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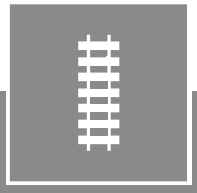

Building up Best Cases of Connectivity in Maritime Transport D.T.2.2.2

Maritime Transport Connectivity Success Factors 11/2020

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Building up Best Cases of Connectivity in Maritime Transport

Maritime Transport Connectivity Success Factors

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I. GENERAL DATA VTMIS AND VTS

I.1 The Vessel Traffic Monitoring and Information System (VTMIS)

The VTMIS is an extension of the Vessel Traffic Service (VTS), in the form of an Integrated Maritime Surveillance, which incorporates other telematics resources to allow allied services and other interested agencies in the direct sharing of VTS data or access to certain subsystems in order to increase the effectiveness of port or maritime activity operations as a whole, but that do not relate to the purpose of the VTS itself. The actual setup must be the subject of a specific project, based on the functional requirements, the availability and reliability required.

The features of a VTMIS are: i) Port management systems; ii) Systems dedicated to port security; iii) Support systems and management of pilotage; iv) Load management systems and overall property; v) Docking Planning; vi) Systems for collecting port taxes; vii) Quarantine control; viii Customs control; and, ix) Support for Coast Guard operations such as repression of illicit acts on ships, smuggling, drug trafficking, etc.

MIS (Management Information System)

The MIS is the system that hold intelligent processing capabilities of information passed on by the VTS, or fed directly into your database. The efficiency of the control and monitoring of the activities depends on the type and the treatment of the information generated. Information collected by a VTS system must be processed, detailed and made available in order to improve and facilitate performance management of the port activities.

Vessel Traffic Service (VTS)

The VTS allows the monitoring of vessels, in real time, to enable safe and efficient traffic management in a specified maritime area, including the position of vessels in order to immediately identify incidents that may generate risks for the crew and the environment. The systems displays a graphical environment with the movements of vessels in the approach areas, putting each of these overlapping vessels to a digital nautical chart, in its real geodesic position and informs the identification of each vessel. In many waterways vessels operate independently in any traffic situation or time, without VTS. However, knowing the types of services and roles assigned to the VTS is part of the procedures used to determine whether the implementation of such a service is the appropriate action for a particular area of interest.

Benefits of the VTS

Basically, the VTS contributes to the following tasks:

- Safety of life at sea and the safety of navigation by identifying and monitoring vessels, by planning for movement of vessels in the VTS area and the disclosure of information and assistance to the navigator;
- Increased efficiency of maritime traffic;

- Prevention of marine pollution and anti-pollution measures; and
- Protection of communities and infrastructures in the VTS and adjoining area.

Additionally, a VTS can provide contribution to the increased efficiency of port activities and to support security activities in the maritime sector.

A distinction must be made between the VTS dedicated to port service and the VTS dedicated to the coastal service. The duties of a port VTS will be directed primarily to the traffic of the port area and its direct access (inland waters and canals, in general), while a coastal VTS is concerned with the transit of vessels for a given stretch of territorial sea. Regarding the types of service for a port VTS, it is common to expect support services for navigation or traffic organization, while a Coastal VTS usually will only have the information service. However, a VTS station may be both, provided that fitted to it.

The VTMIS activities should not interfere with the operation of the VTS in any way. The Maritime Authority has no role to play with respect to VTMIS.[1]

I.2 VTMIS of territorial waters of Montenegro

Starting from the 1st of January 2017, the Maritime Safety Department of Montenegro has introduced a mandatory check-in system for all vessels entering and leaving the VTS zone (Vessel Traffic System) responsibility of 12 nautical miles, or reporting to Montenegrin VTS in Dobra Voda.

The obligation of all vessels that are in the VTS area is sending input and output reports or deviational and incident reports in cases of emergencies.

Monitoring and management of maritime navigation is implemented in order to increase the safety of maritime navigation and protection of the sea from pollution.

Monitoring and management of maritime navigation (VTMIS) includes:

- Gathering data on vessels and maritime navigation;
- Providing data to all vessels;
- Providing navigational advice and support for vessels;
- Organizing navigation and management of maritime navigation;
- Control over the safety of navigation.

The system for monitoring, providing information and management of maritime navigation is done in collaboration of the Harbour Master and the port authorities with vessels that are in use or are in the internal waters, territorial waters and continental belt of Montenegro. This system is being implemented in order to increase the safety of maritime navigation, efficiency of maritime traffic and the protection of the marine area.

VTMIS equipment is located at the following locations: Dobra Voda (Bar), Obosnik (Lustica peninsula), Crni Rt (Sutomore), Mavrijan (Ulcinj). Equipment includes: maritime radar system, radio communication system,

[1] General data collected from https://sheltermar.com/vts/vtmis/

the coastal system of automatic identification of ships, weather stations, electronic cartography, direction finder and backup linking network.

 [2]

Figure 1. VTMIS-system for control and management of maritime navigation

VTMIS system will facilitate rescue operations at sea, which are coordinated by the Maritime Safety Department (MSD). This system contributes to the better work of the Coordination Centre for search and rescue at sea, because it allows precise locating of endangered vessels.

I.3 EU Results - Vessel Traffic Monitoring and Information System in Montenegro

In respect of the European Union (EU) policy papers the implementation of VTMIS is based on the Commission White Paper on European transport policy, in general, and on Directive 2002/59/EC establishing a Community vessel traffic monitoring and information system and repealing Council Directive 93/75/EEC. Beside these two basic documents, implementation of VTMIS takes into account all other legal sources as enumerated in Article 2 of Regulation (EC) No 2099/2002 establishing a Committee on Safe Seas and the Prevention of Pollution from Ships (COSS) and amending the Regulations on maritime safety and the prevention of pollution from ships, as amended by Regulation (EC) No 415/2004. According to the "Ordinance on organisation of state administration" (Official Gazette of Montenegro, No. 59/09) and other legal acts in Montenegro, MSD is responsible for providing maritime safety in inland sea area and territorial sea area and for performing activities connected with the prevention of pollution from navigable vessels (combating, minimizing and eliminating consequences of pollution) in accordance with the NCP.

