NAMIRS

Co-funded by the European Union

University *of Ljubljana*
Faculty *of Maritime Studies and Transport*

DRAFT

REPORT ON THE ANALYSIS OF EXISTING MECHANISMS, EQUIPMENT, TECHNICAL AND HUMAN RESOURCES

WP 2.2

Portorož, December 2022

Co-funded by the European Union

Prepared by:

- Capt. VALTER SUBAN, MSc,
  E-mail: valter.suban@fpp.uni-lj.si
  Tel: 0038656767295
- MARKO PERKOVIČ, PhD,
- Prof. PETER VIDMAR, PhD; SC Member,
- JURE DEMŠAR, BSc,
- URBAN PEGAN, BSc,
- JANVIT SABADIN, MSc.

CONTENT

1. INTRODUCTION

Accidents will happen! No matter how worn out these words may sound, they should be heeded. We should always pay attention to the consequences of accidents and strive towards mitigating them as much as possible. Therefore, as individuals and up to the state level, we should always be ready to cope with an eventual accident, wherever it might occur. It is here worth recalling the proverb the friend in need is a friend indeed. However, the capability of offering help to friends depends on our own preparedness to take action. Besides that, we should be capable of informing them about an accident ourselves, and how to coordinate activities with them. Usually, it is your neighbor that will help you best.

All that also applies to accidents at sea. The Gulf of Trieste is no exception, despite the fact that sea traffic is believed to be a relatively safe branch of transport and that the International Maritime Organisation (IMO) is has made huge efforts in order to provide safe navigation and clean seas. The sea does not recognize state borderlines. It is only subordinate to the laws of nature. Therefore, a joint action of neighbors is of the utmost importance.

All the countries in the Gulf of Trieste, the Republic of Slovenia, the Republic of Italy, and the Republic of Croatia, have prepared themselves to take measures in case of accidents at sea. Thus, all the states and local communities have worked out plans of coordinated action in the case of minor accidents or disasters to a larger extent.

The first attempt to integrate resources was a project titled Rescue Simulation of a Grounded Tanker, supported by the PHARE Cross Border Cooperation funds. Within the project, several workshops were held and a study of existing resources was completed.

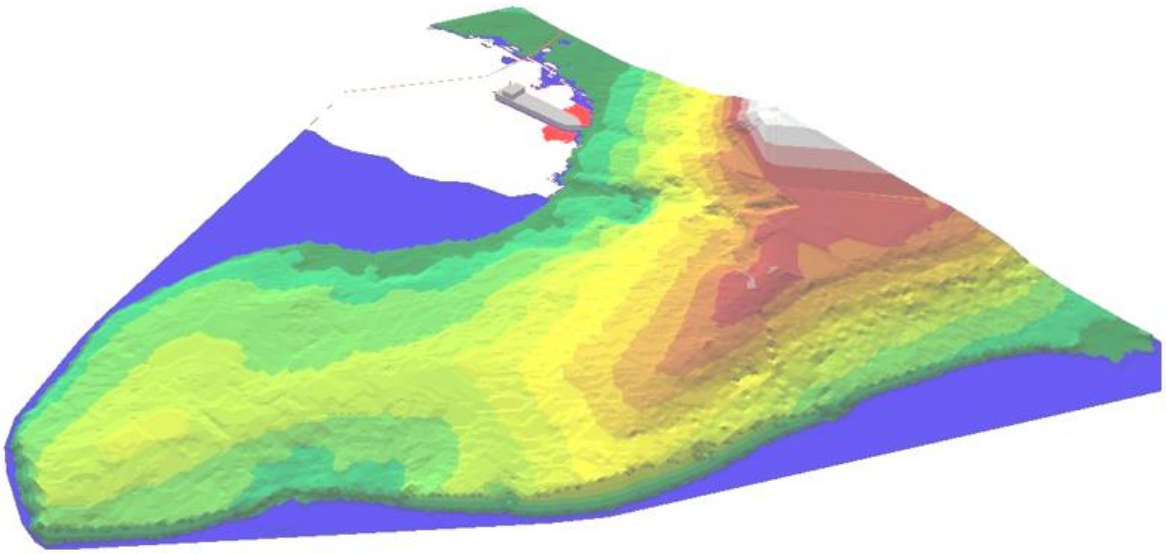


Figure 1: Simulation exercise of a stranded tanker recovery ITA-SLO 2001-2002

Ker se je že takrat čutilo potrebo po skupnem sodelovanju je bil lata 2005 izdelan Contingency plan for Norhern Adriatic, ki pa ni bil ratificiran s strani Republike Italije in zato ni zaživel v praksi in trenutno veljajo le National Contingency plans

Whereas the existing national Contingency Plans are not sufficient enough to tackle such a transboundary threat, the NAMIRS will contribute to better preparedness and a more coordinated response at a transnational level, also in line with the Barcelona Convention and related Protocols. Strengthened regional cooperation and cross-sectorial coordination will be achieved through the integration of knowledge, tools, and resources available within the NAMIRS multi-stakeholder partnership.

Vital to a contingency plan of any meaningful value is the mapping of anti-pollution resources. The task was to gather and analyze the data on all the existing resources along the entire stretch of the coastline between Ancona, Italy, and Zadar, Croatia, located in the southwest and southeast of the North Adriatic, respectively. Altogether, we had nine regions to cover: Marche, Emilia-Romagna, Veneto, and Friuli Venezia Giulia in Italy, Primorska in Slovenia, and Istarska, Primorsko-goranska, Ličko-senjska, and Zadarska in Croatia.

Following a number of initiative meetings between the partners, we started collecting data including the stakeholders involved in a potential response scenario, the relevant services available in each region, and the oil-recovery assets and equipment at the Partners' disposal.

In order to develop an efficient and sustainable contingency plan, one that would serve just as well in the present day as in the future to come, we set out to achieve the following goals:

- A uniform, complete, and detailed mapping of all resources,
- A transparent list of the existing resources annexed to the Plan,
- The assessment of the actual oil-recovering capacity in the North Adriatic,
- The analysis of national and international (cross-border) command scheme, strategy, and cooperation,
- The recognition of conspicuous deficiencies and missing resources along with other less obvious gaps,
- Possibilities and recommendations for improvement.

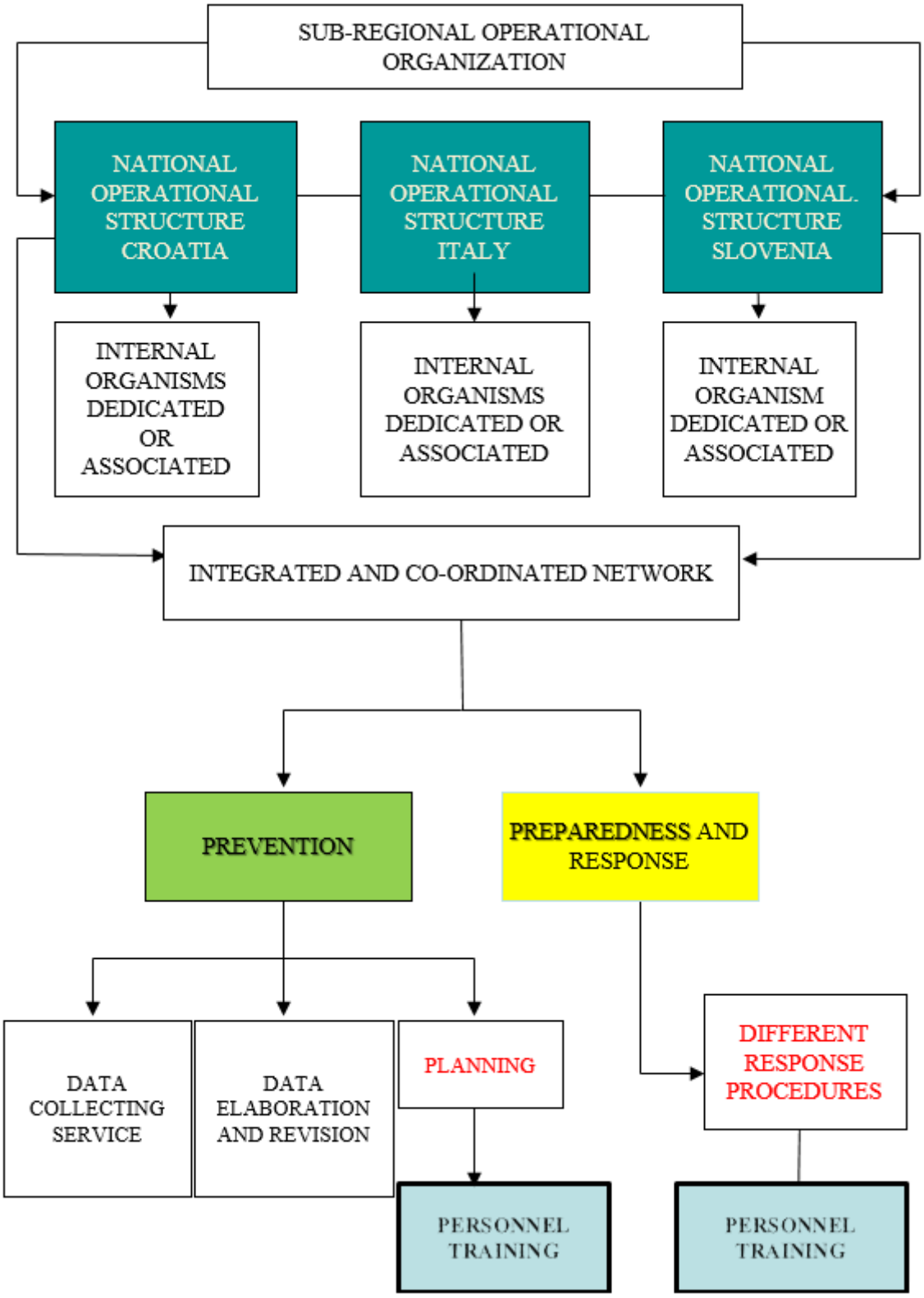


Figure 2: Flow chart of the proposed cooperation

2. CONNECTIVITY TO OTHER WORK PACKAGES

The work packages are inherently interconnected. All of them are of equal importance to developing an efficient cross-border contingency plan.

2.1. WP 2.1: Sensitivity mapping

The PP OGS, with help from other Partners, have been preparing the sensitivity maps of the Northern Adriatic. Sensitive areas will be assessed according to three criteria: the environmental, gomorfological, and socio-economic value. The most important for the decision makers in the case of an eventual oil spill will be a chart that all the forementioned factors will be incorporated into. On this chart, the priorities will be demonstrated by applying different colors to the coastline.

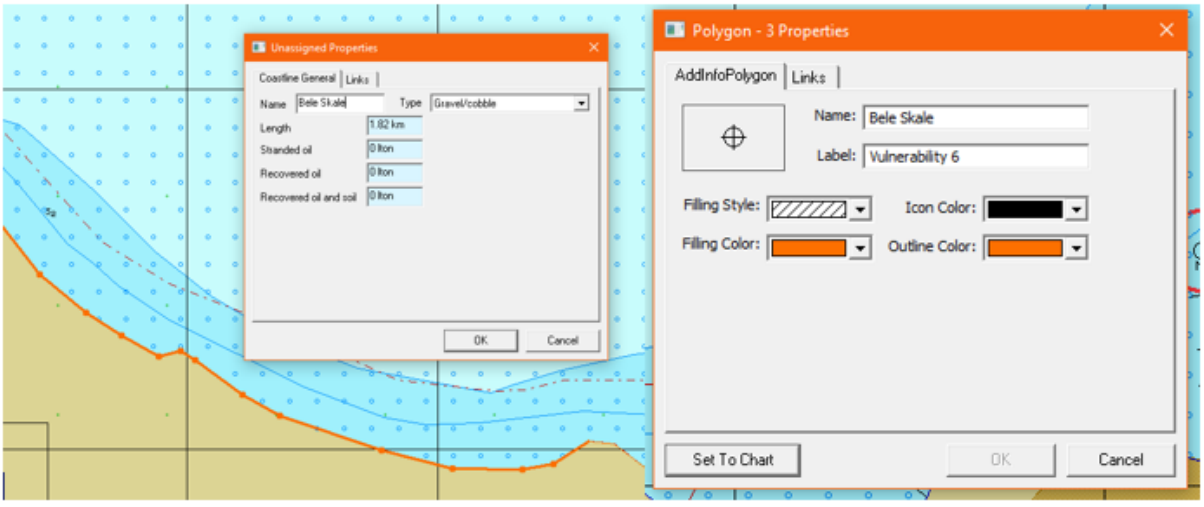


Figure 3: Beach type mapping

After the completition of sensitive mapping, the final evaluation of the coastline will be inserted into the renewed oil-spill simulator, which will provide valuable support to the commander to make the right decision on which areas to protect priorily.

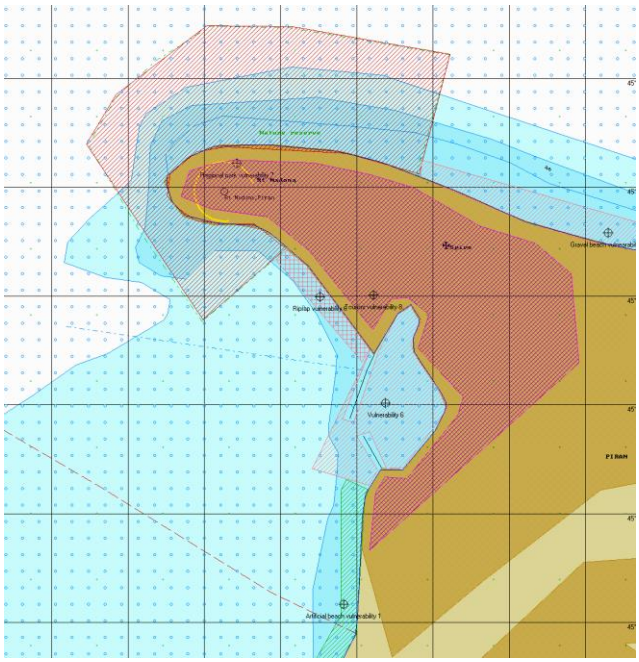


Figure 4: Fully mapped area including nature reserves, beach type, and tourist locations

For the training purposes within the WP4, the simulations done by the OGS will be rasterized and transferred to the PISCES simulator, where the results will be compared. The simulations will be optimized according to the results of the real action taking place at sea.

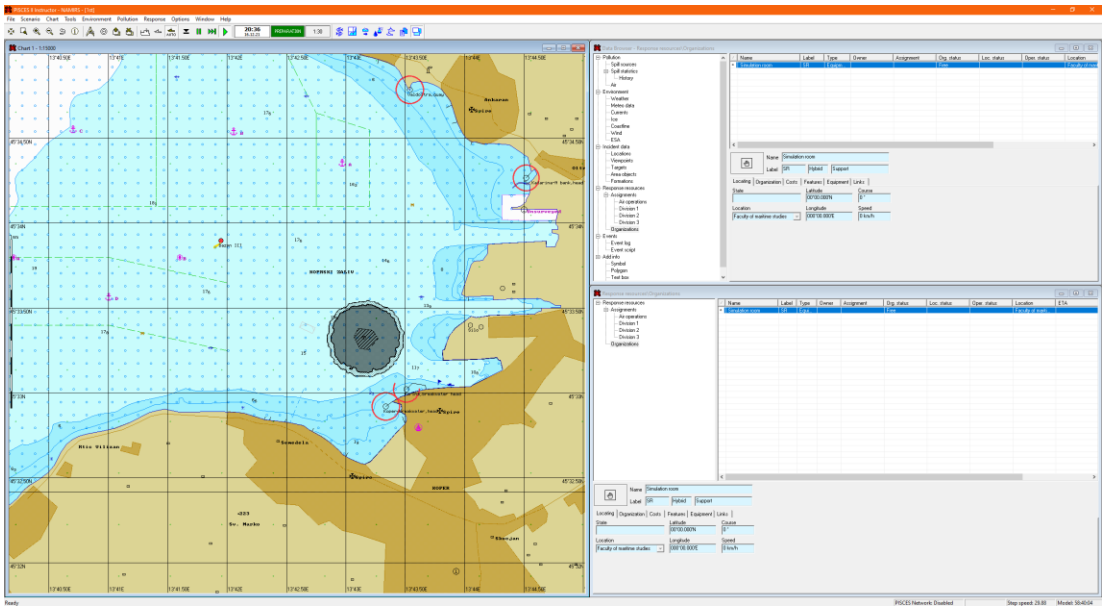


Figure 5: Display of an oil slick

2.2. WP 2.3: Guidelines for the revision and update of the sub-regional contingency plan for the Adriatic Sea

The results of the WP2.3 will be the foundation of the proposal of the Guidelines for the Revision and Update of the Sub-Regional Contingency Plan for the Adriatic Sea, which will be developed upon the completion of the WP 2.2. The data related to services and equipment will be of great significance.

2.3. WP 3: Training

Within the WP3, there are five training sessions planned, taking place on the renewed simulator, where participants from Partner coutries will receive training on the oil-spill simulators on the management level, so that they are competent in leading the operations at sea. On the PISCES simulator, exercises will be conducted using the equipment mapped within the WP 2.2. Response teams will operate in real locations and handle real environmental conditions including the wind, waves, and currents.

2.4. WP 4: Development of the SOP and practical exercises

Within the WP 4, the standard operating procedures (SOP) will be developed, based on the analysis of the resources and procedures as a result of this work package. Of course, the results of the WP 2.2 will be modified during the construction of the SOP, and, later on, during exercises and anual reviews.

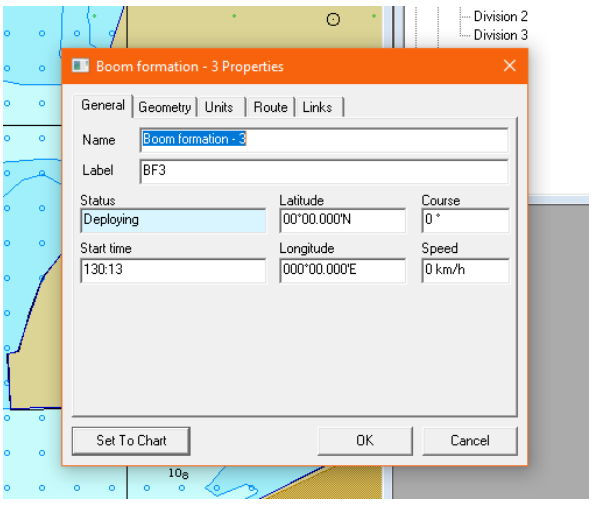


Figure 6: Setting a boom formation

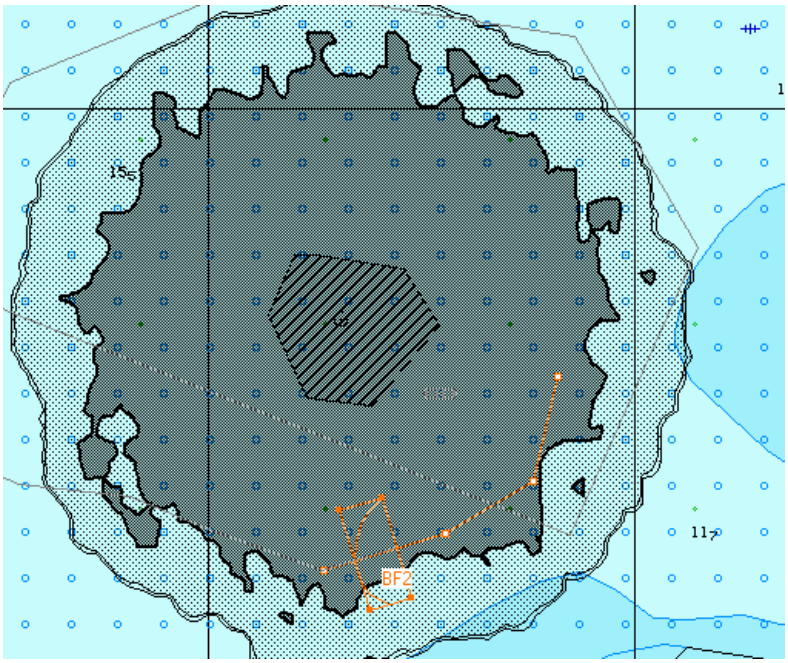


Figure 7: Deployed boom formation

3. RENEWED OIL-SPILL SIMULATOR CENTER

This chapter is very important because of the influence it has had on the other WPs within the project. So, in addition to the justification of the supplied hardware, we have also provided presentations of the features of the software and explained its significant contribution to the results of the entire project.

The Faculty of Maritime Studies and Transport of the University of Ljubljana (UL FPP) has had up-to-date simulators since the year 2000, i.e., communication, nautical, engine-room, and cargo-handling simulators. Later, those were supplemented by the purchase of the simulator called PISCES, which was a state-of-the-art oil-spill software back in the day and is still considered one of the best simulators of its kind worldwide today.

