ARCSAR

Arctic and North Atlantic Security and Emergency Preparedness Network

The 3rd ARCSAR INNOVATION AND KNOWLEDGE EXCHANGE EVENT

5TH OF MAY, BODØ, NORWAY (DIGITAL FORMAT)

This project has received funding from the European Union´s Horizon 2020 research and innovation programme under grant agreement No 786571

Foto: Torbjørn Kjosvold / Forsvaret

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ABOUT
THE EVENT

The 3rd ARCSAR Innovation and Knowledge Exchange Event was organized by Nord University (Norway) and Lapland University of Applied Sciences (Finland) and held on May 5.2021 in the digital format coinciding with the 2nd ARCSAR dissemination workshop (see the program in the Attachment 1).

The event gathered 45 participants, representing academia, industry and other practitioners, connected to the field of preparedness, search and rescue from Norway, Finland, Canada, USA, New Zealand, the UK, Iceland, Italy and the Faroe Islands.

The aim is to facilitatate open dialogue,documenting tacit knowledge through discussions.

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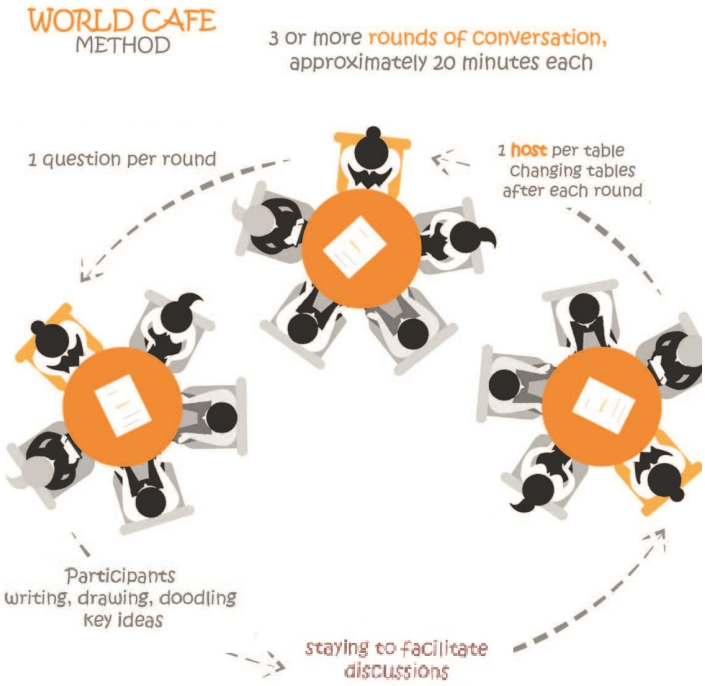
The 3rd ARCSAR Innovation and Knowledge Exchange Event has applied the «Café dialogue» (also known as "Word Café") concept, adapted for digital format. The design of the digital "Café dialogue" enabled to participate together in evolving rounds of discussions while at the same time remaining as a part of a single, larger, connected conversation based on:

- Twenty-minute rounds of conversation for groups of people;
- At the end of the conversation rounds, the topic hosts (facilitators) were "digitally moved" to the next breakout room;
- Topic moderators briefly shared key insights from the prior conversations to link and built the discussion on those ideas;
- Topic moderators were supported by notetakers;
- In addition, the Padlet tool was used (see at Attachment 2), as a digital board to activate the participants of the breakout room to post comments, ideas and thoughts, related to the discussion.
- At the end of the event, the moderators presented summaries of the discussions at the plenum;
- All notes are used to summarize the event, can be used for further analysis in the project.



The overarching purpose of the event was to discuss the "uptake of innovations", learning about status, challenges and barriers for developing and use of innovations for training in the Arctic and North Atlantic.

The event started with a presentation on "Training for innovations and innovations for training in the Arctic and North Atlantic", held by Odd Jarl Borch (Professor, Nord University Business School). In his presentation, professor Borch discussed training concepts, the importance of training as a facilitator of innovation processes as well as touched upon questions which are important for innovation efforts. Further the event continued with discussions constructed around the following key topics:

- Innovations in training and education within pollution and incident control in the Arctic and North Atlantic, moderated by Jan Pedersen (Senior Advisor, Norwegian Coastal Administration)
- Innovations in training and education within mass rescue operations in the Arctic and North Atlantic , moderated by Rob Brown (Research Scientist, Marine Institute, Memorial University)
- Innovations in training and education in the Arctic and North Atlantic induced by Covid-19 pandemic, moderated by Natalia Andreassen (Associate Professor, Nord University Business School).

