



Project title:

“The Impact of Seismic on the Environment”

Mobilization and Demobilization procedure for field test off shore NINA’s facilities at Ims, Norway

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1.1 Purpose

The purpose with this document is to gather relevant information and guidelines related to the practical implementation of the tests defined to be part of this project.

As the mobilization, tests and demobilisation will be carried out in a relative narrow time frame, Biota Guard has decided to issue this document covering responsibility matrix both for mobilization and demobilization, and also event log for mobilization and demobilization.

This will be a dynamic document, where findings and results will be continuously updated and verified.

1.2 References

BG-KA-0001 Factory Acceptance Test – OERA seismic project

1.3 Site specifics

Item	Description
Geographic location	Imsavika, Sandnes, Norway
Target coordinates	(N58°90'5", E5°97'07")
Distance from shore	500 m
Target depth	50 m
Seabed characteristic	Sand, sediments
Sea current	1-2 knots
Wave height	0,5 m
Infrastructure onshore	Ethernet, power, access to Internet
Infrastructure offshore	Umbilical cable to shore

Table 1 Site specifics



Figure 1 Field test site. Map of southern Norway in the top left corner. Biota Guard logo marks the exact position of the deployment. Right left of the logo, adjacent to the bay is NINA's facilities

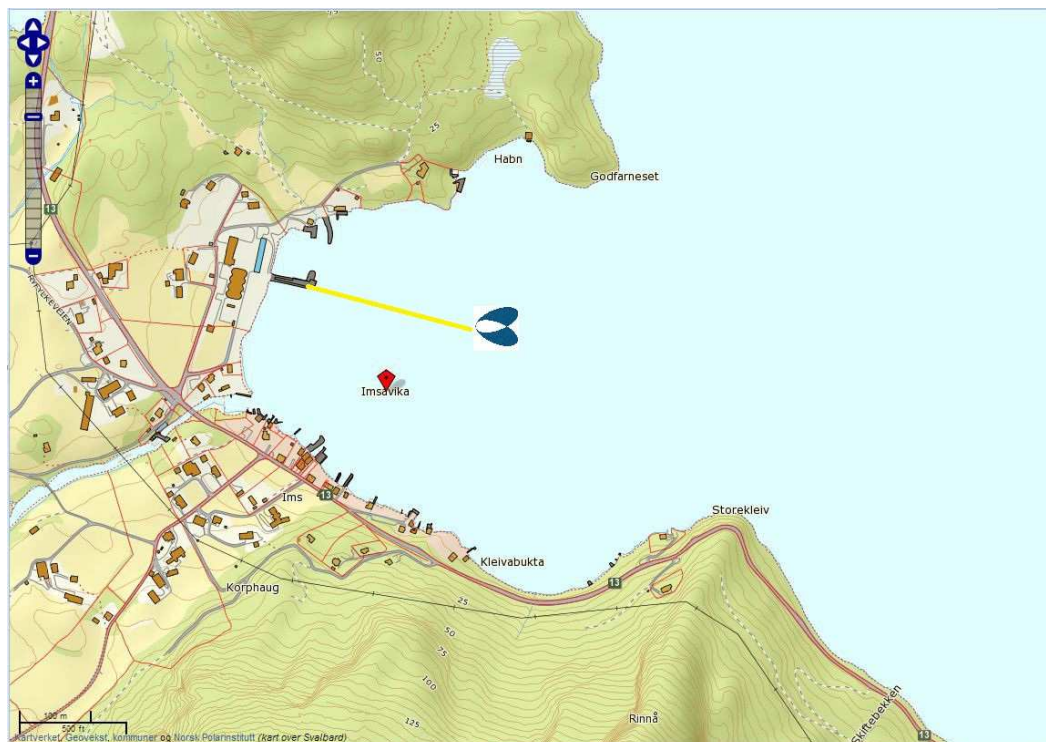


Figure 2 Close up of the "Imsavika" bay area. Biota Guard fjord test infrastructure setup. Yellow line represents subsea cable for power and communication

1.4 Equipment and personnel

Item	Description
"Claudius", deployment vessel ref. Figure 3	Crane Diving station with pressure chamber Inspection ROV Work area Crew: 5
Assisting boat	Personnel: 1
Decompressing chamber	Diving safety equipment
Biota Guard Personnel	3
1x Subsea Sensor Arrays (sSA), comprise of: <ul style="list-style-type: none"> - 2x electronic canisters - Aanderaa Seaguard suite of sensors - 16x Blue Mussels - Hydrophone 	
1x Umbilical cable	2 km
1x Indicator buoy	Topside to mark and protect lander mooring
1x Subsea lander platform	
1x Topside PCU, comprise of: <ul style="list-style-type: none"> - Industry PC - Power distribution unit w/UPS - Communication unit (ICE) 	
16x Snow crabs in separate cages	

Table 2 Equipment and personnel



Figure 3 Deployment vessel "Claudius"

1.5 Factory Acceptance Test (FAT)

The FAT will take place at Biota Guard warehouse, where the entire system (minus the subsea lander, Snow crabs and Blue mussels) will be interconnected and functional tested.

1.6 Site Acceptance Test (SAT)

The SAT will take place at NINA's facilities at Ims, where the entire system, including subsea lander and snow crabs will be connected and functional tested.