[2] Retrieved: https://yachtagent.blogspot.com/2017/03/vtmis-a-system-for-controlling-traffic-at-sea-montenegro.html

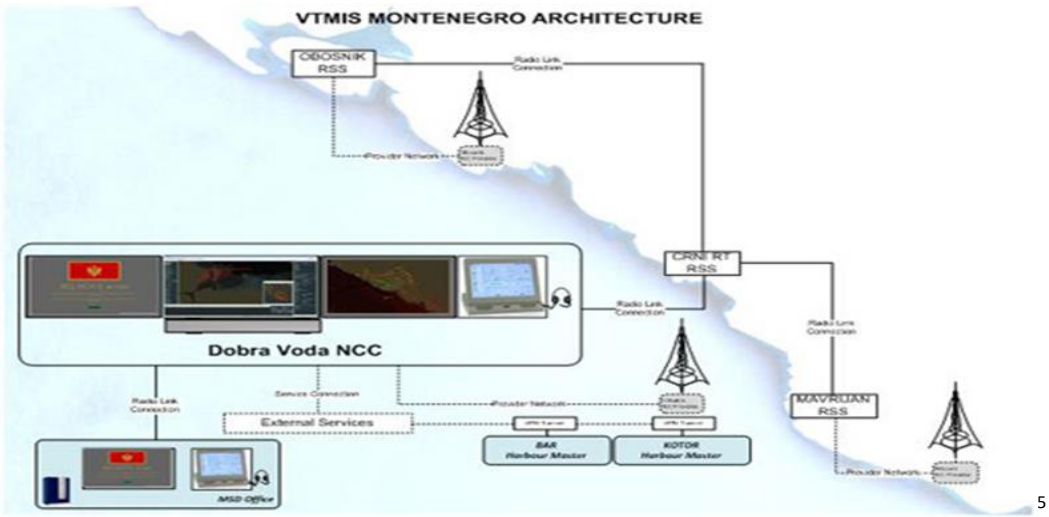
Strategic goal of MoTMA in Transport Development Strategy is to preserve areas of Montenegro, to protect the environment against the negative impact of traffic, and regarding the pollution of sea by vessels, it is planned to perform these activities among others:

- Implement constant supervision (radar, photo) of the sea.
- Provide stipulated and adequate equipment for actions in accidental pollution situations. The stated equipment could be allocated to ports or to a qualified company that would address such issues.[3]

This project allowed the Maritime Safety Department in Montenegro to allocate sufficient basic equipment to local industry and regional authorities to respond to potential spills (identified in the risk assessment as likely to occur). This gives each region the independence both to deal with minor spills, and to mount a credible first response to more significant incidents. All equipment allocated to local industry and regional authorities will remain the property of the Maritime Safety Department.

The Maritime Safety Department maintains a complete database of all national oil spill response equipment, including dispersant stocks. All response equipment will be maintained according to standards specified in the maintenance plans developed by the Maritime Safety Department to ensure readiness, availability and protection against bio security risks during deployment. As part of the project, response equipment has been allocated to the Port of Bar for the Harbour Master's Office Bar and to the Bijela Shipyard for the Harbour Master's Office Kotor.

The project also ensured the procurement and installing of VTMIS equipment for the coastal stations and the central hub in Dobra Voda. In addition, the Maritime Safety Department staff participated in operational and maintenance training. [4]



[5]

Figure 2. VTMIS scheme

[3]Retrieved: https://ec.europa.eu/neighbourhoodenlargement/sites/near/files/pdf/montenegro/ipa/2011/pf_7_ipa_2011_vtms.pdf

[4] Retrieved: https://ec.europa.eu/budget/euprojects/vessel-traffic-management-information-system-montenegro_en

[5] Retrieved: http://www.elmansrl.it/en/case-studies/36-vtmis-montenegro

II. VTMIS IN MONTENEGRO: LESSONS LEARNED

The European Commission has made available funds within the IPA 2011 Program (2.8 Million Euro) for the purposes of safety navigation and protection of sea from pollution.

Montenegro's coast length is 294 km. Inland sea area is 362 km2, territorial sea area is 2 099 km2 and epicontinental shelf area is 3 885 km2, where land area of 13 812 km2 with population of 650 500.

Safety at sea, pollution prevention and consequently, the preservation of biological diversity of the Adriatic Sea are condition sine qua non of sustainable development of Montenegro. The primary responsibility for execution of these tasks lies mainly with Maritime Safety Department (MSD).

In respect of the EU policy papers the implementation of Vessel Traffic Monitoring and Information System (VTMIS) is based on the Commission White Paper on the European transport policy, in general, and on the Directive 2002/59/EC establishing a Community vessel traffic monitoring and information system and repealing Council Directive 93/75/EEC, in particular. Beside these two basic documents, implementation of VTMIS takes into account all other legal sources as enumerated in the Article 2 of the Regulation (EC) No 2099/2002 establishing a Committee on Safe Seas and the Prevention of Pollution from Ships (COSS) and amending the Regulations on maritime safety and the prevention of pollution from ships, as amended by Regulation (EC) No 415/2004.

According to the “Ordinance on organization of state administration” (Official Gazette of Montenegro, No. 59/09) and other legal acts in Montenegro, MSD is responsible for providing maritime safety in inland sea area and territorial sea area and for performing activities connected with the prevention of pollution from navigable vessels (combating, minimizing and eliminating consequences of pollution) in accordance with the Montenegro National Contingency Plan.

Strategic goal of Ministry of Transport and Maritime Affairs (MoTMA) in Transport Development Strategy is to preserve areas of Montenegro, protect environment against negative impact of traffic, and regarding the pollution of sea by vessels, it is planned to perform these activities among others:

- Implement constant supervision (radar, photo) of the sea.
- Provide stipulated and adequate equipment for actions in accidental pollution situations.

Montenegro has an obligation to protect and preserve its coastal area and marine environment. Having in mind that vast majority of the population in Montenegro coastal area depends directly or indirectly on the tourism and that not only safe but clean sea is crucial factor, MSD has identified the importance of creating unique system of response to marine pollution incidents. The Montenegro National Contingency Plan is one of the measures that Montenegro has taken to meet this obligation.

II.1 VTMIS steps

In order to implement VTMIS a sound investment has to be done. Maritime Safety Department (MSD) of Montenegro implemented some subsystems of VTMIS and technical requirements that Montenegro had to do as coastal state (VHF, GMDSS, AIS, LRIT, ADRIREP mandatory reporting etc.) through regular budget, despite budgetary limitations experienced in the past years.

This project will allow MSD to allocate sufficient basic equipment to local industry to respond to spills identified in the risk assessment as likely to occur within their individual areas of responsibility. This gives each region the independence both to deal with minor spills and to mount a credible first response to more significant incidents.

Considering the aforementioned, the aim of this project will be to provide support to the MSD to improve monitoring of Montenegro coastal zone and to combat, minimize and eliminate the consequences of oil spill incident.

The global objective is to fulfill the preconditions for improvement of maritime safety and marine environmental protection. The methodology will include a desk review, field assessments, data collection and consultations with the relevant stakeholders.