EVENT'S DISCUSSIONS:
CONTENT & KEY TAKE-AWAYS

1. Innovations in training and education within pollution and incident control in the Arctic and North Atlantic moderated by Jan Pedersen (Norwegian Coastal Administration).

This topics concentrated on how innovations can strengthen and increase efficiency of training and education in the field of maritime pollution control. Unfortunately, the event did not gather many participants who work with maritime pollution related emergencies and possess enough competence and knowledge in the field. Nevertheless, the discussion was very interesting and fruitful.

One of the main outcomes of the discussion was the understanding that it is important for SAR-professionals dealing with different types of emergencies, to learn about maritime pollution and incident control, . Digital learning tools and platforms are one of the best and most efficient ways to provide such education and give required knowledge in this field.

Keep it simple, not introduce too much technology. Can combine high-tech to simple solutions.

Participants also discussed different international projects aimed on developing knowledge, innovative tools and approaches to improve efficiency of education and trainings in the field of maritime environmental response such as "Neptun" project (aimed at investigating if expedition cruise vessels could be utilized as a resource in oil spill preparedness and response in the Arctic); newly EU funded project "AI-ARC" (aimed on developing a virtual control room with artificial intelligence capabilities for coastguards.) and the MArEmAr map, an online Geographical Information System database for Marine Emergencies in the Arctic, developed through MAREC project "The Inter-organizational coordination of mass rescue operations in complex environments" (www.marpart.no).

Share simulation exercises between countries. Enables sharing of knowledge and ideas.

*an online Geographical Information System database for Marine Emergencies in the Arctic

2. Innovations in training and education within mass rescue operations (MRO) in the Arctic and North Atlantic, moderated by Rob Brown (Marine Institute, Memorial University).

This discussion was built around various questions including *currently available innovations, efficiency of existing training possibilities and barriers for innovations in trainings and development of training innovations.*

Topics that were brought up the most were connected to MRO kits and modern technologies that are in use and can be used for MRO operations and trainings, such as tracking systems for evacuated passengers, AI[1] and VR[2] technologies; digital broadcasting platforms and simulators; drones, and old-school vs. modern format for top-table exercises.

Post-event learning on how to do things better, so it can be incorporated into training.

Some of key take-aways out of the discussions include the following statements:

- Many innovative systems and gadgets for better MRO have been
- developed (such as tracking sensors, drones, MRO kitss, AI, VR and etc.). Such technologies can be especially useful in the Arctic areas but it is important to include and test these solutions and tools at trainings and exercises;
- Despite the fact that we have a broad range of information sources, dissemination and communication means aimed at knowledge and experiences exchange, there is still a great demand for an efficient way to exchange of new knowledge and new experiences. It is important that information on new and efficient technologies and solutions is transferred among relevant actors quickly enough. This allows professionals across borders to train new techniques, introduce and apply innovative practices as soon as possible;
- Innovation needs should be driven by a strong knowledge and scientific based studies, and field exercises;
- The use of new technologies should be an integral part of training and exercise, especially the training experience and for training situational awareness.
- Digital learning platforms allow to train "presence" in Arctic areas, without physically being on site. This is a very efficient and cost effective approach;
- It is of great value to train good coordination and common understanding of procedures and terminology in communication with rescue centers from different countries in international rescue operations;
- While use of new innovative digital based training technologies (VR, simulations) have its merits, field exercises or "simple" top-table trainings can be equally important;
- In order to increase efficiency of MRO related trainings and exercises, in any format used, representatives from local communities and voluntary organizations should be involved. The main reason for this is that the local actors, especially the volunteers, are the "muscles" in remote MRO operations, especially in the evacuation part.

Knowledge based decision-making, practices and standard operating procedures (SOP) based on science and research.

Casualty tracking: need more training and how to share the data and tracking across agencies.

[1] Artificial Intelligence

[2] Virtual Reality

3. Innovations in training and education in the Arctic and North Atlantic induced by Covid-19 pandemic, moderated by Natalia Andreassen (Nord University).