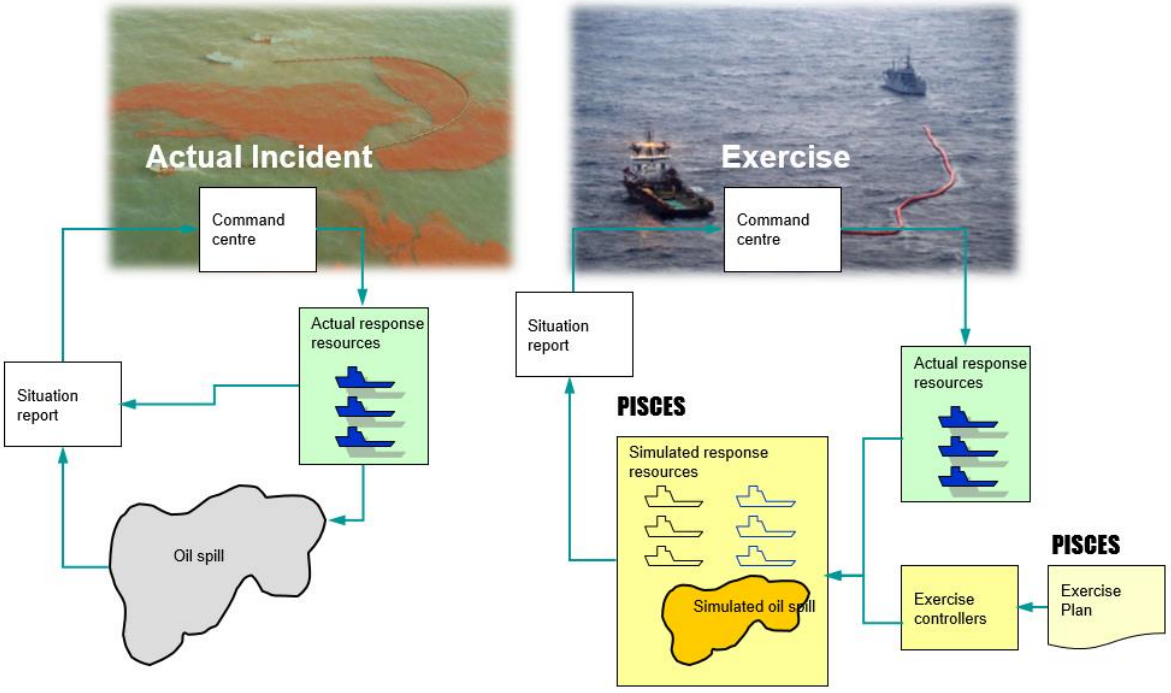


Figure 8: PISCES approach

3.1. PISCES

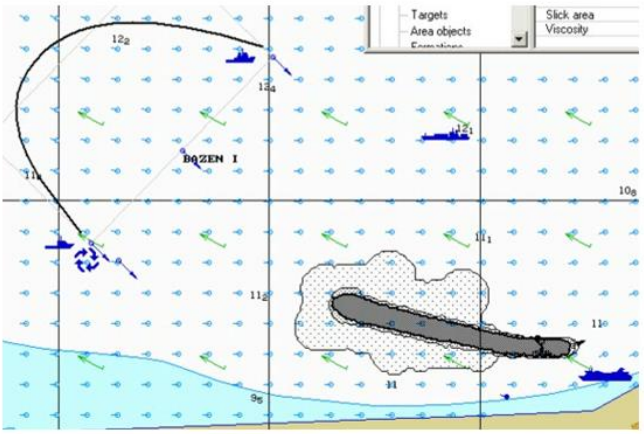
The PISCES II is an incident-response simulator designed for the preparing and conducting ofcommand-centre exercises and area drills. The application was developed to offer support to the exercises focusing on oil-spill response.

The PISCES II us used to establish an interactive-information environment based on the mathematical modeling of an oil spill interacting with surroundings and combat facilities. The PISCES II spill model simulates the weathering processes and the behavior of an oil slick on the water surface: transport by currents and wind, spreading, evaporation, dispersion, emulsification, variation in viscosity, burning, including interaction with booms, skimmers, and the shoreline.

The key benefits of using the PISCES are:

- The realistic crisis scenarios created for both offshore and coastal teams. The oil-spill model is affected by currents and wind. It simulates spreading, evaporation, dispersion, emulsification, viscosity variation, burning, and even the slick's visual appearance, which depends on the amount of the discharged oil and its characteristics. The computations of the oil flow distribution, affected by vessels, recovery objects, and other structures, are masterfully executed.
- A realistic equipment response is achieved by modelling the response objects (such as booms and busters) stated on the manufacturers' equipment data. Interaction with various objects is modelled, as well. For instance, inapropriate handling of booms will cause leakage.
- Realistic assessment: for determining the success of an exercise scenario, there are two factors taken into account - situational variables, like the actual sea state and its limits and currents, and the nature of the spill vis-a-vis trainees' response.
- Shared environment enables joint training of various parties involved in oil-spill-response operations, such as bridge teams, deck teams, and shore personnel.

- OPA 90, USCG PREP, OPRC 1990
- IMO course “On scene commander”
- Simulation of oil spill and response operations
- Contingency planning
- Table-top and field exercises
- Backtracking ….



Modeling of an oil spill incident

Simulation of response strategies

Conducting of exercises and area drills

Figure 9: Description of the tasks in the PISCES

3.2. Simulation center

The PISCES and all the other simulators are part of the UL FPP integrated simulator center (see figure 5).

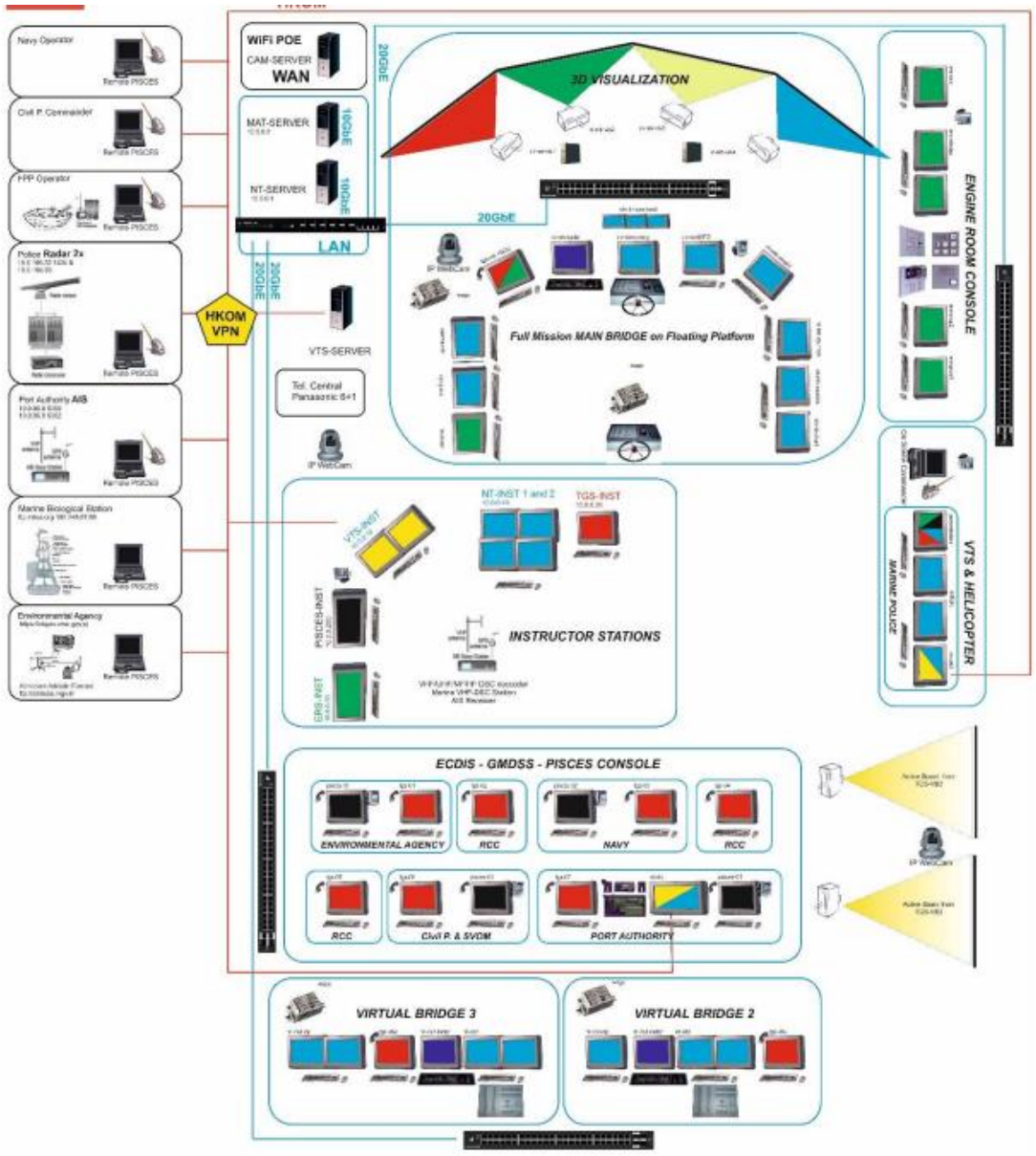


Figure 10: Scheme of the UL FPP simulation center

In combination with the nautical simulator, the PISCES enables the training of oil-spill responders in a lifelike environment, displaying the situation at sea.

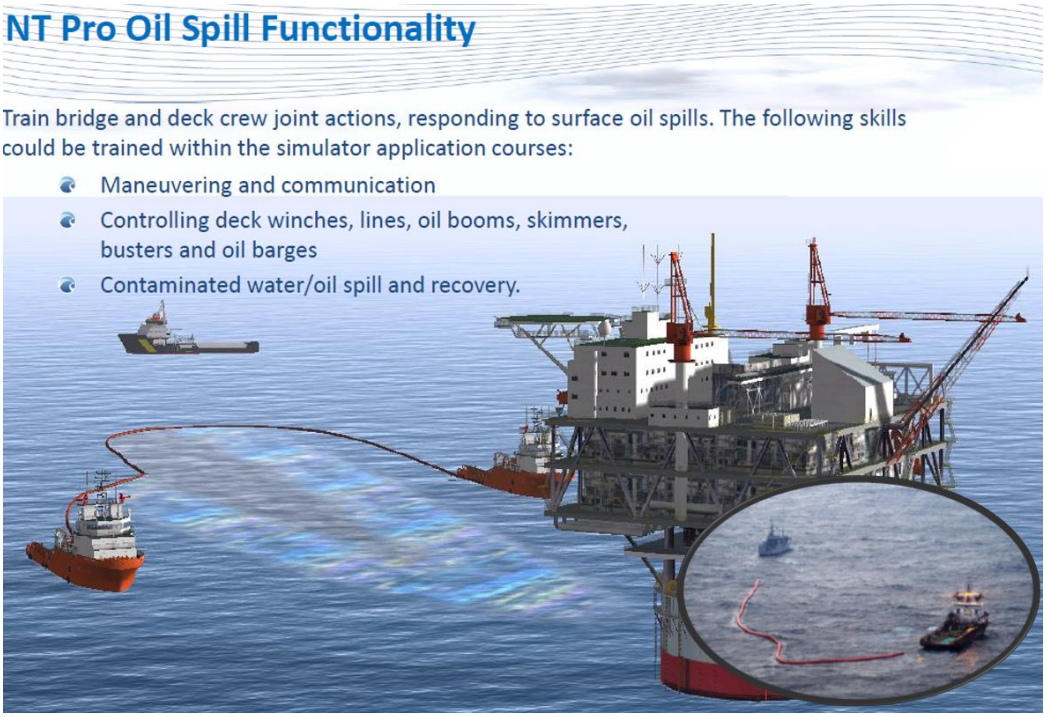


Figure 11: Display of a PISCES scenario on the navigation simulator

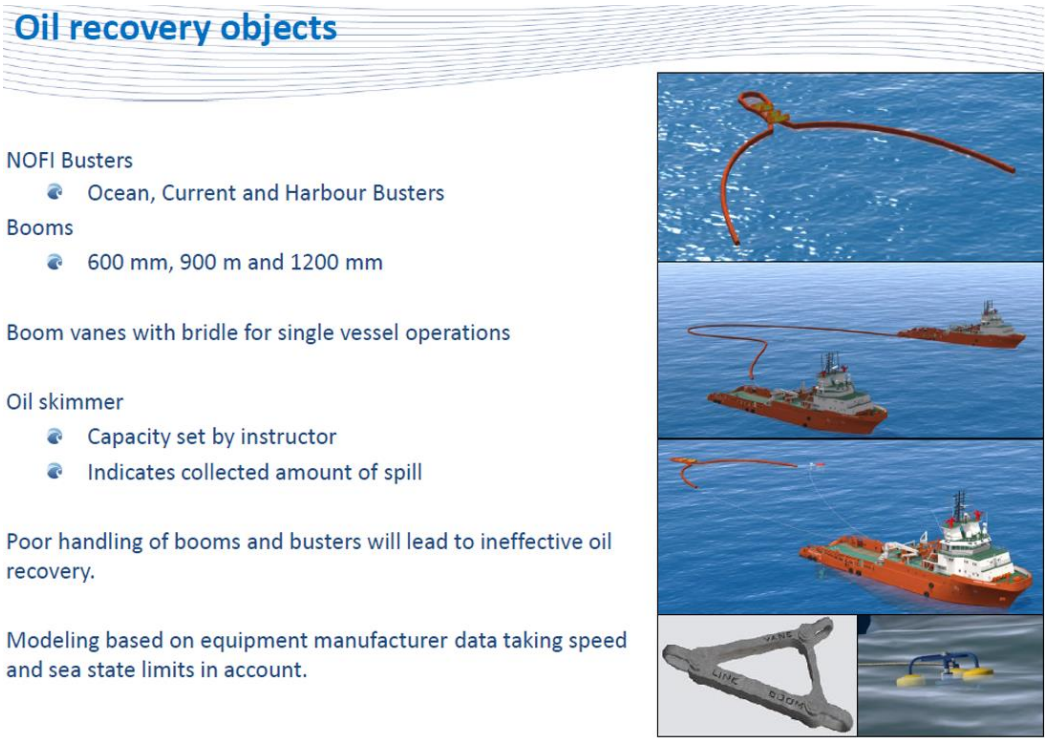


Figure 12: Display of the oil-recovery equipment on the navigation simulator

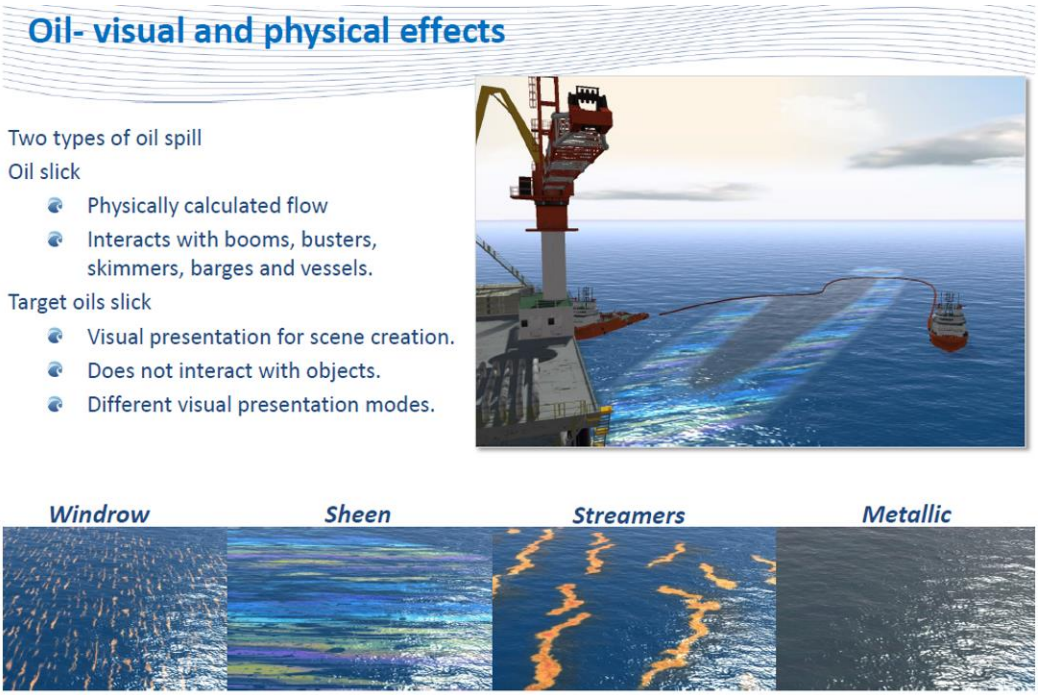


Figure 13: Display of the visual and physical effects of oil on the navigation center

3.3. New equipment

The following equipment has been supplied:

- 1 server,
- 8 workstations,
- 1 laptop,
- Supporting equipment, such as monitors, stants.

The equipment was installed during the first month after it had been received, so the appreciation of the equipment started in April 2022. Equipment was immediately made available to all the services involved in a potential intervention. All equipment is properly labeled with the logos of the project and the EU.

In the future, the new equipment will be used (in general):

- For the support to the Slovenian governmental services in the case of an accident in Slovenian waters,

- On request, for the support to the governmental services of other countries in the case of an accident,
- For the analysis of traffic and accident risk assessment, especially in the Gulf of Trieste,
- For the proffesional studies, such as oil risk assesment in the Port of Koper (other ports on request),
- For the training of professional oil-spill responders on management level,
- For the education and awareness of students,
- For the performance of research activities related to oil spills.

The following activities, related to the project NAMIRS, will take place:

- Mapping of sensitive areas within WP 2.1,
- Mapping of ports and other locations where assets would be deployed from - according to the new plan proposal (WP 2.3),
- IMO level 2 (management level) training for oil-spill responders (in total, 5 training sessions each with 8 participants within the WP 3),

Overall, the new equipment will provide support to the activities for the preparation of the SOP and exercises within the WP 4.

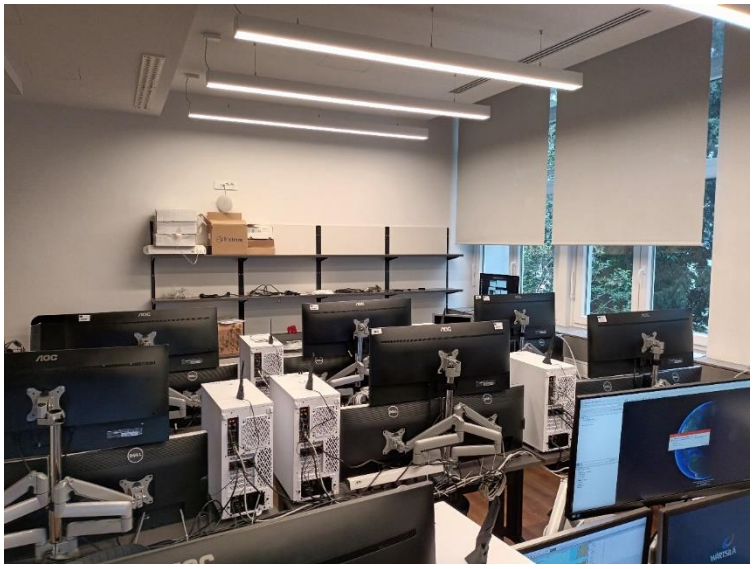


Figure 14: New equipment

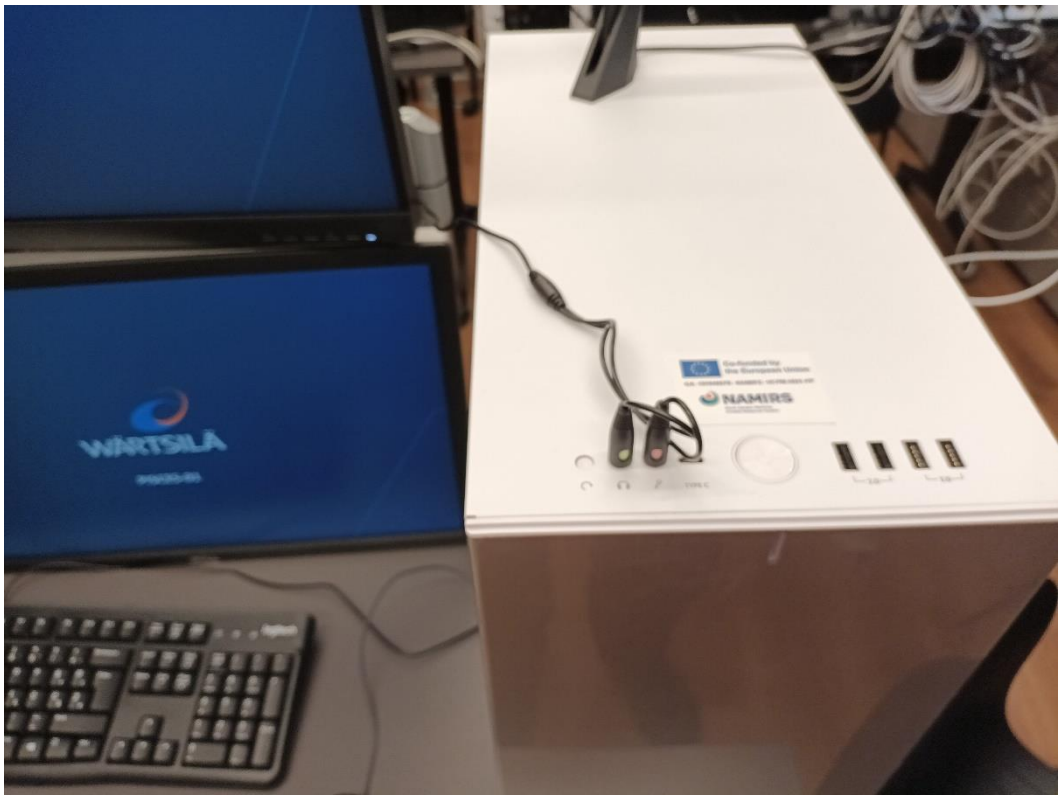


Figure 15: Logo of the NAMIRS project

4. MAPPING OF STAKEHOLDERS, SERVICES, ASSETS, AND EQUIPMENT

In the first stage, we designed simple fill-out forms in MS Excel, based on somewhat obsolete questionnaires that other countries had been using as the recommended practice. We believed such a method would be efficient enough, especially if the received data were supplemented by the data extracted from the CECIS online database. We then sent the forms to the Partners' institutions, asking each to revert with those forms filled out. They were all requested to name and count the resources and provide general descriptions and the particulars essential to an oil-spill response. Initial uncertainties were clarified and suggestions considered via frequent online meetings and e-mail correspondence.

The initial form comprised four main tables, each intended for the mapping of the following separate resources:

- Stakeholders,
- Services,
- Assets,
- Equipment.

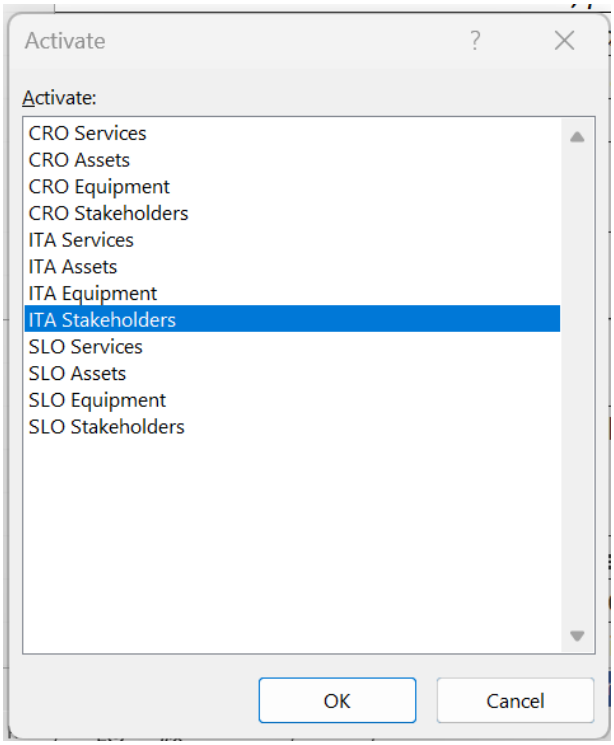


Figure 16: Spreadsheets in our MS Excel database

4.1. Stakeholders and services

4.1.1. Stakeholders

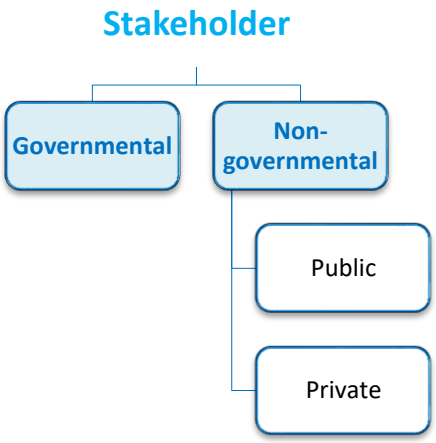


Figure 17: Division of stakeholders

We distinguished between governmental, public non-governmental, and private non-governmental stakeholders (see figure 10), each playing different roles in different stages of the response.

