



Client: **Republic of Croatia – Central Finance and Contracting Agency – CFCA – Contract EuropeAid/123223/D/SER/HR**

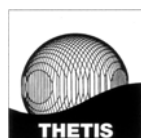
Subject: **Functional and Technical Study on Vessel Traffic Monitoring and Information system (CVTMIS)**

Doc title: **CVTMIS data management system design**

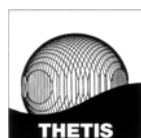
Document no.: 67612-SPE-T420.2

Distribution list: PIU/SPO, Thetis, D'Appolonia, Rina Industry, file 67612

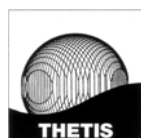
Rev.	Date	Issued for	Pages	Made by	Approv.d	Authoriz.
0	19/05/08	Comments	153	PS	Team Leader	PS
1	22/06/08	Revision after preliminary comments received	191	PS	Team Leader	PS
2	08/07/08	Approval	194	PS	Team Leader	PS
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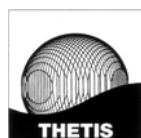
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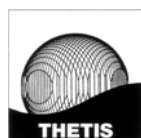
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1 Introduction

The main objective of the present document is the preparation of the design of the CVTMIS data management system developed covering data display, storage, integration with existing information management system (such as “AIS Database” and “Arrivals and Departures of Ships Database”) and international and regional exchange of data pursuant to the requirements of Directive 2002/59/EC as amended.

This work is dealing with the preparation of the design for the modernisation of the current VTS (Vessel Traffic Service) and the setting up of a modern Croatian Vessel Traffic Management Information Service (CVTMIS). The purpose of Vessel Traffic Management Information System (VTMIS) is to improve the safety and efficiency of navigation, and protect the marine environment and/or the adjacent shore area, work sites and offshore installations from possible adverse effects of maritime traffic. CVTMIS also have a role to play in maritime security.

The CVTMIS data management system documents contains the following:

- o A summary, with list of abbreviation and acronyms, the list of applicable standards and norms, the references and annexes
- o An introductions, with a description of the objectives, a summary of the pre-feasibility study 2005, a summary of feasibility study 2006, a description of the maritime ship traffic in Croatian Waters, the present Maritime organization, the measures implemented to improve safety at sea, a description of main EU Directives (Directive 2002/59/EC, Directive 2002/6/EC), Directive 98/41/EC, a description of SafeSeaNet, of the existing systems, the EU project results on data management system, a description of ADRIREP, the real time regional data exchange
- o A description of the existing system CIMIS, with main requirements, users, cooperation between users, database structure, system architecture, main functions, existing interconnection, next development
- o A description of the existing AIS system
- o A description of other existing system in Croatian ports, as VTMIS /PMIS in Rijeka, PCS in Rijeka, VTMIS/PMIS in Port of Ploče, PCS in port of Ploče, PCS in port of Slip, ERP in all main ports.
- o An analysis of all data collected, with reference to document exchange in ports, the information flow, the NOA for and CIMIS database vs. EU directives and SafeSeaNet, the evaluation of additional users, the improvement of data quality, and the main recommendations
- o A review of Client's requirements, with a description of general requirements, system users, task to be performed, type and level of services, categories of vessels required to participate to the system, integration with existing systems, the performance requirements, the availability of the system, the SafeSeaNet performance, the



environmental conditions, the telecommunication network and localization requirements

- o the system set-up, with a description of the Architecture, the data management software requirements, the DB structure, the ICD – interface with SafeSeaNet, VTS/VTMIS, PMIS, PCS/other system ,a description of the architecture in case of a distributed system
- o A summary of scope of supply and cost estimation

The CVTMIS data management system design includes the following components:

- o evaluation of existing systems, users and information flow in ports, including the upgrade of data gathering and data exchange of existing Integrated Maritime Information System (CIMIS) and the integration with VTMIS / AIS databases the Port Management and Information System (PMIS) in three major Croatian ports (Rijeka, Ploče, Split) and SafeSeaNet
- o evaluation of potential users of SSN, as Customs, Immigration, Fishery inspectorate, Environmental inspectorate, Veterinary / phytosanitary inspectorate and Health inspectorate

he CVTMIS data management system has been designed in line with the requirements of EU Directive 2002/59/EC and covering the use, exchange and integration of data on national level, regional level as well as EU level, such as SafeSeaNet) and real-time regional data exchange (such as HELCOM).

The design has taken as a reference and covered 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.



1.1 List of abbreviations and acronyms

Abbreviation	Explanation
AC	Alternate current
ADRIREP	real time regional data exchange
ADS	Arrival and departure system (is the Croatian AOB application of CIMIS system)
AIS	Automatic Identification System
ALT	height of ground above sea level
a.s.l.	Above Sea Level
BITE	Built In Test Equipment
B/W	Black and White
CC	Control Centre
CCD	charge-coupled device
CCTV	Closed Circuit Television
CIMIS	Croatian Integrated Maritime Information System
C-NCA	Croatian National competent authority
C-NSW	Croatian National Single Windows
COG	Course over Ground
COTS	Commercial-Off-The-Shelf
C-PSW	Croatian Port single window
CPA	Closest Point of Approach
CVTMIS	Croatian Vessel Traffic Management Information System
DB	Database
DBMIS	Data Base Management and Information System
DOA	Direction of Arrival
DSC	Digital Selective Calling
DMZ	De-Militarized Zone
EC	European Commission
ECDIS	Electronic Chart Display and Information
EDI	Electronic Data Interchange
EIS	European Index Server



EMC	Electromagnetic compatibility
EMSA	European Maritime Safety Agency
ENC	Electronic Navigation Charts
ERM	Electromagnetic compatibility and Radio Spectrum Matters
ERP	Enterprise resource planning (ERP) systems
ETA	Estimated Time of Arrival
ETD	Estimated Time of Departure
EMI	Electromagnetic Interference
EMSA	European Maritime Safety Agency
EU	European
FAL	Facilitation Committee
FAT	Factory Acceptance Tests
GMDSS	Global Maritime Distress and Safety System
GPRS	General Packet Radio Service
GPS	Global Positioning System
HAZMAT	Dangerous or Polluting Goods
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol over SSL
IALA	International Association of Marine Aids to navigation and Lighthouse Authorities
ICD	Interface contro document
ID	Identity code
IDABC	Interoperable Delivery of European eGovernment Services to public Administrations, Business and Citizens
IMO	International Maritime Organization
IMO FAL	IMO Facilitations Forms declared by the DIRECTIVE 2002/6/EC
IHO	International Hydrographical Organization
IP	Internet protocol
ISPS	International Ship and Port Facility Security Code
ITU	International Telecommunication Union
IEC	International Electro technical Commission
HPa	Eco Pascal



Hr	Hour
Hz	Hertz
Kt	Nodes
KVA	Kilo Volt Ampere
LAN	Local Area Network
LCA	Local Competent Authority (port, VTS, MRCC, etc...)
LCC	Local Control Centre
LCD	Liquid Crystal Display
LRIT	Long Range Reporting Systems
LRU	Line replaceable unit
MARNIS	Maritime Navigation Information System
MHz	Mega Hertz
MM	Millimetre
MMSI	Maritime Mobile Service Identity
MIL HDBK	Military Handbook and Standards related to reliability
MRCC	Maritime Rescue co-ordination Centre
MRS	Mandatory Ship Reporting System
MS	Member State
MSC	Maritime Safety Committee
MTBF	Mean time between failures
MTTR	Mean time to repair
NAV	Navigation
NCA	National Competent Authority
NCC	National Control Centre
NM	Nautical Miles
NOA	Notice of Arrival
NTSC	National Television System Committee
OBS	Operation Breakdown Structure
PAL	Phase-Alternating Line
PAT	Provisional Acceptance Tests
PAUTH	Port Authorities (Harbour Master Office, Port Authority, Maritime Police, Inspectorates)



PC	Personal Computer
PCS	Port Community System
Pd	Probability of Detection
Pfa	Probability of false alarm
PKI	Public Key Infrastructure
PLT	Probability of Track Loss
PMIS	Port Management Information System
PTF	Probability of Track Formation
PTZ	Pan - Tilt – Zoom
QoS	Quality of Services
RCC	Regional Control Centre
RCS	Radar Cross Section
RDF	Radio Direction Finder
ROT	rate of turn
RTX	Receiver transmitter
SAR	Search and Rescue
SAT	Site Acceptance Tests
SAcT	System Acceptance Tests
SART	Search and Rescue transponders
SENC	System ENC
SOG	Speed over Ground
SOLAS	Safety of Life at Sea
SSL	Secure Socket Layer
SSN	SafeSeaNet
TESTA	Trans European Services for Telematics between administrations
UHF	Ultra High Frequency
UN LOCODE	United Nations Code for Trade and Transport Locations
UPS	Uninterruptible Power Supply
VCS	Voice Communication System
VHF	Very High Frequency
VoIP	Voice over IP



VTMIS	Vessel Traffic Management Information System
VTs	Vessel Traffic Service
X-Band	8.0 – 12.0 GHz
XML	Extensible Markup Language
WAN	Wide Area Network
WBS	Work Breakdown Structure
WGS	World Geodetic System

1.2 List of applicable standards and norms

Every single item and procedure of the project shall comply with the relevant internationally accepted standards; in particular those standards dealing with human health and safety, safety of navigation, environment protection, quality assurance, good management and maintenance practice, training, etc (IMO, IALA, IEC, ITU, ISO).

International standards will apply where local regulations are not defined or applicable.

The following documents address rules, practices and technical standards which apply to this Project:

- IALA Recommendation V-127 on Operational Procedures for Vessel Traffic Services -Edition 1- June 2004
- IALA Guidelines on the Automatic Identification System (Volume 1 part 1 and 2);
- IALA Recommendation V-125 on the use and presentation of symbology at a VTS Centre (including AIS) – Edition 2 – December 2004;
- IALA/IAPH/IMPA world VTS Guide;
- IALA, Recommendation V-128, “On Operational and Technical Performance Requirements for VTS Equipment”, Ed. 3.0, June 2007.
- IALA, Recommendation V-119, “On the Implementation of Vessel Traffic Services”, December 2000.
- IALA, “Vessel Traffic Services Manual”, 2002.
- IALA, “Guidelines on the Universal Automatic Identification System (Volumes 1 and 2)”.
- IALA, Recommendation A-123, “On the Provision of Shore Based Automatic Identification Systems (AIS)”, June 2007.
- IALA, Recommendation A-124, “On AIS Shore Stations and Networking Aspects Related to the AIS Service”, Ed.1.2, December 2005.
- IALA, Technical Clarification on ITU-R M. 1371.1.
- IMO, Résolution A.857(20), “Guidelines for Vessel Traffic Services”, November 1997.
- IMO, “International Code for the Security of Ships and of Port Facilities”, (ISPS Code), December 2002.



- IMO, "Performance Standards for a Universal Shipborne Automatic Identification System (AIS) - Annex 3", Resolution MSC.74(69), May 1998.
- IMO, Requirements for the display and use of AIS information on shipborne navigational displays – NAV 50/4.
- IMO, "Provision of Radio Services for the Global Maritime Distress And Safety System (GMDSS) - Annex 3", Resolution A.801(19), November 1995.
- IMO MSC/Circ 1056 GUIDELINES FOR SHIPS OPERATING IN ARCTIC ICE-COVERED WATERS
- IMO, "Master Plan of shore-based facilities for the global maritime distress and safety system (GMDSS Master Plan)" and relative corrigenda, Circular 8, February 1999.
- IMO 1974 SOLAS Convention;
- IMO MSC/Circ. 1072 "Guidance on provision of Ship Security Alert System";
- IMO Resolution MSC 147 (77) "Adoption of the revised performance standards for Ship Security Alert System";
- IMO Resolution A.801(19) - (Annex 3): "Provision of Radio Services for the Global Maritime Distress and Safety System (GMDSS)";
- IMO A.851(20) "General Principles for Ship Reporting Systems";
- IMO – NAV 50/4 "Requirements for the display and use of AIS information on ship-borne navigational displays"
- IMO A.741(18) „The International Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM Code)"
- ITU-R, "VHF and UHF Propagation Curves for the Frequency Range from 30 MHz to 1000 MHz. Broadcasting services", Recommendation P.370, 1998.
- ITU-R, "Technical Characteristics for a Universal Shipborne AIS Using Self-Organized Time Division Multiple Access", Recommendation M.1371-1, 2000.
- ITU, "Recommendation on the technical characteristics for a universal shipborne Automatic Identification System (AIS) using time division multiple access in the Maritime Mobile Band", (ITU-R M. 1371.1).
- ITU Radio Regulations, Appendix S18, Table of Transmitting Frequencies in the VHF Maritime Mobile Band.
- ITU-R M.493-9 and ITU-R M.541-8: regarding DSC standards
- IEC Standard 61993-2: "Class A Shipborne equipment of the Universal Automatic Identification System (AIS) - operational and performance requirements, methods of testing and required test results".
- IEC Proposal 80/387/NP: "Maritime navigation and radio communication equipment and systems - Automatic identification systems (AIS): Fixed AIS stations (AIS base station, limited AIS base station and AIS simplex repeater station) – Performance requirements, methods of testing and required test results".
- IEC 60945 Maritime navigation and radiocommunication equipment and systems – General requirements, methods of testing and required test results
- IHO Publication S-57 "IHO transfer standard for digital hydrographic data";
- IALA Recommendation E-106 on the use of retroreflecting material on aid to navigation marks within the IALA maritime buoyage system – May 1998;



- IALA Recommendation E-107 on the design of normal mooring – May 1998. ITU-R Recommendation P.370: "VHF and UHF Propagation Curves for the Frequency Range from 30 MHz to 1000 MHz Broadcasting Services".
- ETSI ETS 300162 Electromagnetic compatibility and Radio Spectrum Matters (ERM); Radiotelephone transmitters and receivers for the maritime mobile service operating in VHF bands; Technical characteristics and methods of measurement.
- ETSI EN 300828 Electromagnetic compatibility and Radio Spectrum Matters (ERM); Electromagnetic compatibility (EMC) for radiotelephone transmitters and receivers for the maritime mobile service operating in the VHF bands.

1.3 References

Reference	Document Title	Code
[SSNICD]	SafeSeaNet ICD	V1, EMSA
[SSNUM]	SafeSeaNet User manual	V1.8, EMSA
[SSNXML]	SafeSeaNet XML Messaging Reference Guide	V1.6, EMSA
[SSNNS]	SafeSeaNet Network & Security Reference Guide	V1.14, EMSA
[SSNPG]	Procedures and Guidelines for the registration of new web server certificates	V1.0, EMSA
[SSNTP]	SafeSeaNet Test Plan	V1.21, EMSA
[SSNMP]	Change Management Plan	V1.0, EMSA
[SSNRP]	Rules and procedures of the SafeSeaNet Group	V1.0, EMSA
[D3]	CVTMIS System Design report	67612-SPE-T410.0
[D5]	CVTMIS Legal, Institutional and Organizational Framework Design report	67612-SPE-T430.0



1.4 Annexes

Reference	Document Title	Code
[1]	CVTMIS analysis of document exchange in ports – Layout and flow	67612-SPE-T421.0



2 Data management introduction

2.1 Introduction

The scope of this introduction is to make a summary of the information collected and useful for the preparation of the design.

2.2 Pre-feasibility study 2005

Pre-feasibility study is dealing with the development strategy for the introduction of the CVTMIS in Croatia.

Main requirements on CVTMIS are described and related to:

- functionality,
- Architecture
- Communication network
- Port Management and Information system
- Project execution and conclusions
- CVTMIS Strategy for the period 2005-2010

Main issues are the following:

- The CVTMIS system is a primary instrument of the Ministry of the Sea, Transport, Tourism and Development dedicated to surveillance, control and management of the maritime traffic.
- The CVTMIS shall consist of primary data collecting system, data processing, TLC system and data dissemination system, complying to EU and/or IMO std or both.
- Information collected within the CVTMIS shall be available to all government services as well as subjects having duties and responsibilities in connection with maritime safety and pollution prevention. Limited information shall be open to public access in accordance with recommendation elaborated in the VTMISS study.
- CVTMIS shall be integrated with PMIS; the port management services have to operate as subsidiary systems to the CVTMIS system. The data, communication protocol and procedures between port management systems and CVTMIS have to be defined in the CVTMIS study.
- As a rule, the PMIS are run by local port authority responsible for that port. The existing port management services or port management services that will be developed in due time have to operate under the responsible port authority and on their expenses.



- The PMIS – Port Management and Information system dedicated to supervise, manage and optimize the traffic within the port limits, and in adjacent waters can be implemented in any port where maritime traffic volume or traffic complexity so requires. The PMIS can be fed with limited set of data acquired and generated by the CVTMIS. In the same way, the PMIS should feed information to the CVTMIS;
- The PMIS can, beside officially approved public information on vessel traffic, offer additional value added information package to their customers

As a summary of this study:

- CVTMIS shall be integrated with PMIS;
- the PMIS are run by local port authority responsible for that port and on their expenses
- to be defined the data exchange, protocol between the PMIS and CVTMIS.

2.3 Feasibility study 2006

Here are a summary of the main requirements of VTMS data management as identified in the CVTMIS Feasibility study, 2006.

- Main content is the following:
 - CVTMIS description
 - Radar coverage study
 - Description of the National Control Center – NCC
 - Specification of subsystems
 - The national maritime database

The CVTMIS shall consist in a National Control Center (NCC) located in Rijeka and remote stations network for data collection. The National Center with their remote stations network shall constitute the National CVTMIS.

In additional 8 Regional Control Centers (RCC) shall be created to control their internal management with the data received from NCC. In the same way, the information generated and updated by those regional centers will be shared with the NCC.

The CVTMIS, located at Rijeka, shall be defined by:

- a NCC of the maritime traffic control
- a Remote station network
- a link network
- a National Maritime Navigation data base



In general the regional centers shall contain at least a PMIS, a VTS console, one PMIS database, and one Meteorological station.

About the data management, it is foreseen a CVTMIS National Maritime Navigation data base and 8 Regional Center, where a PMIS is required.

The 8 Regional Centers to be implemented shall be:

- Pula,
- Rijeka
- Senj
- Zadar
- Sibenik
- Split
- Ploče
- Dubrovnik

The most complex center shall be Rijeka and Split.

According to par.2.8, each regional center shall be managed by the proper Harbour Authority for each port.