This topic discussed and looked at current processes, potential and challenges for innovations in training and education programs in a broad sense. The situation caused by the pandemic has limited the possibilities to conduct physical meetings, training, and learning. Despite the benefits of new digital

solutions, the process has not been straightforward, and challenges were, and are, being faced. The notes, presented below, provide a good picture of key points, discussed in this session:

- Digital learning platforms and communication and collaboration tools (such as Zoom, MS Teams, Padlet, Miro, etc.) allow an increasing number of exercises;
- Innovations and digital learning tools have already been widely used in practice. Technologies have already become a standard, integral part of study approaches in the years to come. This trend will only be towards strengthening roles of use of technologies in both directions – education and utilization in real work. The use of new digital technologies and innovative digital learning platforms and tools are necessary to teach people to be aware of new technologies and how to use them efficiently;
- The universal usage of digital platforms (such as Zoom) or connecting digital simulators (for training and education purposes) makes it easier and more cost-effective to facilitate direct dialogue and knowledge exchange between interlocutors in different geographical regions, which is especially beneficial when working with remote Arctic communities. This is important for building a better understanding among people, agencies and organizations;
- Exercises via digital learning means provides the opportunity to involve decision-makers at different levels, for example at operational and strategic levels, as well as external agencies that would be a part of the operation. In other words digital leaning tools expand the learning effect,
- bringing in participants from the management level up in the response system;
- Stable and good internet connection is needed to use 100% potential of digital learning platforms. Some regions have faced challenges due to the low bandwidth in remote communities, causing the need to create logistic solutions in order to be able to offer the possibility of using virtual tools.
- When it comes to mandatory maritime safety training, fully fledged
- remote delivery is often challenging as there is a need to demonstrate proficiency/ competency in practical applications of safety skills, such as survival at sea, fire-fighting and survival craft operation. While some theory components have been migrated online, demonstrating skills within these practical safety skills online continues to be a challenge.

Challenges

- to teach people how to
- use the technology
- be familiar with digital exercises
- language
- lack of internet
- logistical challenges

Bringing management levels together

Bringing participants from the management level up in the response system, and below, in order to expand the learning effect.

Value added but what do we do next?

...Virtual meetings need to be combined with face-to face.

SHORT
SUMMARY

The 3rd Innovation and Knowledge Exchange Event discussed various topics and each session had its own outcomes. However, common themes can be found from the discussions, such as:

- Digital leaning tools allow connecting decision-makers at different levels as well as external actors, thus expanding the learning effect, bringing participants in the response system together;
- Digital learning means allow facilitating learning processes, exchange of competences and strengthen networking between actors, located in different geographical regions, which is especially beneficial when working with remote Arctic communities;
- Digital learning forms and tools allow simulating and thus training different natural conditions related to operations in the Arctic and North Atlantic regions;
- An increased range of applicability and usefulness of digital learning tools should not however be seen as a full replacement of "off-line" or field trainings. There should be a clear understanding of when training via digital platforms is a solution, and when traditional field and "face-to-face" training and learning should be applied;
- Another statement underlines the necessity of stable and good internet connection. It is critically required to utilize 100% potential of digital learning tools;
- Innovation needs should be driven by a strong knowledge and scientific based studies, and field exercises.

The event was held in tune with project plan and contributed to fulfilling the ARCSAR project's objectives. The event allowed practitioners to become aware of innovation possibilities and facilitated continuous mapping of needs, monitoring of solutions and barriers to uptake innovations, providing a forum where practitioners can engage with innovation providers.

Another outcome of the event is a tacit learning captured from practitioners, academia, and the industry.

The use of virtual tools has allowed to receive more education through e-learning platforms as well as Zoom and MS Teams.

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Attachment 1

THE 3RD INNOVATION AND KNOWLEDGE EXCHANGE EVENT & 2ND DISSEMINATION WORKSHOP

Hosted by Nord University and Lapland University of Applied Sciences

FORMAT: ONLINE, VIA ZOOM
DAY: MAY 5, 2021
TIME: 13.00 – 16.50 CEST (UTC +2)

AGENDA

13.00 – 13.10 **WELCOME TO THE MEETING**
Tore Wangsfjord (Acting director and ARCSAR coordinator, JRCC North-Norway)

13.10 – 14.10 **ARCSAR DISSEMINATION WORKSHOP**
Moderator: Robert Lynch, Munster Technological University

