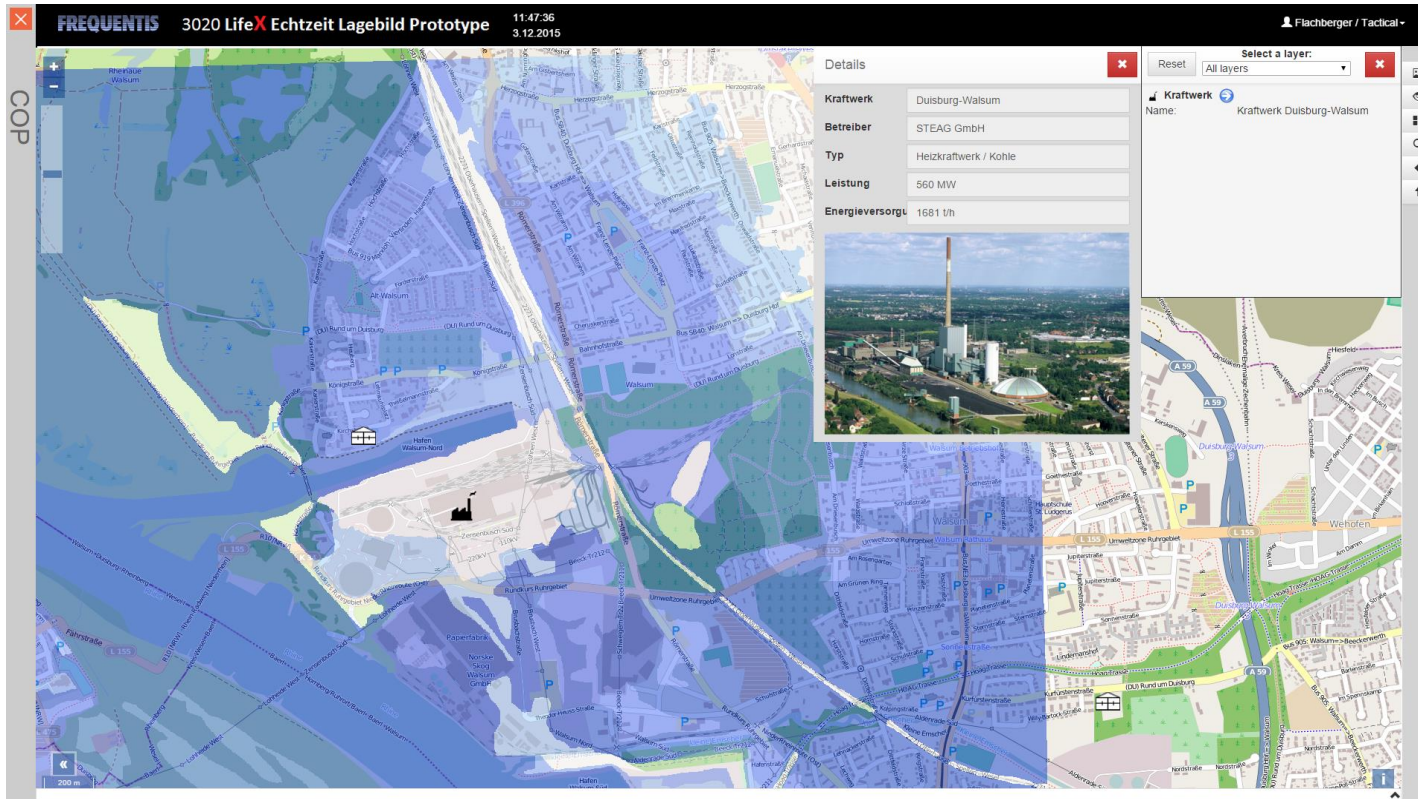
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Flood Situation:

- inhabitants per community
- fire stations
- farms
- hazmat companies

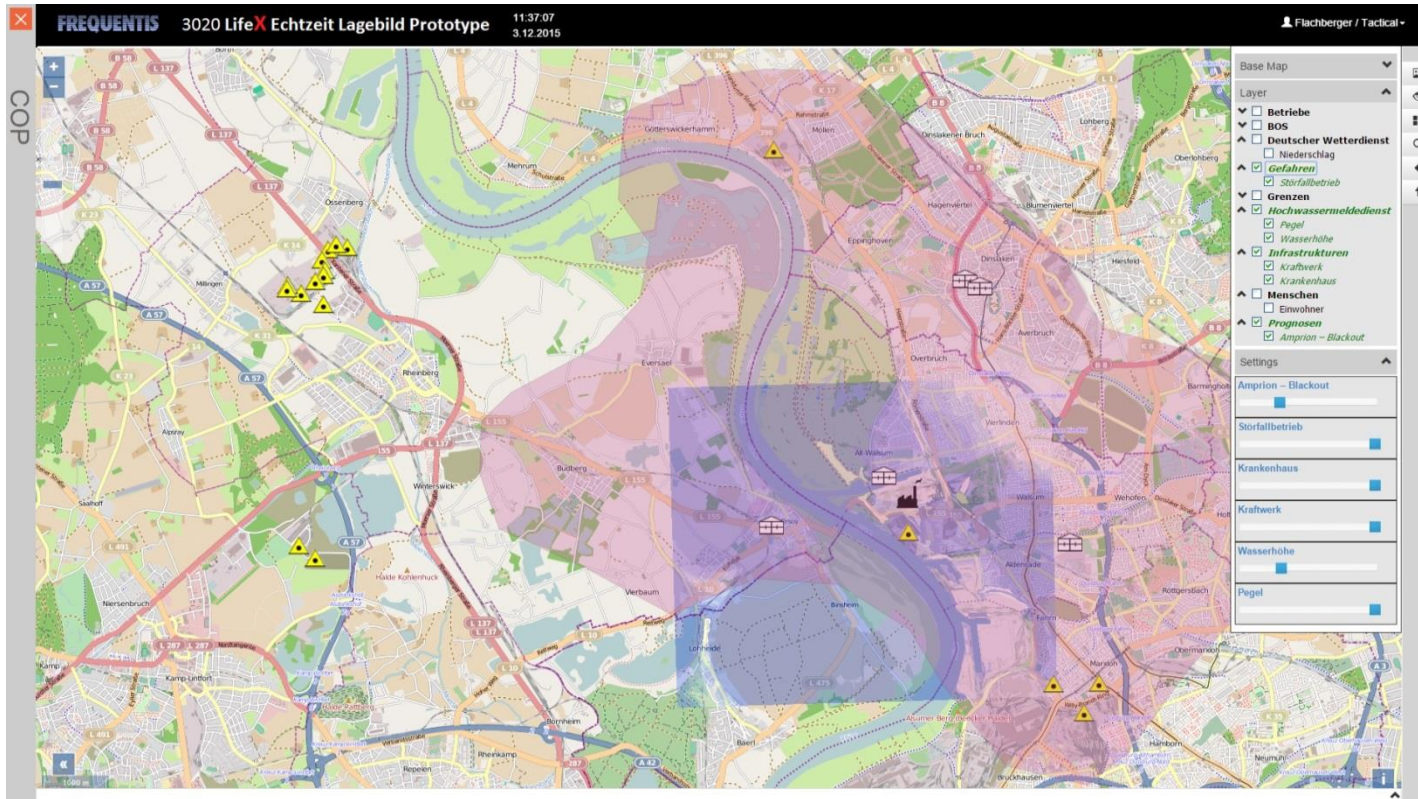
Screenshot 3020LifeX COP



Flood Situation:

- details power station „Duisburg-Walsum“
- question: coal-supply during the flood?