At regional level, a PMIS shall be implemented and fed by the CVTMIS at least in the following field:

- AIS tracks regarding the country
- Traffic information of the vessels relative to the country

Main requirements are:

- get access to data
- get access to data from the regional control centers
- It is necessary that the database of the national control center and the data base of the regional control center work integrated.
- It is necessary to give guarantee that any data introduced in the national data base can be in real time in the regional data base and also to the other authorities that are permitted to get access to the national data base.

2.4 Maritime ship traffic in Croatian waters

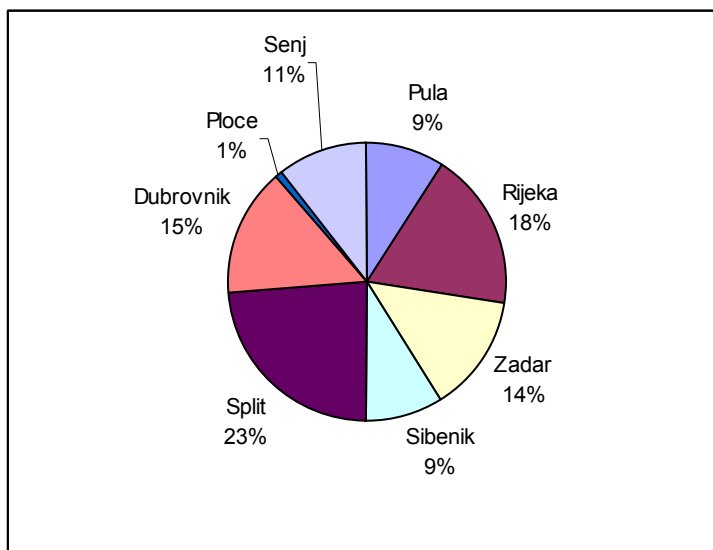
In year 2007 the total arrivals of the traffic realized in the Croatian waters amounted to 219.842 ships, about 2% less than the previous year and 2.5% less with respect to year 2004.



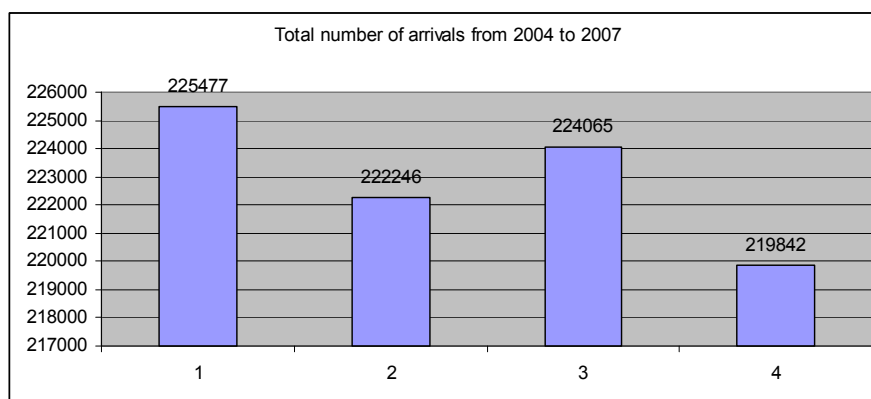
Total number of arrival	Pula	Rijeka	Zadar	Sibenik	Split	Dubrovnik	Ploce	Senj	Total
2007	20398	39980	29783	19733	51780	32838	2228	23102	219842

Split is the biggest port in terms of number of arrivals (23%), followed by Rijeka (18%) and Dubrovnik (15%), while Ploce is the last port in terms of number of arrivals (about 1%).

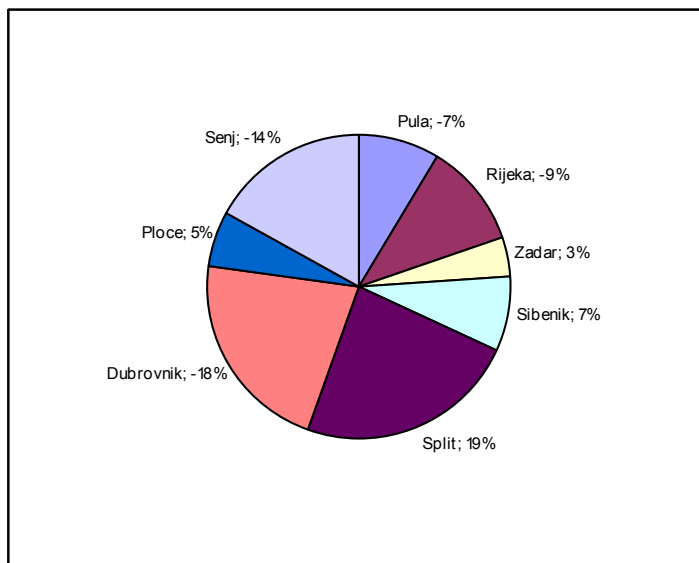
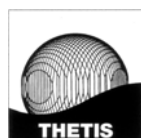
The following picture shows the overall distribution of the traffic.



The table below summarize the total number of arrivals from 2004 to 2007, and highlights the small reduction in number of arrivals.



The following picture shows the traffic difference for each port from 2004 to 2007, where Split port area had about 19% more that the year 2004 of the number of arrivals, while Dubrovnik had a reduction of 18%.



In year 2007 the total arrivals of national ship realized in the Croatian waters amounted to 213.673 ships, about 2,7% less than year 2004, while the total arrivals of foreign ship realized in the Croatian waters amounted to 6.269 ships, about 2,1% more than year 2004.

Therefore most of traffic is from national ships. The % of arrivals from foreign ships is less than 3%.

Type of traffic	2004	2007	Index
National ships	219436	213673	-2,7%
Foreign ships	6041	6169	2,1%
% of foreign ships	2,75%	2,89%	

In year 2007 the total arrivals from national ports realized in the Croatian waters amounted to 213.623 ships, about 2,7% less than year 2004, while the total arrivals of ship from foreign ports realized in the Croatian waters amounted to 6.219 ships, about 1,7% more than year 2004.

Therefore most of traffic is from national ports. The % of arrivals from foreign ports is less than 3%.

Type of traffic	2004	2007	Index
From national ports	219364	213623	-2,7%
From foreign ports	6113	6219	1,7%
% of arrival from foreign ports	2,79%	2,91%	

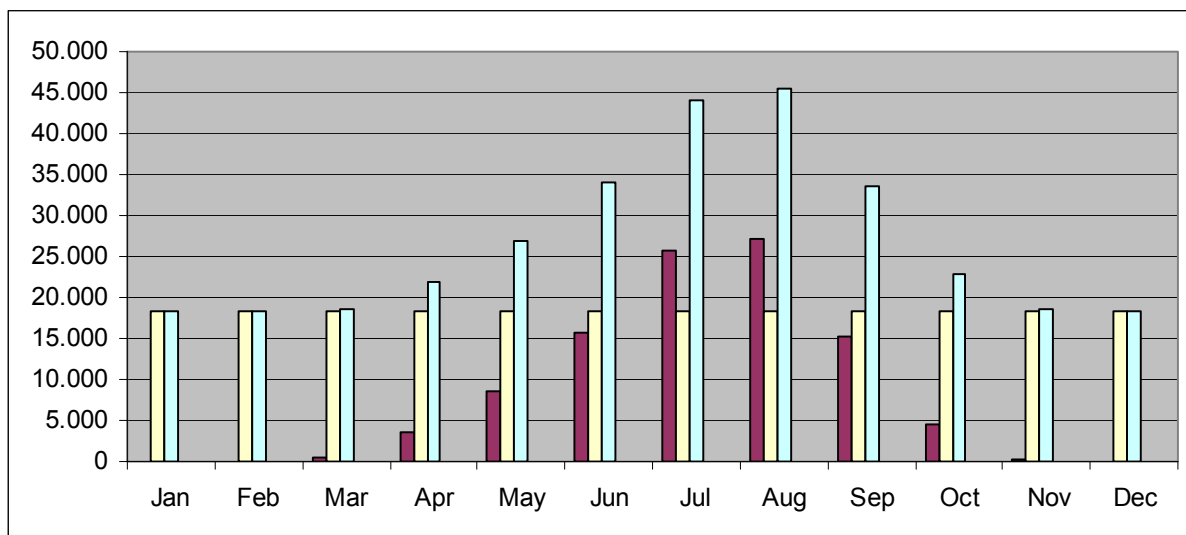


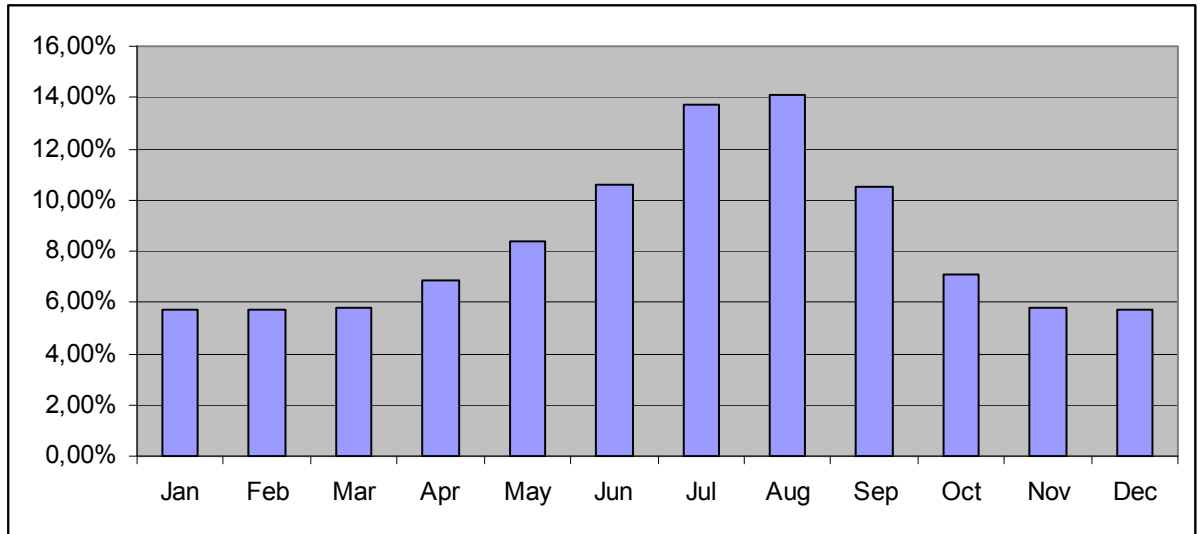
About the passenger traffic, in 2007 the total passenger traffic increased of 11% with respect year 2004, while car traffic increased of 8% with respect year 2004 .

Type of traffic	2004	2007	Index
Passengers	11284015	12629149	11%
Cars	2423074	2628162	8%

Here is a summary of the traffic per month to be taken into consideration, considering in addition the ACI traffic, and two picture that highlights the value and the percentage per months. During summer the traffic is about two times more than during winter time.

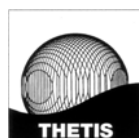
Type of traffic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total
ACI traffic	69	71	362	3.609	8.681	15.640	25.792	27.074	15.342	4.435	270	110	101.455
Other	18320	18320	18320	18320	18320	18321	18321	18320	18320	18320	18320	18320	219.842
Total	18.389	18.391	18.682	21.929	27.001	33.961	44.113	45.394	33.662	22.755	18.590	18.430	321.297
	5,72%	5,72%	5,81%	6,83%	8,40%	10,57%	13,73%	14,13%	10,48%	7,08%	5,79%	5,74%	





Looking at the future, considering data collected, we should take into account a quite stable overall number of arrivals, traffic growth for passengers (estimate of 3% x year) and cars (2% x year), and traffic growth for foreign ships (estimate of 0,5% x year).

The following tables below show details of the arrivals traffic from year 2004 to year 2007, for National and foreign ships, coming from national or foreign ports.



2007	Pula	Rijeka	Zadar	Sibenik	Split	Dubrovnik	Ploce	Senj	Total
1. Number of arrivals of national ships	18271	38909	29595	19423	50468	32022	1883	23102	213673
1.1. Number of arrivals of national ships from foreign port	264	45	196	3	543	193	86	0	1330
1.2. Number of arrivals of national ships from national port	18007	38864	29399	19420	49925	31829	1797	23102	212343
2. Number of arrivals of foreign ships	2127	1071	188	310	1312	816	345	0	6169
2.1. Number of arrivals of foreign ships from foreign port	1843	972	113	263	808	561	329	0	4889
2.2. Number of arrivals of foreign ships from national ports	284	99	75	47	504	255	16	0	1280
Total number of arrivals	20398	39980	29783	19733	51780	32838	2228	23102	219842

2006	Pula	Rijeka	Zadar	Sibenik	Split	Dubrovnik	Ploce	Senj	Total
1. Number of arrivals of national ships	21090	39676	29272	18904	47659	35650	1913	23565	217729
1.1. Number of arrivals of national ships from foreign port	292	103	241	4	588	193	56	0	1477
1.2. Number of arrivals of national ships from national port	20788	39573	29031	18900	47071	35457	1857	23565	216242
2. Number of arrivals of foreign ships	2049	1290	205	324	1389	754	325	0	6336
2.1. Number of arrivals of foreign ships from foreign port	1642	1102	104	277	881	504	293	0	4803
2.2. Number of arrivals of foreign ships from national ports	407	188	101	47	508	250	32	0	1533
Total number of arrivals	23139	40966	29477	19228	49048	36404	2238	23565	224065

2005	Pula	Rijeka	Zadar	Sibenik	Split	Dubrovnik	Ploce	Senj	Total
1. Number of arrivals of national ships	19323	41118	29749	18175	45402	35758	1889	24508	215922
1.1. Number of arrivals of national ships from foreign port	241	97	253	0	547	147	66	0	1351
1.2. Number of arrivals of national ships from national port	19082	41021	29496	18175	44855	35611	1823	24508	214571
2. Number of arrivals of foreign ships	1920	1161	223	396	1549	775	300	0	6324
2.1. Number of arrivals of foreign ships from foreign port	1380	1002	159	327	1092	518	276	0	4754
2.2. Number of arrivals of foreign ships from national ports	540	159	64	69	457	257	24	0	1570
Total number of arrivals	21243	42279	29972	18571	46951	36533	2189	24508	222246

2004	Pula	Rijeka	Zadar	Sibenik	Split	Dubrovnik	Ploce	Senj	Total
1. Number of arrivals of national ships	19858	42765	28620	18362	42083	39106	1860	26782	219436
1.1. Number of arrivals of national ships from foreign port	281	81	239	8	538	119	67	0	1333
1.2. Number of arrivals of national ships from national port	19577	42684	28381	18354	41545	38987	1793	26782	218103
2. Number of arrivals of foreign ships	2063	1264	221	161	1315	751	266	0	6041
2.1. Number of arrivals of foreign ships from foreign port	1736	1106	145	110	938	494	251	0	4780
2.2. Number of arrivals of foreign ships from national ports	327	158	76	51	377	257	15	0	1261
Total number of arrivals	21921	44029	28841	18523	43398	39857	2126	26782	225477

Total number of arrival	Pula	Rijeka	Zadar	Sibenik	Split	Dubrovnik	Ploce	Senj	Total
2007	20398	39980	29783	19733	51780	32838	2228	23102	219842
2006	23139	40966	29477	19228	49048	36404	2238	23565	224065
2005	21243	42279	29972	18571	46951	36533	2189	24508	222246
2004	21921	44029	28841	18523	43398	39857	2126	26782	225477



2.5 Present Maritime organization

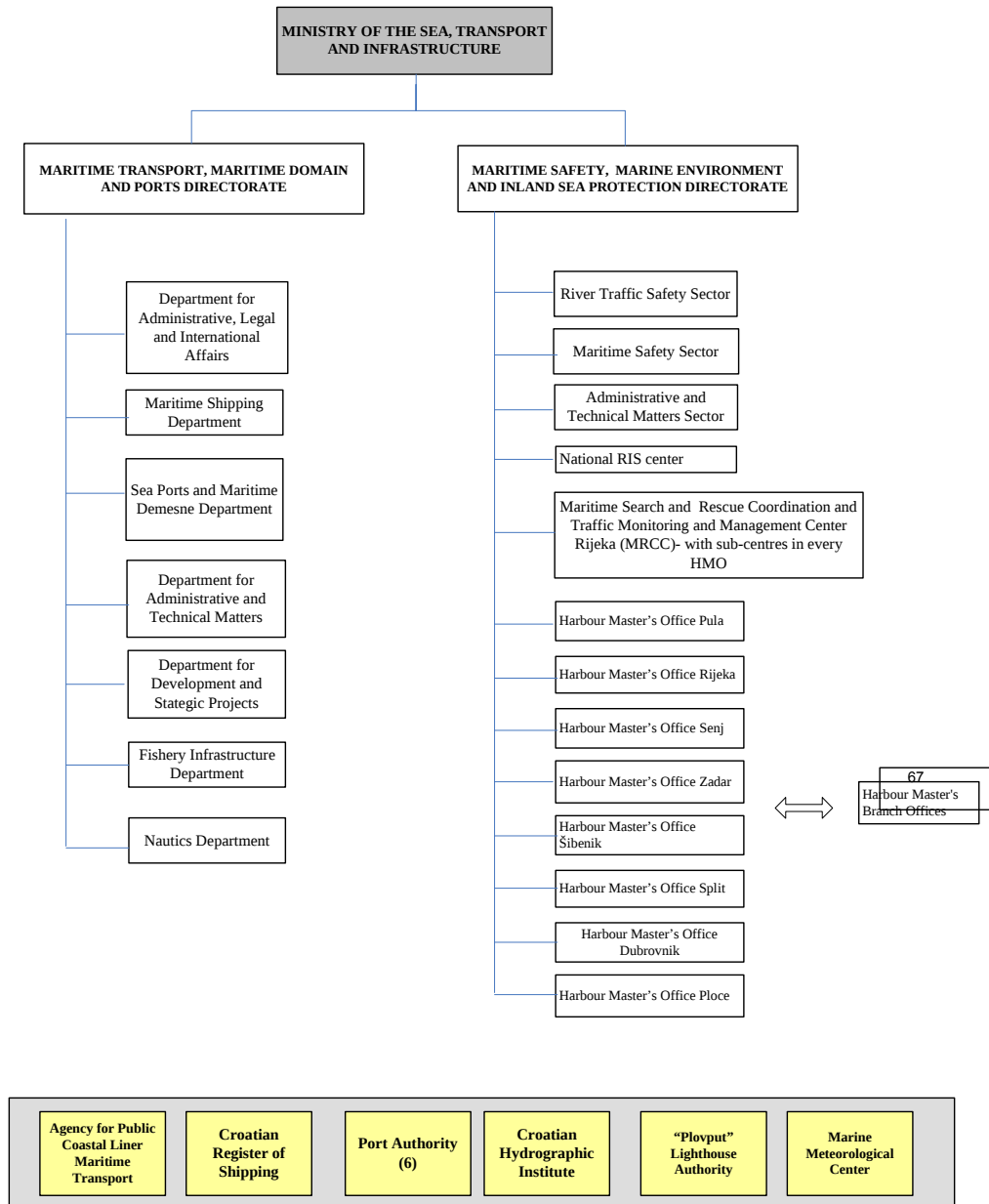
2.5.1 Introduction

Tasks related to safety at sea, pollution prevention and consequently, the preservation of biological diversity of the Adriatic Sea lies mainly with the Ministry of Sea, Tourism, Transport and Development (MSTTD) as a recognized Maritime Administration.

