
CRUISE PLAN

CGV SVALBARD 20.-27. MAY

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1 GOAL AND OBJECTIVES

Main Goal

The overall goal of the SARex Svalbard project is to increase the possibility and probability to survive long enough to get rescued in an emergency in the polar regions (see the overall project plan for SARex Svalbard).

On this cruise we will focus on three main objectives:

Main Objective #1:

Test and evaluation of equipment in order to meet the requirements of the IMOs Polar Code in terms of survival and evacuation. The activities are related to all four working packages (WP) in the project plan, i.e. Survival (WP#1), Information and Communication (WP#2), Evacuation (WP#3), and Oil Spill Protection (WP#4).

Main Objective #2:

To establish and document best practise of evacuation methods from shore to a rescue vessel, through repeated testing and evaluation of several different cases of passenger conditions, and to exercise and train the search and rescue personnel in the Red Cross Longyearbyen, at the Governor of Svalbard's office and at the Coast Guard Vessel Svalbard in order to improve their skills and knowledge. This activity is a recommendation from the SARiNOR project [2].

Main Objective #3:

To increase the knowledge about how leadership and organisation of a group of passengers affect the probability and possibility to survive over a period of several days, on shore, waiting to be rescued after an emergency evacuation of their vessel.

2 FRAMEWORK AND CONDITIONS

The cruise will take place in the Isfjord at Svalbard (Fig. 1). This is an area under the jurisdiction of the Governor of Svalbard, and all activity is coordinated and approved by the Governor. Testing and evaluation will be conducted in Isfjorden, in the vicinity of Longyearbyen. Parts of the field work will be organised and conducted at Deltaneset, in position 78.348°N 15.865°E. If the weather conditions are unfavourable at this site, an alternative will be at Hiorthamn in Adventfjorden, in position 78.249°N 15.696°E. These positions are marked as red dots on the map in Fig. 1.

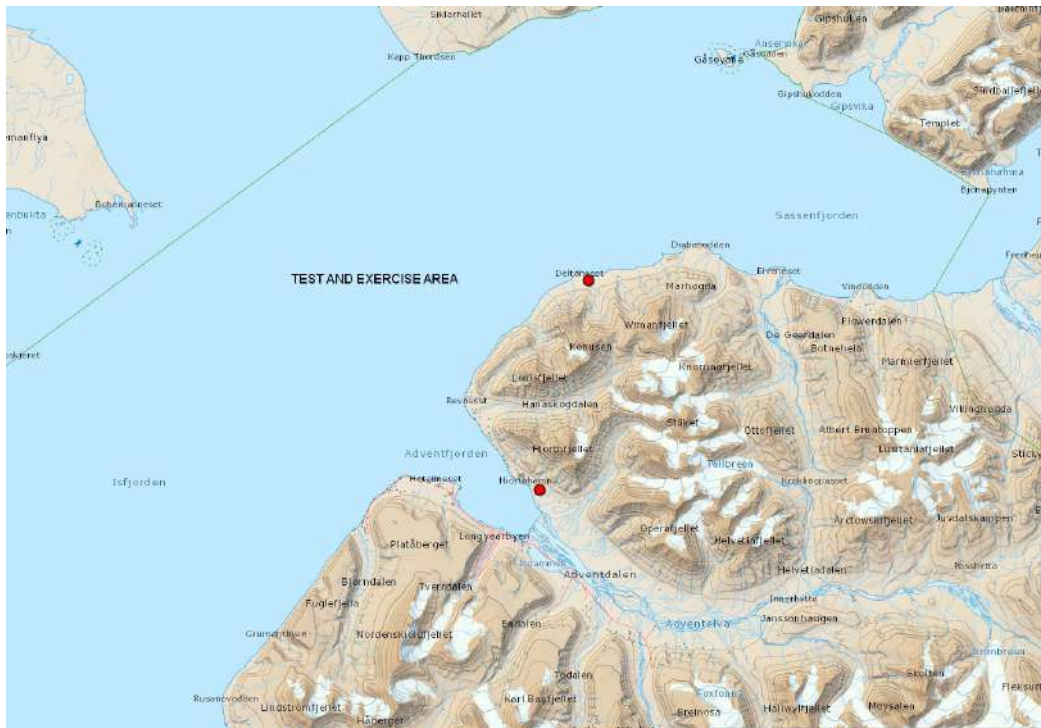


Fig 1. Exercise Area

3 TIME SCHEDULE

Arrival on Longyearbyen Airport Monday 20th:

NORWEGIAN flight DY396 from Oslo Gardermoen at 08:55, arrival at 11:55, no stops. Tickets reserved for cruise participants.