Table 1: Croatian stakeholders

Stakeholder				Purpose			
				PPM	DA	CCRA	PCO
Governmental	Ministry of Sea, Transport and Infrastructure	Maritime Safety Directorate	Sector for Navigation Control, Search and Rescue and Environmental Protection	✓	✓	✓	
			Sector for Inspection and Technical Standards	✓	✓	✓	
			Sector for Seafarers, Boatmasters, Ship Registers and Technical Affairs	✓	✓	✓	
		Directorate for Maritime Affairs		✓			
	Ministry of the Interior	Directorate for Border	Maritime and Airport Police Service	✓	✓		
			National Maritime Data Collection Center	✓	✓		
		Civil Protection Directorate		✓	✓	✓	
	Ministry of Defense	Croatian Coastguard		✓	✓	✓	
		Croatian Navy		✓	✓		
		Croatian Air Force		✓	✓		
	Ministry of Agriculture	Fisheries Directorate		✓	✓		
	Ministry of Physical Planning, Construction and State Assets	Institute for Spatial Development		✓			
		Directorate for Physical Planning and Permits of State Significance		✓			
	Ministry of Finance	Customs Administration		✓			
	Ministry of Culture	Directorate for the Protection of Cultural Heritage		✓			
	Ministry of Health	Directorate for primary health care, health tourism, medicines and medical products, public health and public health protection		✓		✓	
	Ministry of Foreign Affairs			✓			✓
	Agency for the investigation of accidents in air, sea and railway traffic			✓			✓
Non-governmental	Public	Zadar County		✓	✓	✓	✓
		Istra County		✓	✓	✓	✓
		Primorsko - Goranska County		✓	✓	✓	✓
		Lička - Senjska County		✓	✓	✓	✓
		Institute for Public Health of Zadar County		✓		✓	✓
		Institute for Public Health of Primorsko-Goranska County		✓		✓	✓
		Institute for Public Health of Lička-Senjska Count		✓		✓	✓
		Institute for Public Health of Istra County		✓		✓	✓
		Ruđer Bošković Institute - Center for Marine Research		✓			
		Maritime Faculty in Rijeka		✓			
		National Park "Brijuni"		✓			
		National Park "Kornati"		✓			
		National Park "Paklenica"		✓			
		Nature Park "Telašćica"		✓			
		Nature Park "Velebit"		✓			
		Nature Park "Limski Kanal"		✓			
		University of Zadar		✓			
		University of Rijeka		✓			
		County Harbour Authorities		✓	✓	✓	✓
		Harbour Authorities		✓	✓	✓	
	Private	Port of Rijeka		✓	✓	✓	
		Port of Pula		✓	✓	✓	
		Port of Zadar		✓	✓	✓	
		Port of Poreč		✓	✓	✓	
		Port of Rovinj		✓	✓	✓	
		Port of Umag/ Novigrad		✓	✓	✓	
		Port of Labin		✓	✓	✓	
		Jadranski pomorski servis		✓	✓	✓	
		Brodospas		✓	✓	✓	
		Jadrolinija		✓	✓		
		Shipyard "Viktor Lenac" Rijeka		✓			
		Shipyard "3. maj" Rijeka		✓			
		Shipyard "Dalmont" - Kraljevica		✓			
		Shipyard "Uljanik" Pula		✓			
		Forwarding agencies		✓			
		Ship agencies		✓			
		ADRIA - mariculture company		✓			
		Istra Pilot		✓			
		Croatia Pilot Rijeka		✓			
		Zadar Pilot		✓			
		LNG Croatia Omišalj		✓			
		INA- Croatian Oil Industry		✓			
		Dezinsekcija Rijeka		✓	✓	✓	✓
		Rijekatank		✓	✓	✓	✓
		IND-EKO Rijeka		✓	✓	✓	✓
		Hidro inženjering Rijeka		✓	✓	✓	✓
		JANAF- Adriatic Oil Pipeline, terminal Omišalj		✓			
		Ciklon		✓	✓	✓	✓
		ATRAC		✓	✓	✓	✓
		Metis Kukuljanovo		✓	✓	✓	✓
		ACI Marina Umag		✓	✓		
		ACI Marina Rovinj		✓	✓		
		ACI Marina Pula		✓	✓		
		ACI Marina Pomer		✓	✓		
		ACI Marina Opatija		✓	✓		
		ACI Marina Cres		✓	✓		
		ACI Marina Supetarska draga		✓	✓		
		ACI Marina Rab		✓	✓		
		ACI Marina Šimuni		✓	✓		
		MarinaPreko (Preko)		✓	✓		
		Marina Oliva Island Ugljan (Ugljan)		✓	✓		
		Marina Veli Iž (Veli Iž)		✓	✓		
		Marina Ist		✓	✓		
		Marina Veli Rat		✓	✓		
		Marina Borik (Zadar)		✓	✓		
		Marina Zadar		✓	✓		
		Marina Dalmacija (Sukošan – Bibinje)		✓	✓		
		Marina Kornati (Biograd na moru)		✓	✓		
		Marina Šangulin (Biograd na moru)		✓	✓		

Table 2: Italian stakeholders

Stakeholder				Purpose			
				PPM	DA	CCRA	PCO
Governmental	Ministry of Sustainable Infrastructure and Mobility	Italian Coast Guard	Harbour Master's Office	✓	✓	✓	
			National SAR organisation (IMRCC - MRSC - UCG)	✓	✓	✓	
			Vessel Traffic Service (VTS)	✓	✓	✓	
	Ministry of the Interior	Police			✓		
		Carabinieri (Gendarmes)			✓		
		Firemans		✓	✓	✓	
	Ministry of Finance	Guardia di Finanza		✓	✓		
		Customs Agency					
	Ministry of Defense	Italian Army					
		Italian Navy		✓	✓	✓	
		Italian Air Force		✓	✓		
	Ministry for the Ecological Transition (Environment)	Italian Coast Guard	RAM - Marine Environment Department	✓	✓	✓	
		ISPRA - Superior Institute for environmental protection		✓			
		General Directorate for naturalistic and marine heritage - Marine Defence Division		✓		✓	
	Ministry of Health	Local Sanitary Agency	Public Hygiene and Health Istitute				
			Animal health				
		USMAF Maritime Health Offices					
	Ministry of Foreign Affairs						
	Prime Minister Office	Civil Protectio Department					
	Friuli Venezia Giulia Region	Central Directorate for Health, Social Policies and Disability					
		SORES - Regional Operative Structure for Sanitary Emergency					
		Regional Civil Protection	OperationsRoom and 112 emergency number		✓	✓	
			Volunteering service	✓		✓	
		ARPA - Regional Environmental protection Agency		✓	✓	✓	
Non-governmental	Public	IN OGS - national institute for Oceanography and experimental geophysics		✓	✓	✓	
		Protected sea area MIRAMARE		✓	✓	✓	
		Padova University - CERT Cetacean Emergence Response Team					
		IZSVe Istituto Zooprofilattico Sperimentale delle Venezie					
		Port System Authority of the western adriatic sea (Trieste and Monfalcone ports)			✓	✓	
		Chamber of Commerce				✓	
		Municipalities					
	Private	Tripmare - Vessel Towing Services		✓	✓	✓	
		Mooring company			✓		
		Pilotage Corporation of Trieste			✓		
		Castalia consorzio stabile		✓	✓	✓	
		Crismani Ecologia		✓	✓	✓	
		Ocean		✓	✓	✓	
		Sub Sea Loperfido				✓	
		Gala Logistica				✓	
		SIOT - TALOIL				✓	
		Seastock				✓	
		Mariculture Companies					
		Docks dealers and terminal operators					
		Bathig facilities					
		Small port and Marina dealers					
		Fishing companies					
		Terranova wildlife recovery center					
		WWF and others similar institutions					

Table 3: Slovenian stakeholders

Stakeholder				Purpose			
				PPM	DA	CCRA	PCO
Governmental	Ministry of Infrastructure	Slovenian Maritime Administration (URSP)	Harbor Master's Office			✓	✓
			Rescue Coordination Center (RCC)		✓	✓	
			Vessel Traffic Service (VTS)	✓	✓	✓	
			Safety of Coastal Sea Division (SVOM)	✓	✓	✓	
			Maritime Inspection Division				✓
			Maritime Documents and General Affairs Division				
		Air, Marine and Railway Accident and Incident Investigation Unit					✓
		Directorate of Aviation and Maritime Transport			✓		✓
	Ministry of the Interior	Police	Fleet of the Maritime Police	✓		✓	
			Crime Detection and Investigation				✓
			Opeartions and Communications Center +386 113		✓		
	Ministry of Defense	Fleet of the 430. Naval Division of the Navy of the Republic of Slovenia		✓		✓	
		Administration of the Republic of Slovenia for Civil Protection and Disaster Relief		✓	✓	✓	✓
		Opeartions and Communications Center +386 112			✓		
		Inspectorate of the Republic of Slovenia for Protection against Natural and Other Disasters					✓
	Ministry of Agriculture, Forestry and Food	Inspectorate for Agriculture, Forestry, Hunting and Fisheries	Hunting and Fisheries Inspection Service	✓		✓	✓
	Ministry of the Environment and Spatial Planning	Slovenian Environment Agency		✓	✓	✓	✓
		VGP Drava		✓		✓	✓
		Slovenian Water Agency		✓		✓	✓
	Ministry of Finance	Financial Administration of the Republic of Slovenia	Customs Department Koper				✓
			Port of Koper Border Control Department				✓
	Ministry of Culture	Institute for the Protection of Cultural Heritage of Slovenia				✓	✓
	Ministry of Health	National Institute of Public Health			✓	✓	✓
	Ministry of Foreign Affairs	Directorate for International Law and Protection of Interests			✓	✓	✓
Non-governmental	Public	Institute of the Republic of Slovenia for Nature Conservation		✓		✓	✓
		Municipalities		✓		✓	✓
		Debeli Rtič Landscape Park		✓		✓	✓
		Strunjan Landscape Park		✓		✓	✓
		Sečovlje Salina Nature Park		✓		✓	✓
		Škocjanski Zatok Nature Reserve		✓		✓	✓
		Marine Biology Station Piran		✓		✓	✓
		University of Ljubljana	Faculty of Maritime Studies and Transport (UL FPP)	✓		✓	✓
			Other Faculties				✓
		University of Primorska					✓
		Electro and Maritime School Portorož (GEPŠ)					✓
		Science and Research Center Koper					✓
		Morigenos, Slovenian Marine Mammal Society		✓		✓	✓
		DOPPS, Birdlife Slovenia		✓		✓	✓
		Maritime Museum Piran					✓
		Other Research and Educational Institutions					✓
	Private	Port of Koper, d.d., Environmental Protection Unit				✓	
		KOPP, d.o.o., Pilotage Service				✓	
		Adria-Tow, d.o.o., Vessel Towing Services				✓	
		Ship Agencies					✓
		Forwarding Agencies					✓
		Fishing companies				✓	✓
		Mariculture Companies					
		Marinas				✓	✓

Additionally, the stakeholders were sorted according to the type of their engagement/purpose in an oil-spill contingency, which was divided into additional four sub-categories:

- Prevention, preparedness, and monitoring (PPM),
- Detection and alerting (DA),
- Cleaning and cleaning-related activities (CCRA),
- Post-cleaning operations (PCO).

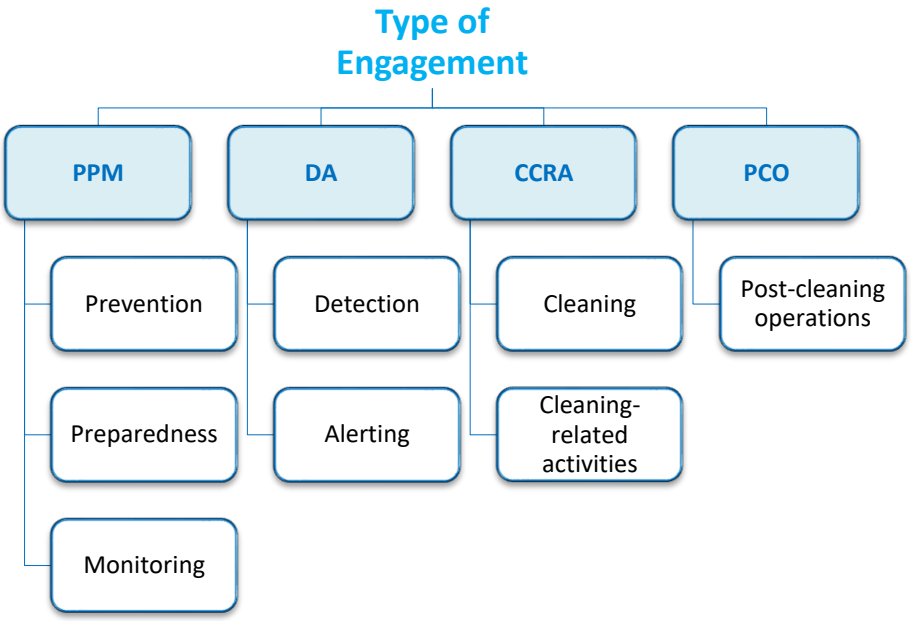


Figure 18: Types of engagement

4.1.2. Services

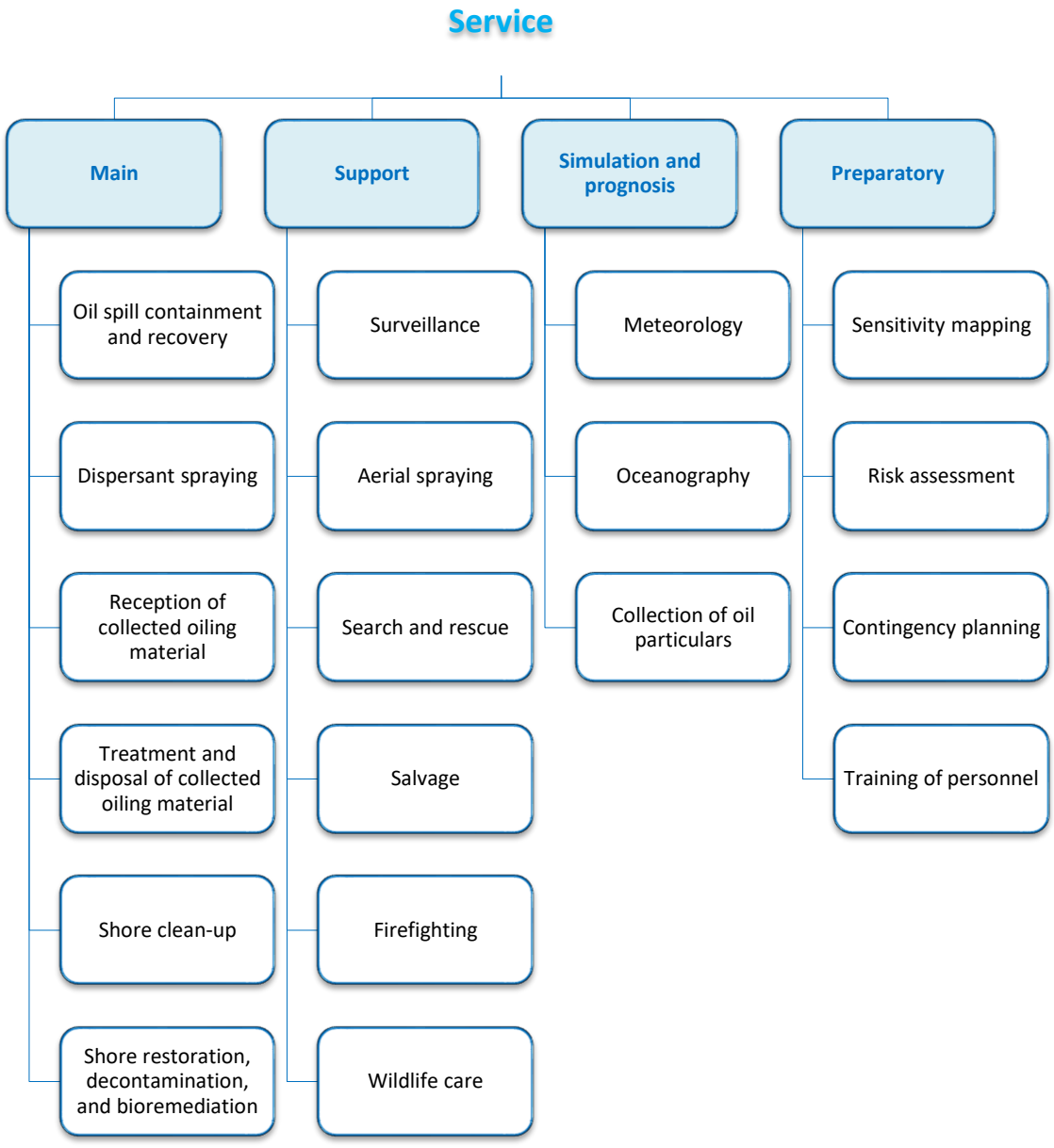


Figure 19: Anti-pollution services

The next step was to ascertain the availability of necessary services in Partners' regions including the main and support services, simulation and prognosis, and the preparatory services.

Table 4: Availability of the services in Italy

Service		Availability
		Friuli Venezia Giulia
Main	Oil spill containment and recovery	✓
	Dispersant spraying	✓
	Reception of collected oiling material	
	Treatment and disposal of collected oiling material	
	Shore clean-up	Not yet
	Shore restoration, decontamination and bioremediation	
Support	Surveillance	✓
	Aerial spraying	
	Search and rescue	✓
	Salvage	✓
	Firefighting	✓
	Wildlife care	✓
Simulation & Prognosis	Meteorology	✓
	Oceanography	✓
	Collection of oil particulars	✓
Preparatory	Sensitivity mapping	Not yet
	Risk assessment	Not yet
	Contingency planning	✓
	Training of personnel	✓

Table 5: Availability of the services in Croatia

Service		Availability			
		Istarska	Primorsko - goranska	Ličko - senjska	Zadarska
Main	Oil spill containment and recovery	✓	✓	✓	✓
	Dispersant spraying	✓	✓	✓	✓
	Reception of collected oiling material		✓		
	Treatment and disposal of collected oiling material		✓		
	Shore clean-up	✓	✓	✓	✓
	Shore restoration, decontamination and bioremediation		✓		
Support	Surveillance	✓	✓	✓	✓
	Aerial spraying				
	Search and rescue	✓	✓	✓	✓
	Salvage	✓	✓	✓	✓
	Firefighting	✓	✓	✓	✓
	Wildlife care	✓	✓	✓	✓
Simulation & Prognosis	Meteorology	✓	✓	✓	✓
	Oceanography	✓	✓	✓	✓
	Collection of oil particulars	✓	✓	✓	✓
Preparatory	Sensitivity mapping	✓	✓	✓	✓
	Risk assessment	✓	✓	✓	✓
	Contingency planning	✓	✓	✓	✓
	Training of personnel				

Table 6: Availability of the services in Slovenia

Service		*Availability*
Main	**Oil spill containment and recovery**	✓
	Dispersant spraying	
	Reception of collected oiling material	✓
	Treatment and disposal of collected oiling material	
	Shore clean-up	✓
	Shore restoration, decontamination and bioremediation	✓
Support	**Surveillance**	✓
	Aerial spraying	
	Search and rescue	✓
	Salvage	✓
	Firefighting	✓
	Wildlife care	✓
Simulation & Prognosis	**Meteorology**	✓
	Oceanography	✓
	Collection of oil particulars	✓
Preparatory	**Sensitivity mapping**	✓
	Risk assessment	✓
	Contingency planning	✓
	Training of personnel	✓

4.2. Assets and eqipment

The remaining two parts, concerning assets and equipment, called for a more detailed approach, taking into account their type of engagement, quantities, capacities, as well as their locations and mobilization times.

4.2.1. Assets

Groups of assets on the form:

- Marine craft,
- Aircraft,
- Storage facilities,
- Treatment facilities.