The practical steps for the set up of the VTMIS were as below:

- Analysis of the legal bases and the relevant data regarding maritime traffic surveillance in Montenegro;
- Assessment of the legal documents that should be prepared in order to commit all parties (i.e. the Ministry, MSD, Police Directorate, Ministry of Defense, Port Authorities) in the project implementation;
- Assessment of institutional organization, staffing and the management system of MSD for implementation of VTMIS;
- Create an inventory of the VTMIS relevant infrastructure (GMDSS / AIS / VTS / VHF / LRIT / CCTV / DF);
- Evaluate existing VTMIS inventory and analyze a possibility for using of existing equipment in future VTMIS system;
- Conduct site survey;
- Calculation of the radar performance calculations with simulators (CARPET or similar) for targets with different radar cross-section and different height, taking in consideration different weather conditions (precipitation and sea state) in order to propose specific radar's specifications for each site. Propose relevant equipment for other sites and Control Centre: VHF, CCTV, DF, AIS, Meteo, Hydro, network equipment (switches, routers), radio network equipment if necessary to improve existing one, servers for recording and replay, tower masts, housing equipments etc. Calculation of coverage for VHF, CCTV, AIS and DF;
- Drafting technical specifications for the required equipment for VTMIS.

II.2 Response equipment

Risk assessment study shall include determination of high risks areas in relation to marine pollution, estimated quantities of potential oil and hazardous and noxious substances (HNS) releases and their effect on specially sensitive areas, determining the number and frequency of port entries by ships carrying oil and HNS, their size and cargo capacities, analysis of oceanographic, hydrographical and meteorological data, records of reported marine pollution incidents caused by oil and HNS, records of maritime casualties not causing marine pollution and economic valuation of the consequences of potential marine pollution.

Sensitivity mapping study shall include defining and mapping of the coastline type, listing and description of protected and sensitive natural resources, listing and description of resources at risk and list of potential places of refuge.

Drafting technical specifications and tender documentation for the required response equipment and tender documentation for training for use of response equipment. The Expert should provide support during tender evaluation process for both tenders: response equipment supply and training.

Experts should perform an assessment, which will require desk research, interviews and site visits to the beneficiaries. In the course of accomplishing the required services, Experts should maintain regular communication with the Contracting Authority and work in close cooperation with the Beneficiary staff nominated to act as counterparts on this project. They should provide concise and clear technical specifications.

II.3 Required outputs

The outputs of the assignment should be, as follows:

i) VTMIS:

a) Final Report on the VTMIS. Report should contain as a minimum the following: coverage (radar for targets with different cross section, VHF, AIS, DF and AIS), obstruction and reflection. Telecommunication network, Civil Engineering scope of work (existing equipment house, antenna towers, roads, commercial power, engine generator with storage fuel tank, fencing etc). Calculations will be done as separate attachment or annex and should also contain: radar range limits, radar accuracy and resolution, determination of radar performance;
b) Technical specifications and tender documentation for two tenders: (VTMIS supply and training).

ii) Response equipment:

a) Report of the Risk Assessment,
b) Report of the Sensitivity mapping,
c) Technical specifications and tender documentation for three tenders: (supply and training for response equipment and for Places of Refuge)

iii) Results to be achieved:

a) VTMIS System Design developed in compliance with national legislation defining the inventory of all equipment (including sensors, communication network and power supply, software and other technical elements) with technical specifications on each remote location/Control Center and defining the requirements of small scale construction works as well as general considerations on placement of equipment on micro-location on each remote location/Control Center.;
b) Radar subsystem visibility analysis for purposed sites;
c) Design of the VTMIS data management system developed covering data display, storage and international and regional exchange of data pursuant to the requirements of Directive 2002/59/EC as amended;

d) VTMIS Legal and Organizational framework developed containing at least preliminary analysis of VTMIS Operators workload, human resources needs, human resources management system, recommendations on institutional arrangements of the VTMIS service, evaluation of existing international, EU and national legal instruments applicable to VTMIS services and recommendations on amendments to national legislation as well as administrative and procedural arrangements including application of VTMIS tools for the establishment of VTS services;
e) Vessel Traffic Monitoring and Information System Study developed.

II.4 Scope of work

In order to ensure the systematic and stable development in addition to economically most efficient implementation of all required functions of vessel Traffic Monitoring/Management and Information System the overall functionality should be ensured within single organizational structure – the Vessel Traffic Monitoring and Information System (VTMIS).

The general objective of the VTMIS is to collect all the necessary information on maritime traffic in the Albanian waters through different on-shore sensors, thus making possible to process, analyze, display in real time, store and replay all collected data, to share and distribute such information to the competent national and international authorities and institutions. In addition, the Montenegro VTMIS is assigned the task to control and manage the maritime traffic in the Montenegro part of the Adriatic Sea on everyday basis as well as in case of incidents or accidents anywhere within the internationally recognized area of the responsibility of Montenegro.

Aim of this project is development of integrated Montenegro Vessel Traffic Monitoring and Information System (VTMIS) Study, on the basis of the analysis of the existing IT solutions and existing VTMIS documentation and studies, covering detailed technical design and appropriate baseline legal, administrative, organizational and institutional solutions. The Study is to be developed in line with relevant guidelines and recommendations of International Association of Lighthouse Authorities (IALA) (e.g., etc.) and relevant guidelines of the International Maritime Organization (IMO) bearing in mind information exchange systems setup on the bases of the Directive 2002/59/EC on the EU level (such as SafeSeaNet) and real-time regional data exchange (such as HELCOM).

Relevant IALA recommendations and guidelines are at least the following:

- Recommendation on the Implementation of Vessel Traffic Services - IALA Recommendation V-119 September 2000
- IALA Recommendation V-127 On Operational Procedures for Vessel Traffic Services Edition 1, June 2004
- IALA Recommendation V-128 On Technical Performance Requirements for VTS Equipment Edition 1.1, June 2005
- IALA Guideline No. 1045 On Staffing Levels at VTS Centers Edition 1, December 2005
- Guidelines For The Accreditation Of Institutes For Training VTS Personnel, September, 2000
- Guidelines On AIS As A VTS Tool, DECEMBER 2001
- IALA Guideline No. 1028 On The Automatic Identification System (AIS)-Volume 1, Part I-Operational Issues- Edition 1.3, December 2004

- IALA GUIDELINES on The aspects of the Training of VTS Personnel relevant to the introduction of Automatic Identification System (June 2003)
- IALA Recommendation V-103 (May, 1998) on Standards for Training and Certification of VTS Personnel
- IALA Guidelines On The Assessment Of Training Requirements For Existing VTS Personnel Candidate VTS Operators Revalidation Of VTS Operator Certificates, JUNE 2001
- IALA Guidelines On Designing And Implementing Simulation In VTS Training At Training Institutes And VTS Centers, June 2002
- IALA Guidelines On The Universal Automatic Identification System (AIS) Volume 1, Part II – Technical Issues Edition 1.1, December 2002
- Recommendation on Guidelines on the application of „User Pays "Principle to Vessel Traffic Services – IALA Recommendation V-102, March 1998
- IALA Recommendation A-124 On Automatic Identification System (AIS) Shore Station and Networking Inspected relating to the AIS Service Edition 1.1, December 2003
- IALA Recommendation A-126 On The Use of the Automatic Identification System (AIS) in Marine Aids to Navigation Edition 1, December 2003
- Recommendation on The Provision Of Shore Based Automatic Identification Systems (AIS) IALA Recommendation A-123, December 2002

The VTMIS Study should include elements as set out by the Recommendation on the Implementation of Vessel Traffic Services - IALA Recommendation V-119 September 2000, detailed design and functionalities of the equipment and software for detection, presentation and pursuing of the navigation movements, for the establishment of identification of ships, communication network, means for interconnection and interaction with other systems as well as data storage, management, exchange and sharing, operation and maintenance as well as legal instruments, institutional and organizational setup with human resources training and management.