Departure from Longyearbyen Airport

The participants on the cruise take care of their own return tickets. Some of our participants will leave on Thursday 24th, and others will arrive.

Table 1: Cruise Plan Timeline 20th May - 27th May 2019

Activity	20	21	22	23	24	25	26	27
CGV Svalbard departure LYB								
Preparations field work								
Test of equipment								
MS Polarsyssel activities								
Main Objective #2								
Main Objective #3								
Summary meeting at UNIS								
CGV Svalbard dep.								



4 RISK ASSESSMENT

4.1 Risk Factors

T1: Severe wind conditions and large waves in the landing zone.

T2: Injuries on personnel during the exercise.

T3: Polar bear attacks.

		Severity of Consequences				
		Very low severity	Low severity	Medium severity	High severity	Very high severity
Probability	Very high probability		T2	T3		
	High probability	T1				
	Medium probability					
	Low probability					
	Very low probability					

4.2 Risk Management

T1: Personnel participating in the exercise and investigations may suffer from injuries because difficult evacuation conditions, fatigue and bad judgements or wrong decisions. Scientists and personnel conducting the exercise must be alert and focused on the safety of the personnel involved.

T2: Severe wind conditions and waves can make it difficult to enter the shore from a small boat, and likewise in the opposite direction. This risk can be mitigated by working at an alternative site. If the weather changes during the fieldwork, the safety of the participants on shore must be prioritized.

T3: Polar bear attacks is a risk, and situation where the participant has to shoot an animal in order to protect their own lives will stop the field experiments. Polar bears are a protected species, and a killed polar bear will be a case for police investigations. Armed guards in order to protect the life and health of the participants must be present. The guards can be armed with a spectre of devices from pyrotechnical devices to fire arms.



5 CRUISE MANAGEMENT AND ORGANIZATION

Commander of CGV Svalbard:

Geir Martin Leinebø, Commander SR, The Norwegian Coast Guard

Commander of MS Polarsysse:

Kjetil Enoksen
Kjetil Bogstrand

Cruise management

Terje Brinck Løyning, cruise leader, Dr. Scient., Maritimt Forum Nord

Espen Olsen, Police Chief Inspector, The Governor of Svalbard

Annette Meidell, Professor, Department of Computer Science and Computational Engineering, The Arctic University of Norway – UiT

6 PARTICIPANTS

6.1 Description of participants of the cruise with CGV Svalbard

Del 1 varer fra mandag 20. mai til torsdag 23. mai

Del 2 varer fra torsdag 23. mai til søndag 26. mai

Name	Organisation	Part 1	Part 2	Full time
Terje Brinck Løyning	Maritimt Forum Nord	x	x	x
Annette Meidell	Universitetet i Tromsø	x	x	x
Line Husjord	UiT	x		
Stein Bexrud	Aviation and Survival Support	x		
Iain Mc Lean	Survitec Group	x	x	x
Brede Valanes	AECO	x	x	x
Scott N MacKinnon	Chalmers Univ.	x	x	x
Bjørn Helge Utne	Norwegian Coastal Admin,	x		
Alf-Wiggo Eriksen	Kongsberg Seatex as	x		
Vladimir Sovilj	Viking/Norsafe	x	x	x
Jakob Storjord Andersson	Viking/Norsafe	x	x	x
Dorthe Iselin Austevoll	Sealift Systems	x	x	x
Miriam Vikingstad	Sjøfartsdirektoratet	x	x	x



Erik Landa	Sjøfartsdirektoratet	x	x	x
Jan Reinert Vestvik	Sjøfartsdirektoratet	x	x	x
Natalia Andreassen	Nord Universitet		x	
Line Sandbakken	Nord Universitet		x	
Alvhild Alette. Bjørkum	W Norway Univ. Appl. Scienc.	x	x	x
Helle Asgjerd Oltedal	W Norway Univ. Appl. Scienc.	x	x	x
Kristina Lærdal	W Norway Univ. Appl. Scienc.	x	x	x
Tiril Knutsen	W Norway Univ. Appl. Scienc.	x	x	x
Richard Norland	ISPAS		x	
Anders Rosnes	ISPAS		x	
John Inge Hammersmark	Norges Rederiforbund	x	x	
Hans Sande	Norsk Sjøoffisersforbund	x	x	x
Terje Herland	Lederne Equinor	x		
Tormod C. Endresen	UD	x		
Guy Mauseth	UIT	x		
Lars Nergård	HRS		x	
Morten Jørgensen	SARex Svalbard		x	x

