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Figure 1: The USS Hartford submarine surfaces near Ice Camp Sargo during Ice Exercise 2016 in the Arctic Circle on March 19, 2016. (U.S. Navy photo by Petty Officer 2nd Class Tyler Thompson)

ABOUT AI-ARC

The AI-ARC "Artificial Intelligence based Virtual Control Room for the Arctic" project's main objective is to create an innovative and user-friendly AI based platform, the Virtual Control Room (VCR), that has the power to greatly improve maritime situational awareness, decision-making, communication, available rescue resources, and thus the safety of all maritime actors, particularly in the Arctic Sea.

The AI-ARC project will develop a shared collaboration workspace based on innovative and efficient AI-services, a VCR that will significantly enhance border and external security, as well as support cooperation managing external borders in the Artic and High North Seas. The platform will be tested and developed together with practitioners and other end users in order to properly address their needs. The new technological solutions to be developed rely on existing systems, in compliance with EUROSUR. Further, the platform is integrated with the CISE environment to ensure a seamless cross-sector and cross-border interoperability. This ensures a quick uptake of the platform by the practitioners, and the platform does not require costly investments or increased workload. Finally, AI-ARC pays specific attention to societal resilience and aims to improve citizens' perception safety too.

Through novel technologies and innovations, AI-ARC will improve maritime situational awareness, decision-making, communication, available rescue resources, and thus the safety and security of all EU maritime actors, particularly in the Arctic Sea. The AI-ARC solution will be most particularly valuable for Coast and Border Guard Authorities, private communities and private enterprises, such as the fishing and cruise industries and commercial shipping. By enhancing capabilities of these endusers, AI-ARC partakes in the efforts of the European Union to improve the management of EU borders, build secure societies and protect the freedom and security of Europe and its citizens. AI-ARC also fully embraces the European Union's ambition for a stronger engagement towards a peaceful, sustainable and prosperous Arctic throughout.

GOVERNANCE OF THE ARCTIC – AND THE FUTURE OF COOPERATION

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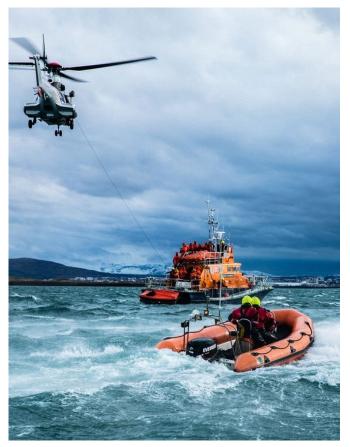


Figure 2: the Icelandic Association for Search & Rescue (gearpatrol.com)

1. Arctic governance with growing challenges

Arctic intergovernmental cooperation faces several challenges and problems, primarily due to the unique geopolitical, environmental, and economic factors in the region. The Arctic spans multiple countries, and SAR operations may require cooperation between nations, making coordination and response times more complex. Agreements and protocols for cross-border SAR efforts need to be established and adhered to.

The Arctic is rich in natural resources, including oil, gas, and minerals. As a result, there are ongoing disputes and claims over territorial sovereignty and jurisdiction among Arctic nations, most notably between Russia, Canada, Denmark (via Greenland), and Norway. These disputes are not new and they have been managed rather well, but they can hinder cooperation efforts.

Moreover, climate change and its impacts are particularly pronounced in the Arctic, leading to melting ice, rising sea levels, and shifts in ecosystems. Cooperation is essential to address these environmental challenges, but differing priorities and interests among Arctic nations can complicate efforts to mitigate and adapt to these changes.

The potential for resource extraction, such as oil and gas drilling, fishing, and mining, has economic implications for Arctic nations. Competing economic interests can sometimes overshadow environmental and sustainability concerns, making it challenging to find common ground.

As the Arctic ice melts, new shipping routes open, making the region strategically important. This has led to increased military presence and security concerns among Arctic nations. Balancing security of interests with cooperation for peaceful purposes can be complex.

Global geopolitical tensions can spill over into the Arctic. The region's proximity to Russia has raised concerns about military activities and the potential for conflict. Geopolitical rivalries can hinder cooperation and dialogue among Arctic nations.

The legal framework governing the Arctic is primarily based on the United Nations Convention on the Law of the Sea (UNCLOS). However, interpretations and disputes over UNCLOS provisions can create challenges for governance and cooperation, especially in the absence of a comprehensive Arctic treaty.