13.10 – 14.05 Presentation of the ARCSAR project and results so far

14.05 – 14.20 Discussion and Q&A

14.20 – 14.30 **COFFEE BREAK**

14.30 – 16.50 **THE 3RD ARCSAR INNOVATION AND KNOWLEDGE EXCHANGE EVENT**
"Training for innovations and innovations for training in the Arctic and North Atlantic"

14.30 – 14.40: **Event format presentation and instructions Natalia Andreassen, Nord University**

14.40 – 14.55: **"Training for innovations and innovations for training in the Arctic and North Atlantic"**
Odd Jarl Borch, Professor, Nord University Business School

14.55 – 15.55: **Discussions – "Digital Café Dialogue" (20 min per topic/groups discuss each topic):**

1. *Innovations in training and education within pollution and incident control in the Arctic and North Atlantic* - Moderator: Jan Pedersen (Senior Advisor, Norwegian Coastal Administration)
2. *Innovations in training and education within mass rescue operations in the Arctic and North Atlantic* - Moderator: Rob Brown (Research Scientist, Marine Institute, Memorial University)
3. *Innovations in training and education in the Arctic and North Atlantic induced by Covid-19 pandemic* - Moderator: Natalia Andreassen (Associate Professor, Nord University Business School)

15.55 – 16.15 **COFFEE BREAK**

16.15 – 16.45 SUMMARY OF THE 3RD INNOVATION EVENT

16.45 – 16.50 CLOSING REMARKS

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padlet

THE 3RD ARCSAR INNOVATION AND KNOWLEDGE EXCHANGE EVENT

Digital Café Dialogue

NATALIA ANDREASSEN MAR 5 2021

1.Innovations in training and education within pollution and incident control in the Arctic and North Atlantic

NEPTUNE project

The NEPTUNE projects aims at investigating if expedition cruise vessels could be utilized as a resource in oil spill preparedness and response in the Arctic. The project is co-led by Norway and the United States of America, in cooperation with AECO.

NEPTUNE

Projects Arctic Marine Risk Assessment Guideline Prevention, Preparedness and Response in Small Communities Circumpolar Wildland Fire Project Circumpolar Oil Spill Response Viability Analysis Phase II (COSRVA II) New Low-Sulphur Fuels - Fate and Behavior in Cold Water Conditions ARCSAFE & RADSAR Arctic Rescue Review of Legal Issues Related to the MOSPA Agreement NEPTUNE Risks Project See all

SDWG

Digital TTX

Digital oil spill response exercises at Nord university, Nordlab -innovative approaches to exercise collaboration of the involved agencies and management structure.

AI-ARC, Newly funded EU project (start 1st Sept, 2021) to develop a virtual control room with artificial intelligence capabilities for coastguards.

https://www.laurea.fi/en/current-topics/news/laurea-is-coordinating-a-notable-eu-project-for-arctic-shipping/

2. Innovations in training and education within mass rescue operations in the Arctic and North Atlantic

Helirescue training video

This video that explains how crew and staff onboard vessels can assist in a helicopter rescue operation. The video is the result of a collaboration between Association of Arctic Expedition Cruise Operators (AECO), the Governor of Svalbard and Lufttransport AS, a leading provider of search and rescue (SAR) emergency preparedness and services in the Arctic.

Lufttransport, AECO and the Governor of Svalbard launch heli-rescue training video | AECO

The Arctic expedition cruise industry and search and rescue responders are collaborating to enhance preparedness and collaboration. The latest step in this effort is a new video that explains how crew and staff onboard vessels can assist in a helicopter rescue operation.

AECO

Joint Arctic SAR TTX and workshop

Starting in 2016, the Joint Arctic SAR TTX facilitates an innovative cross-sector collaboration platform that enables direct dialogue, knowledge exchange and joint training between the expedition cruise industry and SAR entities.

AECO's Joint Arctic SAR TTX 2016 | AECO

On April 6th and 7th 2016 AECO, in cooperation with Iceland's Coastguard, is organizing a Joint Arctic Search and Rescue (SAR) Table Top Exercise (TTX) workshop which will take place in Reykjavik, Iceland. The TTX is initiated by AECO and co-hosted by Iceland's Coastguard. AECO is also in dialogue with other partners from different Arctic [...]

AECO

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MAREC-map "MAREMAR"

Interactive GIS map with cases of mass rescue operations that can be used for research and education, as well as recommendations for mass rescue training are being developed through the project Marec "Inter-organizational coordination of mass rescue operations in complex environments" (Research Council of Norway) https://arcsar.eu/marec-the-inter-organizational-coordination-of-mass-rescue-operations-in-complex-environments/

NORDLAB training concept

Innovative technological solutions to exercise emergency response at different management levels.