The Pre-accession Maritime Transport Strategy of the Republic of Croatia of June 2005 define these responsibility.

Instituted within the Ministry of the Sea, Tourism, Transport and Development is the:

- o Maritime Policy Directorate
- o the Maritime Safety and Marine Environment Protection Directorate.



2.5.2 Maritime Policy Directorate

The Maritime Policy Directorate is structured by internal organisational units performing the tasks of preparation of legislation with the aims of implementation of defined maritime policy, those being: Department for legal and international affairs, Department for maritime transport and shipping, Department for maritime demesne and seaports and the Department for technical affairs. This Directorate currently employs 14 persons out of the total of 28 systematized workposts.



2.5.3 The Maritime Safety and Marine Environment Protection Directorate

The Directorate for maritime safety and marine environment protection is structured throughout internal organisational units which monitor and implement provisions of the law and executive regulations in the field of maritime industry, those being the Department for inspection affairs, Department for maritime traffic management and search and rescue operations, as well as the Maritime Search and Rescue Coordination and Traffic Management Center (MRCC) in Rijeka. The Directorate employs 21 persons out of the total of 50 systematized workposts. Of that staff, 10 are employed in the National Centre for Coordinating Search and Rescue at Sea and Maritime Traffic Control.

Directorate for maritime safety and marine environment protection also includes 8 harbourmaster's offices (Pula, Rijeka, Senj, Zadar, Šibenik, Split, Ploče i Dubrovnik) with 67 harbourmaster's branch offices as regional units employing a total of 298 persons out of the systematized 331 workposts.

Basic tasks related to activities to be developed within the future national vessel traffic monitoring and information system are currently assigned to the Maritime Search and Rescue Coordination and Traffic Management Center (MRCC) in Rijeka.

Tasks of the MRCC at present include:

- o the use of AIS subsystem (4 base stations) for monitoring of maritime traffic in internal sea waters and territorial sea,
- o protected ecological-fishery zone and open sea,
- o reporting ships' violations of existing routing measures and SRS to flag state and to port of destination.

2.5.4 Other institutions

Apart from the Ministry, there are several other institutions performing the tasks in the area of navigational safety, security, protection of the sea against pollution, maritime infrastructure and seaports. Those are the following:

Croatian Register of Shipping (CRS), public institution, recognized organisation for statutory certification of ships.

The Agency for Public Coastal Maritime Liner Shipping, regulatory body for conducting the activities with regard to announcing tenders, granting concession, allocation of aids and exercising control in coastal liner maritime traffic.

Port authorities, public institutions for constructing and maintaining ports, and granting concessions for running port operations.

Croatian Hydrographic Institute, scientific-research institution responsible for hydrographic and geographic surveys of the Adriatic, maritime geodetics, drawing up and editing charts and other publications, as well as other oceanographic and geological research.



„Plovput“ Split, state company carrying out the activities of maintaining about 1 000 lighthouses and other aids to navigation as well as of the maritime radio service.

Marine meteorological centre within the National Meteorological and Hydrological Service, the basic institution for meteorology and hydrology on the territory of Croatia.

2.6 Measures implemented to improve safety at sea

In order to improve the present status of the safety of navigation and maritime environmental protection the Ministry already implemented several measures.

As the most important and very recent measures aiming to establish a new traffic system in the Adriatic Sea and provoked by mentioned increase of traffic volume are, already implemented, Mandatory Ships Reporting System (ADRIREP), as approved by the Maritime Safety Committee on its 76th session (2-13 December 2002, operative from 1st of July 2003), and the Traffic Separation Scheme in the Northern Adriatic Sea, approved by the Maritime Safety Committee on its 78th session (21st May 2004, operative from 1st of December 2004).

2.7 Directive 2002/59/EC

The purpose of the Directive 2002/59/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 June 2002 is to establish in the EU Community a vessel traffic monitoring and information system with a view to enhancing the safety and efficiency of maritime traffic, improving the response of authorities to incidents, accidents or potentially dangerous situations at sea, including search and rescue operations, and contributing to a better prevention and detection of pollution by ships.

Member States shall monitor and take all necessary and appropriate measures to ensure that the masters, operators or agents of ships, as well as shippers or owners of dangerous or polluting goods carried on board such ships, comply with the requirements under this Directive.

2.7.1 Ship involved

This Directive applies to ships of 300 gross tonnage and upwards, unless stated otherwise.

This Directive shall not apply to:

- o warships, naval auxiliaries and other ships owned or operated by a Member State and used for non-commercial public service;
- o fishing vessels, traditional ships and recreational craft with a length of less than 45 metres;
- o bunkers below 5 000 tons, ships' stores and equipment for use on board ships.



General requirements on **data management system** are included according to art 14 on Computerised exchange of data between Member States:

- o Member States shall cooperate to ensure the interconnection and interoperability of the national systems used to manage the information indicated in Annex I of directive 2002/59/EU.
- o Communication systems set up pursuant to the first subparagraph must display the following features:
 - o data exchange must be electronic and enable messages notified in accordance with Article 13 to be received and processed;
 - o the system must allow information to be transmitted 24 hours a day;
 - o 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.
 - o Member States shall develop and maintain the necessary infrastructure to enable transmission, reception and conversion of data between systems using XML or EDIFACT syntax, based on Internet or X.400 communication facilities.

Annex I of directive 2002/59/EU speaks about the notifications to be notified in accordance with articles 4, 12, 13 and 5:

- o Port notification
 - o Article 4: Notification prior to entry into ports of the Member States, from agent/master/ operator of a ship shall to a “competent authority” at least twenty-four hours in advance; or at the latest, at the time the ship leaves the previous port, if the voyage time is less than twenty-four hours
 - o Article 5: Monitoring of ships entering the area of mandatory ship reporting systems
 - o Article 12: Obligations on the shipper, to deliver declaration on dangerous goods to the master
- o HAZMAT notification:
 - o Article 13: Notification of dangerous or polluting goods carried on board, The information must be transferred electronically whenever practicable. The electronic message exchange must use the syntax and procedures set out in Annex III

According to Annex III, the Commission shall develop and maintain, in consultation with the Member States, an .Interface Control Document. which describes the system facilities in terms of the message scenario, the message functions and the relation between the messages. The



message timing and performance shall be detailed, as well as data interchange protocols and parameters. The Interface Control Document shall further specify the data content of the required message functions and describe those messages.

These procedures and infrastructure should incorporate, whenever practicable, reporting and information exchange obligations resulting from other Directives, such as Directive 2000/59/EC of the European Parliament and of the Council of 27 November 2000 on port reception facilities for ship-generated waste and cargo residues.

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

2.7.2 Information to be notified in accordance with Article 4 . General information

Here is a list of information to be notified:

- o ship identification (name, call sign, IMO identification number or MMSI number),
- o port of destination,
- o estimated time of arrival at the port of destination or pilot station, as required by the competent authority, and estimated time of departure from that port,
- o total number of persons on board.

2.7.3 Information to be notified in accordance with Article 12 . Cargo information

Here is a list of information to be notified:

- o the correct technical names of the dangerous or polluting goods, the United Nations (UN) numbers where they exist, the IMO hazard classes in accordance with the IMDG, IBC and IGC Codes and, where appropriate, the class of the ship needed for INF cargoes as defined in Regulation VII/14.2, the quantities of such goods and, if they are being carried in cargo transport units other than tanks, the identification number thereof;
- o address from which detailed information on the cargo may be obtained.

2.7.4 Information to be notified in accordance with Article 13

The following information shall be notified:

- o General information:



- o ship identification (name, call sign, IMO identification number or MMSI number);
 - o port of destination;
 - o for a ship leaving a port in a Member State: estimated time of departure from the port of departure or pilot station, as required by the competent authority, and estimated time of arrival at the port of destination;
 - o for a ship coming from a port located outside the Community and bound for a port in a Member State: estimated time of arrival at the port of destination or pilot station, as required by the competent authority;
 - o total number of persons on board.
- o Cargo information:
 - o the correct technical names of the dangerous or polluting goods, the United Nations (UN) numbers where they exist, the IMO hazard classes in accordance with the IMDG, IBC and IGC Codes and, where appropriate, the class of the ship as defined by the INF Code, the quantities of such goods and their location on board and, if they are being carried in cargo transport units other than tanks, the identification number thereof;
 - o confirmation that a list or manifest or appropriate loading plan giving details of the dangerous or polluting goods carried and of their location on the ship is on board;
 - o address from which detailed information on the cargo may be obtained.

2.7.5 Information referred to in Article 5

The following information shall be notified:

- o A. ship identification (name, call sign, IMO identification number or MMSI number),
- o B. date and time, L 208/22 EN Official Journal of the European Communities 5.8.2002
- o C or D. position in latitude and longitude or true bearing and distance in nautical miles from a clearly identified landmark,
- o E. course,
- o F. speed,
- o I. port destination and estimated time of arrival,
- o P. cargo and, if dangerous goods present on board, quantity and IMO class,
- o T. address for the communication of cargo information,
- o W. total number of persons on board,
- o X. various information:



- o characteristics and estimated quantity of bunker fuel, for ships carrying more than 5000 tons of bunker fuel,
- o navigational status.

The master of the ship must forthwith inform the competent authority or port authority concerned of any change to the information notified pursuant to this Annex.

2.7.6 Regulation:

Main regulations are the following.

SHIP REPORTING AND MONITORING

- Notification prior to entry into ports of the Member States
- Monitoring of ships entering the area of mandatory ship reporting systems
- Use of automatic identification systems
- Use of ship's routing systems
- Monitoring of the compliance of ships with vessel traffic services
- Infrastructure for ship reporting systems, ships' routing systems and vessel traffic services
- Voyage data recorder systems
- Casualty investigation

NOTIFICATION OF DANGEROUS OR POLLUTING GOODS ON BOARD SHIPS (HAZMAT)

- Obligations on the shipper
- Notification of dangerous or polluting goods carried on board
- Computerised exchange of data between Member States
- Exemptions

MONITORING OF HAZARDOUS SHIPS AND INTERVENTION IN THE EVENT OF INCIDENTS AND ACCIDENTS AT SEA

- Transmission of information concerning certain ships
- Reporting of incidents and accidents at sea
- Measures in the event of exceptionally bad weather
- Measures relating to incidents or accidents at sea
- Places of refuge
- Information of the parties concerned



ACCOMPANYING MEASURES

- Designation and publication of a list of competent bodies
- Cooperation between Member States and the Commission
- Confidentiality of information
- Monitoring the implementation of this Directive and sanctions
- Evaluation

The Directive define the following forms/documents:

- LIST OF INFORMATION TO BE NOTIFIED
- PRESCRIPTIONS APPLICABLE TO ON-BOARD EQUIPMENT
- ELECTRONIC MESSAGES
- Measures available to Member States in the event of a threat to maritime safety and the protection of the environment

2.7.7 Amendment to the directive

The following amendment shall be considered (they are under evaluation by the EU commission).

- **“Article 6a - Use of automatic identification systems (AIS) by fishing vessels:** Any fishing vessel with a length of more than 15 metres overall and sailing in waters under the jurisdiction of a Member State must, in accordance with the timetable set out in Annex II, part I(3), be fitted with an AIS which meets the performance standards drawn up by the IMO.”
- **“Article 12 - Obligations on the shipper.** No dangerous or polluting goods shall be offered for carriage or taken on board any ship, irrespective of its size, in a port of a Member State unless a declaration has been delivered to the master or operator containing the following information:
 - (a) the information listed in Annex I(2);
 - (b) for the substances referred to in Annex I to the Marpol Convention, the safety data sheet detailing the physico-chemical characteristics of the products, including their viscosity expressed in cSt at 50°C and their density at 15°C;
 - (c) the emergency numbers of the shipper or any other person or body in possession of information on the physico-chemical characteristics of the products and on the action to be taken in an emergency.



- It shall be the duty of the shipper to deliver to the master or operator such declaration and to ensure that the shipment offered for carriage is indeed the one declared in accordance with the first paragraph.”
- **“Article 23a - Processing and management of maritime safety information**
 - 1. The Commission shall ensure, where necessary, the processing, use and dissemination to the authorities designated by the Member States, of the information gathered under this Directive or gathered by any public or private bodies in the pursuance of their respective missions.
 - 2. Where appropriate, the Commission shall contribute to the development and operation of systems for collecting and disseminating data relating to maritime safety, in particular through the ‘Equasis’ system or any other equivalent public system.”
- **Art 18a: Measures in the event of risks posed by the presence of ice**
- **“Article 20: Accommodation of ships in distress in places of refuge**
- **“Article 20a: Plans for the accommodation of ships in distress**
- **Article 20b: Financial guarantees**
- **Article 22a: European maritime information exchange system SafeSeaNet**

2.8 Directive 2002/6/EC

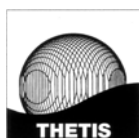
The Directive 2002/6/EC of the European Parliament and of the Council of 18 February 2002 is related to reporting formalities for ships arriving in and/or departing from ports of the Member States of the Community

The purpose of this Directive is to facilitate maritime transport by providing for standardisation of reporting formalities. This Directive shall apply to the reporting formalities on arrival in and/or departure from ports of the Member States of the Community, as set bellow, relating to a ship, its stores, its crew's effects, its crew list and, in the case of a ship certified to carry 12 passengers or fewer, its passenger list.

It follow a brief description of IMO FAL, as a reference, and next the content of the present regulation.

2.8.1 Introduction to IMO Facilitation Committee (FAL)

The FAL Convention was adopted in 1965 and has been amended a number of times since then. This Convention defines a maximum number of documents that contracting governments can require from a ship as well as standard formats for these documents (on paper). This is covered in IMO FAL Standard 2.1 [FAL].



Public authorities shall not require for their retention, on arrival or departure of ships to which the convention applies, any documents other than those covered by the present section:

- General Declaration;
- Cargo Declaration;
- Ship's Stores Declaration;
- Crew's Effects Declaration;
- Crew List;
- Passenger List;
- Dangerous Goods Manifest;
- Moreover: The document required under the Universal Postal Convention for mail and Maritime Declaration of Health.

The FAL Convention has in Recommended Practice 1.4 given the recommendation for contracting governments when they introduce EDI techniques to facilitate clearance processes to exchange data in conformity with the relevant UN/ISO standards and recommendations.

In FAL Standard 1.6 has it been indicated that public authorities, when introducing EDI techniques for clearance processes, shall limit the information they require from ship owners and other parties concerned to that required by the FAL Convention.

In FAL Standard 1.8 it is said that when introducing EDI techniques to assist clearance processes public authorities shall encourage their use by maritime operators and other parties concerned.

In the FAL recommended practice 4.12 has been indicated that public authorities should use EDI techniques for the purpose of obtaining information in order to accelerate and simplify clearance processes.

The EDI messages which can be used to implement the FAL reporting requirements are indicated in the below table which has been compiled from the FAL Compendium [FALc15]. This document also contains the templates as mentioned in the FAL Convention for the FAL Forms.

Data	FAL form	Suggested EDI	Note
General declaration	1	CUSREP	1
Cargo declaration	2	CUSCAR	
Ship's store	3	INVRPT	
Crew's effects	4		2

¹ As the CUSREP only caters for Customs information and due to the ISPS code also other information is required, the BERMAN message has been used and proposed in a number of Ports such as Amsterdam, e.g., [BICS]. Rotterdam, Bremen, Hamburg, Le Havre, Singapore and all other members of the Protect group of ports.



Crew list	5	PAXLST	
Passenger list	6	PAXLST	
Dangerous goods	7	IFTDGN	

Recently, some discussions have been made in the FAL committee on the use of XML. It is in particular ebXML that has been suggested [FAL32/5/3]. In the FAL Compendium it is clearly indicated that EDI stands for Electronic Data Interchange in whatever format including standard XML solutions.

The FAL committee has recommended where possible to use the Single Window concept as defined by UN/CEFACT Recommendation 33 [SWin]. One should note that FAL do not require the use of EDI documents for electronic port clearance, but strongly recommends it. (See above).

2.8.2 Regulation

List of reporting formalities referred to in respect of ships arriving in and/or departing from ports of the Member States of the Community

1. IMO FAL form 1, general declaration

The general declaration shall be the basic document on arrival and departure providing information required by the authorities of a Member State relating to the ship.

2. IMO FAL form 3, ship's stores declaration

The ship's stores declaration shall be the basic document on arrival and departure providing information required by the authorities of a Member State relating to a ship's stores.

3. IMO FAL form 4, crew's effects declaration

The crew's effects declaration shall be the basic document providing information required by the authorities of a Member State relating to the crew's effects. It shall not be required on departure.

4. IMO FAL form 5, crew list

The crew list shall be the basic document providing the authorities of a Member State with the information relating to the number and composition of the crew on the arrival and departure of a ship. Where the authorities require information about the crew of a ship on its departure, a copy of the crew list, presented on arrival, shall be accepted on departure if signed again and endorsed to indicate any change in the number or composition of the crew or to indicate that no such change has occurred.

5. IMO FAL form 6, passenger list

² As the crew's effects list needs to be signed by each individual crewmember, as it is their responsibility it was not deemed appropriate to define a message dealing with this FAL Form 4. A suggestion has been made for the Customs to use the crew and passenger lists for this form as well.



For ships certified to carry 12 passengers or fewer, the passenger list shall be the basic document providing the authorities of a Member State with information relating to passengers on the arrival and departure of a ship.

2.8.3 Acceptance of forms

Member States shall accept that the reporting formalities referred above are satisfied when the informationsubmitted is in accordance with:

- o the respective specifications set out in Annex I, Parts B and C of this Directive,
- o the corresponding model forms set out in Annex II of this Directive with their categories of data.

2.9 Directive 98/41/EC

COUNCIL DIRECTIVE 98/41/EC of 18 June 1998 is dealing with the the registration of persons sailing on board passenger ships operating to or from ports of the Member States of the Community.

The directive 98/41/EC has been already implemented in CIMIS, so there is no need to trace data related to this directive.