Table 7: Italian assets

Asset		Quantity	Capacity [m3/h] [m3] [m]	Purpose PPM	DA	CCRA	PCO	UN LOCODE	Mobilization Time	Additional Info
Marine craft	Anti-pollution vessel	12		✓	✓	✓		ITTRS/ITMNF	4 h Max	Most of the marine craft located in Trieste (ITTRS) and Manfalcone (ITMNF) are considered multipurpose vessels. For example, many tugbouats have elevated firefighting capacities or antipollution systems on board, and many patrol boats can also be used in SAR operations. Therefore, the real number of available vessels is different.
	Fire-fighting vessel	2		✓	✓				Immediate	
	Survey vessel	21		✓	✓	✓				
	Multi-purpose vessel									
	Tug	14		✓	✓	✓		ITTRS/ITMNF		
	Response vessel	?								
	Rescue boat	3								
Aircraft	Airplane									
	Helicopter	5		✓	✓			ITUDN (2)/ITVCE (3)	30 min Max	
	Drone									
Storage facilities	Barge	6				✓		ITTRS		Unable to receive liquids
	Flexible/portable container									
	Tank	5	3,500.0			✓		ITTRS		Barge tanks (shore tanks are not available)
	Vehicle									
Treatment facilities	TF for oily water	2				✓		ITTRS		A treatment plant used for the collection of bilge and oily water from ships. Installed on board 2 barges.
	TF for absorbents									
	TF for contaminated personal protective wear and equipment									

Table 8: Croatian assets

Asset		Quantity	Capacity	Purpose PPM	DA	CCRA	PCO	UN LOCODE	Mobilization Time	Additional Info
Marine craft	Anti-pollution vessel	15		✓	✓	✓	✓	HRRJK/HRPUY/HRZAD		All oil-recovery vessels are equipped with dispersant spraying system. EMSA response vessel "Kijac" is also equipped with spraying nozzles.
	Fire-fighting vessel	6				✓	✓	HRRJK/HRPUY/HRZAD		
	Survey vessel	1				✓		HRROV		
	Multi-purpose vessel									
	Tug	6						HRRJK/HRPUY/HRZAD		
	Response vessel	1			✓	✓		HRRJK		
	Rescue boat	4						HRRJK/HRPUY/HRZAD/HRSEN		
Aircraft	Airplane	1		✓	✓			Zadar Airport		
	Helicopter	1		✓	✓			Zadar Airport		
	Drone									
Storage facilities	Barge	4	3,300.0			✓	✓			
	Flexible/portable container / Tank	32/70	2,057.0/35.0			✓	✓	HRRJK/HRZAD		
	Vehicle	85/1/6						HRRJK/HRPUY/HRZAD		
Treatment facilities	TF for oily water	3	2,000.0					HRRJK		
	TF for absorbents									
	TF for contaminated personal protective wear and equipment									

Table 9: Slovenian assets

Asset		Quantity	Capacity [m3/h] [m3] [m]	Purpose PPM	DA	CCRA	PCO	UN LOCODE	Mobilization Time	ACPDR Quantity	ACPDR Capacity	SVOM Quantity	SVOM Capacity	Port of Koper Quantity	Port of Koper Capacity
Marine craft	Anti-pollution vessel	3	0.0			✓	✓	SIKOP				1		2	
	Fire-fighting vessel	1	0.0			✓		SIKOP						1	
	Survey vessel	0	0.0												
	Multi-purpose vessel	0	0.0												
	Tugboat	5	0.0			✓	✓	SIKOP		5					
	Response vessel	14	0.0			✓	✓	SIKOP		5		2		7	
	Rescue boat	0	0.0												
	Defense vessel	2	0.0			✓		SIKOP		2					
Aircraft	Airplane	2	0.0	✓	✓	✓		SIPOW		2					
	Helicopter	0	0.0												
	Drone	0	0.0												
Storage facilities	Barge	0	0.0												
	Flexible/portable container	4	24,008.0			✓	✓	SIKOP		2	24,000.0	2	8.0		
	Tank	28	198.0			✓	✓	SIKOP						28	198.0
	Garbage container	184	844.8			✓	✓	SIKOP						184	844.8
	Vehicle	15	93.0			✓	✓	SIKOP						15	93.0
Treatment facilities	TF for oily water	0	0.0												
	TF for absorbents	0	0.0												
	TF for contaminated personal protective wear and equipment	0	0.0												

4.2.2. Equipment

General types of equipment were split into the following categories:

- Equipment for cargo transfer from damaged vessels,
- Oil-containment equipment,
- Oil-recovery equipment,
- Dredges for contaminated sediments,
- Dispersant-distribution equipment,
- Treatment and disposal equipment,
- Beach-cleaning, decontamination, and restoration equipment,

- Special equipment,
- Non-specialized resources.

Table 10: Croatian equipment

Piece of Equipment			Quantity	Capacity	UN LOCODE	Mobilization Time
Cargo transfer from damaged vessels (if ship equipment is non-operational)		Hose		150.0	HRRJK	
		Pump	31/7		HRRJK/HRZAD	
		Fender				
		Inert gas generator				
Oil containment		Boom [m]	24	20,500.0	HRRJK/HRPUY/HRZAD	
Oil recovery		Skimmer	41		HRRJK/HRPUY/HRZAD	
Dredges for contaminated sediments		Mechanical	12	360.0	HRRJK	
		Hydraulic	1	480.0	HRRJK	
		Pneumatic				
Dispersant distribution	Dispersants	Bioremediation agent [l]/[l]		500.0/15.00	HRRJK /HRPUY	
		Absorbent [l]/[kg]		3,000.0/200.0	HRRJK /HRPUY	
		Emulsion breaker [l]/[l]/[l]		200.0/ 160.0/ 160.0	HRRJK/HRPUY/HRZAD	
		Cleaning agent [l]/[l]/[l]		2,515.0/520.0/180.0	HRRJK/HRPUY/HRZAD	
		Other chemical agent [kg]/[l]/[kg]		980.0/1,200.0/350.0	HRRJK/HRPUY/HRZAD	
	Dispersant spraying	Vessel-mounted system				
		Portable system				
		Aerial system				
Treatment and disposal		Mobile treatment plant	8		HRRJK	
		Fixed treatment plant [m3]	1	730.0	HRRJK	
Beach cleaning, decontamination and restoration		Beach cleaner	24		HRRJK	
		Pressure cleaner	16		HRRJK	
		Vacuum system	7/1	85/6	HRRJK/HRZAD	
Special equipment		Power pack ?				
		Transfer pump	23	638.0	HRRJK	
		Other (please state)				
Non-specialized resources		Hand tools	Full stock of PPE, tools, and bags in each County storage			
		Plastic bags				
		Mobile lab				
		Meters and samplers				
		Other				

Table 11: Italian equipment

Piece of Equipment			Quantity	Capacity	UN LOCODE	Mobilization Time
Cargo transfer from damaged vessels (if ship equipment is non-operational)		Hose				
		Pump [m3/h]	13	150.0	ITTRS	1 h - 6 h
		Fender				
		Inert gas generator				
Oil containment		Offshore boom [m]		7,300.0	ITTRS	
		Coastal boom [m]		3,300.0	ITTRS & other in FVG	1 h - 4 h
		Fireboom				
		Absorbent booms [m]		4,700.0	ITTRS & other in FVG	1 h - 4 h
Oil recovery		Skimmer [m3/h]	31	1,300.0	ITTRS	1 h - 4 h
Dredges for contaminated sediments		Mechanical				
		Hydraulic				
		Pneumatic				
Dispersant distribution	Dispersants	Bioremediation agent				
		Absorbent				
		Emulsion breaker				
		Cleaning agent [l]		7,300.0	ITTRS	1 h - 4 h
		Other chemical agent				
	Dispersant spraying	Vessel-mounted system	10			
		Portable system				
		Aerial system				
Treatment and disposal		Mobile treatment plant	2		ITTRS	
		Fixed treatment plant				
Beach cleaning, decontamination and restoration		Beach cleaner				
		Pressure cleaner				
		Vacuum system				
Special equipment		Power pack [kW]	3	108.0		
		Transfer pump				
		Other (please state)				
Non-specialized resources		Hand tools				
		Plastic bags				
		Mobile lab				
		Meters and samplers				
		Other				

Table 12: Slovenian equipment

Piece of Equipment			Quantity	Capacity [m3/h] [m3] [m]	UN LOCODE	Mobilization Time	URSZR		SVOM		LK	
							Quantity	Capacity	Quantity	Capacity	Quantity	Capacity
Cargo transfer from damaged vessels (if ship equipment is non-operational)		Hose	0	0.0								
		Pump	0	0.0								
		Fender	0	0.0								
		Inert gas generator	0	0.0								
Oil containment		Offshore boom [m]	0	5,840.0	SIKOP			5,250.0		590.0		
		Coastal boom [m]	0	6,302.0	SIKOP			975.0				5,327.0
		Fireboom	0	0.0								
		HNS boom [m]	0	750.0	SIKOP			750.0				
		Air blower	5	0.0	SIKOP		5					
		Reel	21	0.0	SIKOP		21					
		Generator	3	0.0	SIKOP		3					
		Anchor set	18	0.0	SIKOP		18					
Oil recovery		Skimmer [m3/h]	8	225.0	SIKOP		1	50.0	4		3	175.0
Dredges for contaminated sediments		Mechanical	0	0.0								
		Hydraulic	0	0.0								
		Pneumatic	0	0.0								
Dispersant distribution	Dispersants	Bioremediation agent	0	0.0								
		Absorbent [kg]	0	1,143.6	SIKOP							1,143.6
		Emulsion breaker	0	0.0								
		Cleaning agent [l]	2	32.0	SIKOP						2	32.0
		Other chemical agent	0	0.0								
	Dispersant spraying	Vessel-mounted system	0	0.0								
		Portable system [m3]	3	0.6	SIKOP						3	0.6
		Aerial system	0	0.0								
Treatment and disposal		Mobile treatment plant	0	0.0								
		Fixed treatment plant	0	0.0								
Beach cleaning, decontamination and restoration		Beach cleaner	0	0.0								
		Pressure cleaner	1	0.0	SIKOP						1	
		Vacuum system	1	0.0	SIKOP		1					
Special equipment		Power pack	5	0.0	SIKOP		2		1		2	
		Transfer pump	6	0.0	SIKOP				3		3	
		Other (please state)	0	0.0								
Non-specialized resources		Hand tools	0	0.0								
		Plastic bags	0	0.0								
		Mobile lab	0	0.0								
		Meters and samplers	0	0.0								
		Other	0	0.0								
Firefighting		Foam [m3]	0	4.1	SIKOP			3.4				0.7

4.3. CECIS resource list

CECIS or Common Emergency Communication and Information System is a joint European database created to establish the interconnection between National Authorities (civil protection services) and the Emergency Response Coordination Center (ERCC) with responsibility to protect citizens from natural and technological hazards. Through CECIS, operational information can be exchanged in a secure and reliable way, as needed for the effective implementation of the mechanism.

We had a team work on extracting every detail from each listing on the CECIS website related to the Partners' anti-pollution resources, one by one, and compare them to what we already had. The assets and equipment in the database fell under similar categories to the ones that had already been included in our list.

Figure 20: Chart of the CECIS resource loacations

All the locations of equipment storage facilities, marine craft homeports, and airports from the CECIS were put on a chart (see figure 13). The locations in the North-Adriatic area are colored yellow. We have kept the entire chart for two reasons. Number one, even though a vessel setting sail or an airplane taking off from a location outside the NAMIRS area, it might still arrive at the site sooner than one

starting from within the area. For instance, suppose it comes to a spill in the south part of the North Adriatic, and the northerly wind is advancing the slick towards the imaginary borderline extending from Ancona to Zadar, a vessel from, say, Giulianova or Šibenik will evidently reach it much faster than one coming from Koper. The other reason is, the chart might prove useful in future endeavors, especially if the project were to be expanded across the whole Adriatic.

Table 13: CECIS listings for Croatia

Category	Sub-Category		Name/Type	NAMIRS	Quantity	Capacity [m3/h] [m3] [m]	UN LOCODE	Latitude [deg N]	Longitude [deg E]	Contact Point	Ownership [GOV/PVT]	Mobilisation Time	Purpose				Additional Info
													PPM	DA	CCRA	PCO	
Equipment	Other	Not specified	Chemical lab	✓	N/A	N/A	HRRIK	45.326	14.431	IND-EKO	PVT	N/A	✓	✓	✓	✓	Analysis of all types of fluids and solids
			Storage		1		HRSPU	43.505	16.442	Brodospas	PVT	N/A	✓	✓	✓	✓	Oil-response container - Ro Clean Desmi
			Storage		2		HRSIB	43.730	15.866	PFDS	GOV	N/A	✓	✓	✓	✓	
			Storage	✓	7	1.0	HRZAD	44.109	15.235	Ciklon	PVT	N/A	✓	✓	✓	✓	
			Storage		6		HRSPU	43.547	16.394	DVDKG	PVT	N/A	✓	✓	✓	✓	
			Storage		1	12.0	HRSPU	43.508	16.441	Cian	PVT	N/A	✓	✓	✓	✓	
			Storage		2	10.0	HRSPU	43.508	16.445	Cian	PVT	N/A	✓	✓	✓	✓	
			Storage		20	1.0	HRSPU	43.506	16.445	Cian	PVT	N/A	✓	✓	✓	✓	
	Mechanical recovery	Skimmer	Dual Terminator		1	100.0	HRSPU	43.506	16.442	Brodospas	PVT	N/A	✓	✓	✓	✓	
			DBD 40		2	40.0	HRSPU	43.504	16.442	Brodospas	PVT	N/A	✓	✓	✓	✓	
			Mopmatic 1003/02	✓	6		HRRIK	45.359	14.405	Dezinsekcija	PVT	N/A	✓	✓	✓	✓	
			Mopmatic Sk-100	✓	8		HRRIK	45.359	14.403	Dezinsekcija	PVT	N/A	✓	✓	✓	✓	
			Drumm	✓	1		HRRIK	45.359	14.401	Dezinsekcija	PVT	N/A	✓	✓	✓	✓	
			Combi	✓	3		HRRIK	45.358	14.402	Dezinsekcija	PVT	N/A	✓	✓	✓	✓	
			Kiel	✓	1		HRRIK	45.357	14.404	Dezinsekcija	PVT	N/A	✓	✓	✓	✓	
			Vikoma Delta	✓	2		HRRIK	45.357	14.401	Dezinsekcija	PVT	N/A	✓	✓	✓	✓	
			Follex Micro	✓	2	15.0	HRRIK	45.358	14.400	Dezinsekcija	PVT	N/A	✓	✓	✓	✓	
			Vikoma Komara MK 2	✓	1	12.0	HRRIK	45.358	14.401	Dezinsekcija	PVT	N/A	✓	✓	✓	✓	Power supply
			Vikoma Komara Mini	✓	1	7.0	HRRIK	45.351	14.402	Dezinsekcija	PVT	N/A	✓	✓	✓	✓	Power supply
			Vikoma Komara Midi	✓	1	30.0	HRRIK	45.335	14.402	Dezinsekcija	PVT	N/A	✓	✓	✓	✓	Power supply
			Komara 30 Follex	✓	1	10.0	HRZAD	44.109	15.238	Ciklon	PVT	N/A	✓	✓	✓	✓	Power supply
			Komara 30 Follex	✓	1	30.0	HRZAD	44.109	15.239	Ciklon	PVT	N/A	✓	✓	✓	✓	Power supply
			Skimmer		1	5.0	HRSPU	43.548	16.391	DVDKG	PVT	N/A	✓	✓	✓	✓	Power supply
			Skimmer		1	10.0	HRSPU	43.548	16.396	DVDKG	PVT	N/A	✓	✓	✓	✓	Power supply
			Komara		1	10.0	HRSPU	43.506	16.441	Cian	PVT	N/A	✓	✓	✓	✓	Power supply
		Boom	T1250/H - 120 cm	✓	N/A	190.0	HRRIK	45.359	14.399	Dezinsekcija	PVT	N/A	✓	✓	✓	✓	
			T630/H - 60 cm	✓	N/A	1,760.0	HRRIK	45.359	14.404	Dezinsekcija	PVT	N/A	✓	✓	✓	✓	
			Boom		N/A	900.0	HRSIB	43.732	15.866	FDSKZ	GOV	N/A	✓	✓	✓	✓	
			Boom	✓	N/A	960.0	HRZAD	44.109	15.236	Ciklon	PVT	N/A	✓	✓	✓	✓	
			Boom		N/A	500.0	HRSPU	43.547	16.396	DVDKG	PVT	N/A	✓	✓	✓	✓	
			Boom		N/A	1,500.0	HRSPU	43.506	16.441	Cian	PVT	N/A	✓	✓	✓	✓	
	Shoreline clean-up	Pump	Peristaltic pump Z-series	✓	2	20.0	HRRIK	45.358	14.395	Dezinsekcija	PVT	N/A	✓	✓	✓	✓	Power supply
			Honda centrifugal	✓	6		HRRIK	45.358	14.390	Dezinsekcija	PVT	N/A	✓	✓	✓	✓	Power supply
			Peristaltic pump ELRO	✓	1	20.0	HRRIK	45.358	14.392	Dezinsekcija	PVT	N/A	✓	✓	✓	✓	Power supply
			Peristaltic pump ELRO	✓	3	20.0	HRRIK	45.359	14.395	Dezinsekcija	PVT	N/A	✓	✓	✓	✓	Power supply
			Pump	✓	2	40.0	HRZAD	44.107	14.239	Ciklon	PVT	N/A	✓	✓	✓	✓	
			High-pressure pump		1	100.0	HRSPU	43.548	16.397	DVDKG	PVT	N/A	✓	✓	✓	✓	Power supply
		Power pack	Vikoma Power Vac	✓	1		HRRIK	45.358	14.398	Dezinsekcija	PVT	N/A	✓	✓	✓	✓	Power supply
	Dispersant application	Vessel operations	High-pressure pump	✓	2		HRRIK	45.323	14.444	Dezinsekcija	PVT	N/A	✓	✓	✓	✓	
			Pump		1		HRSPU	43.548	16.395	DVDKG	PVT	N/A	✓	✓	✓	✓	Power supply
			High-pressure pump	✓	1		HRRIK	45.331	14.414	Dezinsekcija	PVT	N/A	✓	✓	✓	✓	
			High-pressure pump		3	5.0	HRSPU	43.506	16.441	Cian	PVT	N/A	✓	✓	✓	✓	Power supply
			High-pressure pump	✓	1		HRPUY	44.871	13.837	Dezinsekcija	PVT	N/A	✓	✓	✓	✓	
Marine craft	Oil recovery	Barge	Tag 18	✓	N/A	900.0	HRRIK	45.326	14.280	IND-EKO	PVT		✓	✓	✓	✓	Specialized/Firefighting/Chemical munitions crew
			Kate	✓	N/A	300.0	HRRIK	45.326	14.435	IND-EKO	PVT		✓	✓	✓	✓	Specialized/Firefighting/Chemical munitions crew
			Transporter III		N/A	5,000.0	HRSPU	43.504	16.441	Brodospas	PVT		✓	✓	✓	✓	
		Oil tanker	Eko-Mar	✓	N/A	1,054.0	HRRIK	45.326	14.431	IND-EKO	PVT		✓	✓	✓	✓	Specialized/Crane/Firefighting/Chemical munitions crew
		Tugboat	Antares		N/A		HRDBV	42.668	18.083	Brodospas	PVT		✓	✓	✓	✓	Firefighting/Equipment
			Rigel		N/A		HRSPU	43.504	16.442	Brodospas	PVT		✓	✓	✓	✓	Firefighting/Equipment
	Oil recovery & Dispersant application	Not specified	Inkoclean Eko C2		N/A	5.0	HRDBV	42.644	18.095	Cian	PVT	30 min	✓	✓	✓	✓	Specialized/Dispersant/Crane/Towing/High-viscocity/HNS/Chemical munitions crew/Equipment
			Inkoclean Eko C1		N/A	5.0	HRSPU	43.506	16.441	Cian	PVT	30 min	✓	✓	✓	✓	Specialized/Dispersant/Crane/Towing/High-viscocity/HNS/Chemical munitions crew/Equipment
			Eco 13/5		N/A	4.8	HRSPU	43.506	16.438	DVDKG	PVT	1 h	✓	✓	✓	✓	Specialized/Dispersant/Crane/Towing/High-viscocity/Firefighting/Chemical munitions crew/Equipment
			Eco 13/2		N/A	0.3	HRSIB	43.747	15.884	FDSKZ	GOV	30 min	✓	✓	✓	✓	Specialized/Dispersant/Crane/High-viscocity/Firefighting/Lightering/Equipment
			Eco 13/3	✓	N/A	4.6	HRZAD	44.052	15.161	Ciklon	GOV	1 h	✓	✓	✓	✓	Specialized/Dispersant/Crane/Towing/High-viscocity/Firefighting/Equipment
			Eco 13/4	✓	N/A	5.0	HRRIK	45.321	14.448	Dezinsekcija	PVT	1 h	✓	✓	✓	✓	Specialized/Dispersant/Crane/Firefighting/Equipment
			Eco III	✓	N/A	10.0	HRRIK	45.322	14.437	Dezinsekcija	PVT	1 h	✓	✓	✓	✓	Specialized/Dispersant/Firefighting
			Eco II	✓	N/A	10.0	HRRIK	45.323	14.444	Dezinsekcija	PVT	1 h	✓	✓	✓	✓	Specialized/Dispersant/Firefighting
			Eco I	✓	N/A	10.0	HRPUY	44.871	13.839	Dezinsekcija	PVT	1 h	✓	✓	✓	✓	Specialized/Dispersant/Firefighting
Aircraft	Aerial Reconnaissance	Helicopter	MI-8 MTV 1	✓						MRCC	GOV	1 h	✓	✓	✓	✓	Ministry of Defense
		Airplane	Pilatus PC-9M	✓						MRCC	GOV	1 h	✓	✓	✓	✓	Ministry of Defense
Dispersant stockpiles		Not specified	Bioversal HC	✓	N/A	3.5	HRRIK	45.328	14.423	Dezinsekcija	PVT	N/A	✓	✓	✓	✓	
			Finasol OSR 51		N/A	0.1	HRSIB	43.730	15.866	FDSKZ	GOV	N/A	✓	✓	✓	✓	
			Radiagreen	✓	N/A	0.4	HRZAD	44.109	15.238	Ciklon	PVT	N/A	✓	✓	✓	✓	
			Finasol OSR 51		N/A	0.7	HRSPU	43.548	16.395	DVDKG	PVT	N/A	✓	✓	✓	✓	
			Radiagreen		N/A	0.1	HRDBV	42.644	18.095	Cian	PVT	N/A	✓	✓	✓	✓	
		Type 2/3	Radiagreen		N/A	2.5	HRSPU	43.504	16.441	Cian	PVT	N/A	✓	✓	✓	✓	