Nord universitets beredskapsledelseslab (NORDLAB)

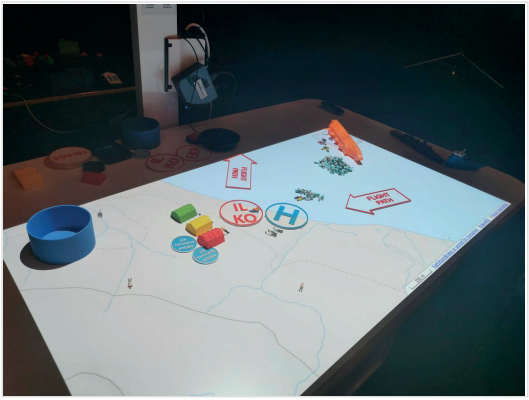
NORDLAB er et øvings- og testsenter innenfor sikkerhet og beredskap med fokus på sikre operasjoner og kriseledelse. Det ser ut som om JavaScript ikke er aktivert i nettleseren din. Vennligst aktiver JavaScript, og prøv på nytt. Det ser ut som om JavaScript ikke er aktivert i nettleseren din.

NORD UNIVERSITET

Going "old school" on tabletop exercise using map and 3d printed figures

Having conducted one of these exercise with great feedback from participants. Print a map on paper, display it on a projector, let SAR responders place figures and discuss.

Printed figures



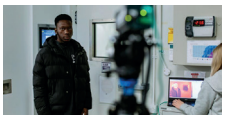
At Laurea we have been conducting live exercises on a smaller scale involving local emergency responders in different cases of accidents/crisis. We develop a questionnaire by experts, appoint evaluators who ask responders how the quesitons i.e. how well everything worked out from time to respond to equipment and difficulties faced etc. We do the evaluations with an online tool where after the event immediately the data is transfererd into charts for interpretation. So the feedback and results are provided on the spot.

Extreme Environments Research Group

https://www.port.ac.uk/research/research-centres-and-groups/extreme-environments-research-group

We do various work at the Extreme Environment Lab in Portsmouth on survival in extreme environments

Extreme Environments Research Group



The Extreme Environments Group investigates the physiological and psychological responses to adverse environments (e.g. heat, cold, and hypoxia) and the preparation and protection of those who enter such environments. This group has a world renowned reputation for their work in the areas of water safety and drowning prevention, non-freezing cold injury, cryotherapy, heat exposure, hypoxia and the physiology, psychology and psychophysiology of extreme environments.

PORT

Post-event learning on how to do things better, so it can be incorporated into training.

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Involvement of communities and volunteers; in later stages of event, knowing what resources are in communities.

How to learn better from each other, to share best practices and the succesfful exercises and trinaing, so other can learn.

AR/VR/sim training, could be cost associated barriers, lack of real-life data but could be very useful

Keep it simple, not introduce too much technology. Can combine high-tech to simple solutions.

Drop-kit for MRO, how to train to put it together, learn what other countries have.

Share simulation exercises between countries. Enables sharing of knowledge and ideas.

Knowledge based desicion-making, practices and SOP informed by science and research.

Casualty tracking: need more training and how to share the data and tracking across agencies.

Voluntary organizations often see what is needed in the field and come up with innovations based on exercises: Finnish Red Cross tracking system.

3. Innovations in training and education in the Arctic and North Atlantic induced by Covid-19 pandemic

We have started using tools (paddlet, Miro) that make working together easier

Virtual meetings

The universal usage of digital platforms such as Zoom makes it easier to facilitate direct dialogue and knowledge exchange between interlocutors in different geographical regions, which is especially beneficial when working with remote Arctic communities.
People that would have not been included in a meeting in pre-pandemic times due to distance and/or cost have been invited and have participated.

Challenges

-to teach people how to use the technology
-be familiar with digital exercises
-language
-lack of internet
-logistical challenges

Exercises in Teams/other platforms

use of communication spaces, phisically don't need to be in the same space

Digital TTX at Nord university, NORDLAB

Digital Tabletop Exercise in Maritime Nuclear Emergency Preparedness at Nord University

The purpose of the exercise was to provide the students gain a better understanding on Norwegian nuclear safety preparedness, as well as discuss roles, responsibilities and cooperation between agencies that will be involved in case of a nuclear accident at sea. The increase in traffic of nuclear-powered ships along the Norwegian coastline makes this scenario particularly relevant.