2.9.1 Purpose

The purpose of this Directive shall be to enhance the safety and possibilities of rescue of passengers and crew on board passenger ships operating to or from ports in Member States of the Community and to ensure that search and rescue and the aftermath of any accident which may occur can be dealt with more effectively.

2.9.2 Scope

This Directive shall apply to passenger ships with the exception of:

- o ships of war and troop ships,
- o pleasure yachts unless they are or will be crewed and carry more than twelve (12) passengers for commercial purposes.

2.9.3 Regulation

The following regulations shall be considered:

- o All persons on board any passenger ship which departs from a port located in a Member State shall be counted before that passenger ship departs.



- o Before the passenger ship departs the number of persons on board shall be communicated to the master of the passenger ship and to the company's passenger registrar or to a shore-based company system that performs the same function.

The following information shall be recorded regarding every passenger ship that departs from a port located in a Member State to undertake a voyage of more than twenty miles from the point of departure:

- the family names of the persons on board,
- their forenames or initials,
- their sex,
- an indication of the category of age (adult, child or infant) to which each person belongs, or the age, or the year of birth,
- when volunteered by a passenger, information concerning the need for special care or assistance in emergency situations.

That information shall be collected before departure and communicated not later than thirty minutes after the passenger ship's departure to the company's passenger registrar or to a shore-based company system that performs the same function.

The regulations of

2.10 SafeSeaNet

2.10.1 Introduction

SafeSeaNet is a European Platform for Maritime Data Exchange between Member States' maritime authorities, a network/Internet solution based on the concept of a distributed database.

Prevention of accidents at sea and marine pollution is an essential component of the European Union's transport policy. Since 1993, the Commission has initiated over 15 proposed Directives or Regulations concerning passenger vessels' safety, prevention of pollution, port state control, requirements for seafarers, etc. Their implementation includes the collection and dissemination of maritime data which SAFESEANET supports.

SAFESEANET's main objective is to aid the collection, dissemination and harmonised exchange of maritime data. The network assists communication between authorities at local/regional level and central authorities thus contributing to prevent accidents at sea and, by extension, marine pollution, and that the implementation of EU maritime safety legislation will be made more efficient.



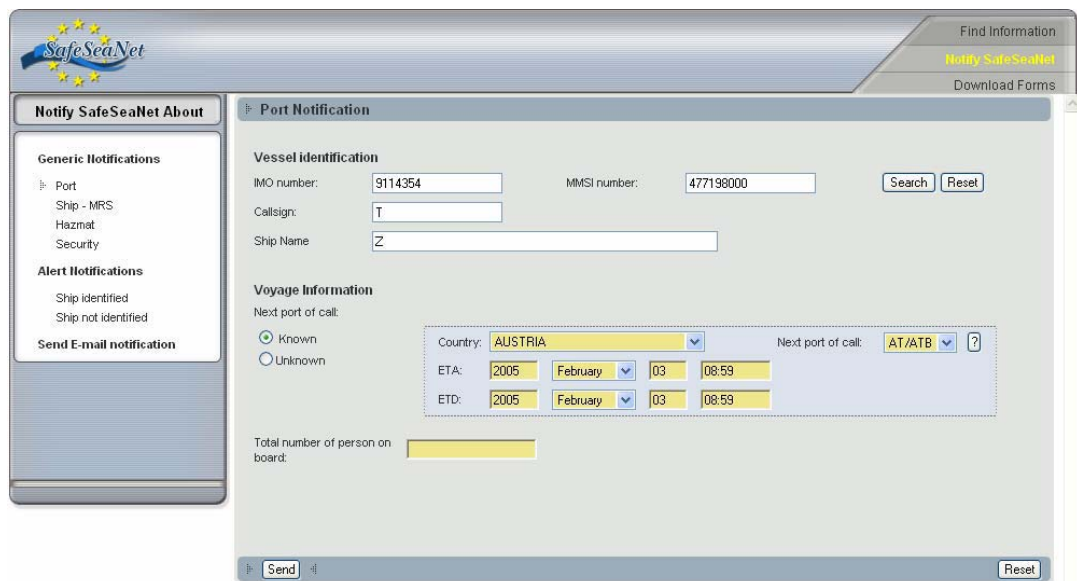
The SAFESEANET network involves many maritime authorities across Europe, each with their own IT infrastructure and objectives. This invariably leads to varying data formats distributed across different systems throughout Europe.

Consequently SAFESEANET has implemented a Central Index System that stores only references to the data locations and not the actual data itself. It functions as a central hub for all communication between data requesters and data providers - somewhat like a telephone switchboard. The Central Index needs to know what information each data provided holds. Data providers connected within the SAFESEANET network send information by means of a notification mechanism. The data provider, upon receiving queries from the data requester routed through the Central Index, retrieves the data from their local database. In this way the Central Index acts as the sole point of contact.

SAFESEANET has developed a Community vessel traffic monitoring and information system according to Directive 2002/59/EC. In addition, it incorporates data exchange requirements from other EU Directives such as those relating to:

- Port reception facilities for ship waste
- Port state control inspections in ports of the European Union.

SAFESEANET covers EU Member States plus Iceland and Norway and involve a number of different authorities per country, both at local and central level. The system uses new IT technologies, but is flexible enough to cope with possible future technological developments as well as new categories of users.



The screenshot shows the 'Port Notification' form in the SafeSeaNet system. The form is divided into several sections:

- Generic Notifications:** Includes links for Port, Ship - MRS, Hazmat, and Security.
- Alert Notifications:** Includes links for Ship identified and Ship not identified.
- Send E-mail notification:** A button to send an email notification.
- Vessel identification:** Fields for IMO number (9114354), MMSI number (477198000), Callsign (T), and Ship Name (Z). Search and Reset buttons are present.
- Voyage Information:** Includes a 'Next port of call' section with radio buttons for 'Known' (selected) and 'Unknown'. Below this are dropdowns for Country (AUSTRIA) and Next port of call (AT/ATB). ETA and ETD fields are also present, both showing 2005 February 03 08:59.
- Total number of person on board:** A text input field.
- Buttons:** Send and Reset buttons at the bottom.



2.10.2 Benefits

Here is a list of possible benefits:

Public Administrations: Through the use of SAFESEANET, and its linked legislation, maritime authorities are able to improve controls of vessels in ports and produce statistics for the European Maritime Safety Agency (EMSA), Member States and the European Commission. In addition, the once-only data collection process and a 'one-stop shop' for data provision simplify procedures and, consequently, increase the overall competitiveness of European ports by minimizing their administrative overheads.

Navigation survey services: This group is set to benefit by being able to increase efficiency of port logistics such as accurate Expected Times of Arrival, waste handling etc.

Search and rescue services: This group can better react in case of threat to maritime safety and the environment.

Anti-pollution services: These agencies aim to improve emergency responses in case of incidents or pollution at sea.

Others: Information contained in the SAFESEANET system and mandated by the control and safety at sea legislation, is often similar or even identical to information requested by other authorities. This could lead to a broadening of the SAFESEANET scope which could include information of interest to other bodies or administrations such as Customs and Border Police.

2.10.3 IDA (BC)

The information on SAFESEANET is constantly available, reliable and confidential. IDA(BC) ensures that access to the Central Index is restricted and secure yet available 24/7 on TESTA. Confidentiality is guaranteed by the use of PKI.

IDABC stands for Interoperable Delivery of European eGovernment Services to public Administrations, Business and Citizens. It takes advantage of the opportunities offered by information and communication technologies.

To achieve its objectives, IDABC issues recommendations, develops solutions and provides services that enable national and European administrations to communicate electronically while offering modern public services to businesses and citizens in Europe.

The programme also provides financing to projects addressing European policy requirements, thus improving cooperation between administrations across Europe. National public sector policy-makers are represented in the IDABC programme's management committee and in many expert groups. This makes of the programme a unique forum for the coordination of national Government policies.



2.10.4 SafeSeaNet Interface Control Document (SSN ICD)

The purpose of the SafeSeaNet Interface Control Document (SSN ICD) is to describe the system in terms of the message scenarios, the message functions and relationships between the messages. This document details the message timing, performance, as well as the data interchange protocol and parameters. It specifies the data content of the required message functions and describes those messages.

Annex III of the Directive 2002/59/EC requires the Commission in consultation with Member States, to develop and maintain the SSN ICD .

The SSN ICD document (Reference – ssn_icd:c1_rev0) has the following structure :

- o Tables of contents, list of tables, figures and acronyms, preamble;
- o Chapter 1 provides an introduction to the SSN ICD and includes information on the documents itself and its amendments. It also includes a list of reference documents for SSN;
- o Chapter 2 provides a description of the operational concept, including preliminary information on its architecture, distribution principles, and security requirements;
- o Chapter 3 provides information on SafeSeaNet users;
- o Chapter 4 provides information on Data Providers and Data Requesters;
- o Chapter 5 provides information on types of messages and their procedure;
- o Chapter 6 provides information on the test of the system and changes to its status;
- o Chapter 7 provides a detailed technical specification of the system;
- o The annexes present a paper version of the messages or message description and a SafeSeaNet Report on System Status, Activity and Performance.
- o Chapter 8 explains the use and responsibilities for UN LOCODEs.

2.10.5 SafeSeaNet reference Documents

Main documentes related to SafeSeaNet are the following:

- | | |
|---|-------|
| • SafeSeaNet User manual | V1.8 |
| • SafeSeaNet XML Messaging Reference Guide | V1.60 |
| • SafeSeaNet Network & Security Reference Guide | V1.14 |
| • Procedures and Guidelines for the registration of new web server certificates | V1.0 |
| • SafeSeaNet Test Plan | V1.21 |
| • Change Management Plan | V1.0 |
| • Rules and procedures of the SafeSeaNet Group | V1.0 |



Document can be upgraded by EMSA. Upgrade are available on EMSA web site.

2.10.6 SafeSeaNet Architecture

The core of the SafeSeaNet architecture consists of the SafeSeaNet XML Messaging System. It acts as a secure and reliable “yellow pages” index system in a “hub and spoke” network (including authentication, validation, data transformation, logging) for sending requests to and receive notifications and responses from users identified as *Data Providers* and *Data Requesters*.

Detailed factual information is stored at Member State level. Whenever the information changes (information added, updated, removed) the local competent authority (normally via the NCA), sends a notification to the EIS as a consequence of these (changed) notifications and the EIS is up-dated with the location of the information.

The SafeSeaNet System relies on a distributed architecture made up of three levels;

- Local Competent Authorities (LCA)
- National Competent Authorities (NCA)
- European Index Server (EIS)

The LCA is the end user that may range from a port authority to a coastal station. It is the recipient of the SSN messages and feeds the SafeSeaNet system with those messages. It may also request information from the system.

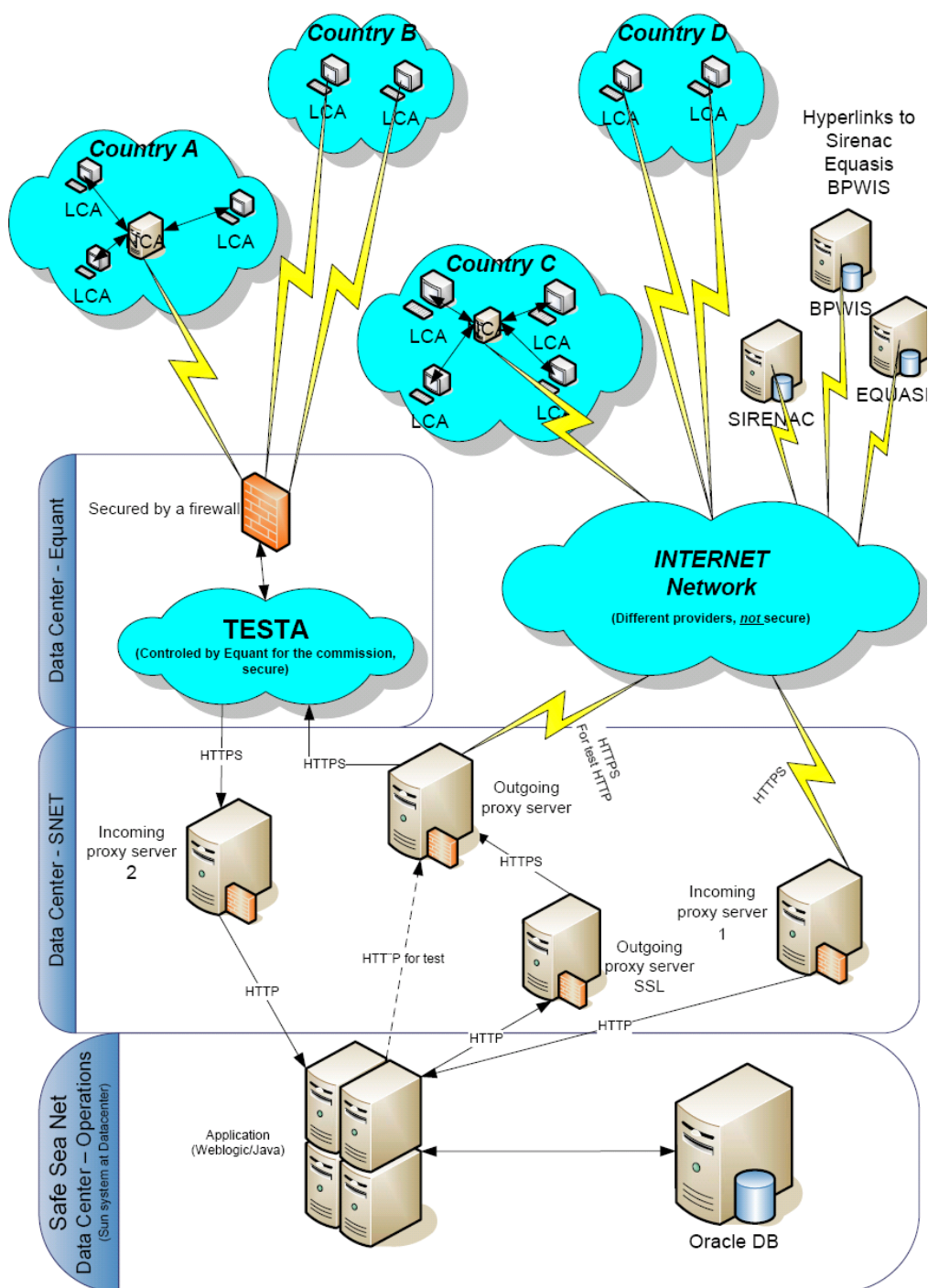
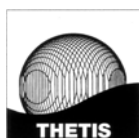
An NCA assumes on behalf of each country, the responsibility for SafeSeaNet management. It is in charge of verifying and maintaining the national network and the procedures for complying with the requirements as described within the ICD. In cases where there is a MPOC solution, LCAs acting as a point of contact are responsible for verifying and maintaining their connection to SSN and for procedures complying with the requirements as described within the ICD.

The EIS is able to locate and retrieve information from one Member State in response to a query made by another Member State.

SafeSeaNet provides two different interfaces to enable Data Providers to exchange messages with the SafeSeaNet system:

- the default browser-based web interface; and
- the XML message-based interface.

The general architecture is presented in figure below.



2.10.7 SSN Data Exchange and Physical Flow

In accordance with the Directive 2002/59/EC ships shall report to the competent authorities of the Member States certain information. Member States shall notify to the EIS in a specified time the following reporting:



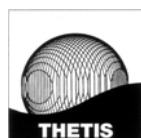
- o port notification
- o Hazmat Notifications
- o Ship Notifications (AIS and MRS)
- o Alert Notifications (Messages emitted by their operational services following events at sea - Search and Rescue report, Pollution report, and Waste notification, Lost/Found container etc.),

according to the following forms.

ANNEX I - PORT NOTIFICATION INFORMATION

Vessel identification
IMO Number:
Ship Name:
Call Sign:
MMSI Number:

Voyage Information
Next port of call:
Estimated Time of Arrival:
ETD from next port of call:
Total number of persons on board:



ANNEX III - HAZMAT INFORMATION

Vessel identification

IMO Number:

MMSI Number:

Call Sign:

Ship Name:

Voyage Information

Next port of call:

Estimated Time of Arrival:

ETD from current port:

Total number of persons on board:

INF ship class:

Cargo Information

DG/PG no:

Technical Name of DG/PG:

UN number of DG/PG:

IMO hazard class (IMDG-IBC-IGC codes):

Gross weight:() Kilo / () Metric tonne

Net weight:() Kilo / () Metric tonne

Location no of goods: (if not in containers):

Location no of container: (if dangerous goods in container)

Cargo transport unit ID:

Container location:

Address from which detailed information on the cargo may be obtained:

.....
.....



ANNEX II - SHIP (MRS) INFORMATION

Vessel identification
IMO Number:
MMSI Number:
Call Sign:
Ship Name:

Voyage Information
Next port of call:
Estimated Time of Arrival:
Total number of persons on board:
Reporting date and time:
Course over ground (COG):
Speed over ground (SOG):
Navigational Status:
Characteristics and estimated quantity of bunker fuel:
Ship position:
Latitude: Longitude:

Cargo Information
Type of cargo:
DG on board (Y/N):
If DG, IMO class and quantity:
Address from which detailed information on the cargo may be obtained:
.....

The forms and detailed data are available on reference document **ssn_icd_v1_rev0**.

When an LCA/NCA receives the above information, it informs the EIS about it using a “notification” message. The system will indicate that the LCA/NCA that provided the data, (identified as the data provider) has certain type of information available on that ship.