The Arctic Council (AC), a key forum for Arctic cooperation, includes Arctic nations and indigenous organizations. However, non-Arctic nations, like China, have sought observer status and invested in Arctic projects, leading to questions about their role and intentions in the region. Since it was established in 1996, the Arctic Council is the leading forum for inter-governmental Arctic cooperation. The Council's main focus is on environmental and scientific cooperation in the Arctic region and it undertakes programmes of work through its six Working Groups (WGs). We identify that the Emergency Prevention, Preparedness and Response (EPPR), and the Protection of the Marine Environment (PAME) WGs are the most relevant to the AI-ARC project and our review of the wider Artic safety and security cooperation. In addition to the 8 Arctic States, there are also 6 Indigenous Nations/Groups that are permanent participants in the AC, albeit that they do not have equal voting rights with member states. At the time of writing, there are also 38 Observers recognised by the AC, including 13 states, 13 international organizations and 12 nongovernmental organizations. While the primary role of observers is to observe the work of the Arctic Council, they can also make relevant contributions through their engagement at the level of Working Groups. From the beginning of the AC, the focus of Arctic intergovernmental cooperation has been on environmental and sustainability issues. Military security and defence policies are beyond the mandate of the AC. However, the AC has succeeded in having three major international agreements brought into force: on the subjects of Air & Sea SAR Cooperation, Oil Spill Response, and Scientific Cooperation. The Ukraine war in 2022 led to a strong response from the Western Arctic member states and resulted in the suspension of most of the AC's work. The situation was exacerbated due to Russia holding the rotating Chairmanship of the AC until May 2023 when it was passed to Norway. The other seven Arctic states have been undergoing negotiations about the future of the Arctic Council and how they will choose to interact with Russia going forward.

The main contributions of other regional and sub-regional Arctic cooperation structures have been the Northern Forum, the Barents Euro-Arctic Council (BEAC), the Barents Regional Council (BRC), the Nordic Council of Ministers, and bilateral Finnish-Russian cooperation agreements. The UN International Maritime Organization (IMO) has also an increased focus on the commercial navigation challenges in the Arctic.

Russian Foreign Minister Sergei Lavrov informed on18 September 2023 the other members of the Barents Cooperation about the withdrawal from its official structures. Russia has already been frozen out since the start of the all-out war against Ukraine in February 2022. "Under the current conditions, we are forced to announce the withdrawal of the Russian Federation from Barents Euro-Arctic Cooperation (BEAC)". This kind of development is naturally fatal for the rescue cooperation in the Barents Sea area. Therefore, it would be useful to seek some practical cooperation forms and measures for maintaining basic preparedness of gross-border rescue capabilities.

Due to the remote and harsh environment of the Arctic, communication and coordination among nations, organizations, and communities can be challenging. This affects emergency response, search and rescue operations, and scientific research efforts. Ensuring the protection of the fragile Arctic environment and biodiversity while permitting economic activities is a delicate balance that requires cooperation, regulations, and enforcement.

Despite those challenges, there have been instances of successful cooperation among Arctic nations, such as agreements on search and rescue coordination and scientific research. Finding common ground and promoting peaceful cooperation in the Arctic remains a priority, given its significance for global climate, biodiversity, and geopolitics.

2. Search and rescue cooperation in the Arctic and the High North

The search and rescue (SAR) operations in the Arctic and the High North are challenged by the extreme environmental conditions, remote locations, and limited capabilities in the region. For instance, hyper cold temperatures added to scarce and scattered resources can pose a significant threat to both rescuers themselves and those in distress. Frequent and severe storms, including blizzards and high winds, can hinder visibility and make navigation difficult. Ice formation to the vessel's structures and drift can create hazardous conditions, obstructing access to areas in need of rescue. In particular, aircraft operations are challenging because the distances are long and the weather restricts flying.

The Arctic is a vast and sparsely populated region with limited infrastructure, making it challenging to reach areas where SAR operations may be required. Remote and isolated communities may lack immediate access to medical facilities and emergency services. Arctic SAR operations often face resource constraints, including limited availability of aircraft, vessels, and trained personnel in the region. The cost of deploying and maintaining SAR assets in the Arctic is high, which can strain budgets and resources.

The Arctic's remote and polar location can lead to communication difficulties, including limited satellite coverage and radio signal range. Communication failures can impede coordination between SAR teams and hinder the timely response to emergencies. Icebergs, ice floes, and pack ice can pose significant hazards to vessels and aircraft involved in SAR operations. Ice conditions can change rapidly, making it difficult to plan and execute rescue missions safely. SAR operations in the Arctic must prioritize environmental preservation, as spills or accidents involving fuel and hazardous materials could have severe consequences for the fragile Arctic ecosystem. During the winter months, the Arctic experiences long periods of darkness, reducing visibility and complicating SAR efforts.

