



Arctic Safety

APPLICATION TO THE MINISTRY OF FOREIGN AFFAIRS' PROGRAMME ARCTIC 2030, FEBRUARY 2015

The natural environment in the High North is undergoing rapid change, while at the same time the interest in presence and economic development in the region has never been greater. Consequently, the need for greater expertise on how to operate in a safe and environmentally sound manner in the High Arctic is acute and extremely relevant. The unique location and subject combination of the University Centre in Svalbard (UNIS) gives it an unrivalled opportunity to lead the development and establishment of a Centre of Expertise in Arctic Safety. There is already a demand from several national and international partners (institutions and networks) for the special basic safety course that UNIS runs for its students

The centre of expertise that UNIS seeks to establish in close cooperation with national and international partners will focus on safety and emergency preparedness associated with activities in a potentially hazardous and vulnerable natural environment. The centre of expertise will engage in teaching, research and dissemination with the objective of acquiring the best possible expertise for the wider population and also for visiting researchers and other visitors to Svalbard and the rest of the Arctic. Furthermore, the centre will develop and disseminate knowledge and technology that will enable operations and traffic in the natural environment in the Arctic to be implemented in a safe and environmentally sound manner. The plan is to develop the centre through a three-year project during which all relevant partners will participate actively.

UNIS will develop and build a new subject area on the theme "Safety in the Arctic" as a "Centre of Expertise in Arctic Safety". The subject area will be based on the huge amount of locally available knowledge, expertise and experience in the natural sciences in Svalbard. Moreover, the subject area will draw on local, national and international experience and expertise in the implementation of often complex activities in the natural environment in a High Arctic area. UNIS will seek collaboration with academic environments, nationally as well as internationally, that have expertise on the subject of safety and develop this theme in the development of the subject area. UNIS will use its excellent cooperation with the universities and research institutes on the Norwegian mainland to ensure that the subject area has the best possible academic content.

A successful establishment of the subject area will be able to produce effects in the following areas/target groups:

- obtain new knowledge of how human activity may be implemented in a vulnerable and often hazardous High Arctic area in the safest manner possible
- contribute to a more efficient management of the natural environment and natural resources by combining knowledge of both the natural environment and safety
- contribute to increased economic development by enabling new activity to be implemented on the

basis of solid expertise in terms of both science and safety, including the requirement for environmental conditions

- UNIS' location, subjects and project portfolio is already extremely international and the establishment of this subject area will be of circumpolar relevance. Consequently, the project will to a great degree contribute to further international cooperation in the Arctic.
- The business and industry sector will be able to acquire personnel with the necessary expertise in the implementation of safe operations in the Arctic.
- The main focus of the subject area will be to develop new knowledge and expertise in the areas of safety, emergency response and environmental protection, and in so doing ensure the safest implementation of the existing natural science and technical engineering subjects in Svalbard.
- The structure of the subject area in Longyearbyen and the link with local institutions, organisations and residents in general will be able to contribute to making Longyearbyen a more safety conscious community with a high level of expertise in safety associated with staying and travelling in the natural environment in the High Arctic.

The application describes a three-year project with the main objective of developing a subject area in collaboration with relevant stakeholders nationally as well as internationally. The subject area will then be incorporated as an ordinary subject at UNIS. It will be funded through UNIS' funding allocation from the Ministry of Education and Research and possibly also by contributions from the industry and international partners who wish to use it, for instance by taking courses. After completion of the project, the subject will also require close cooperation with other institutions, which will be able to contribute to guest lecturers for courses and in the research that will occur. The project describes a gradual development of the subject, whereby the funds applied for will be used for workshops, some appointments and subject and course development as well as the implementation of some pilot courses.

The detailed schedule is included in the implementation plan. We will employ a project manager to lead the development of the subject area in consultation with the project's steering group. Moreover, it is planned to make use of external expertise, both national and international, in the project through the creation of 20% full-time equivalent positions. These experts will actively contribute to the professional development of the subject through design and holding workshops with associated reporting, and in so doing provide quality assurance of the development of the subject area. Finally, the staff from all the partner institutions will actively participate in the project. The total salary-related investment will be approximately 9.9 MNOK, of which we are applying for 4.8 MNOK in the project.

The kick-off workshop will be able to focus on providing the status of field safety in Svalbard and the rest of the Arctic and perform a gap analysis on the topic, as well as report on this. This workshop will involve participation from all partners, while the reporting will focus on what is required in order to develop of this new discipline within sub-topics. After the kick-off workshop, we plan a series of thematic workshops: "Relevant risk and safety theory for Arctic operations", "The use of scientific and other types of observations for increased Arctic safety", "Arctic safety at international research stations" and "Course development in Arctic safety for development of a specific department at UNIS", all of which will involve participants from all relevant partners. The participants in these thematic workshops will be national and international experts in risk and safety research and education, as well as scientific personnel with in-depth expertise in core areas such as meteorology, glaciers, sea and sea ice, oceanography, snow and avalanches, marine and terrestrial fauna and a number of other key natural science topics. The total expenditure for these workshops will be 2.15 MNOK, of which we are applying for 1.65 MNOK.