1.7 Deployment / Mobilization

1.7.1 Mobilization – responsibility matrix

Activity	Comments	Responsible
Operation manager		Biota Guard
Deployment procedure		EB Marine
Security briefing		Biota Guard
Transportation of subsea lander platform to assembly area	Lander platform produced by EB Marine	EB Marine
Transportation of other equipment to site		Biota Guard
Assembly of biosensor modules (snow crabs and blue mussels)		IRIS / Biota Guard
Assembly of mooring		EB Marine
Loading of equipment onto deployment vessel		EB Marine
Maintaining target coordinates during		EB Marine

Activity	Comments	Responsible
deployment		
Deploy sSA and mooring at target depth and coordinates		EB Marine
Ensure that umbilical is not entangled with mooring system during deployment		EB Marine
Confirm correct position and setup of sSA	Inspected by diver	Biota Guard
Lay approximately 500 m of subsea cable to shore		EB Marine
Secure umbilical onshore and provide protection against heavy sea		EB Marine / Biota Guard
Install topside PCU on site		Biota Guard
Provide power and internet connection to topside PCU on site		NINA
Connect sSA to topside PCU and verify data traffic		Biota Guard
Secure equipment onshore for long term operation		Biota Guard

Table 3 Mobilization – responsibility matrix

1.7.2 Mobilization – deployment log

Activity log	Comments	Responsible
Security briefing		EB Marine
Loading of equipment onto deployment vessel		EB Marine
Transportation of equipment to site		EB Marine
Assembly of biosensor module in sSA		Biota Guard
Assembly of mooring		Biota Guard
Maintaining target coordinates during deployment		EB Marine
Deploy sSA and mooring at target depth and coordinates		EB Marine
Ensure that umbilical is not entangled with mooring system during deployment		EB Marine
Confirm correct position and setup of sSA		Biota Guard
Lay approximately 100 m of subsea cable to shore		EB Marine
Secure umbilical onshore and provide protection against heavy sea		Biota Guard
Install topside PCU on site		Biota Guard
Provide power and internet connection to		Biota Guard

Activity log	Comments	Responsible
topside PCU on site		
Connect sSA to topside PCU and verify data traffic		Biota Guard
Secure equipment onshore for long term operation		Biota Guard

Table 4 Mobilization – deployment log

1.7.3 Mobilization – non-conformances and general notes

Nothing to report

1.7.4 Mobilization – corrective actions

Nothing to report



Figure 4 Biota Guard adaptive subsea Sensor Array ready to be lowered to 500 m



Figure 5 ROV inspecting sSA positioned at target depth of 500 m (illustration only, photo from the "Arctic project")

1.8 Demobilization

1.8.1 Demobilization – responsibility matrix

Activity	Comments	Responsible
Operation manager		Biota Guard
Demobilization procedure		EB Marine
Security briefing		EB Marine
Transportation to location		EB Marine
Disconnect topside PCU		Biota Guard
Prepare subsea umbilical for retrieval		Biota Guard
Retrieve umbilical onto demobilization Vessel		EB Marine
Ensure umbilical is not entangled during retrieval of sSA and mooring		EB Marine
Retrieval of sSA and mooring		EB Marine
Loading of equipment onto demobilization vessel		EB Marine
Secure equipment on Vessel for transportation		EB Marine
Evaluate and document the state of the equipment after loaded on deck		Biota Guard
Secure biosensor for transportation to IRIS for evaluation		Biota Guard
Dismantle topside PCU and onshore infrastructure		Biota Guard
Transportation of equipment to Biota Guard		Biota Guard

Activity	Comments	Responsible
premises, Stavanger		
Unload equipment at Biota Guard premises, Stavanger		Biota Guard

Table 5 - Demobilization - responsibility matrix

1.8.2 Demobilization – log

Activity	Comments	Responsible
Operation manager		Biota Guard
Demobilization procedure		Biota Guard
Security briefing		EB Marine
Transportation to location		EB Marine
Disconnect topside PCU		Biota Guard
Prepare subsea umbilical for retrieval		EB Marine
Retrieve umbilical onto demobilization Vessel		EB Marine
Ensure umbilical is not entangled during retrieval of sSA and mooring		EB Marine
Retrieval of sSA and mooring		EB Marine
Loading of equipment onto demobilization vessel		EB Marine
Secure equipment on Vessel for transportation		EB Marine
Evaluate and document the state of the equipment after loaded on deck		Biota Guard
Secure biosensor module for transportation to IRIS for evaluation		Biota Guard
Dismantle topside PCU and onshore infrastructure		Biota Guard
Transportation of equipment to Biota Guard premises, Stavanger		Biota Guard
Unload equipment at Biota Guard premises, Stavanger		Biota Guard

Table 6 Demobilization - log

1.8.3 Demobilization – non-conformances and general notes

Nothing to report

1.8.4 Demobilization – corrective actions

Nothing to report

1.9 HSE

Deployment procedure

Deployment and demobilization procedures were developed in collaboration with a subcontractor of Biota Guard, EB Marine. The operations were described in detail in respective operational procedures.

OPERATION SECURITY BRIEF

Security briefs were held in accordance with Table 3 and Table 5 before mob/demob was initiated.

REPORTED HSE INCIDENTS

Nothing to report