Table 14: CECIS listings for Italy

Category	Sub-Category		Name/Type	NAMIRS	Quantity	Capacity [m3/h] [m3/d] [m3]	UN LOCODE	Latitude [deg N]	Longitude [deg E]	Contact Point	Ownership [GOV/PVT]	Mobilization Time	Purpose				Additional Info
													IPPM	OA	CCRA	PCO	
Equipment	Mechanical recovery	Other	**Coastal boom motorized storage roll**		12	N/A	ITAOI	43.625	13.511	MELS	GOV	N/A	✓	✓	✓	✓	
			Coastal boom motorized storage roll	✓	2	N/A	ITPMA	45.469	12.217	MELS	PVT	N/A	✓	✓	✓	✓	
			Coastal boom motorized storage roll	✓	2	N/A	ITRAN	44.489	12.278	MELS	PVT	N/A	✓	✓	✓	✓	
			Coastal boom motorized storage roll		2	N/A	ITBLT	41.319	16.271	MELS	PVT	N/A	✓	✓	✓	✓	
			Coastal boom motorized storage roll		2	N/A	ITMSN	38.203	15.549	MELS	PVT	N/A	✓	✓	✓	✓	
			Coastal boom motorized storage roll		2	N/A	ITCAG	39.241	9.095	MELS	PVT	N/A	✓	✓	✓	✓	
			Coastal boom motorized storage roll		2	N/A	ITNAP	40.859	14.270	MELS	PVT	N/A	✓	✓	✓	✓	
			Coastal boom motorized storage roll		2	N/A	ITCVV	42.090	11.786	MELS	PVT	N/A	✓	✓	✓	✓	
			Coastal boom motorized storage roll		2	N/A	ITGOA	44.418	8.917	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom motorized storage roll		25	N/A	ITAOI	43.625	13.508	MELS	GOV	N/A	✓	✓	✓	✓	
			Offshore boom motorized storage roll	✓	2	N/A	ITPMA	45.466	12.221	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom motorized storage roll	✓	2	N/A	ITRAN	44.486	12.273	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom motorized storage roll		2	N/A	ITBLT	41.316	16.275	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom motorized storage roll		2	N/A	ITMSN	38.201	15.553	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom motorized storage roll		2	N/A	ITCAG	39.239	9.099	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom motorized storage roll		2	N/A	ITNAP	40.857	14.276	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom motorized storage roll		2	N/A	ITCVV	42.093	11.783	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom motorized storage roll		2	N/A	ITGOA	44.410	8.912	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom anchoring system spare parts		300	N/A	ITAOI	43.622	13.513	MELS	GOV	N/A	✓	✓	✓	✓	
			Boom anchoring system spare parts	✓	50	N/A	ITPMA	45.466	12.219	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom anchoring system spare parts	✓	50	N/A	ITRAN	44.486	12.276	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom anchoring system spare parts		50	N/A	ITBLT	41.316	16.273	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom anchoring system spare parts		50	N/A	ITMSN	38.205	15.551	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom anchoring system spare parts		50	N/A	ITCAG	39.239	9.097	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom anchoring system spare parts		50	N/A	ITNAP	40.857	14.273	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom anchoring system spare parts		50	N/A	ITCVV	42.093	11.780	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom anchoring system spare parts		50	N/A	ITGOA	44.410	8.914	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom air inlet mobile compressor		20	N/A	ITAOI	43.622	13.511	MELS	GOV	N/A	✓	✓	✓	✓	
			Boom air inlet mobile compressor	✓	1	N/A	ITPMA	45.466	12.217	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom air inlet mobile compressor	✓	1	N/A	ITRAN	44.486	12.278	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom air inlet mobile compressor		1	N/A	ITBLT	41.316	16.271	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom air inlet mobile compressor		1	N/A	ITMSN	38.201	15.540	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom air inlet mobile compressor		1	N/A	ITCAG	39.239	9.095	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom air inlet mobile compressor		1	N/A	ITNAP	40.857	14.270	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom air inlet mobile compressor		1	N/A	ITCVV	42.093	11.786	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom air inlet mobile compressor		1	N/A	ITGOA	44.410	8.917	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom air inlet compressor	✓	1	N/A	ITPMA	45.463	12.221	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom air inlet compressor	✓	1	N/A	ITRAN	44.483	12.273	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom air inlet compressor		1	N/A	ITBLT	41.313	16.275	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom air inlet compressor		1	N/A	ITMSN	38.199	15.553	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom air inlet compressor		1	N/A	ITCAG	39.236	9.099	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom air inlet compressor		1	N/A	ITNAP	40.855	14.276	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom air inlet compressor		1	N/A	ITCVV	42.096	11.783	MELS	PVT	N/A	✓	✓	✓	✓	
			Boom air inlet compressor		1	N/A	ITGOA	44.413	8.912	MELS	PVT	N/A	✓	✓	✓	✓	
			Coastal boom joint parts		136	N/A	ITAOI	43.622	13.508	MELS	GOV	N/A	✓	✓	✓	✓	
			Coastal boom joint parts	✓	8	N/A	ITPMA	45.463	12.219	MELS	PVT	N/A	✓	✓	✓	✓	
			Coastal boom joint parts	✓	8	N/A	ITRAN	44.483	12.276	MELS	PVT	N/A	✓	✓	✓	✓	
			Coastal boom joint parts		8	N/A	ITBLT	41.313	16.273	MELS	PVT	N/A	✓	✓	✓	✓	
			Coastal boom joint parts		8	N/A	ITMSN	38.199	15.551	MELS	PVT	N/A	✓	✓	✓	✓	
			Coastal boom joint parts		8	N/A	ITCAG	39.236	9.097	MELS	PVT	N/A	✓	✓	✓	✓	
			Coastal boom joint parts		8	N/A	ITNAP	40.855	14.273	MELS	PVT	N/A	✓	✓	✓	✓	
			Coastal boom joint parts		8	N/A	ITCVV	42.096	11.780	MELS	PVT	N/A	✓	✓	✓	✓	
			Coastal boom joint parts		8	N/A	ITGOA	44.413	8.914	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom joint parts		192	N/A	ITAOI	43.621	13.513	MELS	GOV	N/A	✓	✓	✓	✓	
			Offshore boom joint parts	✓	8	N/A	ITPMA	45.463	12.217	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom joint parts	✓	8	N/A	ITRAN	44.483	12.278	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom joint parts		8	N/A	ITBLT	41.313	16.271	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom joint parts		8	N/A	ITMSN	38.199	15.540	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom joint parts		8	N/A	ITCAG	39.236	9.095	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom joint parts		8	N/A	ITNAP	40.855	14.270	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom joint parts		8	N/A	ITCVV	42.096	11.786	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom joint parts		8	N/A	ITGOA	44.413	8.917	MELS	PVT	N/A	✓	✓	✓	✓	
		Boom	**Coastal boom**			N/A		3,800.0	ITAOI	43.621	13.511	MELS	GOV	N/A	✓	✓	✓	✓	
			Coastal boom	✓		N/A		600.0	ITPMA	45.461	12.219	MELS	PVT	N/A	✓	✓	✓	✓	
			Coastal boom	✓		N/A		800.0	ITRAN	44.480	12.276	MELS	PVT	N/A	✓	✓	✓	✓	
			Coastal boom			N/A		600.0	ITBLT	41.310	16.273	MELS	PVT	N/A	✓	✓	✓	✓	
			Coastal boom			N/A		600.0	ITMSN	38.196	15.551	MELS	PVT	N/A	✓	✓	✓	✓	
			Coastal boom			N/A		600.0	ITCAG	39.233	9.097	MELS	PVT	N/A	✓	✓	✓	✓	
			Coastal boom			N/A		600.0	ITNAP	40.853	14.273	MELS	PVT	N/A	✓	✓	✓	✓	
			Coastal boom			N/A		600.0	ITCVV	42.098	11.780	MELS	PVT	N/A	✓	✓	✓	✓	
			Coastal boom			N/A		600.0	ITGOA	44.416	8.914	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom			N/A		4,800.0	ITAOI	43.621	13.508	MELS	GOV	N/A	✓	✓	✓	✓	
			Offshore boom	✓		N/A		600.0	ITPMA	45.461	12.217	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom	✓		N/A		600.0	ITRAN	44.480	12.278	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom			N/A		600.0	ITBLT	41.310	16.271	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom			N/A		600.0	ITMSN	38.196	15.540	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom			N/A		600.0	ITCAG	39.233	9.095	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom			N/A		600.0	ITNAP	40.853	14.270	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom			N/A		600.0	ITCVV	42.098	11.786	MELS	PVT	N/A	✓	✓	✓	✓	
			Offshore boom			N/A		600.0	ITGOA	44.416	8.917	MELS	PVT	N/A	✓	✓	✓	✓	
			Absorbent boom	✓		N/A		1,000.0	ITPMA	45.461	12.221	MELS	PVT	N/A	✓	✓	✓	✓	
			Absorbent boom	✓		N/A		1,000.0	ITRAN	44.480	12.273	MELS	PVT	N/A	✓	✓	✓	✓	
			Absorbent boom			N/A		1,000.0	ITBLT	41.310	16.275	MELS	PVT	N/A	✓	✓	✓	✓	
			Absorbent boom			N/A		1,000.0	ITMSN	38.196	15.553	MELS	PVT	N/A	✓	✓	✓	✓	
			Absorbent boom			N/A		1,000.0	ITCAG	39.233	9.099	MELS	PVT	N/A	✓	✓	✓	✓	
			Absorbent boom			N/A		1,000.0	ITNAP	40.853	14.276	MELS	PVT	N/A	✓	✓	✓	✓	
			Absorbent boom			N/A		1,000.0	ITCVV	42.098	11.783	MELS	PVT	N/A	✓	✓	✓	✓	
			Absorbent boom			N/A		1,000.0	ITGOA	44.416	8.912	MELS	PVT	N/A	✓	✓	✓	✓	
		Skimmer	**Skimmer**	✓	1	30.0	ITPMA	45.469	12.221	MELS	PVT	N/A	✓	✓	✓	✓	
			Skimmer	✓	1	50.0	ITPMA	45.469	12.219	MELS	PVT	N/A	✓	✓	✓	✓	
			Skimmer	✓	1	30.0	ITRAN	44.489	12.273	MELS	PVT	N/A	✓	✓	✓	✓	
			Skimmer	✓	1	50.0	ITRAN	44.489	12.276	MELS	PVT	N/A	✓	✓	✓	✓	
			Skimmer		1	30.0	ITBLT	41.319	16.275	MELS	PVT	N/A	✓	✓	✓	✓	
			Skimmer		1	50.0	ITBLT	41.319	16.273	MELS	PVT	N/A	✓	✓	✓	✓	
			Skimmer		1	30.0	ITMSN	38.203	15.553	MELS	PVT	N/A	✓	✓	✓	✓	
			Skimmer		1	50.0	ITMSN	38.203	15.551	MELS	PVT	N/A	✓	✓	✓	✓	
			Skimmer		1	30.0	ITCAG	39.241	9.099	MELS	PVT	N/A	✓	✓	✓	✓	
			Skimmer		1	50.0	ITCAG	39.241	9.097	MELS	PVT	N/A	✓	✓	✓	✓	
			Skimmer		1	30.0	ITNAP	40.859	14.276	MELS	PVT	N/A	✓	✓	✓	✓	
			Skimmer		1	50.0	ITNAP	40.859	14.273	MELS	PVT	N/A	✓	✓	✓	✓	
			Skimmer		1	30.0	ITCVV	42.090	11.783	MELS	PVT	N/A	✓	✓	✓	✓	
			Skimmer		1	50.0	ITCVV	42.090	11.780	MELS	PVT	N/A	✓	✓	✓	✓	
			Skimmer		1	30.0	ITGOA	44.418	8.912	MELS	PVT	N/A	✓	✓	✓	✓	
			Skimmer		1	50.0	ITGOA	44.418	8.914	MELS	PVT	N/A	✓	✓	✓	✓	
	Shoreline clean-up	Pump	**Fuel lightening pump**	✓	1	30.0	ITPMA	45.471	12.219	MELS	PVT	N/A	✓	✓	✓	✓	
			Fuel lightening pump	✓	1	50.0	ITPMA	45.471	12.217	MELS	PVT	N/A	✓	✓	✓	✓	
			Fuel lightening pump	✓	1	30.0	ITRAN	44.491	12.276	MELS	PVT	N/A	✓	✓	✓	✓	
			Fuel lightening pump	✓	1	50.0	ITRAN	44.491	12.278	MELS	PVT	N/A	✓	✓	✓	✓	
			Fuel lightening pump		1	30.0	ITBLT	41.321	16.273	MELS	PVT	N/A	✓	✓	✓	✓	
			Fuel lightening pump		1	50.0	ITBLT	41.321	16.271	MELS	PVT	N/A	✓	✓	✓	✓	
			Fuel lightening pump		1	30.0	ITMSN	38.205	15.551	MELS	PVT	N/A	✓	✓	✓	✓	
			Fuel lightening pump		1	50.0	ITMSN	38.205	15.540	MELS	PVT	N/A	✓	✓	✓	✓	
			Fuel lightening pump		1	30.0	ITCAG	39.243	9.097	MELS	PVT	N/A	✓	✓	✓	✓	
			Fuel lightening pump		1	50.0	ITCAG	39.243	9.095	MELS	PVT	N/A	✓	✓	✓	✓	
			Fuel lightening pump		1	30.0	ITNAP	40.861	14.273	MELS	PVT	N/A	✓	✓	✓	✓	
			Fuel lightening pump		1	50.0	ITNAP	40.861	14.270	MELS	PVT	N/A	✓	✓	✓	✓	
			Fuel lightening pump		1	30.0	ITCVV	42.088	11.780	MELS	PVT	N/A	✓	✓	✓	✓	
			Fuel lightening pump		1	50.0	ITCVV	42.088	11.786	MELS	PVT	N/A	✓	✓	✓	✓	
			Fuel lightening pump		1	30.0	ITGOA	44.421	8.914	MELS	PVT	N/A	✓	✓	✓	✓	
			Fuel lightening pump		1	50.0	ITGOA	44.421	8.917	MELS	PVT	N/A	✓	✓	✓	✓	
Marine craft	Oil recovery	Coastal vessel	**Ievoleo Quinto** (IQ9S)			714.0	ITBDS	42.104	11.756		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
			Yoda (IXRI)			80.0	ITQOS	39.060	8.526		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
		CG coastal vessel	**Italian Coast Guard "Class 400"**			0.0	ITMSN	38.195	15.565	MIT CG	GOV		✓	✓	✓	✓	*Crane/Towing/Firefighting/Patrol*
	Oil recovery & Dispersant application	Coastal vessel	**Monte Rosa** (IXXU)			80.0	ITGUI	42.759	13.981		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
			Meilli (IRFU)			83.2	ITPZL	36.713	14.839		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
			Ievoil Shuttle (IIWC2)			528.0	ITCVV	42.104	11.756		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
			Tagis (INLT)			80.0	ITSPE	44.101	9.836		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
			Superabbiano Sette (IFQZ2)			81.0	ITSCX	37.501	13.073		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
			Superabbiano Sei (ISVD)			81.0	ITALIU	37.234	15.215		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Chemical munitions crew/Equipment*
			San Giacomo (INDK)			792.0	ITSAL	40.664	14.741		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
			Rec Oil IV (IFEE)			82.0	ITSAG	38.073	14.063		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
			Punta Izza (IPVL)			80.0	ITCAG	39.201	9.111		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
			Marfin Quarto (IQXU)			83.6	ITCRV	39.094	17.124		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
			Marzocco (IFZZ)			168.0	ITPIO	42.993	10.561		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
			Jerry (IFDS)			82.0	ITPSS	42.044	11.123		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
			Ievolo Terzom (IQIW7)			86.0	ITVVA	38.728	16.121		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
			Ievoleo Quarto (IQWV)			86.0	ITCCQ	39.513	15.922		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
			Fortitudo (IXSZ)			93.5	ITVSO	42.102	14.424		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
			Ecolaguna 4 F.2 (ISNX)	✓		500.0	ITCHI	45.233	12.289		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
			Ecoglio (IFQU2)			82.0	ITPTO	40.849	8.400		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Chemical munitions crew/Equipment*
			Eco Elba (IFPF2)			82.0	ITATX	39.916	8.086		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
			Eco Augusta (IQPS)			82.0	ITLIC	37.082	13.939		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
			Comandante Ugo Casa (ISSR)			84.8	ITIMP	43.880	8.034		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
			Citta di Ravenna (IRYK)			82.0	ITCGC	39.656	16.582		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
			Beluga (IFIE2)			122.8	ITMOL	41.212	16.594		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
			Alle Nere (IQVA)			200.0	ITTRI	37.982	13.721		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/High-viscosity/Firefighting/Lightering/Equipment*
		Offshore vessel	**Santangelo** (IFQQ2)			203.7	ITTPS	38.017	12.486		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/Towing/High-viscosity/Firefighting/Lightering/Equipment*
			Ievoil White (IOGO)			218.8	ITBDS	40.242	17.943		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/Towing/High-viscosity/Firefighting/Lightering/Equipment*
			Ievoil Red (IZIZ)			218.8	ITMSN	38.193	15.563		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/Towing/High-viscosity/Firefighting/Lightering/Equipment*
			Esino (IFQH2)			238.0	ITAOI	43.624	13.485		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/Towing/High-viscosity/Firefighting/Lightering/Equipment*
			Secomar Quattro (IMEQ)	✓		308.3	ITRAN	44.500	12.031		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/Towing/High-viscosity/Firefighting/Lightering/Chemical munitions crew/Equipment*
			Koral (IIZV2)			205.9	ITGAI	40.986	9.621		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/Towing/High-viscosity/Firefighting/Lightering/Chemical munitions crew/Equipment*
			Tito (IZMG)			218.0	ITLIV	43.552	10.281		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/Towing/High-viscosity/Firefighting/Lightering/Equipment*
			Spica (IYF2)	✓		267.8	ITTRS	45.652	13.740		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/Towing/High-viscosity/Firefighting/Lightering/Equipment*
			Bonassola (IWEE)			330.0	ITGOA	44.411	8.920		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/Towing/High-viscosity/Firefighting/Lightering/Chemical munitions crew/Equipment*
			Bino (ITLI)			212.7	ITGAE	41.218	13.575		PVT	2 h Max	✓	✓	✓	✓	*Specialized/Dispersant/Crane/Towing/High-viscosity/Firefighting/Lightering/Equipment*
		CG offshore vessel	**Bruno Gregoretti CP 920** (IGSD)			306.9	ITNAP	40.856	14.246	MIT CG	GOV	4 h/12 h	✓	✓	✓	✓	*Dispersant/Crane/Towing/Firefighting/Equipment/Patrol*
		CG coastal/offshore vessel	**Corsi CP 906**			2.0	ITMSN	38.195	15.566	MIT CG	GOV		✓	✓	✓	✓	*Dispersant/Crane/Equipment/Patrol/SAR*
			Peluso CP 905			2.0	ITMSN	38.192	15.566	MIT CG	GOV		✓	✓	✓	✓	*Dispersant/Crane/Equipment/Patrol/SAR*
			Fiorillo CP 904			2.0	ITMSN	38.185	15.553	MIT CG	GOV		✓	✓	✓	✓	*Dispersant/Crane/Equipment/Patrol/SAR*

Table 15: CECIS listings for Slovenia

Category	Sub-Category		Name/Type	NAMIRS	Quantity	Capacity [m3/h] [m3] [m]	UN LOCODE	Latitude [deg n]	Longitude [deg E]	Contact Point	Ownership [GOV/PVT]	Mobilization Time	Purpose				Additional Info
													PPM	DA	CCRA	PCO	
Equipment	Mechanical recovery	Skimmer	Vikoma Komara 50	✓	1	50.0	SIKOP	45.543	13.724	ACPDR	GOV	N/A			✓		Power supply
			Alfa Laval GP 20/10	✓	1		SIKOP	45.545	13.726	ACPDR	GOV	N/A			✓		Power supply
			Walosep WM	✓	1	10.0	SIKOP	45.543	13.725	ACPDR	GOV	N/A			✓		Power supply
			Vikoma Komara 20	✓	1	20.0	SIKOP	45.543	13.722	ACPDR	GOV	N/A			✓		Power supply
		Boom	SPC 20 cm	✓	N/A	500.0	SIKOP	45.543	13.721	ACPDR	GOV	N/A			✓		Power supply
			SPC 8 cm	✓	N/A	4,000.0	SIKOP	45.544	13.722	ACPDR	GOV	N/A			✓		Power supply
			SPC 13 cm	✓	N/A	1,300.0	SIKOP	45.547	13.727	ACPDR	GOV	N/A			✓		Power supply
			Sava MZ 60	✓	N/A	180.0	SIKOP	45.545	13.728	ACPDR	GOV	N/A			✓		Power supply
			Tacconi BR 85/90	✓	N/A	100.0	SIKOP	45.543	13.729	ACPDR	GOV	N/A			✓		Power supply
			Sava PB 900	✓	N/A	50.0	SIKOP	45.542	13.727	ACPDR	GOV	N/A			✓		Power supply
			Sava PB 900	✓	N/A	840.0	SIKOP	45.541	13.725	ACPDR	GOV	N/A			✓		Power supply
			Sava SGB 900	✓	N/A	10.0	SIKOP	45.542	13.724	ACPDR	GOV	N/A			✓		Power supply
			Sava SGB 900	✓	N/A	20.0	SIKOP	45.543	13.726	ACPDR	GOV	N/A			✓		Power supply
			Vikoma Sentinel 750	✓	N/A	750.0	SIKOP	45.544	13.728	ACPDR	GOV	N/A			✓		Power supply
			Markleen	✓	N/A	1,000.0	SIKOP	45.544	13.726	ACPDR	GOV	N/A			✓		Power supply
			Vikoma Sentinel 1100	✓	N/A	3,900.0	SIKOP	45.542	13.722	ACPDR	GOV	N/A			✓		Power supply
			Rosenbauer L 1000	✓	N/A	825.0	SIKOP	45.543	13.724	ACPDR	GOV	N/A			✓		Power supply
Marine craft	Oil recovery	Response vessel - Tugboat	Mercur (5801823)	✓	N/A	18.0	SIKOP	45.546	13.722		PVT		✓	✓	✓		Specialized/Crane/Towing/Firefighting
			Wotan (7305992)	✓	N/A	0.0	SIKOP	45.546	13.722		PVT		✓	✓	✓		Towing/Firefighting
			Sirius (7612632)	✓	N/A	0.0	SIKOP	45.547	13.724		PVT		✓	✓	✓		Specialized/Towing/Firefighting
			Neptun (9584932)	✓	N/A	15.0	SIKOP	45.543	13.719		PVT		✓	✓	✓		Specialized/Crane/Towing/Firefighting
			Maks (9161924)	✓	N/A	12.0	SIKOP	45.546	13.722		PVT		✓	✓	✓		Crane/Towing/Firefighting
			Zeus (9385513)	✓	N/A	18.0	SIKOP	45.547	13.724		PVT		✓	✓	✓		Specialized/Crane/Towing/Firefighting
		Response vessel	KP - 271	✓	N/A	0.0	SIKOP	45.543	13.719		GOV		✓	✓	✓		Specialized/Equipment
		Rescue vessel	KP - 580	✓		0.0	SIKOP	45.546	13.722		GOV		✓	✓	✓		
			KP - 10	✓	N/A	0.0	SIKOP	45.547	13.724		GOV		✓	✓	✓		
Aircraft	Aerial reconnaissance	Airplane	Cessna 172	✓		0.0	SIPOW	45.547	13.724	CFCP	PVT		✓	✓			
Dispersant stockpiles		Type 3	Slihl SR 420	✓	N/A	0.5	SIKOP	45.547	13.724	ACPDR	GOV				✓		

4.4. EMSA resource list

European Maritime Safety Agency ensures a high, unified, and efficient safety and security level in the maritime world, as well as strives towards better prevention of, and response to potential oil or HNS pollution from ships. The organization also greatly contributes to the overall effectiveness of the maritime transport by facilitating the establishment of the European Maritime Transport Space without Barriers. The EMSA mission is to become the European center for a safe and sustainable maritime sector.

The European Maritime Safety Agency (EMSA) manages a storage facility in Ravenna, Italy, were they keep the anti-pollution equipment intended for use in the North Adriatic. We contacted the EMSA by e-mail and asked for a list of all the equipment stored in Ravenna, including the particulars of the contracted oil-tanker Kijac, whose homeport is Rijeka, Croatia. We received links to the websites where the information is available:

https://emsa.europa.eu/we-do/sustainability/pollution-response-services/equipment-assistance-service.html.