During the second and third years of the project, it is planned to hold the following two pilot courses at UNIS in Svalbard: “Development of safety training at field stations in the Arctic” and “How to use scientific observations to achieve increased Arctic safety”. Lecturers for these courses will be employed at partner institutions and UNIS. These courses will be used to test the concepts from the workshops and to assess/develop discipline the subject area in consultation with the course participants. The total expenditure for these courses will be MNOK 1.77 million, of which we are applying for MNOK 0.77 million.

It will be a strength that existing and future observation networks (e.g., Svalbard Integrated Arctic Earth Observing System (SIOS), started as a EU ESFRI project) will be able to contribute several types of data, which in this subject may be used in risk models and teaching. Scientific data will thus be able to be used to contribute to the development of the new subject area. One example of this is the use of online meteorological stations. Data from this type of installation may be used more systematically in the future to provide better risk models and basis for decision-making directly related to the traffic in the natural environment. Another good example of this is challenges related to travel in avalanche-prone terrain. Remote sensing technology that is currently used to monitor the glacier systems in Svalbard is a third example of technology that may be directly usable in the assessment of risk.

The research to be performed at the department will be able to make use of new methodologies to plan, implement and manage risks associated with scientific and technological activities in the Arctic. Further, this research should make use of existing data series and subject knowledge that the academic departments at UNIS and collaborating institutions have and can contribute. In addition to producing student labour years and research, the subject area will also provide the academic foundation on which the safety rules of UNIS, and the collaborating institutions, will be based in the future.

Several organisations and institutions in Longyearbyen already possess expertise and knowledge about the safe implementation of complex operations in a High Arctic environment. It will be important to be able to use such expertise in the development of the subject area. Consequently, cooperation with local intuitions such as SNSK, the Longyearbyen Community Council, Longyearbyen Red Cross and not least the Governor of Svalbard will be important. Moreover, other organisations located in Svalbard, such as KSAT, Pole Position and local tourism operators, will be important contributors to the project.

Our ambition is to be able to offer a one-year programme at Bachelor level, which for relevant programme options could act as the final year of degree programmes in the field of safety at universities on the Norwegian mainland. Moreover, it is also an ambition to develop more practically-oriented, basic field safety courses and courses in practical risk assessment and safety management. These courses could be offered to the local population in Svalbard, as well as to national and international organisations with similar challenges. The subject area will also serve as a knowledge base for being able to design customised courses of varying length and content for groups with particular challenges associated with their activity. Another objective is the development of areas of specialisation at Master’s and PhD level. This could typically include specialisation in individual courses such as Glacier observation, Snow and avalanche problems, Maritime navigation, Aviation, Mining or other relevant courses. A common theme for all the courses will be that they will be based on the specific challenges of the Arctic natural environment, as well as localisation in a High Arctic area, and will provide knowledge and expertise on how these particular challenges may be solved.

The subject will build directly on the existing expertise and experience in natural sciences at UNIS and the other participants in the project in the following areas: Snow and avalanche problems, Erosion

and slope processes, Structures in permafrost, Ice and ice mechanics, Glaciers, Oceanography, Meteorology, Geomagnetic storms and navigation/communication problems, Biological and marine biological challenges and Rock mechanics. The subject will also build on the experience and expertise the logistics group at UNIS possesses within systematic and professionalised HSE management, safety training and the planning and implementation of operations in the Arctic. The Logistics Unit will serve as practical training unit for the subject and will arrange all the pilot courses.

The cooperation between UNIS and the Norwegian Polar Institute on matters relating to science as well as safety and logistics will be utilised to build up and later run the subject. The Norwegian Polar Institute, whose knowledge and expertise is complementary to UNIS, will be able to contribute to the expansion of the discipline to also include matters related to operations in Antarctica. The cooperation between UNIS and all the universities in Norway, as well as international academic institutions, must continue to be a basic requirement. We will develop the new subject Arctic Safety for, and in collaboration with, our academic partners.

The subject area will be able to make use of data that is already collected in Svalbard within all the above-mentioned subject areas and will very likely also develop more intense monitoring of high-risk areas (avalanches, sea ice and ice movement) in order to improve safety and to research this. The use of future remote sensing technology and other new ICT technologies will be important in the subject in order to be able to monitor the natural environment in the best possible manner. Consequently, the connection with SIOS and its observing systems is both natural and important.