Primary target group includes public servants responsible for the safety of navigation and pollution prevention as well as VTMIS establishment (in Montenegro they are employees in the Maritime Safety Department). Secondary target group consists of maritime cluster- other institutions active in maritime sector such as Navy, Border Police, Port authorities, Harbor Master, Hydrographic Institutes, Ports, shipyards, meteorological centers, Maritime Education and Training Institutions etc.

II.5 VTMIS System Design development

VTMIS System Design should contain at least the following:

i) the inventory of all equipment with detailed technical specifications on each remote location including at least:

- Radar sensor with radar processor (X-band transceiver in dual redundant configuration)
- CCTV sensor (Day/night CCTV camera with pan/tilt)
- Radio Direction Finder (Marine VHF band, VHF emergency frequency 121.5 MHz, COSPAS/SARSAT frequency 406.025 MHz)
- VHF (2 channels)

- Meteorological Equipment (Rainfall, air pressure, temperature, visibility, wind speed, wind direction and humidity sensors, data collection system)
- Power supply and UPS system for,
- Communication network LAN/WAN or microwave links
- earthling and lightning protection
- Software and other technical elements

ii) the inventory of all equipment with detailed technical specifications and functionalities in the Control Center including:

- VTMIS Data Base,
- VTMIS Operator Displays,
- VTMIS Server,
- Overall communication network
- power supply
- earthling and lightning protection
- software and
- other technical elements

iii) requirements of small scale construction works as well as general considerations on placement of equipment on micro-location on each remote location/Control Center.

Detailed VTMIS System Design should be developed ensuring the integration of existing AIS Sub-system data integration in the Radar subsystem. Detailed VTMIS System Design should consider necessity of supply of spare parts as specified by the supplier for first line servicing and maintenance as well as training of operators and maintenance personnel.

II.6 Baseline of the existing Data Management System important for future VTMIS

VTMIS Data Management System should be developed covering the use, exchange and integration of data on national level, regional level as well as EU level in line with the requirements of EU Directive 2002/59/EC as follows:

The Article14 of the EU normative 2002/59/EC says: Member States shall cooperate to ensure the interconnection and interoperability of the national systems used to manage the information indicated in Annex I.

Communication systems set up pursuant to the first subparagraph must display the following features:

- data exchange must be electronic and enable messages notified in accordance with Article 13 to be received and processed;
- the system must allow information to be transmitted 24 hours a day;
- each Member State must be able, upon request, to send information on the ship and the dangerous or polluting goods on board without delay to the competent authority of another Member State.

Annex I referenced above speaks about the notifications to be issued in accordance with articles 4,12, 13 and 5:

- Article 4: Notification prior to entry into ports of the Member States
- Article 5: Monitoring of ships entering the area of mandatory ship reporting systems
- Article 12: Obligations on the shipper
- Article 13: Notification of dangerous or polluting goods carried on board"

The functional and feasibility study should be developed bearing in mind that the compliance to the said Directive is partially (international dimension) to be secured through the SafeSeaNet (SSN) which general objectives agreed with the Member States of the EU are:

- Improved emergency response in case of incidents or pollution at sea
- Early detection of "ships posing a risk"
- Increased efficiency of port logistics
- Production of statistics on ship and cargo movements per sea area

The Study should be developed bearing in mind that the architecture of the SafeSeaNet consists of three levels:

- Local Competent Authorities (LCA) that can range from Port Authorities, Coastal Stations to Harbor Organizations
- National Competent Authority (NCA) that acts as a point of contact at national level
- The Central Index, which is currently located at the Informatics Directorate (DI) in Luxembourg

The Study shall be developed bearing in mind that the SafeSeaNet Server at the National Control Centre should notify to the Central Index at least:

- Port notifications
- HAZMAT notifications
- Ship notifications (AIS and MRS)
- Messages emitted by their operational services following events at sea
- Alert messages (for example on "waste status")
- Security messages

The interchange communication between the European Control Centre and the National Control Centre will be in electronic format by using Internet and the process which carry out this data flew will be automatic bases in the XML syntax with "Public Key Infrastructure" (PKI).

The study should also cover the SSN future potential users which are Customs, Immigration, Fishery inspectorate, Environmental inspectorate, Veterinary/phytosanitary inspectorate and Health inspectorate.

The study should also take a reference and cover data gathering, exchange and integration on national level required under Council Directive 98/41/EC of 18 June 1998 on the registration of persons sailing on board passenger ships operating to or from ports of the Member States of the Community, Directive 2002/6/EC of the European Parliament and of the Council of 18 February 2002 on reporting formalities for ships arriving in and/or departing from ports of the Member States of the Community.

The study should also cover baseline of existing data gathering, exchange and integration of existing Integrated Maritime Information System with future VTMIS and AIS databases.

Following activities should be accomplished under this item:

- Analysis of existing preparatory, baseline and technical documentation as well as data on the existing system (documentation to be provided by the beneficiary)
- Collection and analysis of additional relevant information and statistical data
- Drafting of the baseline of the existing Data Management System

III. VTMIS IN ALBANIA: BUILDING UP ON MONTENEGRO'S CASE

III.1 State of Art of VTMIS in Albania

Albanian coast, from Cape Stilo on the south to the Buna River in the north, has a total length of approximately 220 nautical miles. Safety at sea, pollution prevention and consequently, the preservation of biological diversity of the Adriatic Sea and Ionian Sea are condition sine qua non of sustainable development of Albania. The primary responsibility for execution of these tasks lies mainly with Ministry of Infrastructure and Energy (MIE) and General Maritime Directorate (GMD).

In Albania, the deployment of a Vessel Traffic Monitoring Information System (VTMIS) would be crucial to the monitoring of vessel traffic. VTMIS is as an extension of the Vessel Traffic Service (VTS), in the form of an Integrated Maritime Surveillance, which incorporates other telematics resources to allow allied services and other interested agencies in the direct sharing of VTS data or access to certain subsystems to increase the effectiveness of port or maritime activity operations.

The establishment of the VTMIS is a requirement of the International Maritime Organization (IMO in resolution (A.857(20), ref. 4), EU legal framework (Directive 2010/65/EU and Directive 2002/59/EC), National Transport Strategy and EU Strategy for Adriatic and Ionian Region (EUSAIR). Legislation on an EU vessel traffic monitoring and information system has not been transposed yet and further efforts are also needed to define a strategic framework for the implementing intelligent transport systems on the core maritime network.