6.2 Description of activities on the second part of the cruise on 24th and 25th May

The Governor of Svalbard, represented by Espen Olsen will conduct the exercises and training on the 25th. His command post will be on board M/S Polarsysse

The Players and actors will gather on board M/S Polarsysse in the evening on Friday 25th for briefings and preparing for the day after. The activity on the 26th is described in the last attachment, section 1.5. During this part of the cruise will be the "On-Scene-Commander" in "NO PLAY" events. In phase 1 during the activities on the 26th they will play the ship in distress and a large group personnel on board the Coast Guard vessel will be evacuated. The commander of CGV Svalbard will still have the role as AIR COORDINATOR. In phase two where the activity will be focused on the Deltaneset and transfer to and from



M/S Polarsysse, the Commander of CGV Svalbard will continue in his role as AIR COORDINATOR.

7 CONTRACTS AND AGREEMENTS

The cruise management will take the responsibility to ensure that the participants in the field exercises sign a written consent of participation, after a complete briefing of what they are about to endure.



8 REFERANSER

- [1] The High North Strategy – between geopolitics and social development (2017), The Norwegian Government High North Strategy. Downloaded from: <https://www.regjeringen.no/contentassets/fad46f0404e14b2a9b551ca7359c1000/arctic-strategy.pdf>
- [2] International Maritime Organization (IMO) Resolution Maritime Safety Committee (MSC) 385 (94) International code for ships operating in the polar waters (The Polar Code). Adopted on 21 November 2014. Retrieved from [http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/Maritime-Safety-Committee-\(MSC\)/Documents/MSC.385\(94\).pdf](http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/Maritime-Safety-Committee-(MSC)/Documents/MSC.385(94).pdf)
- [3] Svalbardmeldingen 2015-2016, Meld. St. 32 (2015-2016) Svalbard, downloaded from <https://www.regjeringen.no/contentassets/379f96b0ed574503b47765f0a15622ce/nopdfs/stm201520160032000dddpdfs.pdf>
- [4] The Roadmap to Norway's Arctic Policy, SARiNor Main Findings – A Summary, Maritime Forum North, Havnegata 28, 8514 Narvik, 2016
- [5] Solberg, K. E., Gudmestad, O. T., and Kvamme, B. O. (Eds.), 2016: SARex Spitzbergen April 2016 Search and rescue exercise conducted off North Spitzbergen. Exercise report., Report No. 58, University of Stavanger, September 2016.
- [6] Solberg, K. E., Gudmestad, O. T., and Skjærseth, E., (Eds) 2017: SARex2 Surviving a maritime incident in cold climate conditions. Exercise report., Report No. 69, University of Stavanger, November 2017.
- [7] Solberg, K. E. and Gudmestad, O. T. 2018: SARex3 Evacuation to shore, survival and rescue, Report No. 75, Stavanger University, December 2018.
- [8] Funnemark, E., Dahlsett, H.P., Johsnrud H.J. 2017: SARiNOR2 Salvage and contingency against acute pollution in the northern areas, Report No. 1079, DNV GL, December 2017.

Attachement 1:
1. Detailed Program

DATE	DAY	TIME	ACTIVITY	Responsible Institution	Additional Resources
20.05.2019	Monday	16:00	All participants embarked	All	
		16- 22	Safety brief, brief on cruise program, installation and preparation,	CGV Svalbard, participants	
		1630-1715	DINNER		
21.05.2019	Tuesday	0715-0800	BREAKFAST		
		08-17	Test of equipment	Survitec, Aviation Survival & Support	Volunteers
			Leadership studies on the beach	Chalmers, Høgsk. På Vestlandet	Volunteers: 20 pax in four groups
			Investigation on amount of sleep and rest	Høgsk. På Vestlandet	Volunteers
			Nutrition investigations	UiT	
			Communication tests	NCA, Kongsberg SEATEX, CGV Svalbard, Barentswatch	
		1115-1215	LUNCH		
		13-16	Heli Evac from life raft	Luftransport, UNIS	Volunteers
		1630-1715	DINNER		
		17-19	Evaluation of present-day activities – plans for the next day	All	
22.05.2019	Wednesday	0715-0800	BREAKFAST		
		08-17	Test of equipment		Volunteers