When the NCA (or in the case of a MPOC solution, the appropriate LCA) of another Member State requests the display of more detailed information, the following process occurs:

- o When using the XML interface:
 - The LCA (acting as a Data Requester) sends a “request” message to its NCA, the NCA then forwards it to the EIS;
 - In the case of a port notification, the EIS sends information back to the requester;

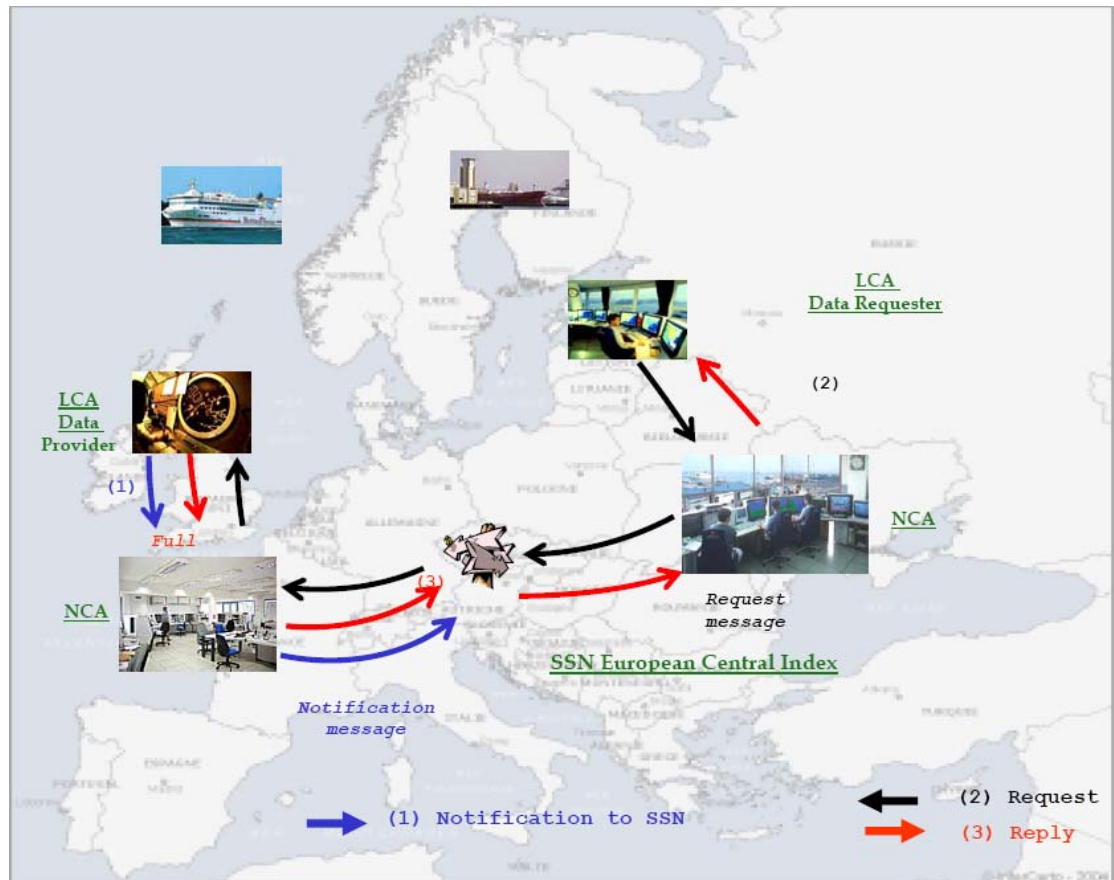


- For other notifications, the EIS forwards the request to the NCA of the Member State where the requested information is located, which, in turn, forwards it to the end user that owns the information;
 - The LCA (Data Provider) that owns the information then answers with the information that is transmitted back to EIS that forwards it to the Data Requester. The information is processed by the application of the Data Requester.
- o When using Web interface:
- The LCA (identified as Data Requester) sends a “request” message to the EIS;
 - The EIS forwards the request to the NCA of the Member State where the requested information is located, which, in turn, forwards it to the end user that owns the information;
 - The LCA (Data Provider) that owns the information then answers with the information that is transmitted back to the data requester. The information is processed by the EIS.

In cases where there is a MPOC solution, LCAs acting a point of contact sends a “request” message directly to the EIS, and the response is directly forwarded to the LCA by the EIS.

Member States may decide to store data on NCA server, and then NCA may answer the requests without involving the respective LCA. Alternatively, data may be stored in the servers of the LCAs or there may be combined data storage model.

Bellow is a simplified illustration of the distribution process in SafeSeaNet according with the flow of information exchanged between shore to shore services.



2.10.8 SSN Security Requirement

Due to the sensitivity of the data and with the object of maintaining data integrity, the system is protected by implementation of several levels of security. The security measures are based on four major services:

- *Authorisation*

It ensures that data access is granted only to those who are authorised to receive the data. EMSA manages the authorisation process.

- *Authentication*

Access is granted on the documented identity of the requester.

- *Confidentiality*

It ensures that information is not disclosed to unauthorised people. Confidentiality is achieved by the use of Secure Socket Layer (SSL) and 2-way SSL between the Central Server and the NCAs (HTTP-S protocol). SafeSeaNet use the IDA Public Key Infrastructure (PKI) to improve the security of each transaction..



2.10.9 TESTA network

The Trans-European Service for Telematics between Administrations is a private Wide Area Network accessible to Members States and European Institutions. TESTA can be seen as a secure network, separate from the Internet.

Interconnection between the NCA and the EIS can be achieved in three alternative ways:

- if the National Network exists and is already connected to the TESTA network, this is the recommended solution;
- through a permanent connection to a TESTA EuroGate with a leased line; or
- through the Internet.

It is assumed that the connection of LCAs to the NCA is made through the Internet or via a local leased line.

At national level, it is recommended for a country to implement a dedicated network linking the LCAs to a unique nodal point acting as SPOC.

A detailed description is available within the SafeSeaNet Network and Security guide.

TESTA is the European Community's own private, IP-based network. TESTA offers a telecommunications interconnection platform that responds to the growing need for secure information exchange between European public administrations. It is a European IP network, similar to the Internet in its universal reach, but dedicated to inter-administrative requirements and providing guaranteed performance levels.

TESTA aims to provide telecommunication services for data exchanges required for the implementation of European policy.

TESTA is a network of networks, composed of the EuroDomain backbone and Local Domain networks. Local Domains can be national or regional networks, European Institutions or Agencies. The EuroDomain is a European backbone network for administrative data exchanges acting as a network communication platform between local administrations. This allows any site connected to EuroDomain to communicate with any other linked site. The EuroDomain is isolated from the public Internet. This guarantees restricted access as only administrations may access the EuroDomain. Security is also enhanced by the implementation of IPSEC technology to prevent eavesdropping. The TESTA domain-based approach allows national administrations to connect to European information sources while maintaining national autonomy in network implementation.

The core service of TESTA is to facilitate communication between local domains. Almost all EU Institutions, EU agencies and Member States are connected to TESTA. Initiatives to connect other administrations are ongoing, including those of Candidate Countries.

TESTA is an IDABC Infrastructure service to provide Trans-European Services for Telematics between Administrations. Interested parties should notify the IDABC Unit of their interest, indicating which sites require access to TESTA, with whom they need to communicate, and the type of services requested. Information about the legal basis of their data exchange should



also be provided so that the IDABC Unit can check eligibility. IDABC will consult national network coordinators on implementation options. Unless reasonable justification is provided, preference will be given to establishing connections through national administrative networks. In exceptional circumstances, direct links to TESTA can be made available, but in this case some costs will have to be covered by the local administration or the sector.

1.4.7. Operational System Requirements

SSN is organized in order to ensure:

- Speed (timely exchange of messages);
- Reliability (distribution of message and System information in the event of failure of communication link or other);
- Accuracy (correctness of information delivered);
- Efficiency (economic and smooth flow of message);
- Accountability (tracking of messages in the system);
- Security (confidentiality and authenticity).

To achieve these objectives, the SafeSeaNet system comply with certain standards. The standards contained in this chapter provide a framework for the functions of the NCA and the EIS including the transmission of message, performance levels and operating procedures.

Participants that meet specified standards of performance are commissioned to operate within the SafeSeaNet system.

2.10.10 General Functions of an NCA

The basic operational objective of SafeSeaNet system is to be an electronic network between the maritime administrations. Each Member State shall be responsible for establishing procedures for the distribution of messages, system information within its own national area.

A NCA shall:

- o notify the SafeSeaNet EIS;
- o respond to direct requests for information;
- o be capable of counting for all messages, received or transferred through its system;
- o monitor the performance of the communication system within its service area to determine degradation of its operational capability;



- o monitor the LCA communication link. The LCA's communication link may be actively monitored (i.e. sending periodic test messages), or passively monitored (e.g. monitoring the time delay between the forecast message at the LCA and the reception of the message at the NCA, or the LCA/NCA message transfer time);
- o monitor its own operation to ensure availability and to avoid distributing unreliable or corrupted messages; and
- o immediately notify the SafeSeaNet system if it is unable to receive, process, and transmit data according to ICD specifications.

Any detected defects that might affect the SafeSeaNet system shall immediately be reported in accordance with ICD, and backup procedures shall be implemented, as appropriate.

2.10.11 Availability of the SSN system

The SafeSeaNet core System is maintained by the system management in operation twenty four hours a day, seven days a week and personnel is available to satisfy the operational and performance requirements documented within the ICD.

Once a Member State's national system has been declared operational, the notified NCA shall be maintained in operation twenty-four hours a day, seven days a week and personnel shall be made available to satisfy the operational and performance requirements documented within the ICD.

Communication availability is the availability of the connection between the NCA and the EIS.

System availability is the availability of the NCA hardware and software. Availability shall be maintained at 99% over a period of one year, with the maximum permissible period of interruption being 12 hours.

2.10.12 Information Archival and Retrieval

National systems connected to SafeSeaNet shall be able to archive and retrieve all messages and any messages transmitted or received during a defined time frame. National systems connected to SafeSeaNet shall then be capable of again transmitting appropriate information to the user that issued the request.

An NCA shall be able to retrieve message using any of the following parameters:

- a) Message Unique Identifier as specified within the XML Messaging Reference guide,
- b) IMO number, MMSI, call sign,
- c) Geographical area,
- d) Locode.

An NCA may implement other retrieval modes as determined by national needs.



The SafeSeaNet EIS shall be able to retrieve a message using any of the following parameters:

- a) Message Unique Identifier as specified within the XML Messaging Reference guide;
- b) Starting time/ending time of the search;
- c) Type of message (Notification, Request, etc.);
- d) Message source or destination;
- e) IMO number, MMSI, call sign; and
- f) Locode.

2.10.13 Communication Links

The SafeSeaNet EIS and NCAs shall implement procedures to ensure that the communication network specifications within the ICD are met.

The national systems connected to SafeSeaNet shall be supported by data communication links and networks that allow them to transfer notification messages to SafeSeaNet EIS within 1 minute for 99% of the time.

The ratio of messages lost or corrupted in message transfer between NCA/SafeSeaNet EIS shall be less than 0.1%.

Communications networked with the SafeSeaNet EIS shall be available 99% of the time 365 days a year, 24 hours a day.

The national systems connected to SafeSeaNet shall allow for forwarding of retrieved information to the requesting authority within 15 Minutes.

2.10.14 Access to Archived Information

The actual information received will be stored by the NCA for a period of 18 months.

The national systems connected to SafeSeaNet shall archive messages for at least 30 days.

The national systems connected to SafeSeaNet shall respond to requests for archived data and messages from other NCAs within 60 minutes.

The national systems connected to SafeSeaNet shall respond to requests for messages covering the preceding 48-hour period within 30 minutes.

The EIS Server will store information over the same period as defined for the NCA, through a database storing the notification messages during the agreed period.



2.10.15 Amendment to EU directive

2.11 Existing systems

The existing data management system are the following:

- CIMIS - Ministry of Sea, Transport and Infrastructure
 - o Arrivals and Departures of Ships Database (DOB or ADS)
 - o Svjedodžbe (database of all crews matriculations, exams, etc)
 - o Strane Jahte (database of arrival of small -boats/yachts from international water to Croatian territorial water)
 - o Croatian Crew Database
 - o Registry of Croatian Vessels (under development)
 - o Croatian Inspection applications and consulting databases
 - Croatian Inspection Database
 - ParisMOU SIRENAC database consulting - web page (<http://www.parismou.org/ParisMOU/Inspection+Database/Basic+Search/xp/menu.3975/default.aspx>)
 - Globallast IMO Ballast water database consulting - <http://globallast.imo.org/index.asp?page=bwdirectories.htm&menu=tr ue>
 - P&I database consulting - <http://www.american-club.com/go.cfm/vessels> (or similar)
- AIS Database"
- VTMIS / AIS databases the Port Management and Information System (PMIS) in three major Croatian ports (Rijeka, Ploče, Split)
 - o VTMIS/PMIS in PA Rijeka (planned 6/08)
 - o PCS in PA Rijeka (under specification, planned in production 2010)
 - o VTMIS/PMIS in Port of Ploče (under specification)
 - o PCS in Port of Ploče (under specification, containing a VTS, planned in production 2010)
 - o PMIS Split, there is a limited PMIS (with arrival and departure information), and a AIS system
 - o ERP systems in all main ports

CIMIS is the general name for all application system used and available by MSTI and HMO.



Analysis of the CIMIS system especially the ADS(DOB) subsystem is detailed in the following chapters.

2.12 EU project results on data management system

Figures in the EU Green Paper state that 90% of the EU's external trade and over 40% of its internal trade is transported by sea, with Europe having 40% of the world fleet. This emphasizes the importance of the continued efficiency of ports, the effective management of vessel traffic in coastal waters and the facilitation of trade through cooperation and coherence.

Further, the EC is promoting the development of E-Maritime, a meeting of services and systems, in response to the need for a more transparent and harmonized approach within the maritime sector in general in order to secure its position as a leading transport mode

Main previous and ongoing project related to data management system are the following:

- MArNIS project
- Stires project
- The MANATEE project
- Intermodal Portal (IP) projec
- Virtuele Haven
- Trasnpot XML and Electronic Trade Corridors

Here is a summary of these projects.

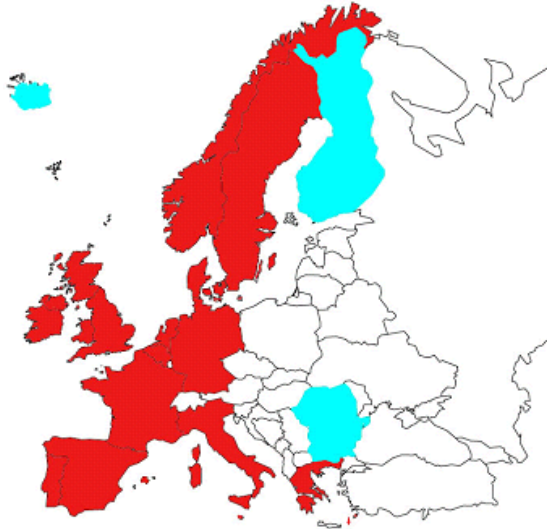
2.12.1 Marnis project

About EU project, the main project is the Marnis project that has the following main aspect:,

- Project type: FP6 - Integrated Project
- Responsible organisation EC: DG TREN
- Project duration: 4 Years
- Starting date: November 2004
- 44 Partners and 12 subcontractors from 13 countries:
 - Ministries of Transport and Port Authorities
 - Branch organisations (Harbour masters, Pilots)
 - Industry & IT companies
 - Universities & Research institutes



- Coordinator: AVV Transport Research Centre of the Ministry of Transport, Public Works and Water Management

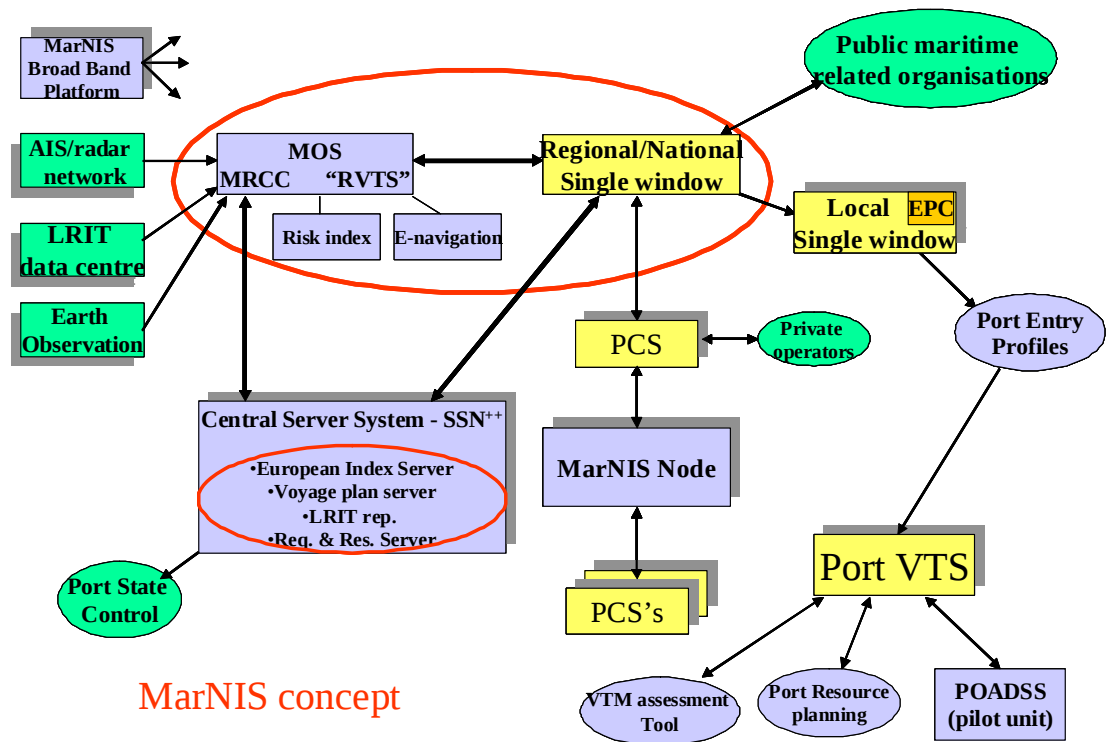


The main objectives are:

- Improvement of safety, efficiency of maritime transport and the protection of the environment;
- Improvement of efficiency and reliability of information flows;
- Develop proposals for administrative, organisational and procedural changes;
- Develop proposals for new legislation.

Improvements at EU levels are related to the following basic elements:

- Maritime Operational Services (MOS), a national authority for improving the new concept designed to provide for routine, enforcement, preventive, and remedial services in the search and rescue area in the form of monitoring and the co-ordination and provision of response services.
- Improvement of SafeSeaNet ++.
- Use of Single Window/Electronic Port Clearance (EPC), for simplification of reporting requirements and the creation of interoperability between different member State systems and sectors provide for coherence, transparency and efficiency.
- MarNIS node concept, for integration of existing Port Community Systems (PCS).
- MarNIS broad band platform, for wireless data transfer in ports.



MOS (Maritime Operational Services) is a new concept designed to provide for routine, enforcement, preventive, and remedial services in the search and rescue area in the form of monitoring and the co-ordination and provision of response services. MOS promotes proactive services to avoid incidents not only developing but also occurring in the first place.

Functions such as SAR, VTS, enforcement, oil pollution response, risk determination, use of places of refuge through the use of temporary Maritime Assistance Services (MAS) and sending Emergency Towing Vessels (ETV) are combined in a MOS centre; people responsible for one or more of these tasks can share the same information and equipment and co-operate in performing their tasks.