NEWS

Education and training in similar platforms

Teams, Zoom

The use of virtual tools has allowed to receive more education through e-learning platforms as well as Zoom and MS Teams.

Challenge for practical skills

One challenge experienced more so from a North-Atlantic perspective as opposed to Arctic, when it comes to mandatory maritime safety training, fully fledged remote delivery is often challenging as there is a need to demonstrate

New virtual tools

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proficiency/competency in practical applications of safety skills such as survival at sea, fire fighting and survival craft operation.. While we have migrated some theory components online, demonstrating skills within these practical safety skills remotely continues to be a challenge..

New projects

Monitoring port logistics, methodology to understand traffic, many new projects in healthcare sector.

Paper on resilience modelling for Covid-19

Safety Science 139 (2021) 105274

Contents lists available at ScienceDirect

Safety Science

journal homepage: www.elsevier.com/locate/safety

Towards a new approach for managing pandemics: Hybrid resilience and bowtie modelling

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ARTICLE INFO

Keywords:
Learning from failure
COVID-19
Resilience modelling
Bowtie modelling

ABSTRACT

Pandemic viruses have historically caused tremendous damage to lives and livelihoods. The coronavirus, COVID-19, has proven to be a significant issue around the world. In this paper it is argued that systems of controlling similar types of disasters need to be improved through learning from past experience and from others, as well as through improved modelling for better decision making. In doing so, the focus will be on resilience modelling and learning from incidents. Therefore, in this paper, first the introduction deals with hybrid approaches in operational research highlighting the differences between hybrid modelling and hybrid models. Second, an introduction to mathematical modelling of epidemics is provided and how such modelling leads to certain types of public health modelling is demonstrated. Third, resilience modelling will be discussed as a complimentary type of modelling, where concepts related to robustness, redundancy, resourcefulness, and rapidity are introduced. Fourth, resilience modelling will be extended to new principles taking COVID-19 as an example for the analysis. Fifth, the analysis will then be used to compare degrees of resilience for different countries. Finally, other modelling approaches for managing – and learning from – pandemics, in terms of root cause analysis, bowtie modelling and safety barriers, are proposed.

Paper_Labib_2021_SAFETY_SCIENCE
PDF document
PADLET DRIVE

Digital platforms for exercises

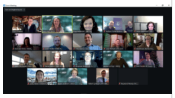
operational/strategic level for decision-making, including agencies that would be a part of the response.
Digital platforms have allowed to increase the number of exercises.

More opportunities, more training

helped to integrate community groups, response agencies More often (eg., Governor of Svalbard)

Virtual SAR TTX organized by expedition cruise industry and SAR responders

Arctic search and rescue partners pioneer virtual tabletop exercise | AECO



For the fifth year in a row, the Arctic expedition cruise industry, search and rescue sector and academia gathered for a joint tabletop exercise. This year, the exercise was organized as a fully virtual event, gathering nearly 130 participants from across the world.

AECO

Bringing management levels together

Bringing participants from the management level up in the response system, and below, in order to expand the learning effect.

Hybrid solutions - Norwegian actors together and connection to the external

This has allowed people at different levels to learn how the other levels work and function

EPPR forum exercises Simulator-based training

connecting simulators between NORDLAB, Nord university and JRCC NN - for tactical/operational
Expanding the EMSN

EMSN network

expanding and developing scenarios for the Arctic

Cloud simulators

deployed in a virtual cloud, together with virtual meetings, advantage to train to prepare for real the next step?

Value added but what do we do next?

increased accessability, but is it a suitable replacement? Having understanding what works well
Virtual meetings need to be combined with face-to face

Healthcare sector innovations

developing innovative platforms, virtual solutions to work together, solutions for doctors to understand the situation, what kind injury, wide range of sensors, blood preparedness

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Looking at projects with different eyes

Ongoing project involving the creation of a remote sensing network that will combine satellite, UAV and USV imagery to be used in SAR and OSR situations. The project will also develop simulation, both live and simulated enhancing the possibilities for remote participation.

Technology for low bandwidth video streaming solutions that can help sharing video via satcom in the arctic and low Bandwidth video conference developed for disaster management.

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