			Leadership studies on the beach	Chalmers, Høgsk. På Vestlandet	Volunteers: 20 pax in four groups
			Investigation on amount of sleep and rest		Volunteers
			Nutrition investigations	UiT	
			LUNCH		
		12-1630-1715	UNIS Activity on the beach	UNIS	
			DINNER		
		17-19	Evaluation of present-day activities – plans for the next day	All	
23.05.2019	Thursday	0715-0800	BREAKFAST		
		08-12	UNIS Activity on the beach	UNIS	
			Nutrition investigations		
			Test of equipment	Survitec	Volunteers
		1115-1215	LUNCH		
		12-16	Change of participants		
		1630-1715	DINNER		
		17-19	Evaluation of morning activities – plans for the next day, security brief, in brief for new participants	All	
24.05.2019	Friday	0715-0800	BREAKFAST		
		08-16	Test of equipment		Volunteers
			Leadership studies	Nord Univ, Chalmers, HVL	Volunteers
			Investigation on amount of sleep and rest	HVL	Volunteers
			Nutrition investigations	UiT	
		1115-1215	LUNCH		
		1630-1715	DINNER		



		17-19	Evaluation of present-day activities – plans for the next day		
25.05.2019	Saturday	0700	Embarkation M/S Polarsysssel (participants from LYB)	SMS, Red Cross	
		0715-0800	BREAKFAST		
		09-11	Helicopter-evacuation from CGV Svalbard	SMS, Rec Cross, CGV Svalbard, Luftransport	Volunteers
		09-17	UAV activity, sensor test,	Andøya Space Center, SMS	
		1115-1215	LUNCH		
		11-17	Training loop: Triage-Transport to Rescue vessel – reception and treatment – return to start	SMS, Red Cross	Volunteers
		1630-1715	DINNER		
		18-19	Evaluation of present-day activities – plans for the next day		
26.05.2019	Sunday	0715-0800	BREAKFAST		
		08-16	HOT WASH UP – Evaluation – packing- debarkation	All	Møysalen+et klasserom Festningen

1 DESCRIPTION OF ACTIVITIES

1.1 Test of different type of survival suits, provided by Survitec and Aviation Survival and Support.

- Arctic Survival Suit, for use for passengers in a helicopter. The provider describes the suit as "... designed for extreme cold conditions and is in use by the Canadian Coast Guard". The suit will be tested during the last part of the cruise, in coordination with the activities under objective #2.
- Crew Endurance Plus Suit. The provider describes the suit as the following: "These immersion suits are approved by many of the world's leading maritime authorities and offer exceptional properties for surviving cold water immersion even in Arctic conditions. They are fast to don with a large zip handle for easy closure and include pre-attached hood and gloves, so you are prepared when entering the water. The suits could be used for passengers on shore and in the water." Testing of this suit will take part during the first part of the cruise with assistance from the personnel from the CGV Svalbard.
- 1000 Series Gen 2 Immersion Suit. The provider gives the following description: "The 1000 series can be integrated with a separate thermal insulation garment to act as an abandonment suit. It has increased breathability and has reinforced points across the suit for durability. The could be used for passengers on shore." The tests and evaluation will be conducted during the last part of the cruise, in coordination with the activities under objective #2.
- Mk4 Marine life raft -20/25 personnel. The provider describes this equipment the following way. "We would suggest we supply either of these 2 products, probably the self-righting raft as there is more headroom and it would be more comfortable (this was a criticism of life rafts in the last SAREX report [7]). The 35P is de-rated to 28 persons for polar use." The testing and evaluation of this life raft will take place at the first part of the cruise.

1.2 Testing of maritime broad band systems and contribution to situational understanding

- Test of Maritime Broad Band communications at Svalbard. The Norwegian Coastal Administration (NCA) is in dialog with Barents Watch, Telenor Svalbard, Kongsberg Seatex and The Governor of Svalbard to test the maritime broad band communication-network with the CGV



Svalbard and MS Polarsysse. If the tests are successful, the maritime broad band network will be a significant increase of the possibility to distribute information of the situation on site to operational SAR centres at the Governor's office and at the mainland. This will contribute to better common situational understanding at all levels.

- UAV activity in combination with communications: Friday and Saturday, there will be test of communications from sensors on humans and life rafts through a UAV link to the operational center. An experiment with a UAV equipped with a radio relay device and power supply from ground through a 100m cable will be conducted for 8 hours. The purpose is to extend the network for cell phones in areas where the ordinary network is out of reach.

1.3 Train and study leadership and organisation

University Studies in Svalbard's (UNIS) main goal with participation in the SARex Svalbard project is to study / train leadership in one exercise and emergency and survival in the other exercise. This is for our employees when they are in the field and are responsible for students / researchers, but also for our boat drivers who are responsible for students / researchers regarding boat operations. At the same time, we would like to look at the use of various types of rescue equipment. Based on the various scenarios described below, this will fit well into work package 1 which has the focus of survival.