National service is built on existing services for Search and Rescue and Vessel Traffic Management for the following tasks:

- Reduced Vessel Traffic Services
- Oil Pollution Response
- Maritime Assistance Services
- Search and Rescue (SAR)
- Enforcement
- Aids to navigation, Marine marking service
- hydro/meteo services



- Traffic image from :
 - AIS, LRIT, radar and other sensors
- Dynamic Maritime Risk Areas
 - MarNIS RISK indices for High Risk Vessels
 - Weather dependent

SafeSeaNet nowadays is based on a European Index Server; European Platform for Maritime Data Exchange between Member States' maritime authorities based on the concept of a distributed databases, with collection, dissemination and harmonised exchange of maritime data and for Prevention of accidents at sea and marine pollution.

SafeSeaNet towards 2012 shall be based on:

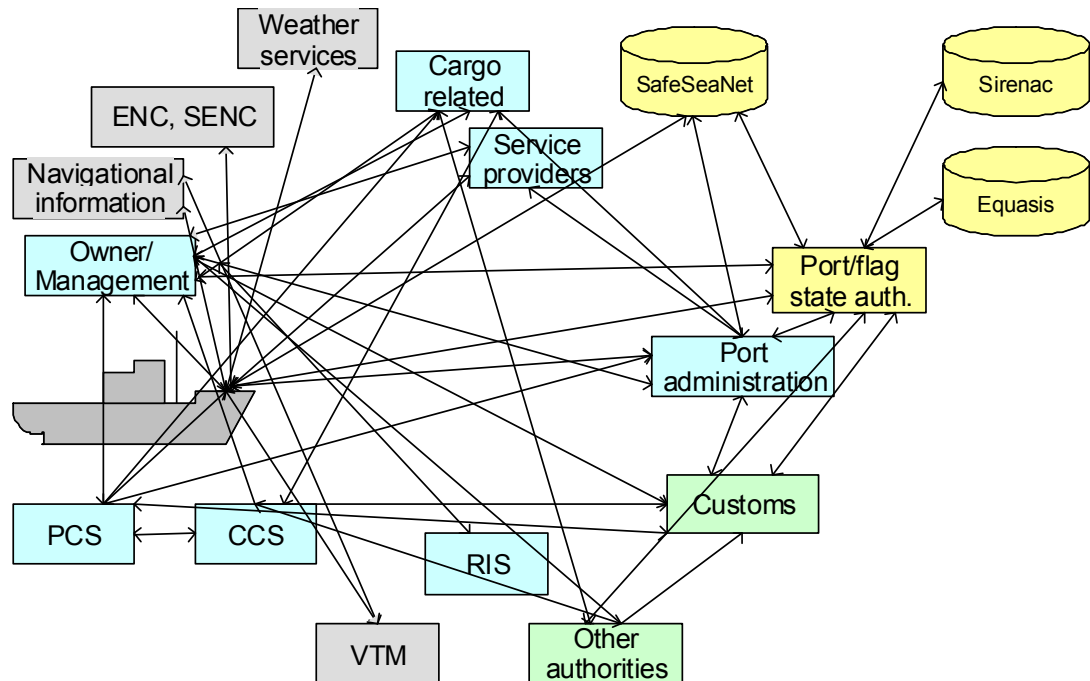
- Voyage plan server
- LRIT repository
- Request and response server

The MarNIS Node allows for communication between different PCS in different ports as well as “feeding” the PSW with the required information. Port Community System or a PCS is a community system which based on an integrated series of procedures, rules, standards and ICT solutions supports the automatic exchange of data and documents related to the authorities' clearance of ships and cargo upon arrival, stay and departure of vessels. (*Business to Business* and sometimes *Business to Government*).

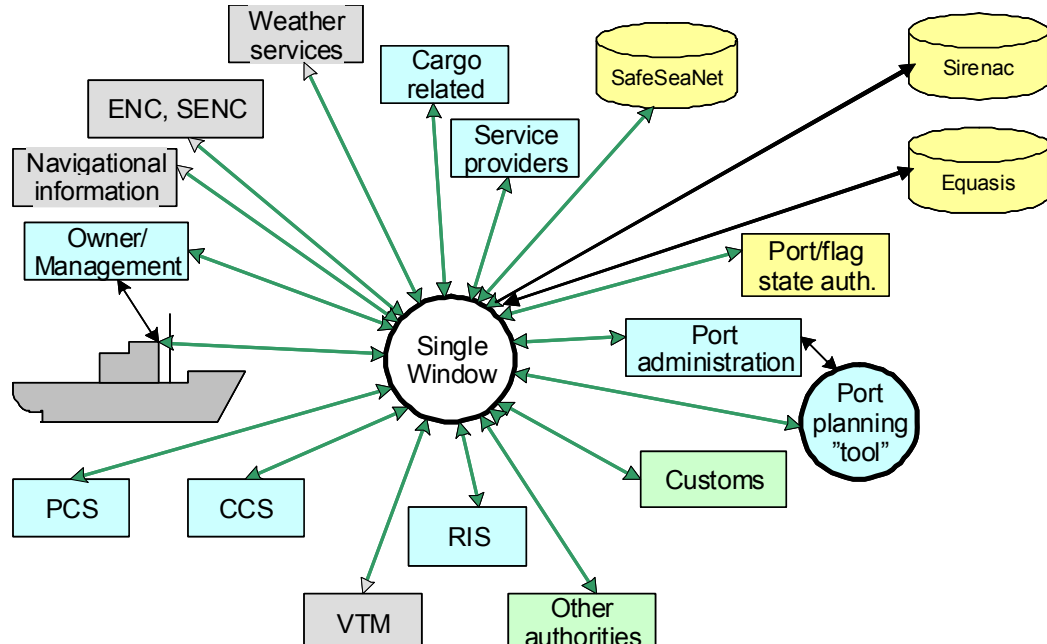
The considerable investment that ports and their communities have made in systems aimed at the facilitation of information exchange are not ignored but embraced in the overall MarNIS concept.

At the heart of the MarNIS concept is the information and information exchange structure, relevant to data management design and related to the implementation of National single windows and Port single windows, Based on the single reporting from the Master and/or agent, for simplification of reporting requirements and the creation of interoperability between different member State systems and sectors provide for coherence, transparency and efficiency.

Here is the today's information flow, where same information is sent to several other users.



Under current Directives and various regulations and rules the Master is faced with a tremendous reporting burden, often having to send the same information numerous times to numerous different authorities.



In the MarNIS concept the Master is required to report once through the port notification to the port of destination. All relevant authorities and services are then provided the information required by them through the National Single Window.



Authorities requiring information from maritime traffic and transport are numerous and fall under the traditional maritime authorities, such as port, coastal, search and rescue and pollution, or other authorities such as security, customs, immigration, health and border control.

Each currently makes use of their own means for maritime information management and would benefit from increased access to data and interoperability.

The MarNIS concept provides for a harmonised and coherent system for the exchange of all relevant information.

As a goal, it is proposed that each member State shall maintain a National Single Window, receiving notifications from ships intending to enter a port in its waters and ensuring the directed distribution of derived messages to the port, other authorities (such as customs, immigration etc.) as well as handling requests for information or clarification. The figure shows the ideal situation to be achieved.

The NSW is the contact point for SSN++ and ensures that the appropriate information is in the first place made available within the index server and secondly available to requesting authorities from other member States.

Introduction of EPC (Electronic Port Clearance): is the concept for vessels visiting a port to deal with all formalities, documentary requirements and procedures associated with the *arrival, stay and departure of ships* engaged on international voyages electronically without the use of paper documents. (Business to Government).

The Port Single Window is the information management system for the port authority and provides for a central collection and distribution of information coming from the port environment and intended for use by either external authorities as additional information to the ship notifications or for internal (local) authorities and maritime services requiring specific information within the port itself.

2.12.2 STIRES project

STIRES - SafeSeaNet Traffic Information Relay and Exchange System was a study contracted by EMSA to develop a methodology and guidelines for enhancement of the SafeSeaNet (SSN) system. This would focus upon exchange of vessel traffic Automatic Identification System (AIS) data based on the current and planned situation in the Member States (MS).

The objective of the study was to enhance the efficiency of vessel traffic and help prevent accidents and incidents at sea. This would be achieved by facilitating the exchange of AIS tracking data and better utilisation of the monitoring potentials provided by combining this data with data from SSN and other systems.



Main outcome of the STIRED Study is to indicate the potential alternative technical solutions for complying with the Directive's requirements.

The study is legally based on Article 9 of the Directive 2002/59 which requires MS to implement their shore-based installations for receiving and utilising the AIS information by the end of 2007 and to ensure the relay and exchange of information between the national systems of MS one year thereafter.

Background related information are that:

- The existing SSN has not been designed to provide a real-time traffic image of vessels sailing within specific areas. Information on vessel movements though meeting Directive Article 9 requirements is available only on request, based on queries using specific vessel particulars on the condition that the requester has proper access rights.
- Ship Notification messages presently comprise the majority of SSN information flows (nearly 90% of the total number of SSN messages).

During the study has been considered that STIRES shall be integrated into the existing SSN, and shall be compatible with existing national and regional AIS networks.

The exchange and relay of information between the traffic monitoring infrastructures is already an operational reality in the Baltic Sea region where MS and Russia have implemented the HELCOM AIS system. A similar system is under development for the North Sea (funded by the Interreg III programme) and discussions are in progress between the Mediterranean MS for developing a similar system within that region. The study considered the regional initiatives and examined possible ways on how these regional developments and initiatives can be further expanded and integrated under STIRES. The regional servers should be integrated into STIRES without changing the message content, data formats and update intervals that are already defined at regional level.

To enable the "exchange and relay" of information as required by Article 9 of the Directive 2002/59, one technical solution is to create an EU server that would collect "shore-based installations' information" and this would be relayed in accordance with the needs of the system requirements of the Member States. One benefit from this is that this data can be correlated with other data already stored at EU level. The information will be exchanged in *real time*¹ mode and distributed to the authorised maritime Administrations of the MS in accordance with a predefined table of "access rights".

Though logically the information that would be relayed to and stored at the EU server should be reduced to the necessary minimum the practical benefits from holding that data and the limitations of existing Member States' systems for process and display of information should be taken into account. Considering that the information in the EU server is based on the existing short range traffic monitoring infrastructures of the MS (AIS), the term SRIT (Short Range Identification and Tracking) is the proposed acronym in this document, striking an analogy with LRIT (Long Range Identification and Tracking), the detailed implementation of which is currently being discussed. This proposal will however need to be reconsidered in view of the potential for correlation between satellite based LRIT data and AIS-based LRIT data.

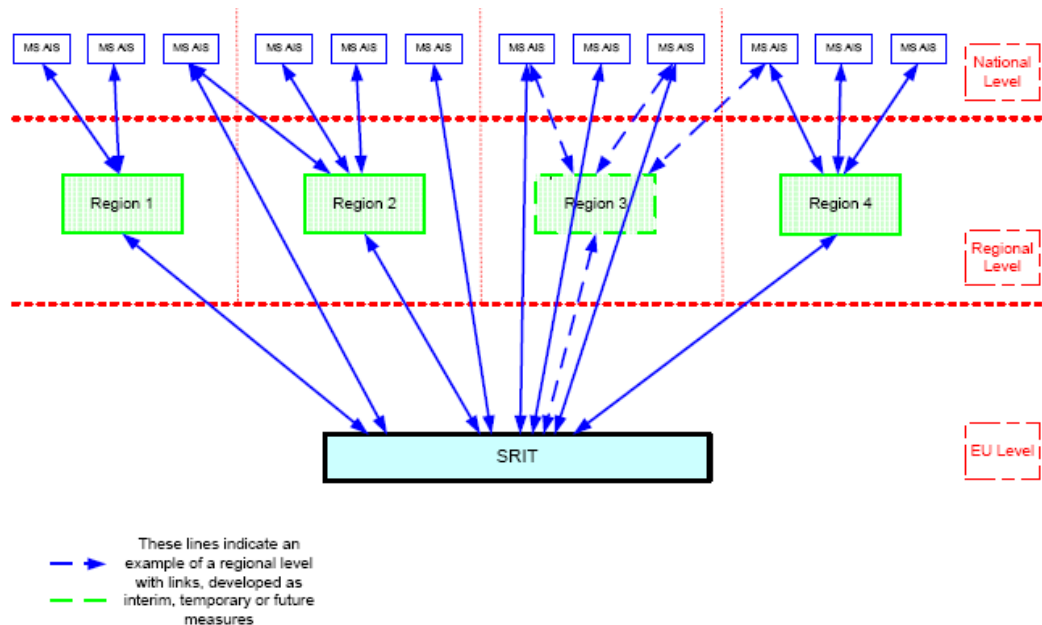


The study suggests that each MS, depending on its geographic characteristics, should be given flexibility to participate in more than one regional server or by being given the option of connected only through the EU server.

The AIS data formats at regional and EU level should follow the existing IEC formats (IEC 61993-2 and 61162-1 sentences) and there would be no need to convert them into another format for exchange purposes within STIRES module. The messages to be transferred from the MS to the regional server will be static, dynamic and voyage related data, covering messages 1, 2, 3 and 5 (as defined in the ITU-R Recommendation M.1371-1). Additional messages may also exchange based on regional agreements. In order to utilise as far as possible the existing presentation systems of the Member States designed to perform in cooperation with regional servers, the same series of AIS messages should be relayed from the regional to the EU server. AIS information shall be transferred from the MS national systems to the regional server with an update rate of six minutes.

For normal operational use, AIS information actually stored at the EU server could be minimised to ship name, IMO number, position and time stamp with an update rate of information flows from the regional to the EU server (at least in the initial stages of development) as low as one hour. However, newly emerging operational requirements, such as future international agreement on LRIT/AIS data compatibility, traffic statistics and matching of the data with satellite images, may require the information flows to the EU server to be at least maintained down to 15 minutes. Similar message and information flow rates may also be maintained to supply other services from the EU level or to be used for storage purposes, but in the latter case, only if such levels can be kept well-suited with demand for rapid access to the stored data.

The following diagram shows the general layout of proposed architecture of the STIRES module:



The basis for the “information” part of the concept is already present SSN. The concept of “monitoring” should be realised to assist MS in providing the vessel traffic image.

In order to facilitate exchange of real-time vessel traffic information between coastal stations in different Member States and make it feasible for users in different geographical areas to share the same traffic image STIRES, a SSN module, has been proposed.

Hence, STIRES should be an integrated part of the future or enhanced SSN and manage the exchange of real-time vessel traffic data between Member States.

2.12.3 Intermodal Portal – IP

This project developed XML variants for several EDIFACT messages. “Intermodal Portal (IP), which started in January 2000, was planned to end in December 2001, and which had the aim of improving the flow of information between vessels, harbours/terminals and the transfer to land transport. The XML messages were developed in cooperation with the PHAROS project.

After 2001, little seems to have happened in the project and it is not clear what long-range effects the project has had.



2.12.4 MANATEE - MSML

The MANATEE project developed among other things the “Maritime Safety Markup Language” MSML. MSML has later been accepted as a public available specification by ISO TC8.

The MSML is a good piece of work, but has never been implemented. Thus, it must compete with other standards for a place in EPC applications. More information about MANATEE can be found at <http://www.manatee.cc/>.

2.12.5 Virtuele Haven

This Dutch project has provided an overview of various electronic port clearance initiatives in Europe and elsewhere. The report is a bit out of date, but still contains useful information [NLVH].

2.12.6 Transport XML and ETC

Norstella in Norway, together with the short sea shipping network has developed XML messages for management of transport operations. The short sea-shipping network has also just completed a project on “Electronic Trade Corridors” (ETC) where use of electronic clearance is an issue. Information about both results can be found at <http://www.shortseashipping.no/DB/Documents.aspx>.

2.12.7 Main conclusions

It is included the introduction of EPC (Electronic Port Clearance): is the concept for vessels visiting a port to deal with all formalities, documentary requirements and procedures associated with the *arrival, stay and departure of ships* engaged on international voyages electronically without the use of paper documents. (Business to Government).

Another conclusion is related to the use of electronic document standard. In many EU ports the current electronic document standard is EDIFACT, established in many ports, and seems to be stable in its deployment. It is believed that EDIFACT will also be used in the future, particularly for trade related documents. However, for less complicated and future ship reporting, via personal computers EDIFACT may be too cumbersome and other solutions such as XML might be more appealing to the industry.

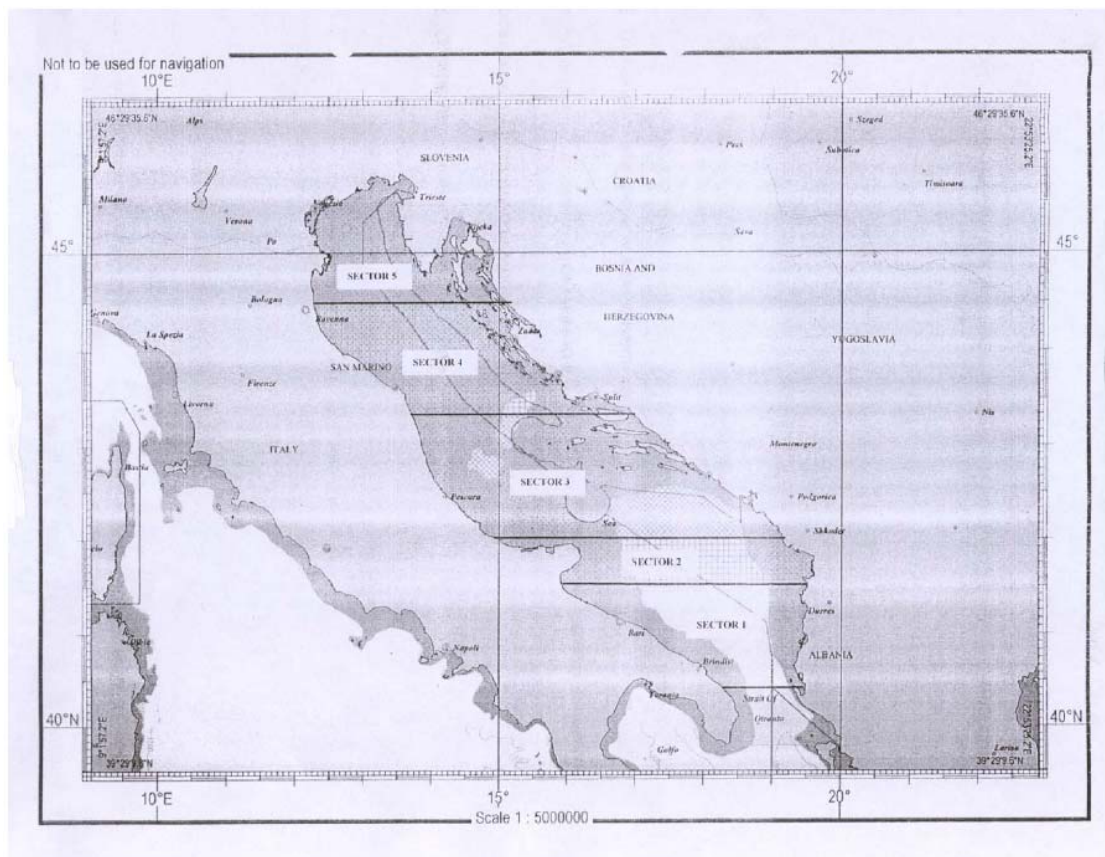


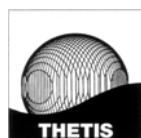
2.13 ADRIREP mandatory reporting system

Adrirep is a Mandatory ship reporting in the Adriatic sea according to IMO SN/Circ.225, 6 Jan 2003. According to this regulation, Member Governments are requested to bring the attached information to the attention of masters of their ships and advise them that they are required to comply with the requirements of the adopted ship reporting systems.