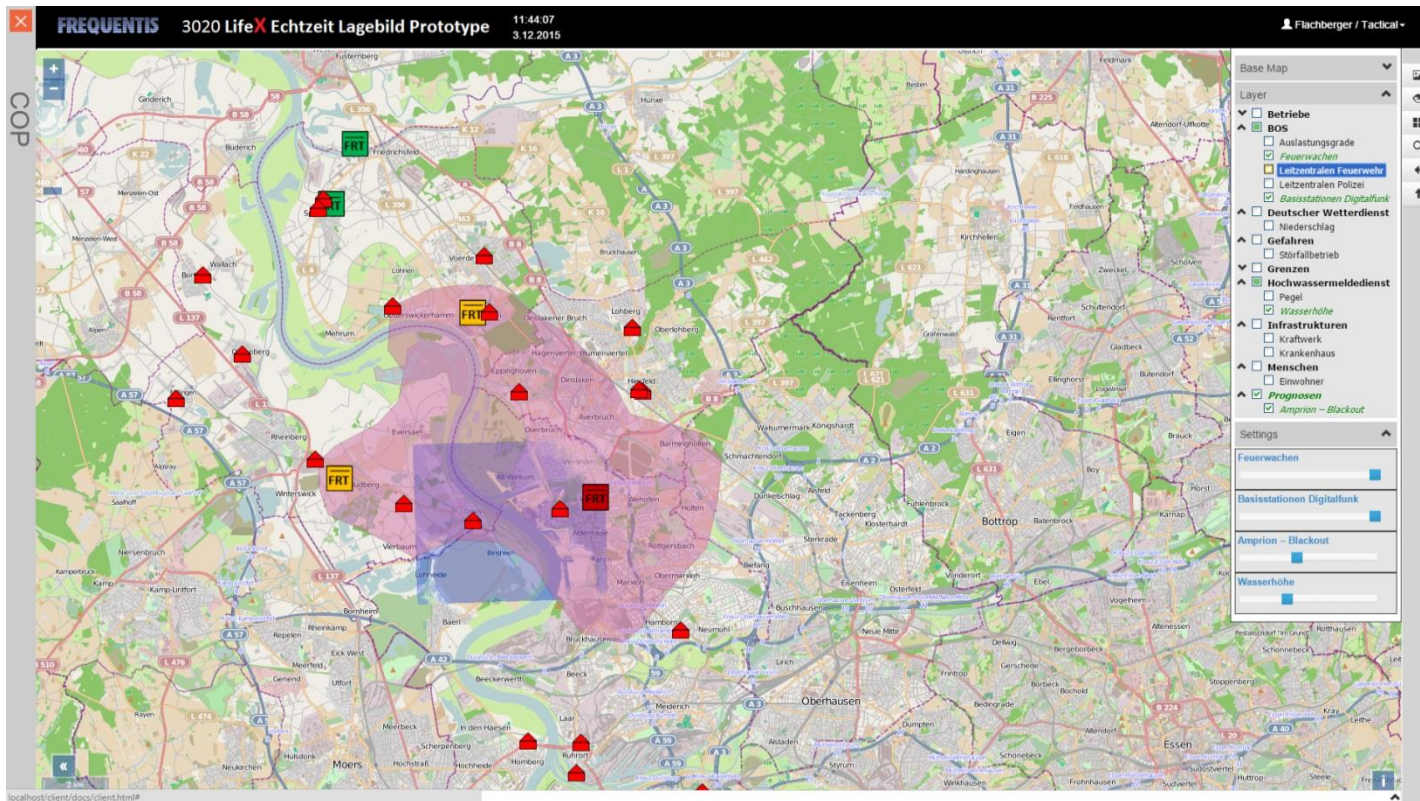
Screenshot 3020LifeX COP



Blackout-prognosis:

- blackout area
- hospitals
- hazmat companies

Screenshot 3020LifeX COP

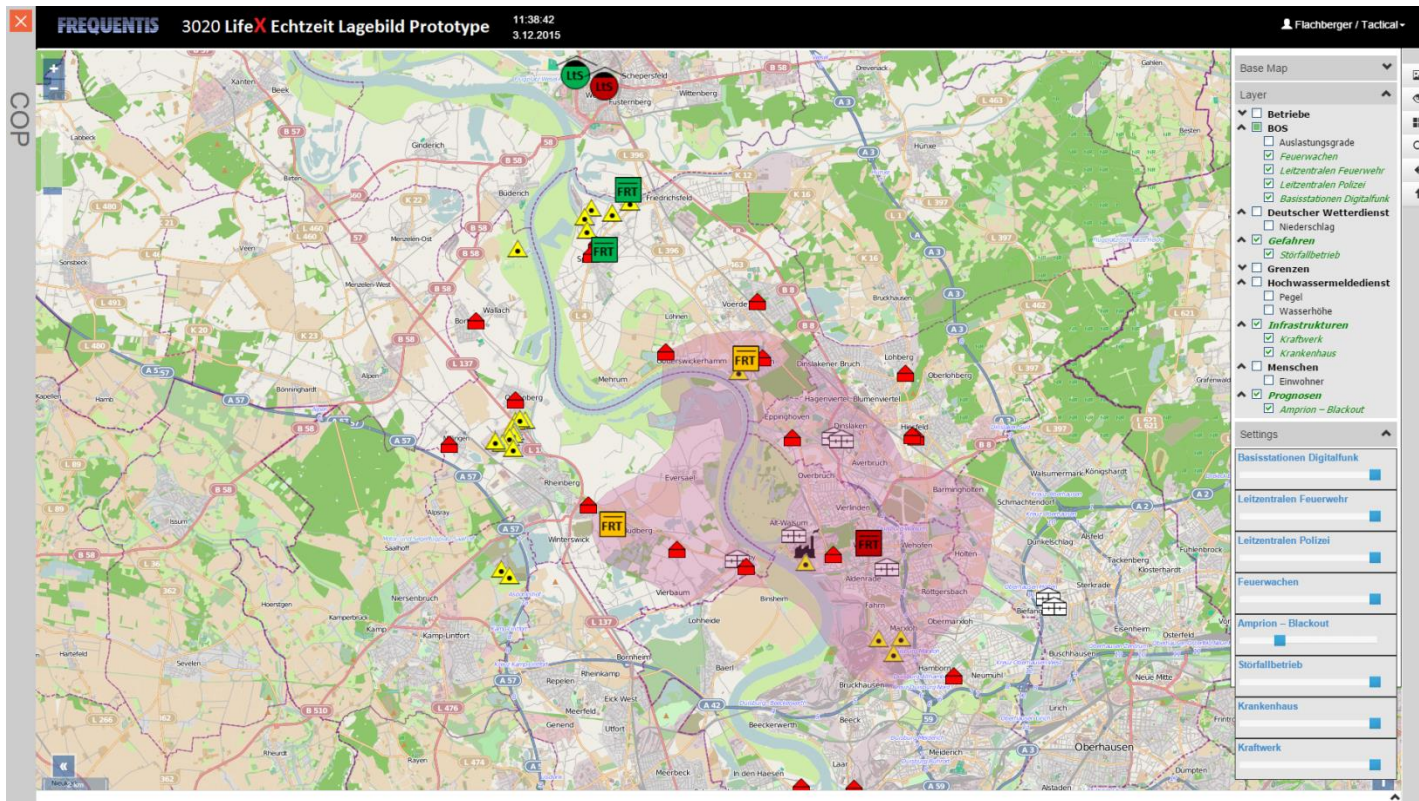


Blackout-prognosis:

→ fire stations

→ PMR base stations:
TETRA (FRT)

Screenshot 3020LifeX COP



Blackout-prognosis:

→ fire stations

→ PMR base stations:
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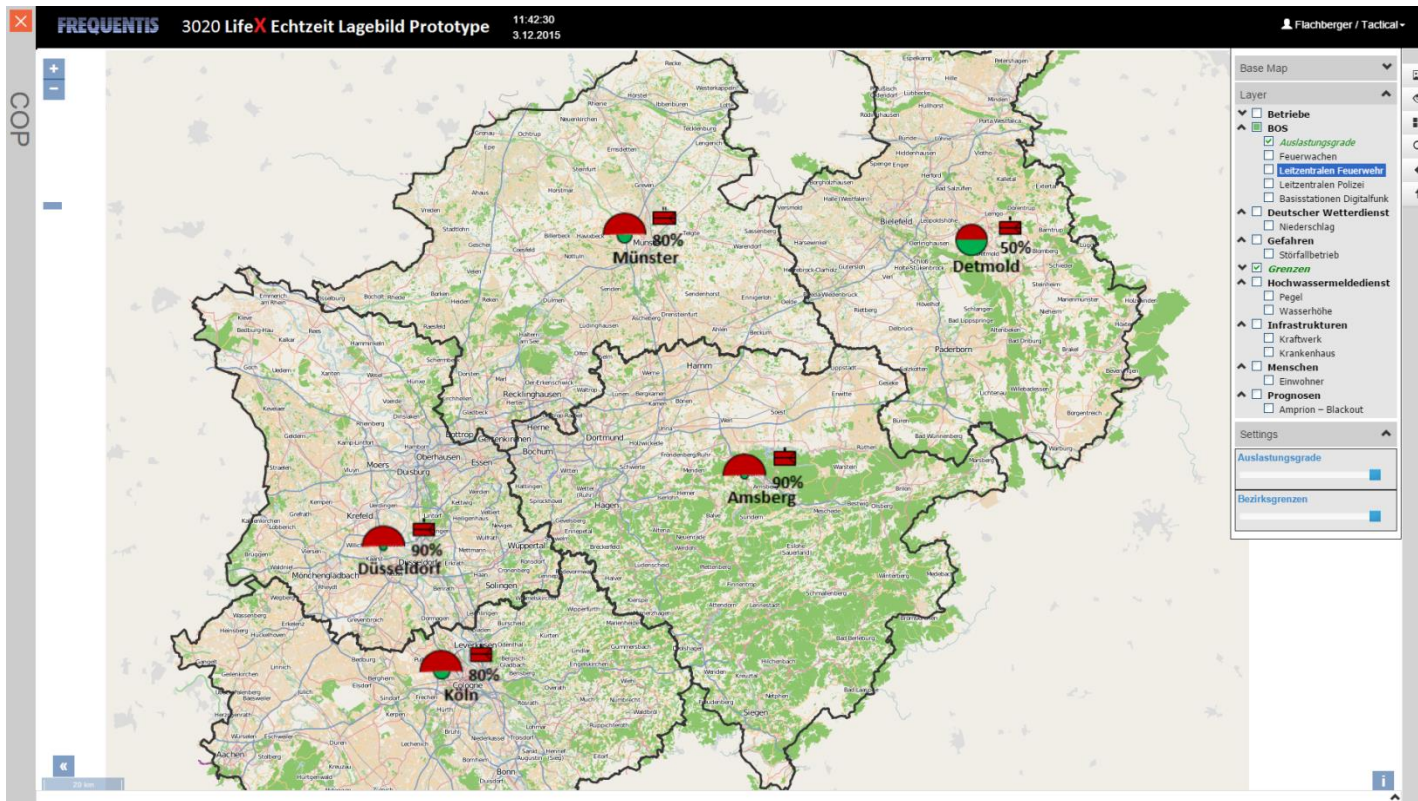
→ hospitals

→ hazmat companies

→ police dispatch
centres (LtS)

→ fire dispatch centres
(LtS)

Screenshot 3020LifeX COP



Strategic View:

→ aggregated utilisation level of firebrigades per district

Digital situation table: our demo device from the EPISECC project





FREQUENTIS

FOR A SAFER WORLD

Michael Zwingl

Head of Sales Public Safety

michael.zwingl@frequentis.com



Markus Seifter

Domain Sales Public Safety

markus.seifter@frequentis.com