Albania is the only country in the Adriatic region that is yet to establish the VTMIS, hence making it an immediate priority and of paramount importance, to facilitate and improve the international maritime traffic, ameliorate traffic monitoring, enhance maritime safety, security and protection of marine environment, improve the response of authorities to incidents, accidents or potentially dangerous situations at sea, including search and rescue operations.

In the past, the Ministry of Transport and Infrastructure had funded through state budget a Feasibility Study for the Establishment of VTMIS. The study was completed in 2016 and included: a document entitled "Preliminary Design", a document entitled "Detailed requirements specifications" and a Document entitled "Feasibility study and project design". Upon completion of this set of documents, the Ministry responsible for infrastructure sought to engage funding to implement the project, but in discussion with IFIs the inadequacy of the documentation was highlighted, mainly in terms of the absence of Cost Benefit Analysis and alignment with EU requirements.

Additionally, the documentation prepared is considered too generic regarding specifications and design, which is very basic, and regarding options analysis, costing (investment, maintenance and operations), traffic analysis/ forecasts and quantification of impacts/ benefits. Accordingly, it is deemed necessary to revise and update current project documentation in line with the EU technical, legal and institutional standards and requirements, in parallel with/ in support to the necessary efforts made by the country to transpose the relevant EU legislation.

It is being recognized, that due to the state of the currently deployed technologies in the field of coastal surveillance and maritime traffic monitoring, investment is needed in order for the Republic of Albania to effectively conduct these two functions within its territorial waters and beyond. The implementation of a VTMIS will provide significant benefits to the general public in terms of border security, search and rescue,

maritime environment protection etc. To this effect, a system consisting of sensors (radars, electro-optics, AIS, VHF, meteo etc.), communication systems, software and related infrastructure is needed. The VTMIS will provide its users with the tools to effectively detect and monitor all the maritime traffic within the territorial waters, manage the ship-shore communications, take the necessary decisions to intervene where necessary and share information as appropriate.

VTMIS would increase the time and costs efficiency for traders when obtaining the relevant clearance and permits for moving cargoes across national and/ or economic borders which is a main objective of the World Bank Trade and Transport Facilitation project. The Project, Phase 1 of a Multiphase Programmatic Approach (MPA), is financing the design, development, and implementation of initiatives to improve transparency and integrity, lower transaction costs, enhance inter-agency coordination, and reduce the time it takes to trade across borders whereas implementation of VTMIS in Albania is one of the project components.

A project funded by World Bank will fund the establishment of the VTMIS in Albania. The project will focus on the adoption and implementation of an Intelligent Transport System (ITS) for the maritime sector. VTS/VTMIS is a technical, legal, and institutional setup by competent authorities, facilitating systematic monitoring of vessel movements and their physical and information tracking. This results into increased safety standards and traffic efficiency. This component has two parts: a) preparation of Feasibility Study; and b) implementation of VTMIS. Project coverage area for VTS/ VTMIS implementation under Phase 1 is the whole sea coastal line of Albania (316 km).

VTMIS should cover the Port of Durres (Port of Core Network), where the main system should be located, and the other ports where VTS should be installed, provided that the updated Feasibility study supports such decision. Also, the connection of Durres VTMIS and other VTS with the Central Ministry at Tirana should be considered. Taking into account the geomorphology of Albania, the location of the necessary repeters should be also carefully investigated. Documentation should also take into account, not only equipment, but also infrastructure needed to host VTMIS (e.g. buildings, control tower, power supply etc.). Moreover, when designing and assessing such systems, organizational, human resources, capacity building as well as market, services, legislative/ royalty and training issues should be addressed.

Budget of the component: Deployment of a Vessel Traffic Management Information System (VTMIS)

1. Feasibility Study (FS) including the best EU practice in implementing a new VTMIS and lessons learned from the neighboring countries - EUR 30,000
2. Implementation plan, Detailed Design and Technical Specifications aligned with the recommendations from the FS and Supervision of the Provision, Installation and Commissioning of ITS Equipment - EUR 120,000.
3. Provision, Installation and Commissioning of Equipment for VTMIS Implementation and ITS - 5,400,000 EUR

For the time being a consultancy aiming the preparation of the TOR for the Feasibility study for the implementation of VTMIS system was expected to start by the end of September 2020 with a duration of 3 months.

III.2 VTMIS Legal and Organizational Framework development

Currently, the maritime regulatory framework of Albania is determined by several laws. However, the framework in under development and several laws and regulation are either under implementation or design. For the VTMIS implementation following legal framework should be taken into consideration:

- The list of current promulgated laws in Albania
- Relevant International Convention accepted by Albania
- Relevant IALA Standards, Recommendation and Guideline, for VTS implementation
- The list of IALA Standards, Recommendations and Guidelines for VTS training
- Relevant IMO instruments important for VTMIS implementation.

The institutional scheme is organized mainly in three levels of public maritime governance which can be distinguished in the maritime sector of Albania:

- The Legislative level represented by the Parliament;
- The Political level, represented by the Government of Albania and relevant Ministries as: Ministry of Infrastructure and Energy, Ministry of Interior, Ministry of Defence, and Ministry of Tourism and Environment;
- The Implementation level, represented by the General Maritime Directorate, Navy (Coast Guard, Hydrographical service), Inter-Institutional Maritime Operational Center, Military Meteorological Service, National Agency for Information Society and Electronic and Postal Communications Authority.

Below is the list of most important institutions for the VTMIS implementation:

- General Maritime Directorate (GMD) (Harbor Master Offices: Shen Gjin, Dures, Vlora (with branch office in Himara) and Saranda
- Ministry of Infrastructure and Energy
- Ministry of Defense (MoD)
- Inter-Institutional Maritime Operational Center (QNOD)
- National center for Search and Rescue (NCSAR)
- Coast Guard (CS)
- Armed Forces (AF)
- Naval Force (NF)
- Hydrographic Service (HS)
- Military Meteorological Service (MMS)
- Port Enterprises in Shen Gjin, Dures, Vlora and Saranda
- Directorate of Fisheries and Aquaculture Service
- Ministry of Tourism and Environment (MoTE)
- National Environment Agency (NEA)
- Ministry of Internal Affairs (MIA)
- State Police (SP)
- Border and Migration Police
- General Directorate of Customs (GDC)
- State Inspectorate for Health
- National Agency for Information Society (NAIS)
- Electronic and Postal Communications Authority

For the VTMIS implementation the main activities are concentrated on the GMD and other related entities and stakeholders.

The list above underlines the absolute necessity of institutional coordination at national level and between many sectors.