The mandatory ship reporting system "In the Adriatic Sea" has entered into force at 0000 hours UTC on 1 July 2003.

The operational area of the mandatory ship reporting system covers the whole Adriatic Sea, north from the latitude $40^{\circ} 25'.00$ N as shown in the attached chartlet as annex 1: the area is divided into 5 (five) sectors, each of them assigned to a competent authority, operating on a VHF channel as shown in the attached table.





SECTOR	SOUTHERN BORDERLINE	NORTHERN BORDERLINE	COMPETENT AUTHORITY	VHF FREQUENCIES
1	Latitude 40° 25' 00 N	Latitude 41° 30' 00 N	Brindisi Coast Guard (Italy)	Channel 10
2	Latitude 41° 30' 00 N	Latitude 42° 00' 00 N	Bar MRCC (Yugoslavia)	Channel 12
3	Latitude 42° 00' 00 N	Latitude 43° 20' 00 N	Rijeka MRCC (Croatia)	Channel 10
4	Latitude 43° 20' 00 N	Latitude 44° 30' 00 N	Ancona MRSC (Italy)	Channel 10
5	Latitude 44° 30' 00 N	Coastline	Venezia MRSC (Italy)	Channel 10
5	Latitude 44° 30' 00 N	Coastline	Trieste MRSC (Italy)	Channel 10
5	Latitude 44° 30' 00 N	Coastline	Koper MRCC (Slovenia)	Channel 12

The first report of ADRIREP (FR) shall be sent by radio to the competent authorities in accordance with the format below.

	Message identifier:	- ADRIREP
	Type of report	- 01/FR (first report)
A	Ship	- Name, call sign, IMO identification number and flag of the vessel
B	Date/time (UTC)	- A 6 – digit group giving date of month (first two digits), hours and minutes (last 4 digits)
C	Present position	- A 4-digit group giving latitude in degrees and minutes suffixed with “N” or “S” and a five-digit group giving longitude in degrees and minutes suffixed with “E” or “W”
E	Course	- a three digit group giving the course in degrees
F	Speed	- a three digit group giving a speed in Knots
G	Departure	- port of departure
I	Destination and estimated time of arrival	- ETA in UTC expressed as in B above, followed by port of destination
N	Estimated time of arrival at the next check point	- Date/time group expressed by a 6-digit group, as in B above, followed by the parallel of the check point
O	Draught of the vessel	- draught expressed by a four digit group indicating centimetres
P	Cargo information	- the general category of hazardous cargo as defined by the IMDG, IBC, IGC Codes and MARPOL Annex I.
T	Agent	- ship's representative and/or owner available on 24-hour basis
U	Size and type	- type, DWT, GT, and length overall in meters
W	Total number of persons on board	- The total number of crew and other persons on board
X	Miscellaneous	- Any other relevant information



In the last section of the first report, in accordance with provisions of SOLAS and MARPOL Conventions, ships shall also report information on any defect, damage, deficiency or limitations as well as, if necessary, information related to pollution incident or loss of cargo. The possession of this information will enable the operators of the shore-based competent authority to broadcast safety messages to other ships and to ensure more effective tracking of the trajectories of ships concerned.

The position report of ADRIREP (PR) shall be sent by radio to the competent authorities in accordance with the format shown

	Message identifier:	- ADRIREP
	Type of report	- 01/PR (position report) - 02/PR - 03/PR - ER (final report)
A	Ship	- Name, call sign, IMO identification number and flag of the vessel
B	Date/time (UTC)	- A 6 – digit group giving date of month (first two digits), hours and minutes (last 4 digits)
C	Present position	- A 4-digit group giving latitude in degrees and minutes suffixed with “N” or “S” and a five-digit group giving longitude in degrees and minutes suffixed with “E” or “W”
E	Course	- a three digit group giving the course in degrees
F	Speed	- a three digit group giving a speed in Knots
G	Departure	- port of departure
I	Destination and estimated time of arrival	- ETA in UTC expressed as in B above, followed by port of destination
N	Estimated time of arrival at the next check point	- Date/time group expressed by a 6-digit group, as in B above, followed by the parallel of the check point
X	Miscellaneous	- Any other relevant information

About the Times and geographical positions for submitting reports depends on direction (northwards, southwards, crossin), required the participation of all Member states in the Adriatic sea. Information are in principle forwarder to the maritime authority of the port of destination and to other authorities in between.

Ships of the following categories are required to participate in the system:

- o all oil tanker ships of 150 gross tonnage and above;
- o all ships of 300 gross tonnage and above, carrying on board, as cargo, dangerous or polluting goods, in bulk or in packages.

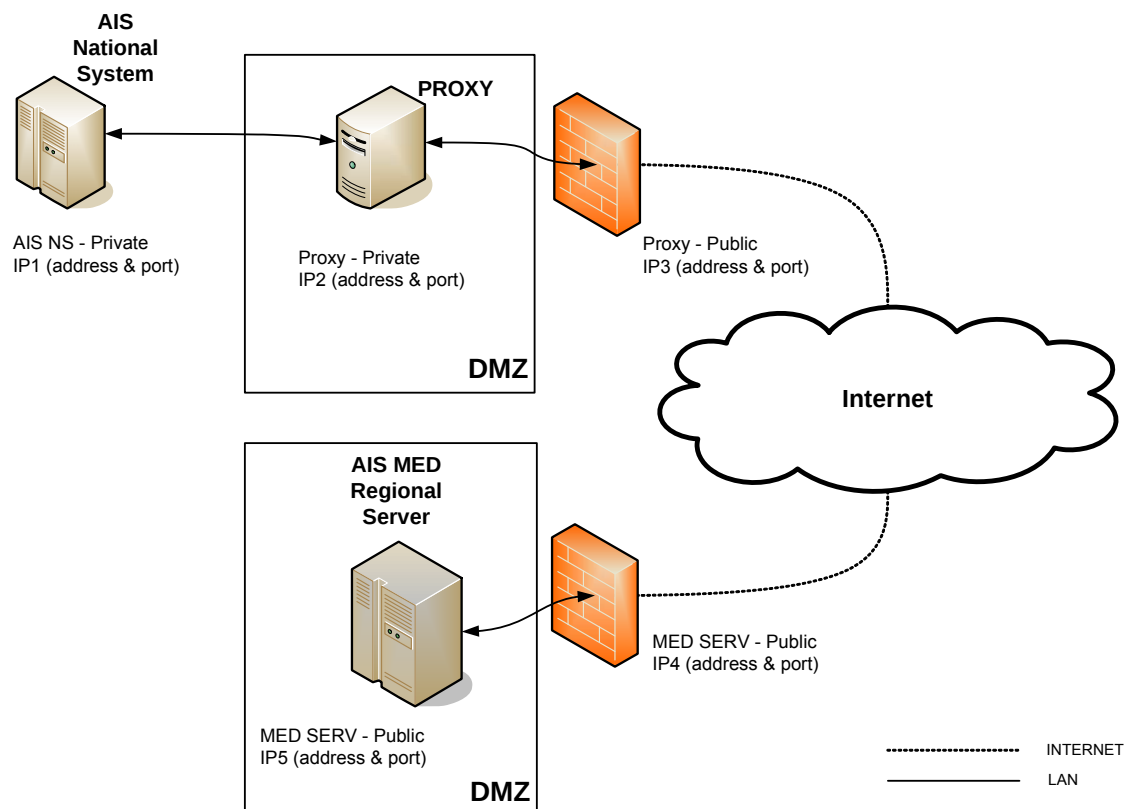


All these information are up to now collected manually and delivered by fax and email to other authorities.

2.14 Real-time regional data exchange

Based on STIRES, the implementation of the common Mediterranean AIS Real time regional data exchange is in progress (final release expected within November 2008). A detailed system description and interconnection are described in the "CVTMIS system design document", where AIS database is integrated.

Figure below presents the system architecture of a typical Member State that connects trough Internet with the Regional Server.



For the implementation of the system and the connection of the national AIS network (NS) to the Regional Mediterranean Server (RMS), located in Italy, it is required the following:

- A national AIS network to collect AIS data to one point of access,
- A Proxy server, as front end with the RMS,
- Ip addresses shall be provided:



- one static IP address (IP1) together with the related port from which all AIS data collected by the national network will be sent to the proxy,
- one static IP address (IP2) together with the related port from which proxy application shall receive/send data to the national server,
- one static IP address (IP3) together with the related port, resident on the public network (internet). By the mean of this address the regional server shall acquire/send the AIS data,
- set up a firewall in order to connect IP2 with IP3, establishing a logical connection between private and public network,
- provide adequate bidirectional bandwidth of at least 256 kbps for the internet connection. This value is based on a 6 min down sampling rate.

Italy will provide one IP address exposed on the public network with adequate bandwidth. Initially the bandwidth will be 3 Mbps (256 Kbps x 12 MS), with a possible future increment in order to guarantee full data rate with all participating countries.

SSL certificate will be installed within the Regional Server. There is no requirement for MS in regard to the certificates. If a two ways SSL solution is chosen, MS will be required to provide their own SSL certificate to enhance the security of the AIS data exchanged between the AIS regional server and the AIS subscriber proxy via internet.

An interface Design Document (IDD) shall be available specifying the configuration at the application level to exchange data between National Server and proxy.

Italy will deliver a CD-Rom containing the National Proxy application software, free of charge. The configuration setup will be performed by MS. The provided CD-Rom will also contain the installation guidance.



3 CIMIS – Integrated Maritime Information System

3.1 Introduction

CIMIS is the general name for all system available in Zagreb.

The main applications available in the CIMIS centre are the following:

- ADS Arrival/Departure application
- Ship DB for foreign yacht, containing information on type of ship and administrative payment information for permission in Croatia
- DB for ship and boat of Croatian Flag (system in testing)
- Inspection results for PSC and flag state control

One of the main application related to data management system is the “Arrival and departure of ships”, here named “ADS” (original name is AOB). The analysis is related to this application.

3.2 Main requirements

Main requirements of ADS application are the following:

- Register arrival and departure prevision of the ship inside the Croatian ports and waters,
- Receive update information of each participant ship,
- Use these information and last update for operational use of HM and MRCC,
- Provide Statistical data.

3.3 Users

The main users of ADS application are the following:

- MRCC central in Rijeka,
- Harbour Master in 8 ports and branch offices,
- Minister of Sea, transport and Infrastructure for statistical data (usually monthly).

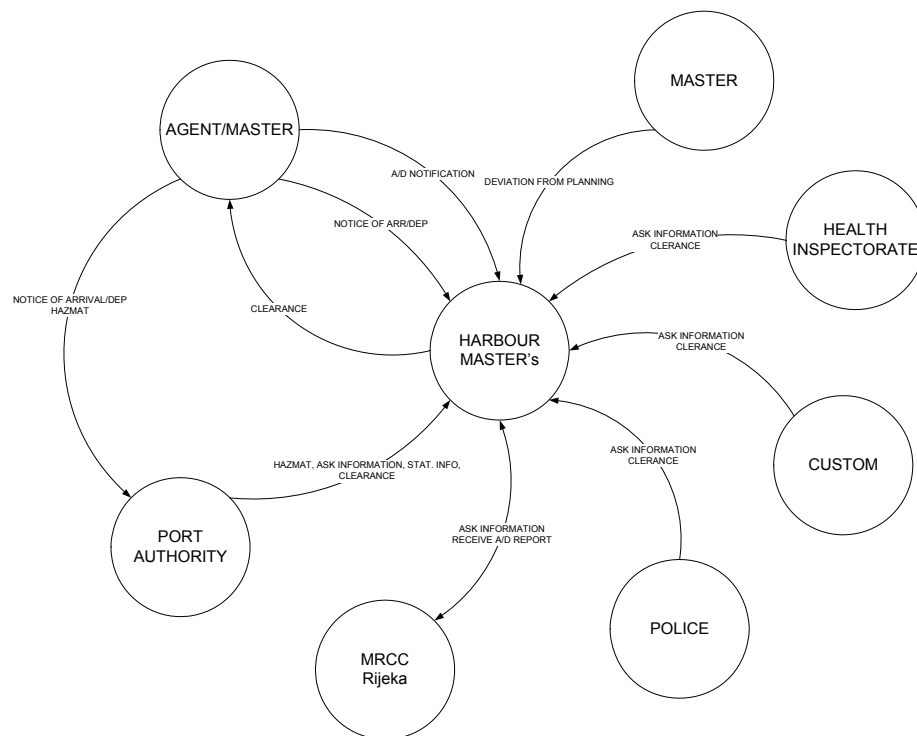
Port authority and Custom usually ask for information at local level about additional data on arrival of ship and statistical data.

Police can access the system related to foreign yacht.



3.4 Cooperation between users

Here is a summary of the present information flow and document exchange in port and for CMIS - ADS.



About ship arrival, the agent notifies the Harbour Master Office about the vessel arrival 48 hours before the estimated arrival and Port control centre at least 24 hours before estimated arrival (at least 48 hours before entering the port for ship carrying dangerous cargo). If the ship's voyage is shorter than 24 hours, a ship arriving from abroad shall send a Notice of Arrival before arriving within the territorial waters of the Republic of Croatia, and, if arriving from a domestic port, immediately on departure.

According to the regulations the arrival notification shall include filled predefined forms: Notice of Arrival (vessel details, arrival details, cargo details, International Ship Security Certificate - ISPS Code data, ballast water details) accompanied with: IMDG Report, Ballast water Report, General Waste Notification, ISPS Code Arrival Notification, ISPS Certificate, and Dangerous Cargo Plan (for the ship carrying dangerous cargo).

The agency send a general declaration, the arrival / departure notification, containing additional information on passenger and cargo. These information are next inputted into the CIMIS - ADS application.



The master of the ship shall notify the (PA) Port Control Centre operator (by VHF) the exact time of ship's arrival at the anchorage or pilot boarding station at least 2 (two) hours before the ship's arrival. Upon receipt of the notice on the exact time of the ship's arrival, the (PA) Port Control Centre operator instructs Ship Master about berth allocation passing him on to pilot. Berths are allocated to ships according to the berth allocation plan specifying the name of the port basin, berth, and position of the ship in relation to neighbouring berths and time of berthing.

If the vessel is to be berthed outside the port border crossing boundaries, the agent shall obtain the permission from the Authorities.

The cargo announcement data (type and quantity of cargo), Stowage plan for loading/discharge, Cargo plan, Cargo manifest, Bill of lading and other commercial documents needed regarding to the type of cargo are communicated to the Port operator for the cargo handling planning purposes.

For all dangerous cargo operations the permission has to be obtained from Harbour Master Office. Agent shall present predefined Declaration of Dangerous or Polluting Goods and other obligatory ship certificates (IOPP, SLC, SCC). PA IMDG inspector shall receive cargo documents from agent for dangerous cargo discharge and from forwarder for dangerous cargo loading.

Vessel towage and mooring are planned according ship's agent announcements. Planned services are confirmed at daily coordination meetings where all interested parties of PC are presented (Port operator, Agent, Forwarder, Authorities, PA, Control Company, Railway). The received orders are to be executed according to the Ship agent's instructions (unless in the case of "force major").

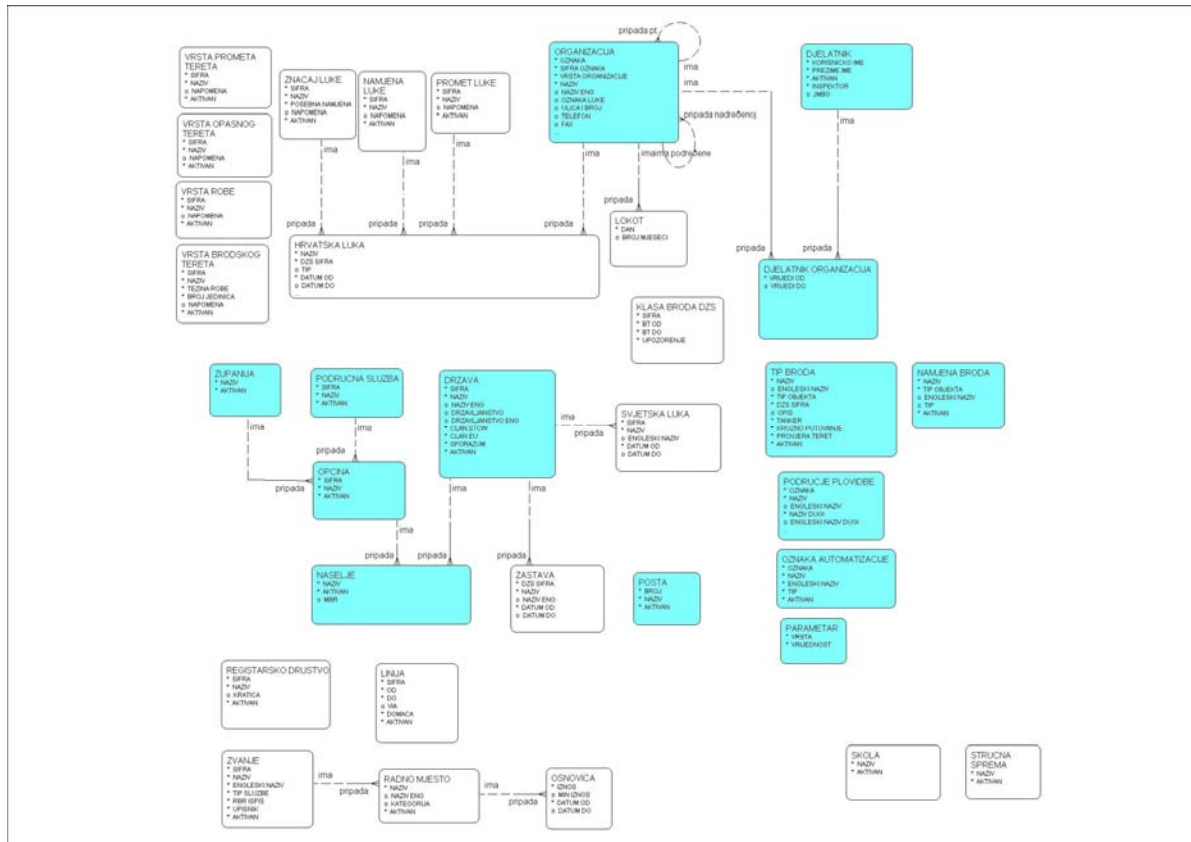
Immediately upon berthing, or on roads if berthing is postponed for more than 24 hours, ship's Agent shall invite the Authorities to make inward clearance. Relevant ships and cargo documents (Crew List, Passenger List, Bill of Lading Copies, Manifests...) and certificates have to be prepared and presented to the Authorities to obtain inward clearance.