The method for this is as follows:

Scenario 1 Survival in the sea

Haverage on smaller boat due to fire on board with 12 pax on board. Everyone must evacuate into the sea. The driver of the boat and 2 others have survival suit with different type of clothing underneath. 9 is wearing a regatta suit with different types of clothing underneath as well as lifejacket. The raft is released (this is reversed). Everyone must get up in the fleet and will survive in the fleet with the equipment that is available here. The evacuated people (markers) here will be available to try out different types of equipment for measuring physiological reactions such as temperature, pulses, O2 content in blood etc. The time aspect of this scenario will be 3-4 hours. It is desirable for this to take place on May 21th.

Scenario 2 - Survival on land

A group of researchers is put ashore to collect data (12 pax). They will be picked up on the same day. Due to bad weather they will have to survive on the beach for 16-20 hours until the weather is better, and evacuation is possible. The leadership of field assistants will be tested, the selection/equipment in the



emergency box will be evaluated, the organization of group, polar bear guard, food and drink ration will be tested, disembarkation under rough conditions, cold, infrastructure etc. Blood sugar measurements and some biometric data will be collected from some of the participants.

The time aspect of this scenario will be 16-20 hours. It is desirable that this be carried out May 22-23.

ASC / UNIS even has markers, boat, rescue equipment and other equipment that will be used during both scenes, but we will depend on support for follow-up of safety during the exercise and follow-up of markers afterwards.

Several actors operating in Arctic waters have small boats with 12 pax or fewer that are put ashore for a short period. Haverage due to fire is a risk that is always present. In our opinion, these scenarios have a large transfer value to operators operating in the Arctic.

All markers will be anonymized about name and personal number. It will only be gender and age that will be known.

1.4 Study of leadership as a survival factor

An area that will be of interest to study more closely in this project is to what extent leadership and organisation affects the ability to survive under demanding conditions in cold climates, both as an individual and in groups. There is ongoing research within subjects of leadership and organization of activities where the situation and environment may change rapidly, and decision-making is under pressure in terms of time and risk. One of our academic collaborators, The Chalmers University of Technology, work with development of leadership and management of search and rescue operations both in their research- and education programs. They want to extend their knowledge by including the polar perspective, and by this include factors as the cold environment, darkness, distance, communication and limited resources. They want to compare this with other studies of the same matter, and by this map the differences and common features. They collect their data through observations, video recordings, interviews, etc. The researchers have experience as search and rescue personnel at sea and understand the importance of making observations without disturbing the ongoing activity. This research group has experience with dissemination of results into the IMO regulations and has succeeded in changing the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual vol. III. They will cooperate with the Nord University and the Arctic Safety Center in Longyearbyen.



1.5 Evacuation

Mass Rescue Operation (MRO)

This exercise is conducted in two phases:

- Phase 1 MRO AIR
- Phase 2 MRO LAND and SEA

Phase 1 MRO AIR

There will be two helicopters in action, training on mass evacuation from CGV Svalbard. The players will be organised in groups of 20 with one representative from the Red Cross as leader of the group. List of names in each group will be established and copied to the group leader and to the CGV Svalbard. The groups will be marked with coloured tape. This operation is estimated to last for about two hours.

Phase 2 Phase two starts on the beach with triage and preparing the players for transport to MS Polarsysssel for further treatment. After treatment on board Polarsysssel the players are returned to the Deltaneset for another “loop”. This activity will continue to 1730 hrs (0530 pm)

1.6 Biometric measurements

- Test of finger rings to measure amount of sleep and rest, physiology-parameters of individuals, and other types of measurements and observations by interviews and questionnaires. These investigations will be conducted as a part of other investigations such as those described in section 1.3, 1.4 and 1.5

1.7 Nutrition

Cognitive failure may lead to irrational actions in connection with survival and evacuation. When the blood sugar drops below two to three mmol it may affect the mental function. It is therefore interesting to know more about the nutrition and activity connected to evacuation situations. We will therefore compare blood sugar levels with the intake of energy and activity in order to see the difference and effects of different energy intake.

For the exercise on Tuesday-Wednesday at the beach, we will measure blood sugar in a total of 2 of the 4 groups, a total of 15 people in one day. One in two of the four groups will only eat emergency supplies from Seven oceans, which are used in cruise ships in polar areas. Blood glucose measurements will be taken before food intake, and after food intake to follow the development of blood sugar levels. Simple cognitive tests will be performed throughout the test period.



For the exercise in Scenario 2, which UNIS will carry out on Wednesday the 22nd to Thursday, May 23, we will measure blood sugar of approx. 5 of the participants and follow up with simple cognitive tests.