Extremely low temperatures can affect the performance of equipment, including aircraft, vehicles, and survival gear. Cold weather can also lead to frostbite and hypothermia in survivors awaiting rescue. In many parts of the Arctic, there is limited access to medical facilities, which can pose challenges for providing immediate care to injured or ill individuals during SAR operations.

Indigenous communities in the Arctic have unique cultural and social considerations that SAR teams must be sensitive to when conducting operations in these areas. Efforts are continually being made to address these challenges, including improved technology, better coordination, and increased training for SAR personnel in Arctic environments. International cooperation and investment in infrastructure and resources are also critical to enhancing Arctic SAR capabilities.

3. Future perspectives for the EU in the Arctic and the High North

The European Union (EU) has been increasingly involved in Arctic and High North geopolitics due to its interests in the region, which include climate change, energy resources, shipping routes, and environmental protection. However, there is no agreement between all EU member states as to what the role of the EU should be as regards Arctic matters. So, while the EU's application to become a Permanent Observer on the Arctic Council was received affirmatively in May 2013, the final decision on implementation is still pending. The EU is a member of the Barents Euro-Arctic Council and a party to the Convention for the Protection of the Marine Environment of the North-west Atlantic (OSPAR). The EU also has a Partnership agreement with Greenland which is not a member state of the EU.

Although predicting the future of the *European Arctic* is still elaborating, we might provide some perspectives on the EU's potential role in the Arctic and High North region:

Climate Change Leadership: The EU has been a leader in the global fight against climate change. In the Arctic, the effects of climate change are particularly pronounced, with rising temperatures leading to melting ice and environmental challenges. The EU is likely to continue its efforts to combat climate change in the region and promote sustainable practices.

Economic Interests: The Arctic is rich in natural resources, including oil, natural gas, and minerals. The EU may seek to collaborate with Arctic states to ensure responsible resource extraction, which aligns with its emphasis on sustainability and environmental protection.

Shipping Routes: The melting of Arctic ice has opened up new shipping routes, such as the Northern Sea Route, which can significantly shorten shipping times between Europe and Asia. The EU may work to establish regulations and infrastructure to facilitate safe and sustainable shipping in the region.

Environmental Protection: The EU is likely to continue to prioritize environmental protection in the Arctic, given the region's unique and fragile ecosystems. This could involve regulations to reduce shipping emissions, protect marine life, and combat plastic pollution.

Geopolitical Competition: The Arctic is increasingly becoming a theater for great power competition, with Russia, the United States, and China asserting their interests. The EU may seek to play a balancing role and promote multilateral cooperation to avoid conflicts in the region.

As the Arctic becomes more accessible, the EU may need to address security concerns related to the region. This could involve bolstering maritime security and surveillance capabilities, particularly in the face of potential security challenges. Security can be separated into two main categories: first, military security and defence, also known as 'hard' security', and, on the other hand, civil security (including law enforcement, border security, SAR and emergency management), often referred to as 'soft security' issues. Arctic intergovernmental cooperation is well-established through the Arctic Council and other Arctic regional forums. However, the Arctic does not have a formally defined security architecture in place to enable security dialogue to occur between all eight Arctic states. In the absence of a specific Arctic security council, security cooperation exists on an ad hoc basis amongst a number of structures and regional organisations. Civil security cooperation in the Barents Euro-Arctic Region (BEAR) and the Baltic Sea region is also discussed in this manner.

EU has sought to enhance its cooperation with the Arctic Council, an intergovernmental forum for Arctic cooperation. Continued collaboration with the Arctic states and indigenous peoples is crucial for the EU's involvement in the region.

The EU is capable to engage with indigenous communities in the Arctic and support their rights and participation in decision-making processes. This is in line with its principal commitment to human rights and multiculturalism.

The EU may continue to invest in Arctic research and scientific cooperation, as understanding the region's changing environment is vital for addressing global climate challenges.

It's important to note that the EU's role in the Arctic and High North will be influenced by various factors, including the policies of its member states, evolving geopolitical dynamics, and international agreements. The EU will likely continue to adapt its strategy in the Arctic to align with its broader goals and principles, such as sustainability, cooperation, and environmental protection.

The European Union can be a well-functioning framework for cooperation also during the present tensions between the major powers. Therefore, it is useful keep alive functional cooperation, especially concerning maritime safety and rescue issues, as effective as possible. It includes also maintaining and improving the means and practices for situational awareness in the demanding Arctic conditions. The AI-ARC project can produce useful solutions for that purpose.