Overview

› What are control organisations?
› Trends and developments
› HF-based framework for designing control organisations
› Implications for railway security
What are control organisations?

› Operational teams
› Critical environments
› Managing or controlling a system or process
› Deal with predicted and unexpected real-time events
› Typical examples:
  › Critical/vital infrastructures
    › Highway, rail, utility, telecom
  › Complex operations
  › Crisis management, logistics, defence
The environment is changing

- Interdependency between organisations: multidisciplinary
- Network-enabled operations
The system is changing

- Self-organisation and autonomy
- Changing roles
- Social media
Control Organisations are changing

- Shift from operational to tactical tasks
  - Higher levels of automation
  - From direct control to supervisory control
- From reactive to a proactive mindset
- Smaller teams, higher operational efficiency
- From domain experts to information managers
  - Lower levels of domain knowledge required for operators
  - Other competences and skills required for operators
Organisation
- Goal and services
- Roles and responsibility
- Culture
- Network

Collaboration
- Multi-team
- Leadership
- Communication
- Information sharing

Operators
- Situation awareness
- Decision making
- Workload
- Human error

Training
- Selection
- Training on the job
- Time-to-competence
- Simulations

Workspace
- Centralized vs networked
- Work place
- Work environment

Systems
- Decision support
- Levels of automation
- Large Screen Displays
- Multi-touch systems
- Alarms
Trends in organisation

- The control organisation is part of a network of organisations
  - Trans-organisational networks: the control network
  - Adaptive, variation in partners
  - Boundary spanning issues between organisations in different domains and disciplines
- Shift from isolated control rooms to a networked virtual control center
Trends in collaboration

› Multi-team systems (team of teams)
› Collaboration at a distance
   › Ad hoc virtual teams with local and remote experts
› New forms of leadership
Trends in systems

- Networking-enabled cooperation technologies
  - Interoperability
  - Integration of data sources
- Autonomous software agents, new HCI principles
- Social media monitoring and acting (Twitcident)
- Smart mobile devices bring control data and functions to the field
- Intelligent camera systems
Railway security (and safety)

Challenges (TRIPS/PROTECTRAIL):

- The complexity of interconnected infrastructures and systems
- Different and sometimes conflicting stakeholder requirements

Interoperability needs to be addressed at a technological and an organizational level
Railway security (and safety)

- Challenge (TRIPS/PROTECTRAIL):
  - Quick threat/incident detection
- Two important technical enablers
  - Advanced camera systems
  - Social media tools
- Shift to proactive emergency response centres
  - Prediction and early signalling
  - Smarter influencing crowd behaviour
- Changing attitude towards citizens
  - Increasing self-reliance
  - Citizens can support first responders
Questions?