4.5. Analysis of the mapping of resources

Having examined the completed forms that had been submitted, we can say that the attempt has brought partial success. Unfortunately so, but not unexpectedly at all. The list provided by the EMSA, however, is exemplary. If our mapping looks anything like that when the project is through, we will be on the right track.

Regarding stakeholders and services, the mapping has been carried out satisfactorily. We do figure that there is still room for minor improvements, which are being addressed at this very moment.

On the other hand, the data that we have managed to gather from all the Partners on assets and equipment will simply not suffice, not at this point, anyway. Most likely owing to poorly designed fill-out forms, the data are, for the most part, incomplete, deficient, non-uniform, and ambiguous, not at all delivering a clear picture of resources. Much less a complete one. Surprisingly, the data that we have obtained from the CECIS turned out not to be a significant contribution to the list, either.

Generally, two types of issues were found. One the one hand, we have data on different resources listed for each country, when they should obviously be on the same since the very same types of anti-pollution resources are in question. The latter suggests that the lists are incomplete. On the other hand, those resources that actually do match in type are described in different ways, stating different particulars. And that indicates that the lists are in lack of detail, having been filled out by personnel with limited insight or not with enough effort. To make that clearer, for instance, an Italian listing might read that they have booms including storage reels and air blowers, and a Croatian listing might read that they have five hundred meters of booms categorized as either coastal or offshore. The discrepancy is obvious. Furthermore, the number of empty cells in particular tables sort of implied that the forms we had drawn up in the beginning were too complicated.

Examples of the most conspicuous deficiencies and discrepancies that we have detected are shown and explained in the charts and paragraphs below. There are comparisons between the data extracted from the CECIS and the data provided by the Partners for skimmers, booms, marine craft, and aircraft.

4.5.1. Skimmers

The differences in number of skimmers from to the CECIS database and our list can be clearly seen in figure 14. Also, just as important as the number of skimmers is their type, their nominal oil-recovery rates and, last but not least, their power supply. Neither are specified in several listings. Depending to the viscosity of oil and environmental conditions, such as wave height, different types of skimmers would be the preferred option. Moreover, if there is debris at the site, some skimmers will be of little to no help due to pieces of debris restricting the flow.

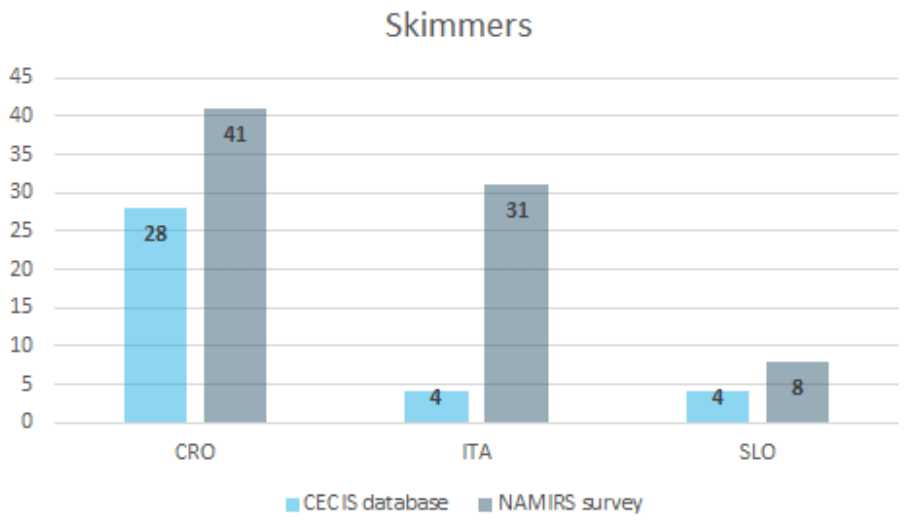


Figure 21: Comparison - number of skimmers per country

4.5.2. Booms

Inspecting the total lengths of booms extracted from the CECIS (see figure 15) and given that the Slovenian coastline is by far the shortest, there has got to be something wrong. Additionally, knowing only the lengths is meaningless without including the boom's type and basic design. There are standard, HNS, fire-resistant, and sorbent booms. According to their shape, freeboard, and floatation element, not every boom is suitable for every situation. Another important factor to be considered is the compatibility among types. Most of that information seems to have been left out on both lists.

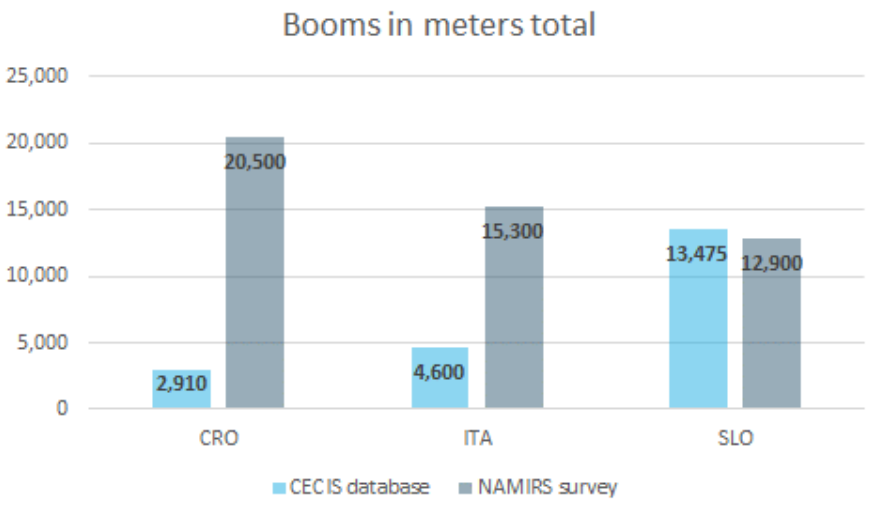


Figure 22: Comparison - total length of booms per country

4.5.3. Marine craft

Both lists offer a limited amount of information about the available marine craft, also missing some information critical to choosing a particular vessel to mobilize in a particular situation. Vessel types are mixed up. Their navigational area and endurance (coastal or offshore) are left out in many cases. The list does not include details on the shipboard anti-pollution equipment. What is their service speed? What is the number of additional personnel that could embark? What about contact points? At the moment, our database lacks quite a lot of necessary details about marine craft and that will have to be rectified in the following months.

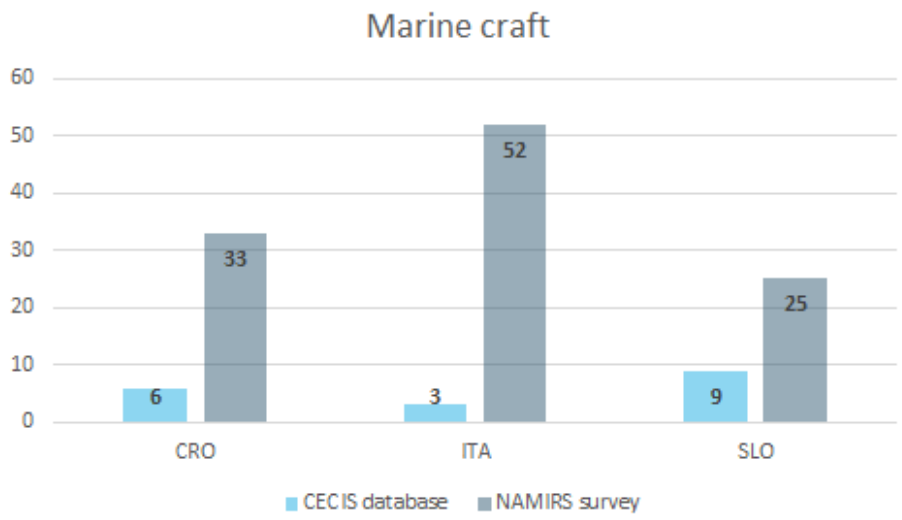


Figure 23: Comparison - number of marine craft per country

4.5.4. Aircraft

We believe that a lot of aircraft have been neglected to enter into the CECIS. We know for a fact that Italy has many at their disposal, but there is not a single aircraft listing on the website. Those aircraft that can be found on the lists are, again, not described at all.

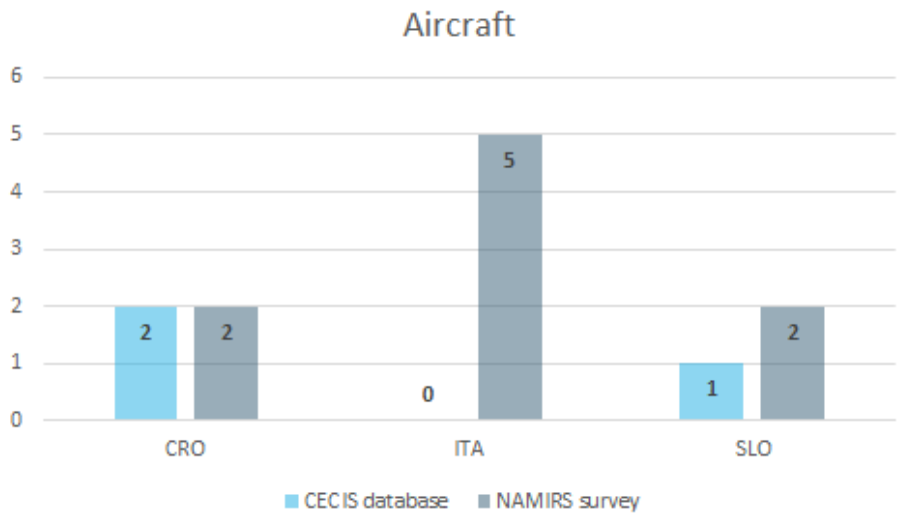


Figure 24: Comparison - number of aircraft per country

There are many other assets we are certain that should be listed, such as storage facilities, quantities and capacities of shore tanks, floating tanks, barges, power pack, transfer pumps, etc.

All things considered, we needed to start over and find a more efficient way of performing the mapping. Initial difficulties are always anticipated to some extent. However, careful consideration and analysis of what might have been approached the wrong way can eventually lead to improvements, which can ultimately be turned to one's advantage.

4.6. Way forward

After careful consideration, we believe to have found a more sistematic way of collecting data. We have designed new forms. Moreover, we wish to take the accessibility of the resources and thus the facilitation of organizing an intervention to a higher level. We have taken the initial steps towards developing an app where the available resources will be displayed against their locations on a chart of the North Adriatic.

4.6.1. New forms

Recently, we have come up with new, amended forms, having taken into consideration the factors we believed to be of greatest significance to a swift and successful oil-spill response. An imminent threat

to human life and the environment needs to be addressed immediately upon detection. In a real emergency, one cannot afford to waste time. With every minute, more oil is discharged into the sea and the amount of the mixture of oil and water that needs to be recovered, stored, and treated increases due through emulsification. Hence, the forms should include only the essential information that the first responders require to mobilize the most suitable resources and take action.

We have introduced three separate forms, one for marine craft, one for aircraft, and one for equipment. Including drop-down lists and thorough instructions for guidance, they are all designed in a way that allows the user to enter data with very little freedom of choice, which will contribute to detailed descriptions of only the targeted information and result in a compact, uniform, and focused design and structure of the entire list. Also, we came up with the idea of adding a box to the marine craft and aircrafts forms where the user will be requested to drop off an image of the asset. No matter how corny it may sound, a picture is worth a thousand words. A lot can be read from a picture in a single glance, which is definitely an advantage when one is in a rush and under pressure. Moreover, several resource categories, those irrelevant to a Tier-3, cross-border response, have been excluded from the forms, because we figured that those had only been creating confusion and redundance.

Having seen the first examples of the completed forms, we are confident that we have taken the right path. We intend to reform those into annexes and add them to the Plan. When the implementation of the SOP takes place, the responsibilities for updating and modifications will be assigned and maximum time intervals between updates will be determined.

4.6.1.1. Annex I: Marine craft

Annex I (working title) will include all the Partners' Tier-3 vessels and EMSA's M/T Kijac.

There are five groups of requested entries on the marine craft listing form:

- General data,
- Homeport,
- Particulars,
- Capacities,
- Shipboard equipment.

General data include the vessel's name, type and category, its picture, and the necessary details for contact and communication. Next, there are homeport details and the vessel's particulars along with

the service speed, endurance in nautical miles, and the number of additional personnel, which is very important when boarding extras or passengers. Besides the storage and dispersant capacity in the fourth group, we have added additional services: firefighting, lightering, and the handling of high-viscosity oil and HNS (hazardous and noxious substances). In the final group, the user will be requested to list all the shipboard equipment. In order to avoid any duplication of data, together with the equipment listing form, we have emphasized in the instructions that only the vessel-mounted equipment and the stand-by equipment permanently stored on board must be entered.

MARINE VESSEL Listing Form NAMIRS

DATE OF ENTRY/MODIFICATION

08/12/2022

GENERAL

NAME	ZEUS

IMO		9395513
CALL SIGN		S5EK9
VHF DSC [MMSI]	✓	278301000
TYPE		Tug
CATEGORY		Offshore
MOBILIZATION TIME [min]		60

OWNERSHIP	Private
OPERATOR CONTACT [company]	Adria Tow, d.o.o.
[phone No.]	0038656656318
[email address]	adria.tow@adria-tow.si

HOME PORT

CITY/PORT	Koper	LATITUDE [degrees]	45.548 N
UN/LOCODE	SIKOP	LONGITUDE [degrees]	013.730 E

PARTICULARS

LENGTH OVERALL [meters]	34.50	SERVICE SPEED [knots]	10
BEAM [meters]	11.60	ENDURANCE [nautical miles]	1,500
DRAFT [meters]	6.70	NO. OF CREW	4
POSSIBILITY OF BOARDING ADDITIONAL PERSONNEL	✓	NO. OF ADD. PERSONNEL	8

CAPACITY

STORAGE [cubic meters]	☐			CRANE [SWL tons at 12.5 m]	✓	1	
DISPERSANT [liters]	☐			TOWING [metric tons]	✓	74	
FIREFIGHTING	✓	LIGHTERING	☐	HIGH VISCOSITY	☐	HNS	☐

SHIPBOARD EQUIPMENT

EQUIPMENT	UNIT	CAPACITY
FIRE PUMP KVAERNER	[cubic meters per hour]	1,500
FIRE PUMP KVAERNER	[cubic meters per hour]	1,200
REMOTE CONTROLLED MONITOR WATER/FOAM	[cubic meters per hour]	100
SELF PROTECTECTING CURTAIN SPRAY SISTEM	[cubic meters per hour]	300
ALTERNATOR	[kilowatts]	306
ALTERNATOR	[kilowatts]	306
HARBOUR ALTERNATOR	[kilowatts]	195
ME-DRIVEN HYDRAULIC PUMP DRIVING ALTERNATOR	[kilowatts]	300

Figure 25: Marine craft listing example – tug "ZEUS"

4.6.1.2. Annex II: Aircraft

Annex II (working title) will be a list of all the aircraft, both fixed-wing and helicopters.

The aircraft listing form is very similar to the marine craft listing forms. There is only one different entry in the first two groups – instead of the IMO number, specific to marine vessels, there is the tail number, which is the number an airplane is identified by. The particulars include the minimum takeoff and landing distances. The water storage capacity for firefighting and the dispersant storage capacity, in case there is a spraying system on board, are complemented by additional services: firefighting, search and rescue for helicopters, and whether or not the aircraft is amphibious and whether or not it has the possibility of water scooping. The last group of data is entirely different from the one in Annex I. It is related to reconnaissance aircraft for the detection of oil slicks. The performance of remote-sensing equipment depends on the fraction of the spilled oil and its viscosity, the thickness of the oil slick, and the environmental conditions, such as waves, cloud coverage, or the reflection of sunbeams.

There are six different systems for oil slick detection:

- SLAR (side-looking airborne radar),
- SAR (synthetic aperture radar),
- IR (infrared scanner),
- UV (ultraviolet scanner),
- MWR (microwave radiometer),
- LSF (laser fluorosensor).

AIRCRAFT Listing Form NAMIRS

DATE OF ENTRY/MODIFICATION: 09/12/2022

GENERAL

NAME	ZLIN 526F

TAIL NO.	S5-DBO
CALL SIGN	S5DBO
VHF DSC [MMSI] ☐	
TYPE	Fixed-wing
CATEGORY	Surveillance
MOBILIZATION TIME [min]	60

OWNERSHIP	Private
OPERATOR CONTACT [company]	AK OLCP
[phone No.]	0038651300755
[email address]	info@akolcp.com

HOME AIRPORT

CITY/AIRPORT	Portorož	LATITUDE [degrees]	45.514 N
UN/LOCODE	SIPOW	LONGITUDE [degrees]	013.591 E

PARTICULARS

SERVICE SPEED [knots]	112	ENDURANCE [hours]	4
FLIGHT HOURS [hours per year]	20	TAKEOFF DISTANCE [meters]	220
NO. OF CREW	2	LANDING DISTANCE [meters]	135

CAPACITY

STORAGE [cubic meters] ☐		DISPERSANT [liters] ☐	
FIREFIGHTING ☐	SAR ☐	AMPHIBIOUS ☐	WATER SCOOPING ☐

REMOTE SENSING EQUIPMENT

SLAR ☐	SAR ☐	IR ☐	UV ☐	MWR ☐	LFS ☐

Figure 26: Aircraft listing example - reconnaissance plane "ZLIN 526F"

4.6.1.3. Annex III: Equipment

Annex III (working title) will be a collection of equipment, and storage and treatment facilities. The listing form for equipment was the most demanding to design. There are a lot of different pieces of anti-pollution equipment, and each comes with its own set of specific details. We had to be really

careful considering the ratio of quantity and detail to simplicity, transparency, and user-friendliness. One form is intended for each resource location (see figure 20).

We have decided to map the following equipment and facilities:

- Skimmers (category, type, power source, recovery rate, pump characteristics),
- Booms (category, type, design, length, corresponding equipment),
- Transfer pumps (type, capacity, maximum viscosity)
- Power packs (power source, output, number of connections),
- Storage (barges, floating tanks, mobile containers, tanker trucks),
- Treatment (mobile treatment plants, fixed treatment plants),
- Dispersant (amount, number of spraying systems),
- Other.

EQUIPMENT Listing Form NAMIRS

DATE OF ENTRY/MODIFICATION

Click or tap to enter a date.

LOCATION

CITY/PORT		UN/LOCODE	
LATITUDE [deg N]		LONGITUDE [deg E]	

SKIMMERS

NO. OF SKIMMERS			
NAME		POWER	Choose an item.
CATEGORY	Choose an item.	RECOVERY RATE [m3/h]	
TYPE	Choose an item.		
PUMP	Choose an item.	PUMP CAPACITY [m3/h]	
PUMP TYPE	Choose an item.	MAX VISCOCITY [cSt]	

BOOMS

NAME				FLOATATION ELEMENT	Choose an item.		
CATEGORY	Choose an item.			TOTAL LENGTH [m]			
TYPE	Choose an item.			FREEBOARD [m]			
DESIGN	Choose an item.			DRAFT [m]			
REELS	☐	AIR BLOWER	☐	ANCHORING SET	☐	COMPATIBLE	☐

TRANSFER PUMPS

NO. OF PUMPS			
NAME		CAPACITY [m3/h]	
TYPE	Choose an item.	MAX VISCOCITY [cSt]	

POWER PACKS

NO. OF POWER PACKS			
NAME		OUTPUT [kW]	
POWER	Choose an item.	NO. OF CONNECTIONS	

Figure 27: Equipment listing empty form - page 1/2

EQUIPMENT Listing Form NAMIRS

STORAGE

BARGES

NAME		LENGTH OVERALL [m]	
OWNERSHIP	Choose an item.	BEAM [m]	
CAPACITY [m3]		DRAFT [m]	

FLOATING TANKS

NO. OF FLOATING TANKS		TOTAL CAPACITY [m3]	

MOBILE CONTAINERS

NO. OF MOBILE CONTAINERS		TOTAL CAPACITY [m3]	

SHORE TANKS

NO. OF SHORE TANKS		TOTAL CAPACITY [m3]	

TANKER TRUCKS

NO. OF TANKER TRUCKS		TOTAL CAPACITY [m3]	

TREATMENT

MOBILE TREATMENT PLANTS

NO. OF MOBILE TPs		TOTAL CAPACITY [m3/h]	

FIXED TREATMENT PLANTS

NO. OF FIXED TPs		TOTAL CAPACITY [m3/h]	

DISPERSANT

AMOUNT OF DISPERSANT [l]		NO. OF SPRAYING SYSTEMS	

OTHER

Figure 28: Equipment listing empty form - page 2/2

4.6.2. PISCES

Once the mapping of resources is complete, assets and equipment will be imported to the PISCES. Real quantites and real characteristics will be considered. The latter will contribute to extremely accurate exercise scenarios, resembling real situations where the actual oil-recovering capacity and competency will be put to test.

