

AUTONOMY AND SAFETY WHEN THE HUMAN IS IN THE LOOP – WHAT CAN WE LEARN FROM AVIATION, MARITIME, ROAD AND RAIL?

Clarion Hotel & Congress, August 10th 2017

Program

12:00–12:10	Welcome
12:10–12:40	Øystein Haga Skånland/Ministry of Transport and Communications – <i>The National Transport Plan and Technological Advances in the Transport Sector</i>
12:40–13:00	Q&A and coffee break
13:00–13:30	Missy Cummings/HAL – <i>The human in the loop</i>
13:30–14:00	Ørnulf Rødseth/SINTEF Ocean – <i>Safe human interaction with autonomous ships in Trondheimsfjorden</i>
14:00–14:15	Coffee break
14:15–14:45	Edmund Førland Brekke/NTNU – <i>World's first Autonomous Passenger and Bicycle ferry</i>
14:45–15:15	Gunnar Jenssen/SINTEF Mobility and Safety – <i>Why are self-driving vehicles getting involved in crashes and what can we do to reduce conflicts with other road users?</i>
15:15–15:45	Coffee break
15:45–16:15	Thomas Porathe/NTNU – <i>The problem is not automation, the problem is communication: autonomy, human factors and safety</i>
16:15–16:45	Vegard Evjen Hovstein/Maritime Robotics
16:45–17:30	Coffee break, guided tour and demonstrations by Maritime Robotics

SAREPTA (2017- 2020)

Safety, autonomy, remote control and operations of industrial transport systems

A. Risk identification and risk levels

Maritime Air Rail Road

B. Vulnerabilities and threats

C. Technical, human and operational barriers

D. Organizational and human factors, and regulatory measures for risk mitigation



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SAREPTA

Key objective:

provide necessary knowledge for the development of improved methods for risk assessments and mitigation in transport systems that are autonomous, remotely controlled and/or periodically unmanned.

Goal: contribute to systematizing and expanding the knowledge related to risk level, vulnerabilities, possible barriers and the need for novel, more integrated, regulatory approaches.

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WP1: Risk identification and risk levels (Basis for WP2 to WP5)

- **Goal:** Describe safety and security challenges; key topics: accidents/incidents and successful recoveries.
- **Results:** Document level of accidents; Relevant cases – (Literaturestudy, Interviews, workshops); Learning between the modes
- **Challenges:** Scope and focus

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WP2: Infrastructure vulnerabilities and threats (Building on WP1 and giving input to WP3)

- **Goal:** Infrastructure vulnerability and threats, identify need for regulations, standards and central control instances. Organizational forms, the need for national/international standardization and regulation/cooperation, inspection by the authorities,
- **Results:** Current status, state of the art, Security framework
- **Challenges:** "Security" is kept secret – poor documentation.
Systematic empirical data, challenge of acceptance and risk mitigation

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WP3: Technical, human and operational barriers to mitigate autonomous system risks (Based on WP1, WP2 giving input to WP4 and WP5)

- **Goal:** assure safety, security and resilience when operating autonomous systems in partly control through localized autonomy and central control centres. A theoretical platform will be established, supporting the assessment and development of barriers against hazards.
- **Results:** Methods to be used to assess mitigating technical, human and regulatory measures; Methods/framework to be used to guide the building of operational centres, and verify and validate solutions; Report analysing MTO barriers to mitigate autonomous system risks
- **Challenges:** Industry usability

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WP4: Organisational and human factors, and regulatory measures for risk mitigation Based on WP1,2 and 3

- **Goal:** Develop measures for hazard mitigation in a remote control and monitoring centre, taking into account the role of the human factor.
- **Results:**
 - Methods for assessment (verification and validation) of human factors in remote control and monitoring centers
 - Guidelines and processes for successful implementation of autonomous systems and intermodal perspective
- **Challenges:** Responsibilities when accidents happens – the autonomous system or passengers/driver?

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WP5 b: Verification and Validation

- **Goal:** Ensure that results are verified and validated. Activities related to: Safety case: (Observe/test: risks, hazards, Check barriers; measures – Resilience?)
- **Results:**
 1. Case verification on Hazards identification and risk levels
 2. Case verification to Identify specific risk, threats and vulnerabilities
 3. Case verification on Technical and operational barriers to mitigate hazards
 4. Case verification Organizational and regulatory measures for hazard mitigation
- **Challenges:** Relevant Cases and data?