Figure 3. Administrative building of GMD – Future VTMIS Centre

VTMIS Legal and Organizational Framework should define legal, administrative, procedural and organizational framework necessary for the use of and acquisition of data to be available in the VTMIS system covering at least the following:

- preliminary analysis of VTMIS Operators workload,
- human resources need,
- human resources management system,
- recommendations on institutional arrangements of the VTMIS service,
- evaluation of existing international, EU and national legal instruments applicable to VTMIS services and recommendations on amendments to national legislation
- administrative and procedural arrangements including application of VTMIS tools for the establishment of VTS services
- recommendations on legal framework for regional data exchange.

Below is organizational chart of GMD:

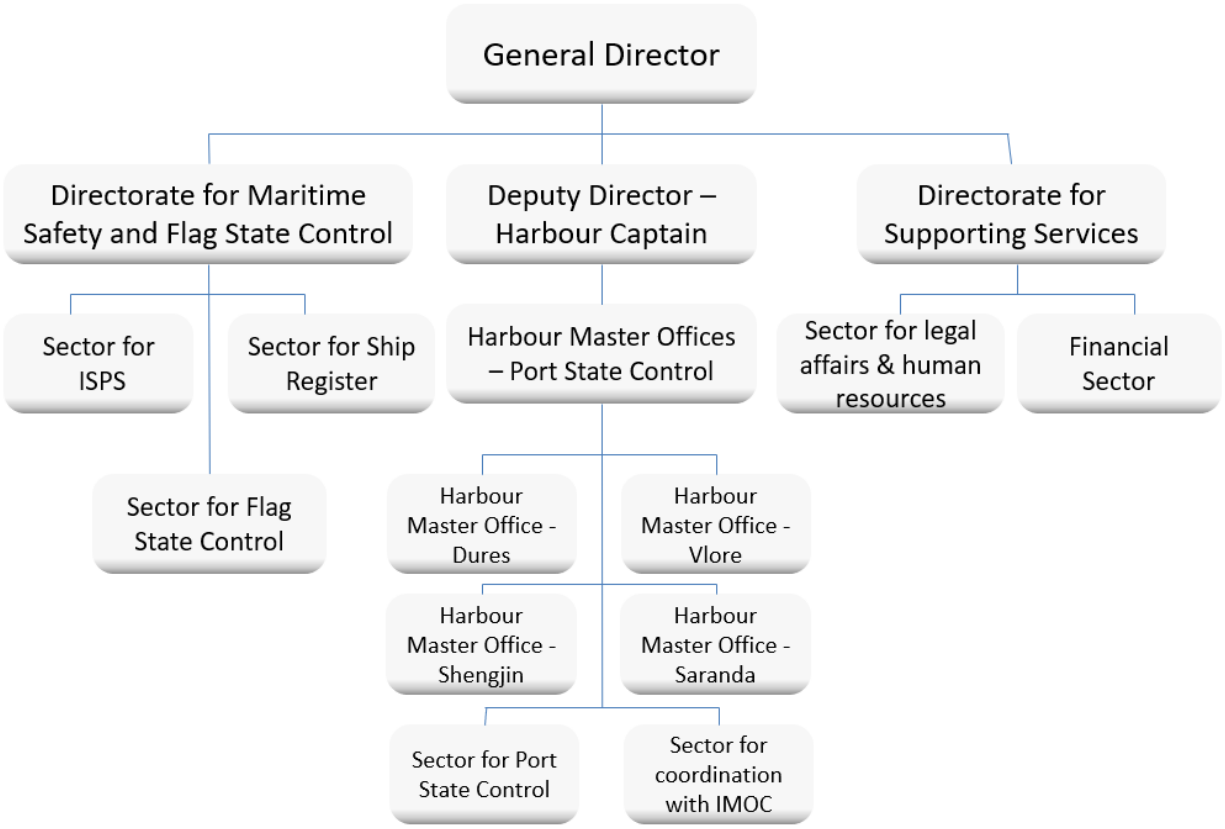
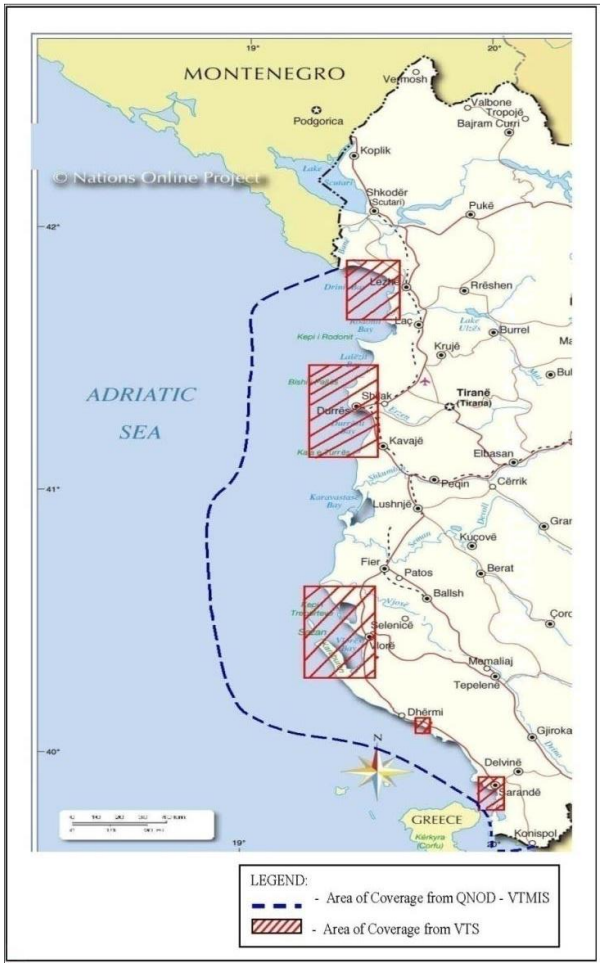


Figure 4. Organizational chart of GMD

Following activities are to be accomplished under this item:

- Analysis of existing preparatory, baseline and technical documentation as well as data on existing legislation and organizational setup and other relevant information (documentation to be provided by the beneficiary)
- Collection and analysis of additional relevant information and statistical data
- Drafting of the VTMIS Legal and Organizational Framework

Port VTMIS shall be implemented in Port of Shengjin, Port of Durres, Port of Vlora and Port of Saranda. The Port of Durres will also support the function of Coastal VTMIS for the surveillance of the entire coast of Albania.



Port of Shengjin located around 35 Nautical Miles to the north of the Durrës port, processes various goods, bulk cargo. Shengjin Harbour Master area of responsibility includes the port of Shengjin and the anchorage. In addition the Harbour Master exercises control and monitoring over the maritime traffic in the area extended from the Montenegro border to Cap Rodoni. The bay offers one of the few safe anchorages in the region for transiting vessels during adverse weather conditions.