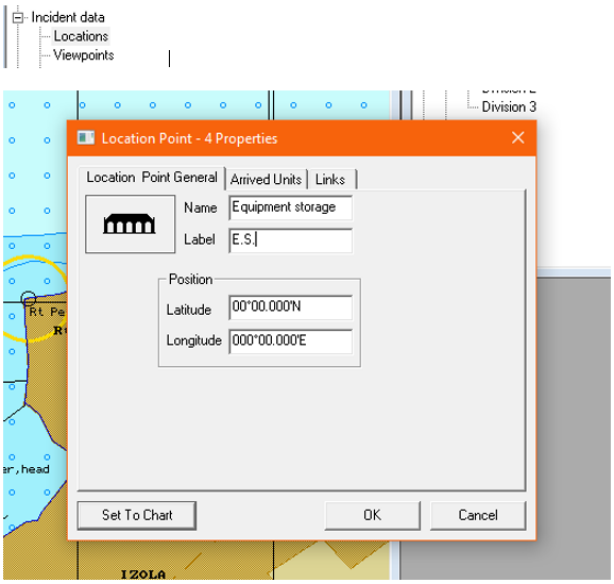


Figure 29: Setting a location point - equipment storage

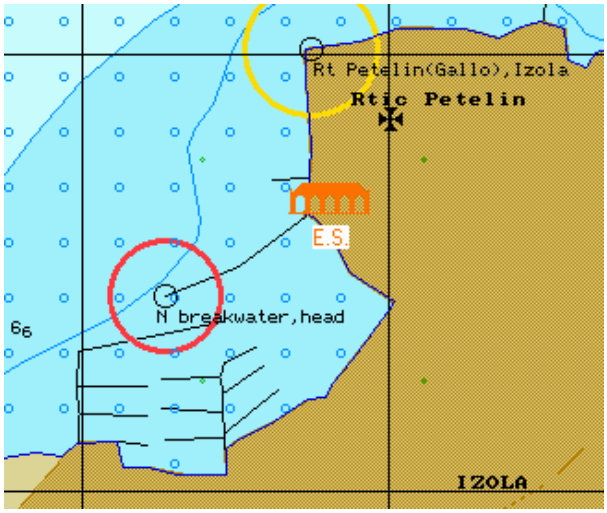


Figure 30: Equipment storage icon on location

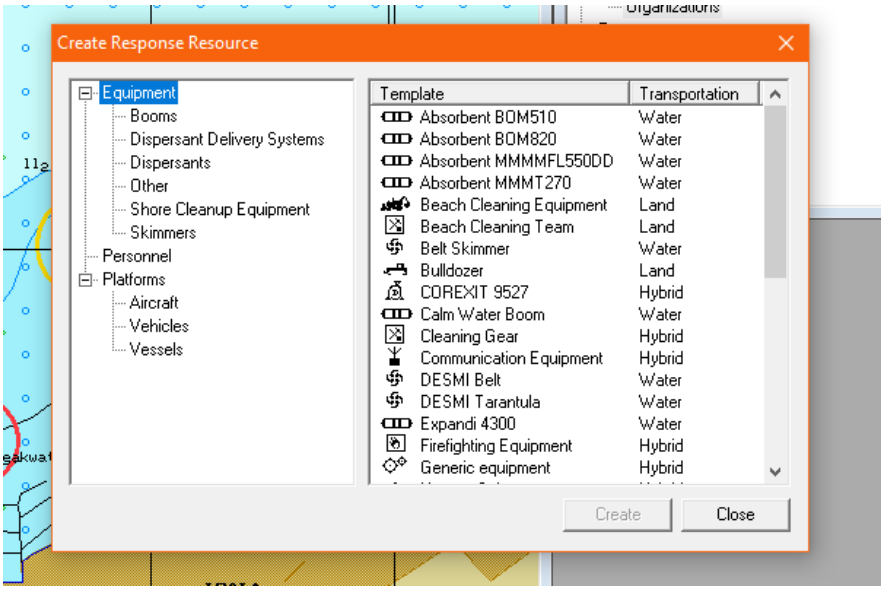


Figure 31: Creating response resources

4.6.3. App

We are striving towards developing an app displaying locations of all the assets and equipment on an interactive chart of the North Adriatic. Selecting a location, the app will show all the resources correspondent to that location (only the essential information, details will be available in the annexes to the contingency plan). All the features and details are yet to be discussed upon delivery of the SOP and during the upcoming seminars, workshops, and exercises.

In our opinion, the app should be kept separate from complicated professional software, such as spill simulators or wind/current predictors. Such programs require expert operators, which are not always at hand. The app should be average-user-friendly and run on an easily accessible platform, so as to facilitate the organization of the first response for everyone involved and thus reduce the time of mobilization. We suggest integrating it into an open map platform, such as QGIS, Google Earth, or Google maps, and protecting with a password to ensure that access is denied to unauthorized personnel.

5. FEASIBILITY STUDY

5.1. General

The Administration of the Republic of Slovenia for Civil Protection and Disaster Relief (ACPDR) is the institution responsible for emergency interventions on national territory. In scope of the project NAMIRS, the ACPDR would be expanding its territory of operation to the international waters of the North Adriatic, shared by the Republic of Italy and the Republic of Croatia.

If the ACPDR wishes to operate properly, making quick and efficient interventions, they need properly trained personnel. In the coursge of the training of personnel, the ACPDR encountered a problem in the area of diver training. The intervention procedures and on depths equal to 25 meters or deeper were not up to the standard because we do not have a professional training center for divers. Should a tanker, loaded with crude oil or any other kind of derivative, sink in the area of the ACPDR operational territory or in the NAMIRS Northern Adriatic area, the oil on board would have to to be pumped out of the tanks with the help of a trained team of divers and oil clean-up service personnel.

For that purpose, the ACPDR would like to have a training center established. Generally, there is a lack of such facilities in the area covered by the NAMIRS. Besides professional divers, a potential user of the training center could be anyone in need of that kind of training, even foreigners, from Partner countries or other countries from the Adriatic and Central Europe. According to the data currently known to us, the only centers of such nature are located in Padua, Italy, and in Poland.

Figure 32: Conceptual exterior of training center

The centre would be located in the Municipality of Izola, which is located in the hearth of Slovenska Istra in the macro region of Obalno-Kraška. The region can be found in the western part of the Republic of Slovenia in the land of Primorska.

Figure 33: Macro location of the training center

The Municipality of Izola encompasses many small settlements around its centre in the coastal town of Izola from which the municipality got its name from. The diver training centre proposed in this document would be located in the north-western part of Izola called Ruda, on land southern of the main road junction which connects Izola with Koper and the national highway.

Figure 34: Micro location of the training center

The construction would be funded partially by the state budget of the Republic of Slovenia, and partially by the European Union's funds for protection and disaster relief, or from other EU-budget resources. A partial amount could also be provided by the Municipality of Izola from its municipal fund.

Apart from the deep-diving training, the center could also hold shallow-water-diving training sessions. The latter would enable diving personnel from the countries participating in the NAMIRS to obtain additional training for activities happening in the waters of the Bay of Trieste, or in the area due north of the imaginary line between Savudrija and Grado, where depths are less than 25 meters.

Based on the needs described above, the concept and the architectural design of the center was created, which is presented in the feasibility study. Besides the deep-diving training, the

pool would be used for the performance of exercises for oil-pollution interventions at sea, as well.

The feasibility study also delivers a raw estimation of the center's operation-procedure costs, based on the expected number of potential employees, and all other associated costs.

5.2. Description of the diving center

The center would comprise the following units (in different locations but functioning as one center):

- Izola fire station,
- Regional station for the rescue unit of lifeguards including divers,
- Storage space for rescue equipment (approximately 600 square meters of warehouse grounds for booms and other equipment with direct access to the sea and a loading lift, or as close to the sea as possible),
- Macro-regional pool for deep-water training of divers and rescuers, and rescue at sea (passenger and cargo ships).

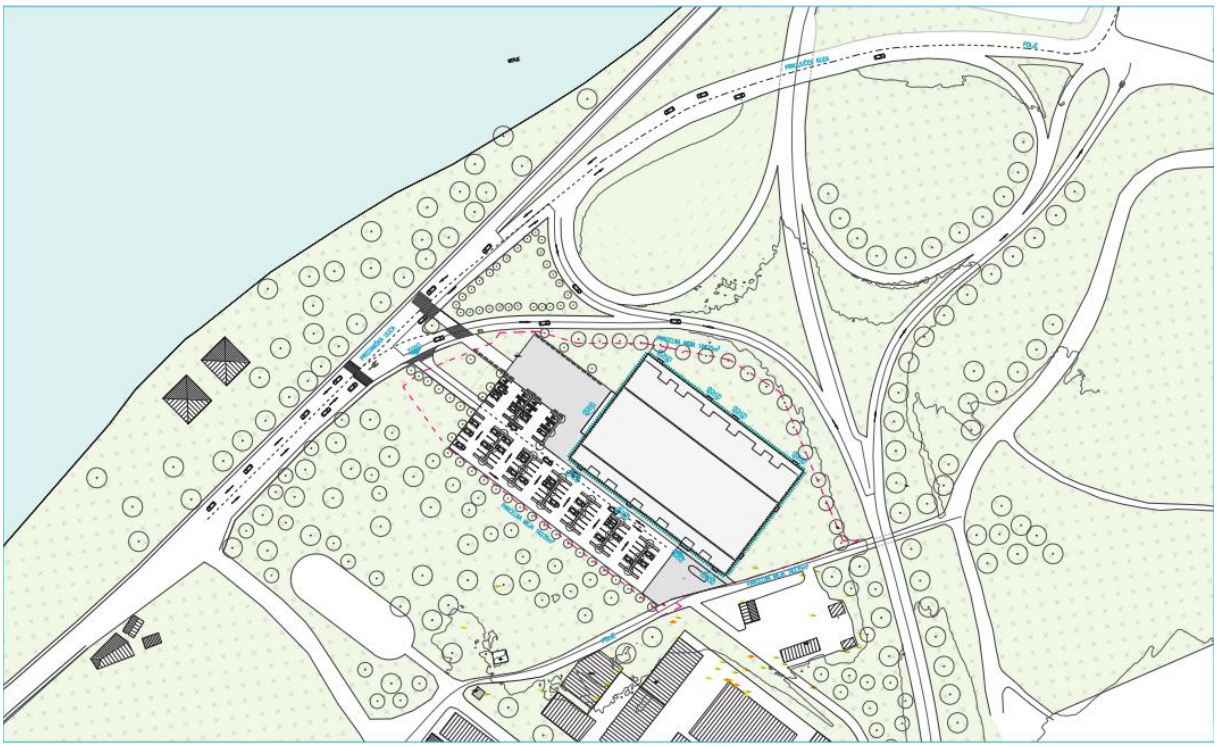


Figure 35: Floor plan of the building (outside view)

Center units can be centralized or decentralized in the area of Izola (within a radius of 500 meters) depending on the access requirements, and other sports facilities and space requirements.

The center should include the following amenities, as proposed by Capt. Rok Sorta:

- A deepwater pool with an extended stepped section at the shallower part and tunnels at different depths,
- A multipurpose pool,
- A connection between the deepwater pool and the multipurpose pool (optional),
- A small pool with low-temperature water,
- A swimming-pool engine room and storages for various props and equipment,
- Diver rescue unit's own premises and storage,
- A first-aid room fitted a decompression chamber,
- Classrooms, one of them connected to the working balcony of the multipurpose pool by steps,

- Changing rooms, toilets, a laundry, and an equipment-drying room,
- Shops and a bar (optional: with underwater windows to the pool),
- A reception office and a control room,
- An outdoor balcony, a green roof covered with solar cells and possibly small windmills for generating electricity (optional),
- Hotel rooms or apartments (optional).

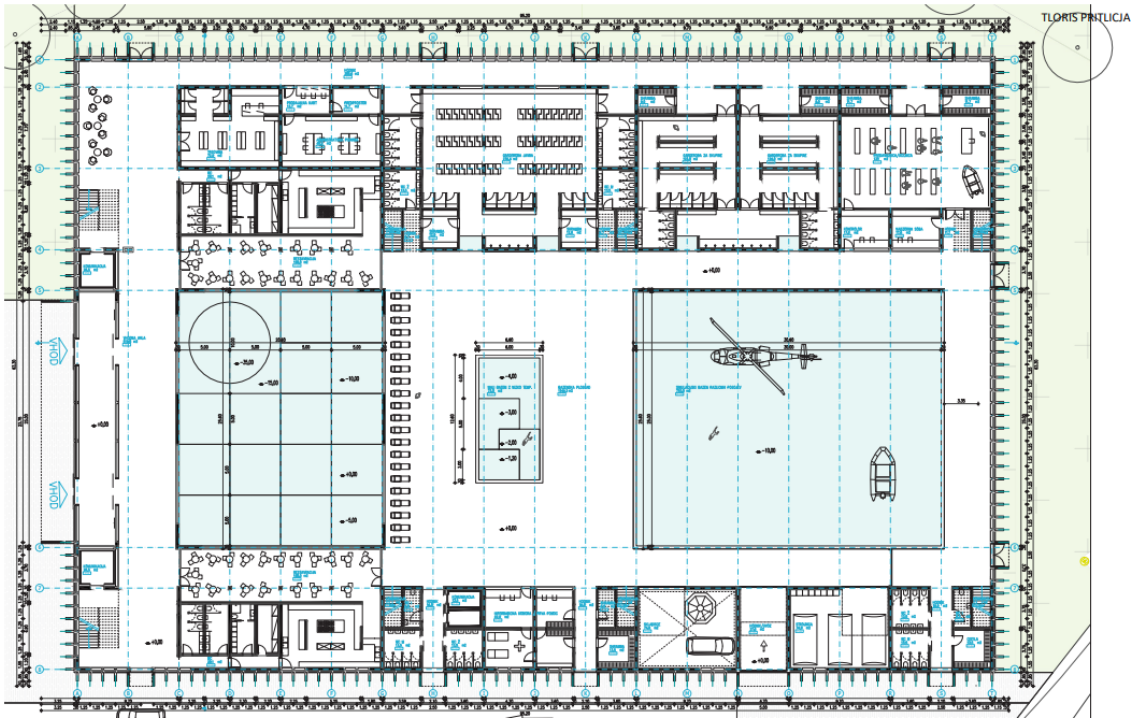


Figure 36: Ground floor of the training center

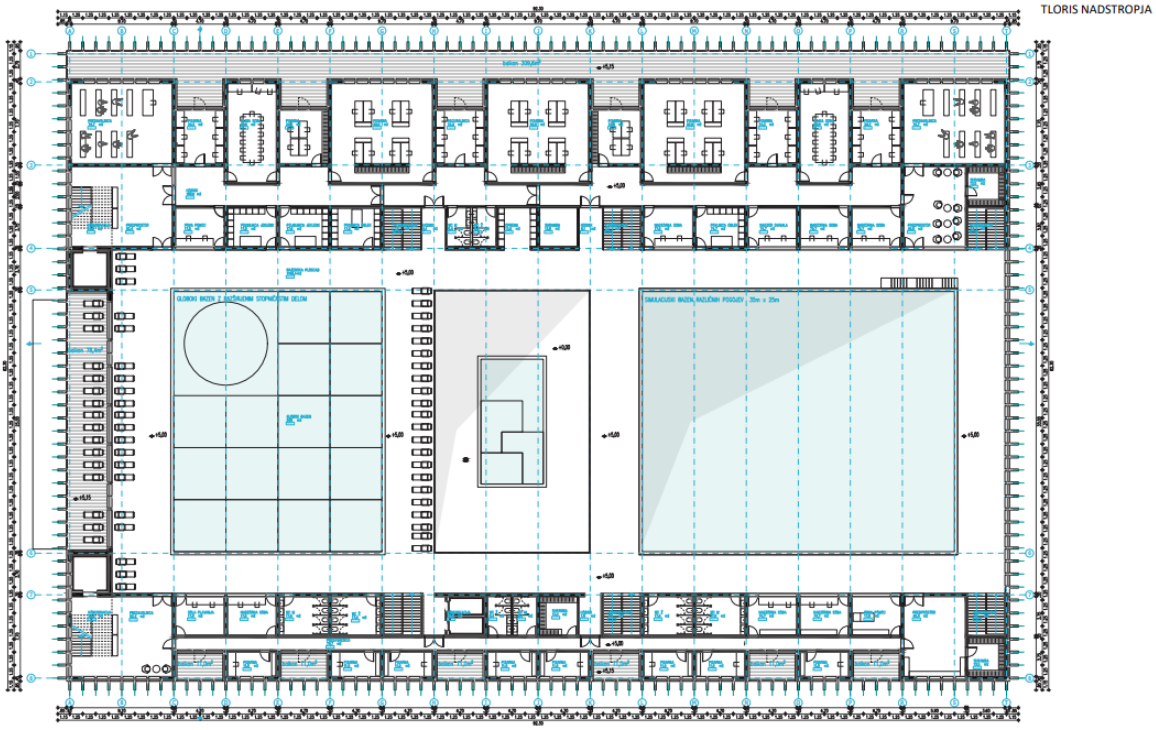


Figure 37: First floor of the training center

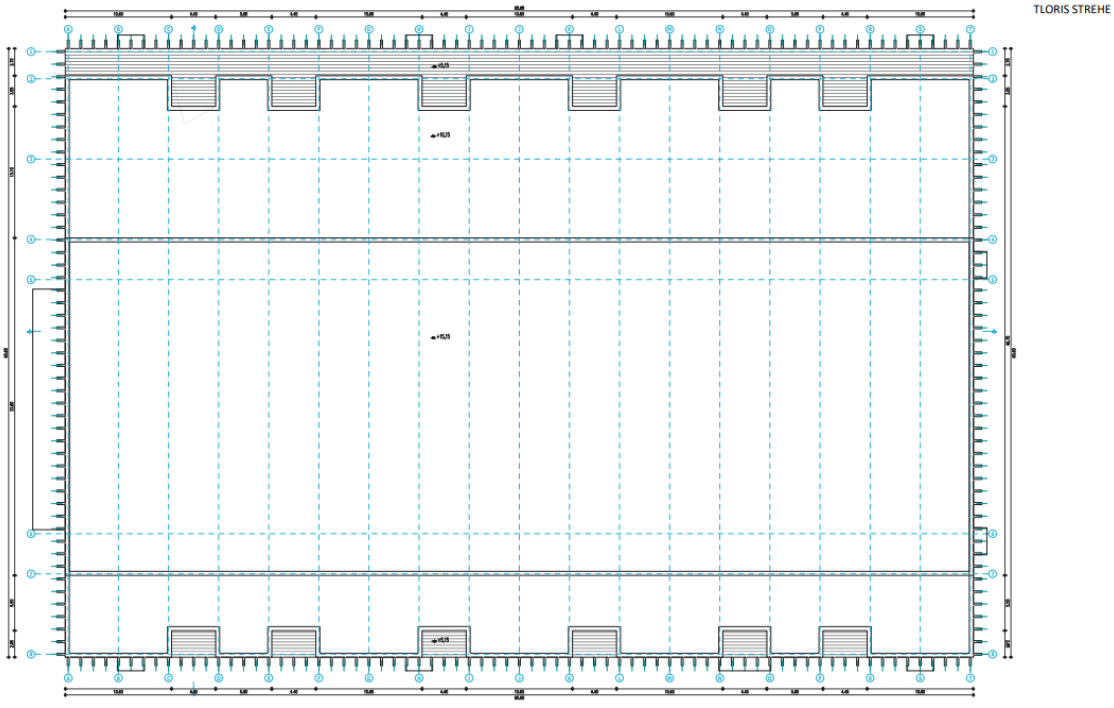


Figure 38: Side view of the training center A-A

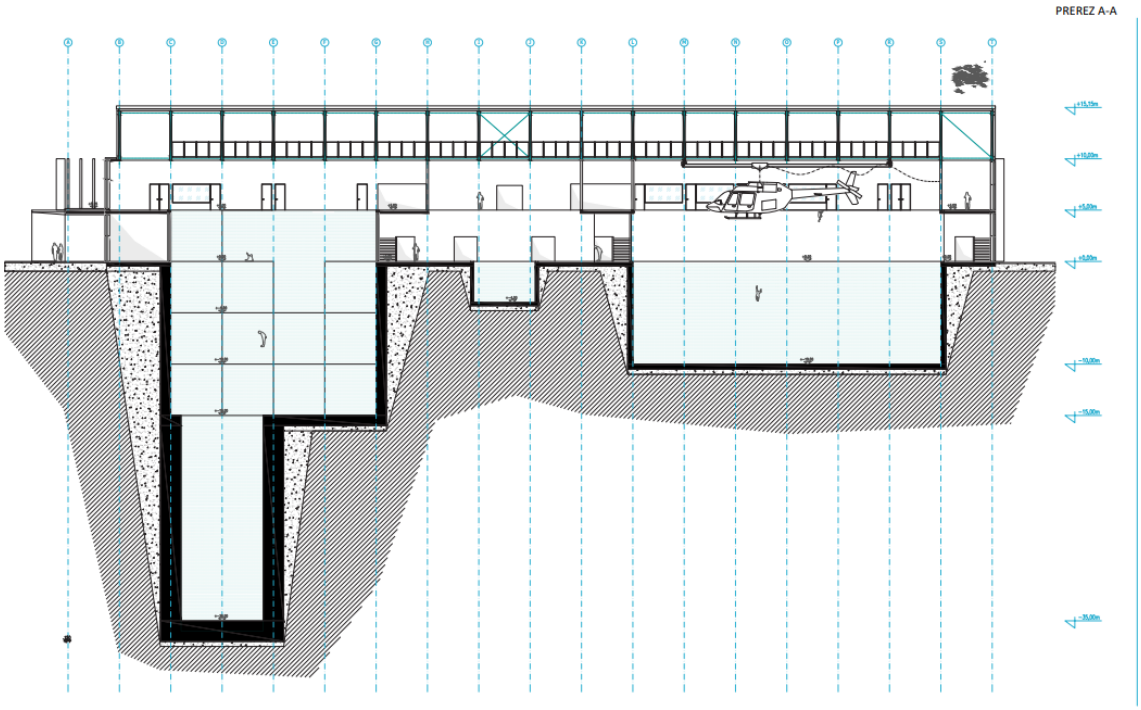
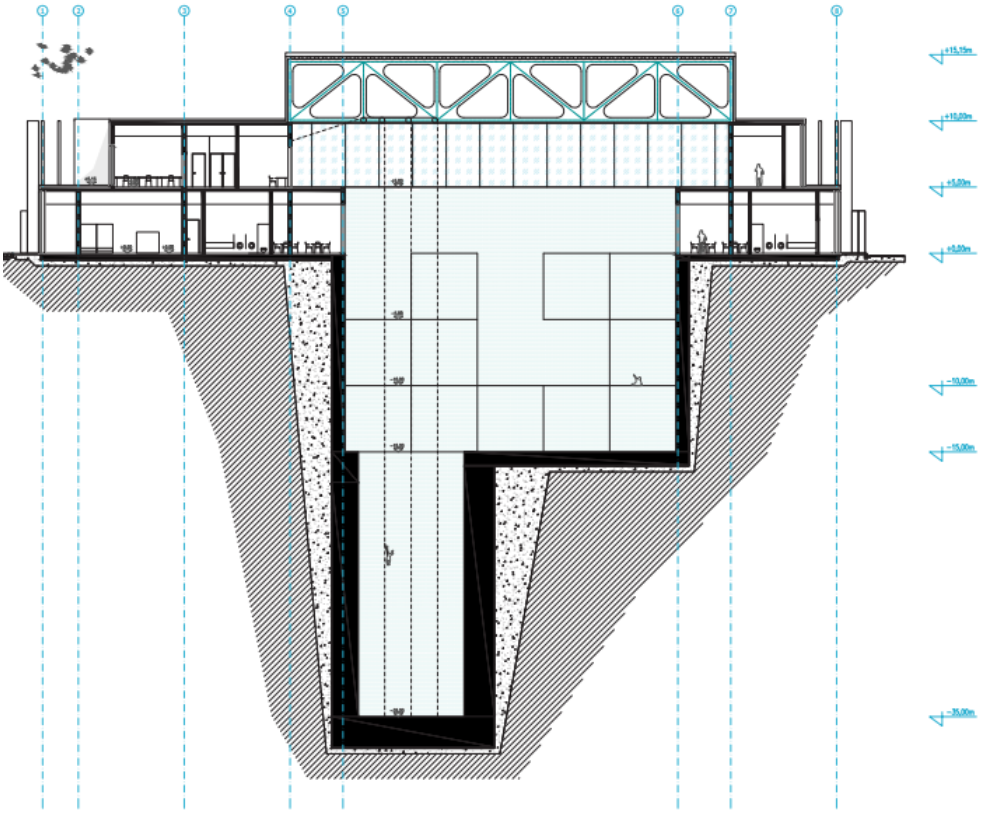


Figure 39: Side view of the training center B-B

PREREZ B-B



5.3. Goals and the purpose of the diving center

The basic goal of the center, common to any state-of-the-art facility, is to enable all users, amateurs and professionals, as well as military personnel, to undergo different training courses in the water, set in a safe and controllable environment.

However, if broader goals were considered during planning and construction, too, the pool could in fact become a multipurpose facility for various activities, such as:

5.3.1. Diving activities

The pool would be suitable for both beginner and advanced level training courses, and tests related to snorkelling and scuba diving in a variety of situations and conditions. In addition to that, the pool would be used for exercises and training for professional divers.

5.3.2. Training of seafarers

Seafarers are required to complete theoretical education and training for the rescue, assistance, and survival at sea. Practical exercises must enable a realistic but safe simulation of a wide spectrum of rescue and survival techniques at sea. This pool would allow a range of exercises and training in the sea for skippers, sailors, and others in all weather conditions.

5.3.3. Research activities

Owing to the distinctive properties of pools and their specific functions, certain research activities could be taking place there, such as oceanographic studies, physics studies, rescue and survival techniques, various measurements, ship stability, propulsion, manouevering, performance studies, naval architecture, hull design and water resistance, studies of wave and wind loads on structures, wave patterns, etc. The center would also be a suitable facility for the performance of various tests of the impact ow water on equipment and materials. When it comes to science, the options are endless.

5.3.4. Activities of other services related to the sea and use of the sea

Not only seafarers, but also lifeguards, civil-protection teams, harbour masters, first-aid teams, army units, police, firefighters, helicopter pilots (e.g., helicopter overturning, winch rescue from water, etc.) would be encouraged to use the premises to perform their own statutory exercises, training, and exams.

5.3.5. Other technical activities

The pool could also serve as the environment for accurate pollution simulations with real oil without any risk of causing harm to the outside world, testing of recovery methods and procedures, as well as training for the use of underwater equipment and devices, such as underwater drones, ROUV, etc.

5.3.6. Extracurricular and afternoon activities

Various clubs and courses could also be organized in the swimming pools (especially in the multi-purpose pools), such as safe jumping into the water, swimming lessons, synchronized swimming, basics of sailing, various diving courses and training (freediving, scuba diving, night diving, apnea), courses in water rescue and survival, demonstrations of activities related to the sea for pre-school and primary school children, water recreations for amatuers, sports training, sports competitions, and last but not least, fun activities, such as pool parties, underwater weddings, etc.

5.3.7. Tourist activities

All the additional features of the training center including shops and an open bar would also promote touristic activities and attract companies by hosting teambuildings or demonstrations.

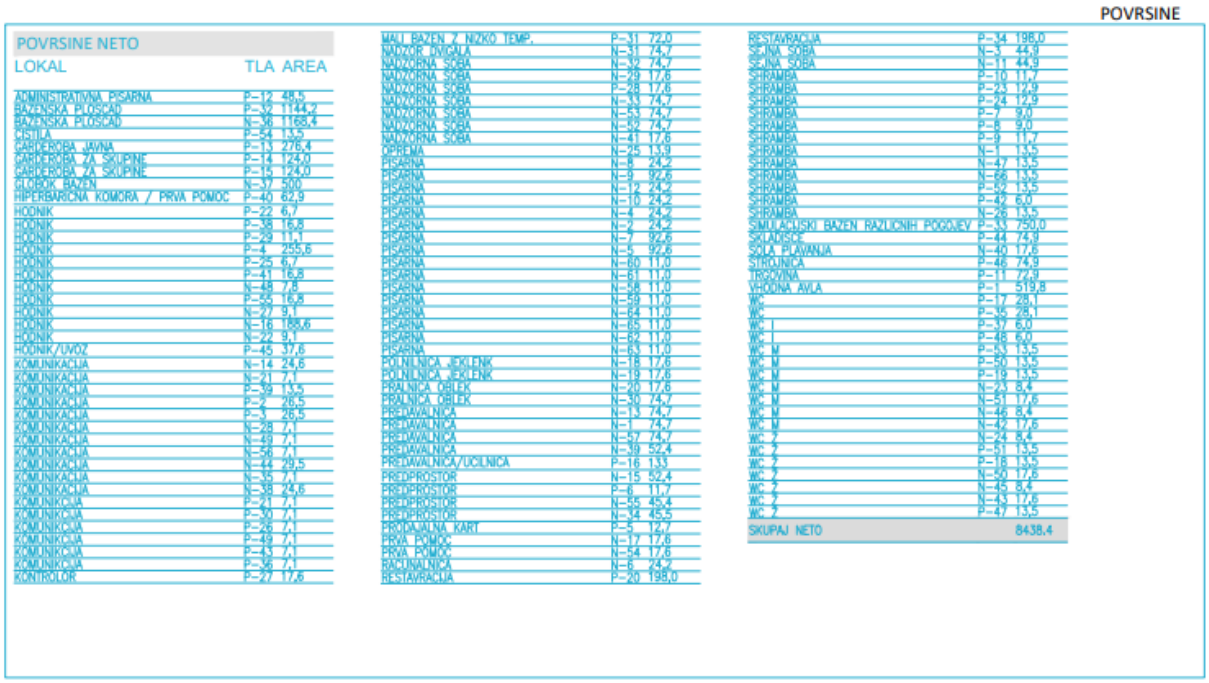


Figure 40: Functional areas in the training center

5.4. Multipurpose pool description

- Dimensions overall: 25 meters by 30 meters,
- On one longer side of the pool, balconies, mounted on a wall at 4.5-meter, 5-meter, and 9-meter heights, will be used for descent and abandon-ship exercises,
- In one corner above the pool, a hanging balcony, 5 meters long and 2 meters wide, will be connected to an external staircase from the pool,
- A 5-meter long part of the wall will be enclosed and fitted doors at 2-meter, 4-meter, 6-meter, and 8-meter heights above the surface.
- There will be a balcony for spectators on the opposite longer side at a height of 5 meters with an open-storage space underneath,
- On one shorter side, a jumping tower will be assembled with jumping boards at heights of 1 meter, 3 meters, 5 meters, 7.5 meters, and 10m meters,
- On the opposite shorter side, there will be a seafety net hanged at the end of the pool (for safety during exercises),
- The prescribed depth below the diving boards is 5 meters and a step at a depth of 4 meters,
- A 4-meter wide mobile underwater platform for exercises at a depth of 1.2 meters,
- Partition in the middle of the pool (optional).

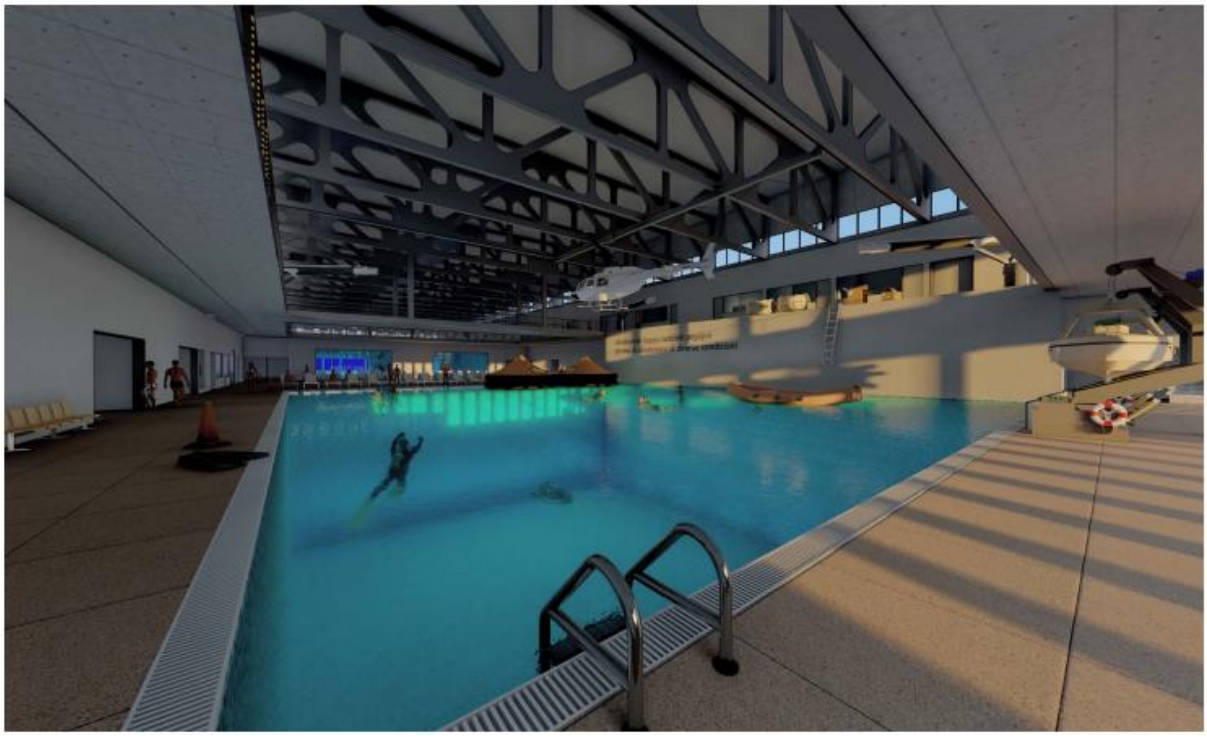


Figure 41: Multipurpose pool

In addition to the general requirements for pools, stronger filtration and an engine room, the multipurpose pool would also have:

- A system for the generation of artificial waves and currents,
- A lighting system, underwater reflectors and cameras,
- Increased lighting (reflectors) of the room,
- A system for complete and partial darkening of the room,
- A water sprinkling system for the simulation of work during rainfall,
- A wind simulation system (fans),
- A strong sound system for the simulation of noise and ship announcement during exercises,
- A control balcony with a control cabin and video surveillance of the pool (safety, analysis of exercises, training, etc.),
- A mobile lift above the pool for simulations of rescue by helicopter, lifting of persons from the sea, etc.),

- Underwater windows at the bottom and certain depths for the observation and supervision of exercises,
- A lift above the working wall for lowering the raft and other objects into the water,
- A powerful ventilation system, also capable of performing simulations, such as working in smoke,
- An underwater lighting and sound system,
- Balconies for installing evacuation systems in vessels on the high wall (the MES systems),
- markings, stickers, and emergency lighting according to the IMO standards.

5.5. Low-temperature small pool description

- Dimensions overall: 12 meters by 6 meters,
- Stepped depths of 1.2 meters, 2 meters, 3 meters, and 4 meters,
- Temperature of 10 degrees Celsius with the possibility of regulating the temperature,
- The possibility of darkening the room,
- Pool lighting,
- Various underwater obstacles - spaces under the pool steps,
- Extremely powerful water filtration,
- A ladder to the bottom of the pool,
- Drains (rinks) at different depths on one side of the pool,
- Windows at different depths on one side of the pool,
- A smaller revolving lift at the edge of the pool.

Figure 42: Cold-water pool

5.6. Deep-water pool description

- Dimensions overall: 20 meters by 25 meters,
- A tunnel 6 meters wide in the deepest part,
- A depth of 45 meters in the deepest part of the pool (another option is a depth of 20 to 25 meters),

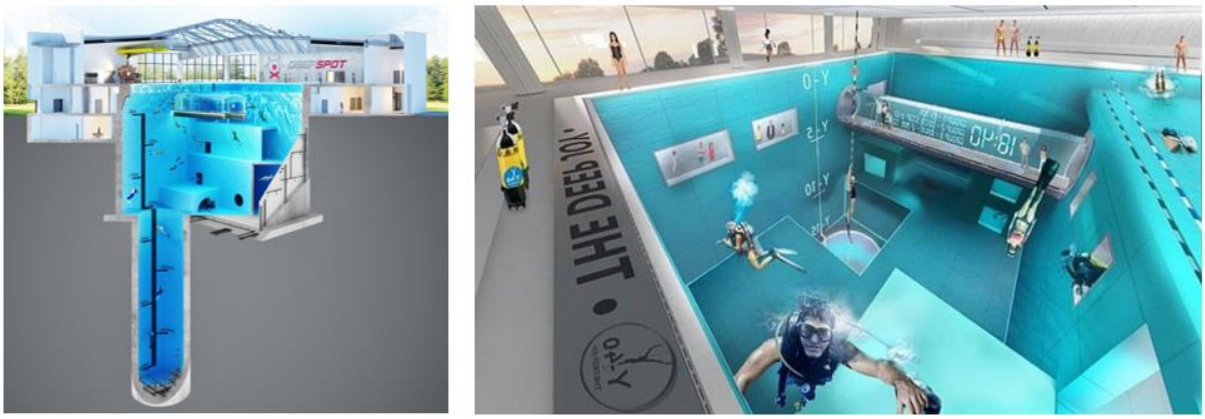


Figure 43: An example of a layout of a similar concept

Source:

http://divemagazine.co.uk/skills/8470-deep-poo,https://www.youtube.com/watch?v=HkflOAvLGUI

- Extended step parts at different shallow depths,
- Underwater windows and an underwater observation tunnel,
- Tunnels at different depths,

Figure 44: An example of gradual stepped depths and an observation tunnel

Sources:

https://pros-blog.padi.com/blue-abyss-aims-to-build-worlds-largest-and-deepest-research-training-and-development-pool/,

https://www.spotmydive.com/en/top-10/what-are-the-deepest-swimming-pool-in-the-world/

- A connection to a multipurpose pool with a door/hatch (optional,)
- An elevator above the pool,
- Depth marking.

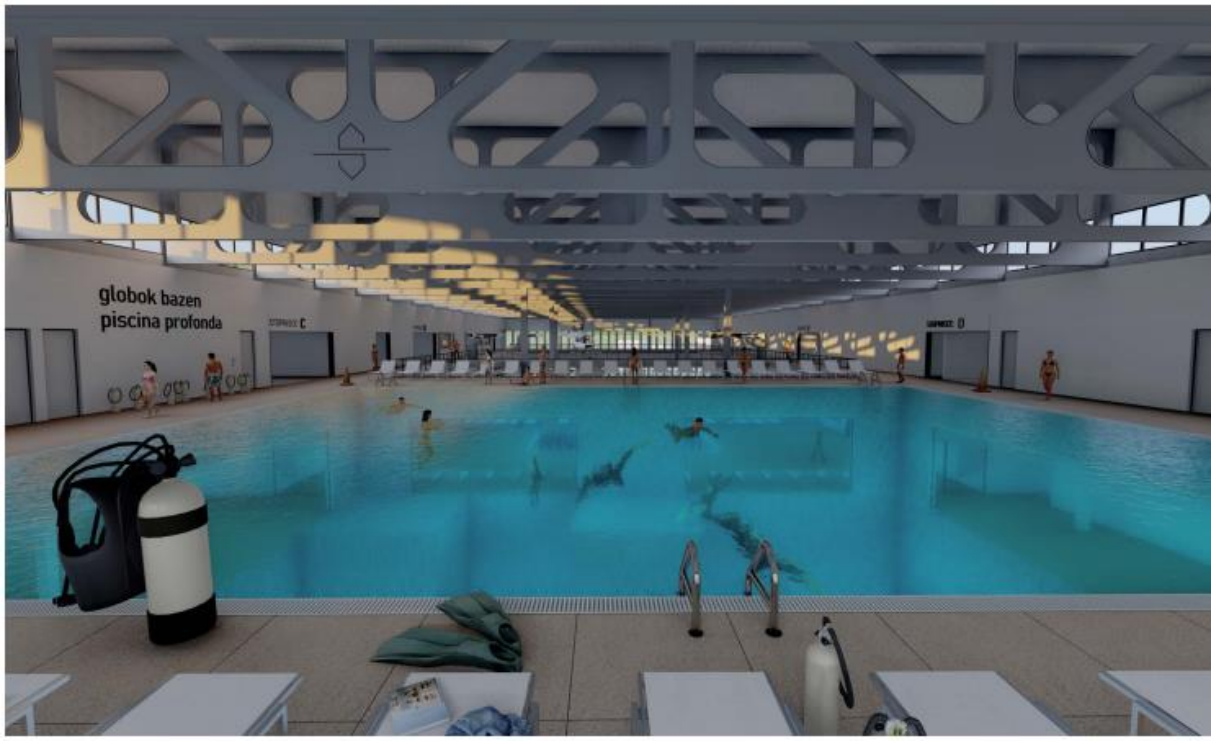


Figure 45: Deep-water pool

6. GAPS

During the collection and analysis of data on available anti-pollution resources including stakeholders, services, assets, and equipment, we have detected the following gaps:

- Data on assets and equipment are incomplete (not all resources are actually listed),
- Assets and equipment are categorized in a non-uniform way (the same assets and pieces of equipment are put under different categories in different listings),
- Different particulars of the same assets and pieces of equipment are stated in different listings,
- The essential particulars to organizing a proper intervention are either not properly listed or not listed at all (missing types, categories, dimensions, capacities, mobilization times, contact points, etc.).

For a more detailed analysis and explanations of the significance of the detected gaps to the cause, see chapter 4.5.

In order to be able to deliver a realistic assessment of the joint recovering capacity and proceed with the development of the contingency plan effectively, these gaps will have to be eliminated. The recommended solutions that we have managed to prepare are presented in the conclusion (see chapter 7).

7. CONCLUSIONS AND SUGGESTIONS

Regarding stakeholders and services, the mapping has been carried out satisfactorily. We do figure that there is still room for minor improvements, but those are being addressed at this very moment.

We have found some obstacles collecting data on available resources. Each of the Partner countries are using their own system for the evidentation of assets and equipment. Most likely, for Tier-1 and Tier-2 interventions that is not even an issue. But, should it come to a larger, Tier-3 cross-border pollution, demanding international effort and precise coordination, that will not be enough.

These are our suggestions for improvement and eliminations of the detected gaps:

- A unified data display system should be used. Our proposal is to place separate databases for each resource location on an open map, such as QGIS, Google Earth, or Google Maps. The The database could be accessed by the password.
- We are not entirely sure who to entrust with the management of the server. The access should be strictly controlled.
- Unified sistematic forms should be used for the mapping of resources providing the necessary particulars and information. See the suggested forms in chapter 4.6.1.
- Common descriptions of assets and equipment should be supplemented by their images.
- We should nominate a permanent technical comittee who will be required to take regular meetings, probably annually, meetings, and have the responsibility to discuss modifications, updates, and improvements for the future.

In our opinion, the overall quantity of assets and equipment in the North Adriatic is sufficient. However, we could not claim with certainty that the same applies to particular locations. The availability of an adequate amount of resources in some locations remains questionable. Sufficient anti-pollution resources are especially important in the Gulf of Trieste and the Gulf of Kvarner, where every minute of delay could result in severe damage to the diverse environment of the area.

The feasibility study for the training center for the governmental service needs is the first step towards better preparedness. At this point, the next steps to take are further studies related to investment plans, spatial planning, geological surveys, eventual modification.

The center will, indeed, not limit their access only to Slovenian users but will also be available to the neighboring countries, promoting cross-border cooperation and enhancing joint efforts for the training of emergency response teams through a common approach.

The renewed oil-spill training simulator has never worked better and faster. The new hardware also allows smoother communication with the navigational simulator NT-PRO, where the visualization of either simulated or real situations is not only possible but incredible.

We strongly recommend that the Partners make use of these advantages, and:

- Share sugestions related to the planned training workshops within the WP 3. In training sessions, we will be using the evidented equipment so as to make scenarios as realistic as possible and test our actual preparedness.
- Use the renewed simulator for the planned excercises within the WP 4.

The simulator could also be used for promotional activities, for instance, live or online demonstrations, videopromotions, pictures for the media, etc.

8. LIST OF FIGURES

9. LIST OF TABLES

10. LIST OF ABBREVIATIONS

ACPDR:	Administration for Civil Protection and Disaster Relief
AOR:	Areas of responsibility
BC:	Beach Commander
CCRA:	Cleaning and cleaning-related activities
CECIS:	Common Emergency Communication and Information System
COLREG:	Convention on the International Regulations for Preventing Collisions at Sea
CP:	Contingency Plan
CRCPH:	Coastal Region Civil Protection Headquarters
DA:	Detection and alerting
DO:	Duty Officer
EA:	Environmental Agency
ELMU:	Ecological Laboratory Mobile Unit
EMSA:	The European Maritime Safety Agency
EPA:	Environment Protection Agency
ENCRS:	The Emergency Notification Centre of the Republic of Slovenia
ERNC:	The Emergency Regional Notification Centre
HNS:	Hazardous and noxious substances
HNS protocol:	Protocol on preparedness, response and co-operation to pollution incidents by hazardous and noxious substances
HO:	Acting Head of Operations
IMDG code:	International Maritime Dangerous Goods Code
IMO:	International Maritime Organisation
IR:	Infrared scanner

LFS:	Laser fluoro-sensors
MARPOL 73/78:	International Convention for the Prevention of Pollution from ships, 1973 as amended by the Protocol of 1978
MI:	Ministry of Interior
MOD:	Ministry of Defence
MOI:	Ministry of Infrastructure
MOSP:	Ministry of Environment and Spatial Planning
MRCC:	Maritime Rescue Co-ordination Centre
MWR:	Microwave radiometer
NAMIRS:	North Adriatic Maritime Incident Response System
NOSC:	National On Scene Commander
OPRC convention:	Oil Pollution, Preparedness, Response and Co-operation convention, 1990
OSC:	On Scene Commander
PAU:	Police Administration Unit
PCO :	Post-cleaning operations
PISCES:	Potential Incident Simulation Control and Evaluation Software
POLREP:	Pollution Report
PP:	Project Partner
PPM:	Prevention, preparedness and monitoring
RC:	Response Commander
RCPC:	Regional Civil Protection Commander
ROUV:	Remotely operated underwater vehicle
SAF:	Slovenian Armed Forces
SAR:	Search and rescue

SAR:	Synthetic aperture radar
SLAR:	Side-looking airborne radar
SMD:	Slovenian Maritime Directorate
SOLAS:	International Convention for the Safety of Life at Sea
SOP:	Standard Operating Procedures
SOSC:	Supreme On Scene Commander
SVOM:	Sea Shore Maritime Administration
UV:	Ultraviolet scanner
WMC:	Watrer Management Company Drava
WP:	Work package