Durres Port is the biggest port. It processes about 75% of the import-export goods through the traffic of passenger ferries, vessels, container vessels, general and bulk cargo vessels. It is defined as the first entry gate to corridor VIII. Handling of oil, gas and its sub products is executed at Romano Port, about 6 nautical miles North of Durrës Port where an oil jetty with max allowable draft design of 11 m is providing berth to tankers for discharge operations. This area and port is managed from Durres Harbour Master Office. Durres Harbour Master area of responsibility includes in priority Port of Durres, the anchorage areas and Port of Romano jetty. In addition the Harbour Master exercises control and monitoring over the maritime traffic in the area extended from Cap Rodoni to the North to Vjosa River to the South.

Port of Vlora is the second important port in Albania, located around 40 Nautical Miles to the south of the Durres port. It is defined as the second entry gate to corridor VIII. Handling of oil, gas and its sub products is executed at Petrolifera Port, about 2 nautical miles North of Vlora Port where an oil jetty is providing berth to tankers for discharge operations. This area and port is managed from Vlora Harbour Master Office.

Vlora Harbour Master area of responsibility includes Port of Vlora, the anchorage areas in the bay of Vlora, and Port of Petrolifera jetty. In addition the Harbour Master exercises control and monitoring over the maritime traffic in the area extended from Vjosa River to the North to Capo Linguetta.

Port of Saranda is located around 80 Nautical Miles to the south of Durres. This port processes passengers and goods. A new wharf is under commissioning. Saranda Harbour Master area of responsibility includes the port of Saranda, the Corfu channel and the anchorage areas in the bay and in the bay of Vrina. In addition the Harbour Master exercises control and monitoring over the maritime traffic in the area extended from the Capo Linguetta to the North to the Greek border to the South. The bay of Vrina offers safe anchorage in the region for transiting vessels during adverse weather conditions.

In order to analyse maritime traffic pattern in Albania, the AIS density maps from www.marinetraffic.com software will be used, and AIS data for the whole year 2019 will analyzed. Six different Density maps have been produced that are represented in the following figures:

1. Figure 5: Density map for all types of vessels based on AIS data for the year 2019 (source www.marinetraffic.com)
2. Figure 6: Density map for vessels with dangerous cargo onboard (tankers, LPG and LNG) based on AIS data for the year 2019 (source www.marinetraffic.com)
3. Figure 7: Density map for passenger vessels based on AIS data for the year 2019 (source www.marinetraffic.com)
4. Figure 8: Density map for cargo and container vessels based on AIS data for the year 2019 (source www.marinetraffic.com)
5. Figure 9: Density map for fishing vessels based on AIS data for the year 2019 (source www.marinetraffic.com)
6. Figure 10: Density map for pleasure crafts based on AIS data for the year 2019 (source www.marinetraffic.com)

Analyzing AIS density maps we can conclude that:

- Most of Cargo and Container vessels are directed to Port of Dures;
- High density traffic with passenger vessels is in Corfu channel and also in area of Port of Durres and Vlora;
- Most activities of fishing vessels are located in the northern part of Albania, especially in Port of Shengjin;
- There is increase of pleasure crafts activity in the southern part of Albania, especially in Port of Saranda. According to representatives of port of Saranda this increase is evident in past three years.

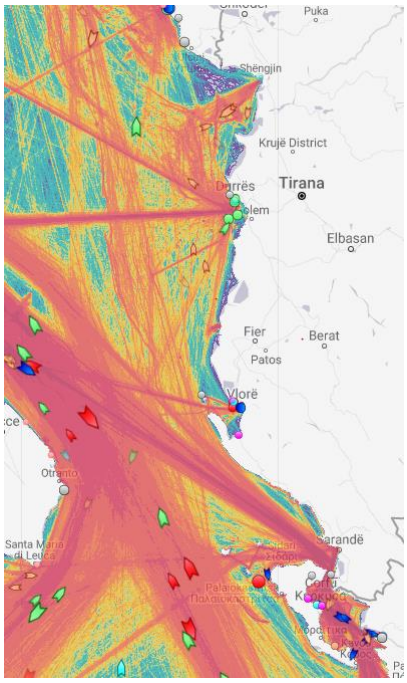


Figure 5. All type of vessels

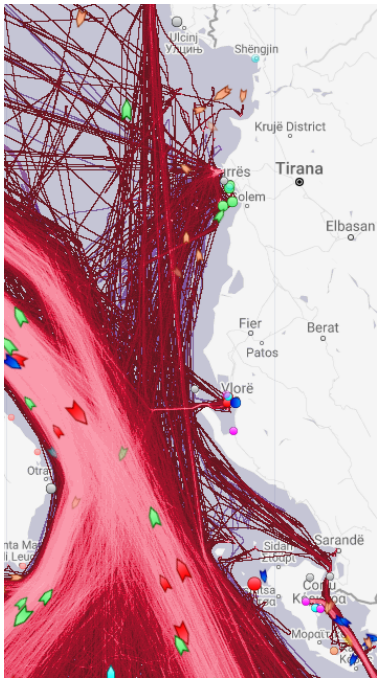


Figure 6. Vessels with dangerous cargo on board

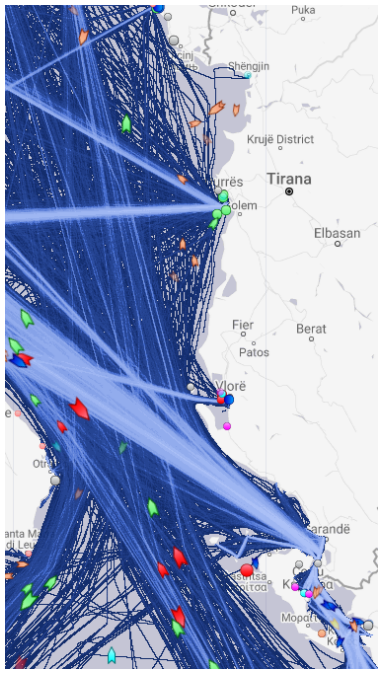


Figure 7. Passenger vessels

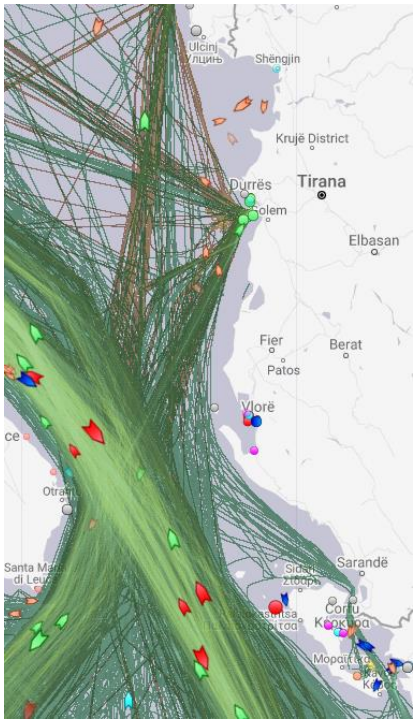


Figure 8. Cargo and container vessels

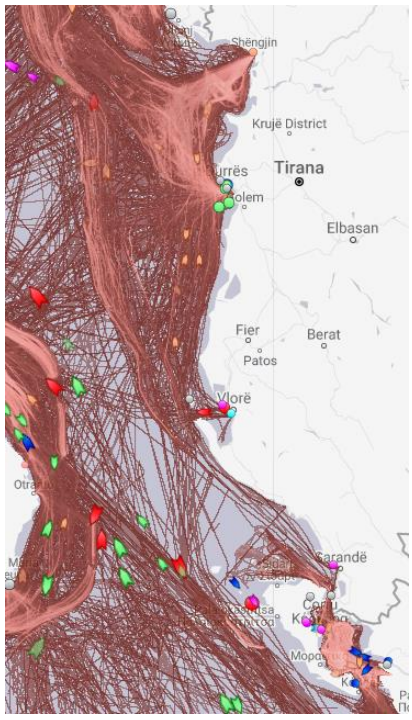


Figure 9. Fishing vessels

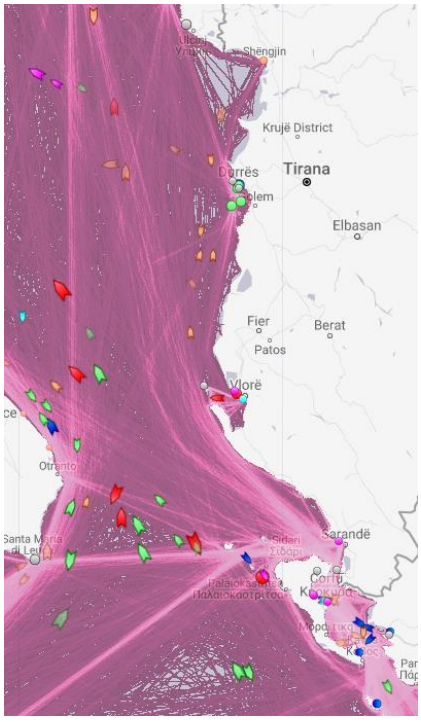


Figure 10. Pleasure Crafts

Conclusions and recommendations

i) Legal and Institutional Issues

After the analysis of the maritime legal framework and discussion with different stakeholders, the consultants can infer measures for improvement:

- The review of the institutional setup and organization, evaluating to rationalize the number of existing maritime entities and institutions (like Harbor Master Offices and MSD), and providing them with the required autonomy and enough resources to perform their mandate.
- The functions and legal obligations must be reviewed and established for the different institutions acting in the public maritime sector, avoiding overlaps, duplicity and different hierarchical responsibilities.
- The organization of those institutions like the one for Maritime safety and Harbor Master Offices could be reviewed in order to comply with the functional and technical criteria in a way and similar to the international practice.
- Several maritime regulations and laws should be identified and drafted, in order to comply with Albanian international and European obligations (acquis communautaire), especially in areas like dangerous goods transport, storage and handling, ballast water management, ship generated waste management, maritime search and rescue, casualty investigation, penalties and sanctions, among others.
- The human resources are of “paramount” importance for the efficient performance of the maritime institutions. Therefore, the technical qualification, recruitment process, development programs, incentives scheme and level of salaries, should be reviewed.

ii) Maritime Safety and Marine Environmental Protection

To strengthen the maritime safety, the existing operational and traffic management procedures should be assessed. It is required to improve the enforcement of responsibilities and sailing transit authorization. Special attention must be taken regarding control of the traffic procedures and authorization of ship maneuvers in internal waters.

The delegation of the combat and recovery operation in cases of oil spills to a private service provider could be considered as a solution in cases when the State does not have enough resources. But in any case the delegation and authorization process must be included and approved by the legal framework to be drafted.

The investigation of accidents can be improved drafting a proper regulation in accordance to the IMO Casualty Investigation Code. Keeping historical information on casualties is required for the decision making process, for continual improvement, and avoidance of similar accident. A scheme for application of penalties and sanctions would help to reduce transgressions, for which it is required to draft a sound regulation.

The National Contingency Plan could reflect its organization in a sound action plan for easier application in the field. In any case, local contingency plans must be designed and developed in order to organize and coordinate the actions on the field, for which it could be considered to delegate this responsibility to local entities like port authorities, terminal operators, marinas, shipyards, etc. Afterwards, the local plans must be verified and authorized by the Maritime safety department relevant unit.

iii) Critical factors

Regarding VTMIS Implementation and Updating:

- Approval of the National Regulation on Vessel Monitoring and Information System;
- Allocation of enough (quantity) and qualified human resources at the VTMIS system;
- Permission from land owners to build at the selected sensor sites;
- Availability of Funds for national contribution;
- Sound design of the VTMIS System;
- Consider enough budget for later maintenance of the VTS system;
- Design a Periodical Maintenance Program for the VTS system after the commissioning of the VTS system;
- Design an Investment Program (in phases) for future updating and upgrading of the VTS system;
- Lead to a level of salaries for VTMIS operators which could be competitive with the market and related responsibilities

Regarding Spill Response:

- Drafting and approval of a Regulation on Marine Environment Protection; Including planning, environmental monitoring, auditing, delegation of operational responsibilities and penalties, among others.
- Identify and sign agreements with institutions which will be included in the Contingency Plan (assigning bonding responsibilities in the National Regulation);
- Proper operational Contingency Plan in place with a clear organization, responsibilities and allocation of equipment;
- Allocate obligations and forms (technical guidelines) for drafting the local Oil Spill Contingency Plans (action/operative plans) and also the response in open sea areas and in internal common waters must be considered;
- Identification and allocation of resources required for the implementation of the Contingency Plan (operational action plan);
- Quantity and qualifications of response crew-human resources; At Management level of Contingency Planning and Organization to the emergency response; At Co-ordination and Operational Level for Spill Response (personnel who will actually act/operate during the emergency in accordance to the Contingency Plan).

Regarding Political and Strategic Issues:

- Keep the political support for the implementation of the current project;
- Keep political interest on future updating phases for the VTS system;
- Strengthen the Maritime safety organization through:
  - The design of a Human Resources Development Program for VTMIS and Contingency Response;
  - The design and establishment of a sound organizational chart;
  - The design and implementation of a sound Manual of Functions/Organization, with hierarchical levels, job descriptions, technical profiles, appointments, subrogation, reporting, and recruitment of technical and administrative personnel;
  - Keep suitable quantity of qualified human resources in accordance to the technical profile and job description;
  - Suitable Financial Resources for maintenance of the equipment and system.

- Establish a National Accident and Incident Investigation System based on the IMO Casualty Investigation Code;
- Draft and implement a penalty scheme for transgressors of maritime safety and environmental issues;
- Lead to a level of salaries for Maritime safety personnel which are competitive with the market.

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