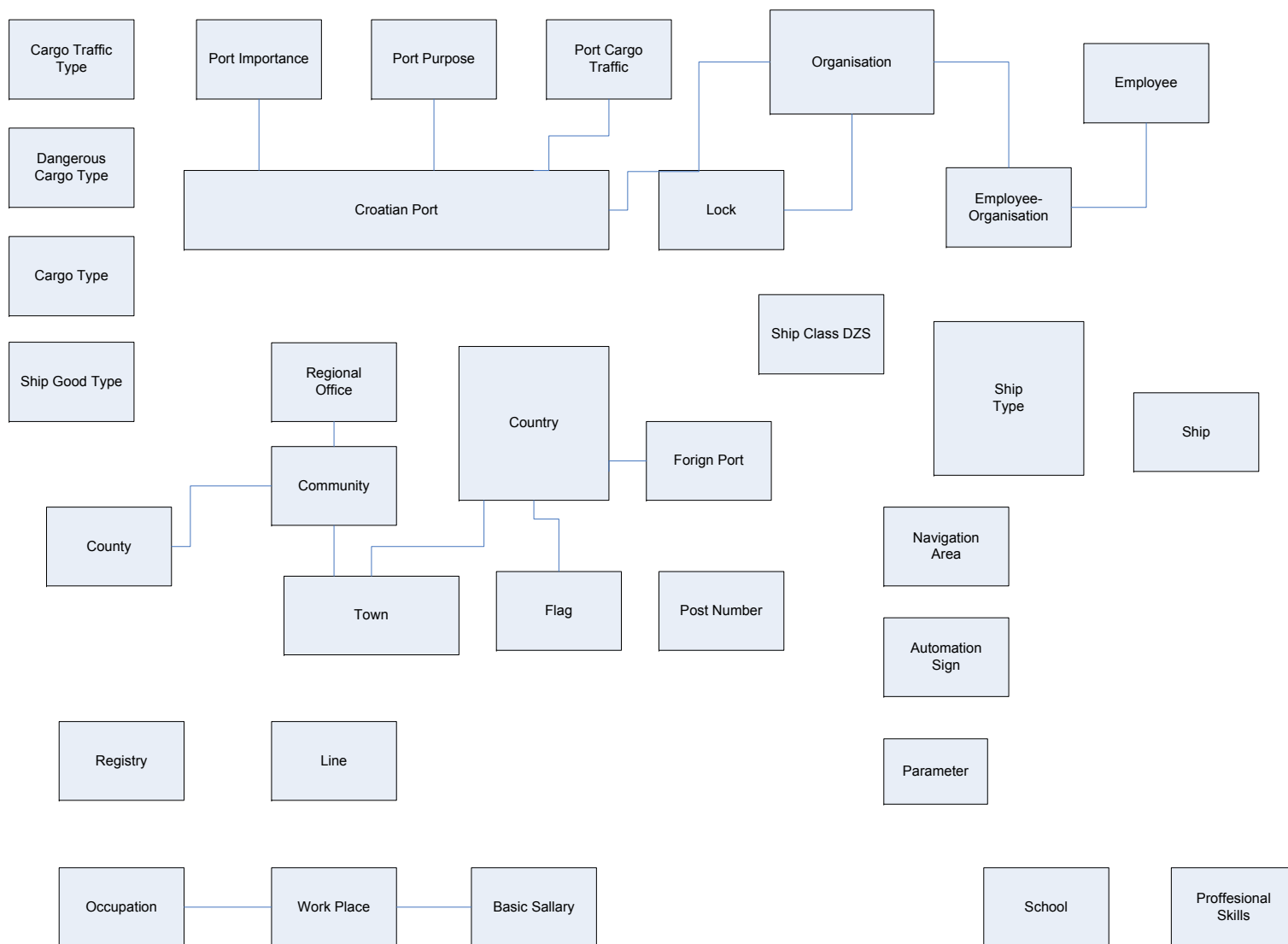
About ship departure, upon cargo operations completion, the agent prepares Statement of Facts, to be signed by Ship and/or forwarder, and other cargo related documents (Cargo Manifest, Cargo Plan, Bill of Lading, Stowage Plan...) needed for forwarder and ship to proceed with their operations.

If there is no administrative or financial reason to ban the ship departure, the Authorities will give the permission to sail off (outward clearance) enabling agent to order the piloting and notify the PA about ship's departure.

3.5 Database structure

The following diagrams (ERD Sifarnici) show the database structure of the existing CIMIS system.



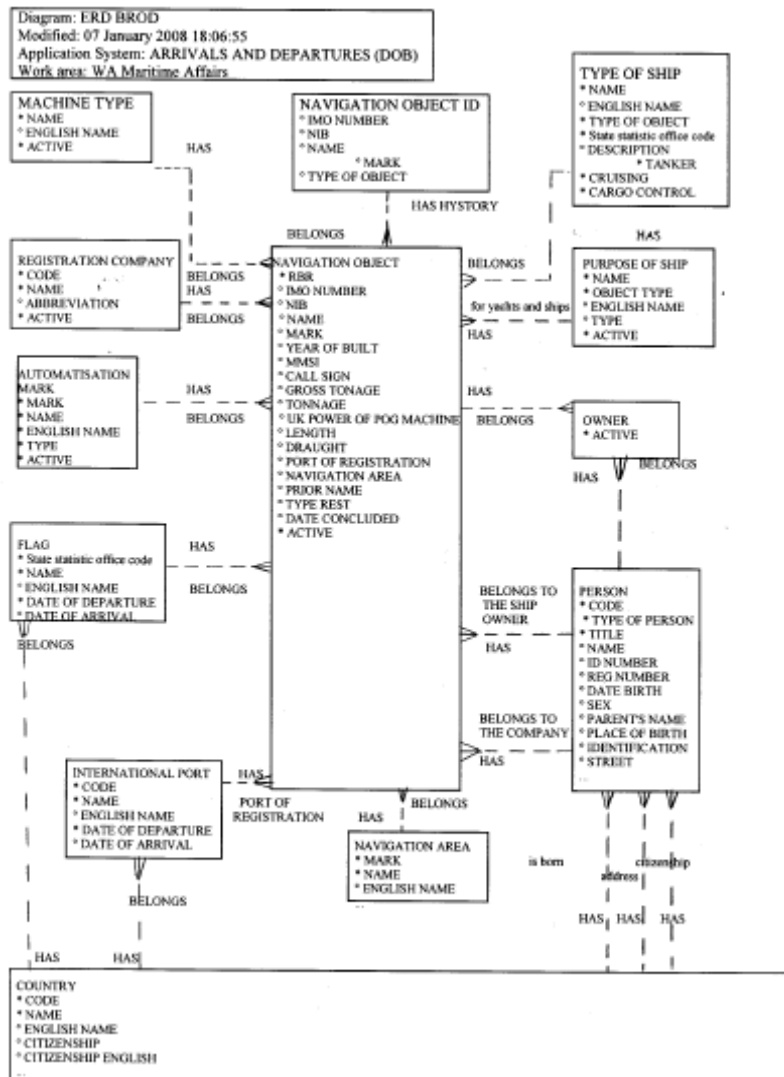




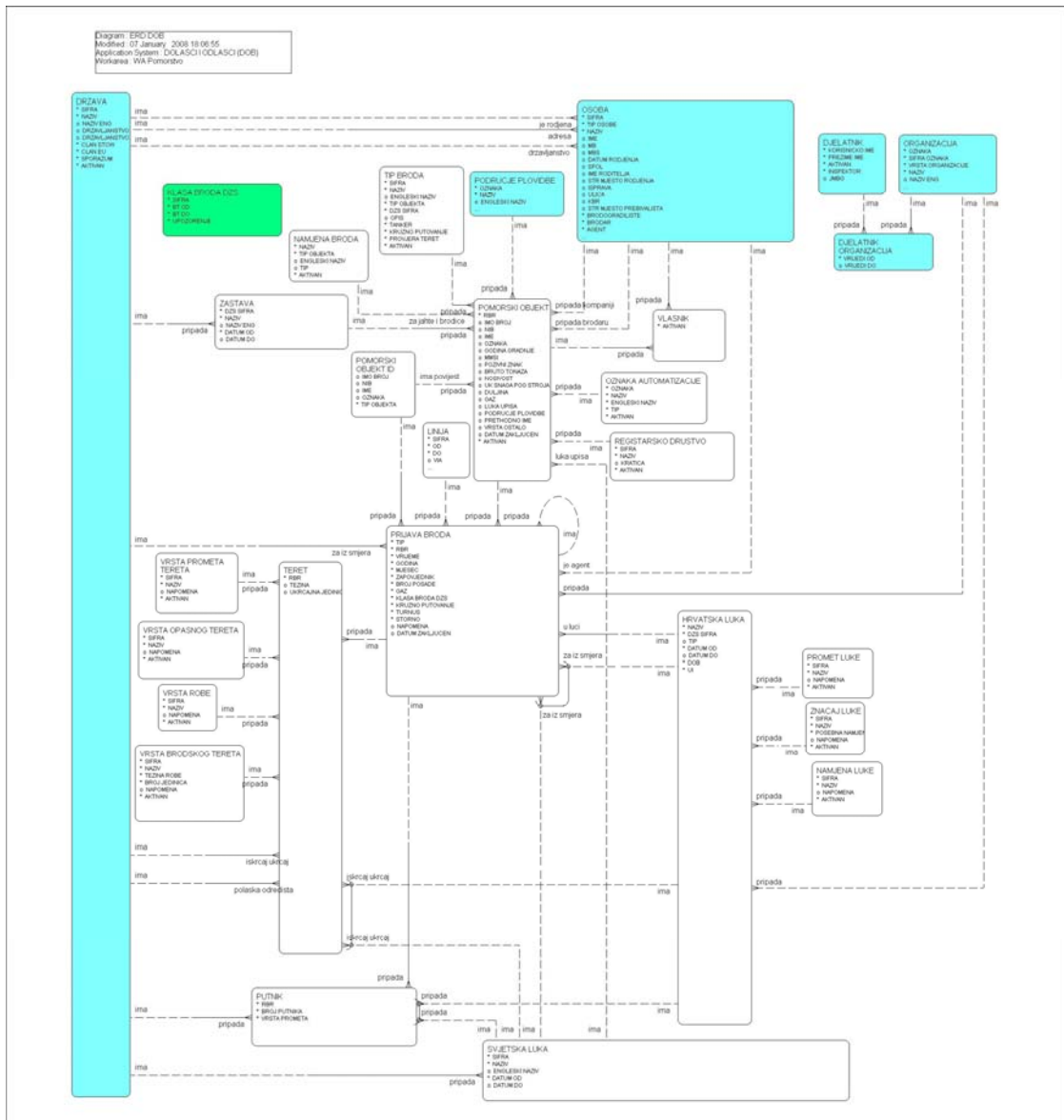
Main databases consist of the following tables:

- Port data
 - o Croatian Port
 - General Information
 - Port Organization
 - Port Traffic Data
 - o World Port
- Cargo Data
 - o Cargo traffic type
 - o Dangerous Cargo type
 - o Cargo type
 - o Ships good type
- Ship Data
 - o Ship General Information
 - o Ship Type and Type of Usage
 - o Ships Navigation Area
 - o Ships Automation
- Organizational Data
 - o General Information
 - o Personal Data
 - o School

The ERD BROD Database shows the structure of Ships Database and their Correlation Databases.



The ERD DOB Database shows the database structure of the Ships Arrival and Departure Database and their Application Process.



3.6 System architecture

The ADS system is based on a National Control Centre located at the Minister of Sea, Transport and Infrastructure in Zagreb.

The National Control Centre is collecting data on maritime field from HM based in the several ports and related Branch offices and MRCC.

In the Control Centres the information are collected, archived, processed, and presented to the Operators.

The architecture is hierarchically composed of the following elements, as shown in the next figure:



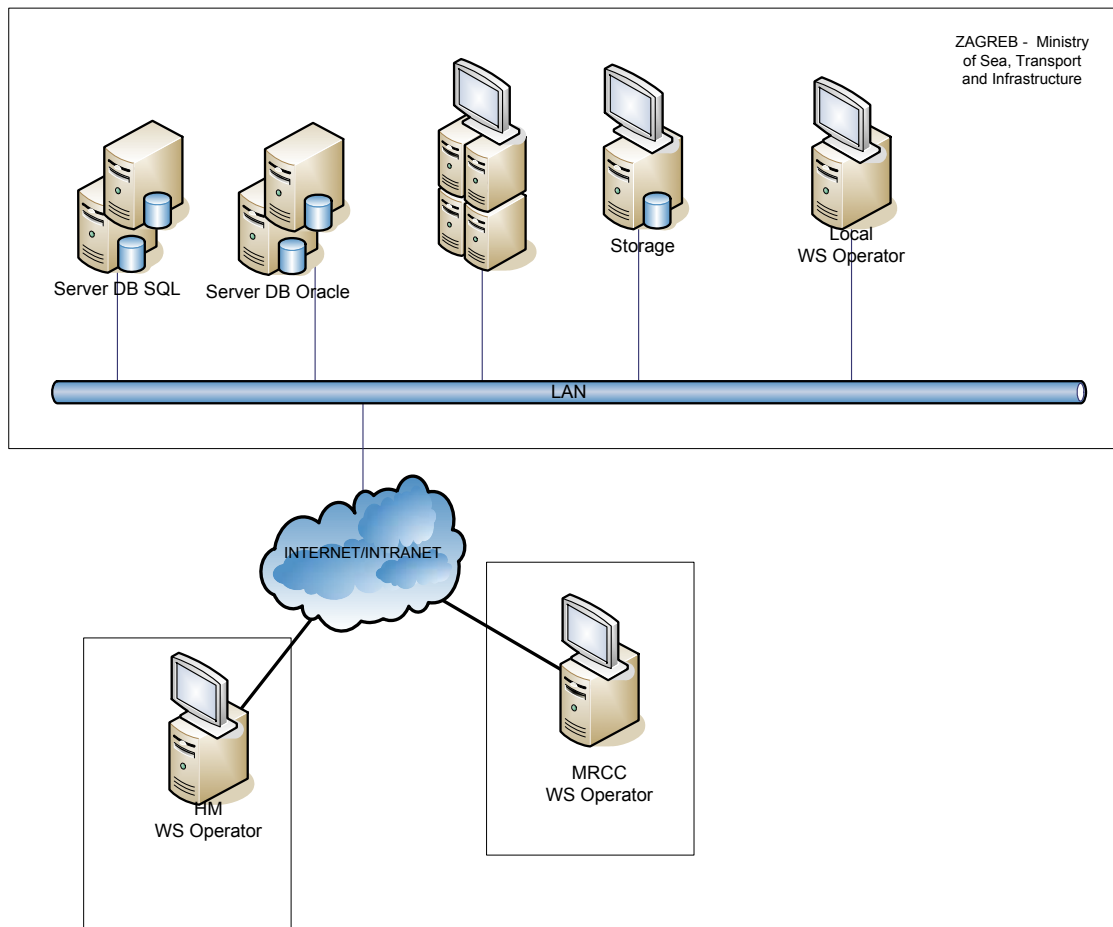
- 1 National Control Centre, located in Zagreb;
- Local Control Centres, for HM and MRCC operators, located in Rijeka, Pula, Senj, Zadar, Sibenik, Split, Ploce, Dubrovnik and other branch offices.

The detailed configuration of the National Control Centre in Zagreb is based on:

- One duplicated DB SQL server based on SUN hw platform and Windows server S.O (hw stand-by),
- One duplicated DB ORACLE server based on SUN hw platform and Windows server S.O (hw stand-by),
- Four Application servers, based on SUN hw platform, and using VMWARE platform for virtualization service, several S.O. are available,
- A storage, based on SUN hw platform and on FO/SCSI with 1 TB storage available,
- Several local WS operator for access the application via WEB.

Both the equipment room and the Operation room in the Control Centre in Zagreb are already equipped with an air conditioning system, all the other Centers have to implemented the conditioning system based on the requirements of the implemented equipment.

Local Control Centres are based on WS operator able to access the application via web using Internet/Intranet connection.



3.7 Main functions

CIMIS system consist of 2 (two) main Registry/Databases and an application subsystem to handle this databases:

- *Ship Arrival and Departure Registry*
- *Croatian Crew Registry*
- *The Vessel and Personal (Croatian Crew) Application Subsystem*
- *The Indexes*

3.7.1 Ship Arrival and Departure Registry

The ship Arrival and Departure registry have a set of functions to enter and handle data on:

- General Information on Ships entering or leaving the Port(s) on a daily basis with the info of:
 - o the Arrival Port
 - o Ship Name



- o Date and Time of Arrival
 - o Line Number (if exist)
 - o Length of the ship
 - o Port of Sign
 - o Name of the Master
 - o Number of Crew on Board
 - o Registration Office
 - o Navigation Area
 - o Type of the Ship
 - o IMO Number
 - o Call Sign
 - o GT
 - o DWT
 - o Country of Arrival
 - o Port of Arrival(Croatia)
 - o Port of Arrival(Foreign Port)
 - o Ships Flag
 - o Ships Agent
- Information about the Passengers on Board
 - o Number of Passengers
 - o Country of Embarkation
 - o Transit or Disembarking
- Information about the Ships Cargo
 - o Country of Origin
 - o Country to Deliver
 - o Type of Manipulation (Internal, Transit, Export,...)

3.7.2 Croatian Crew Registry

The functionality and purpose of the Croatian Crew Registry is to maintain a database of all Croatian Seafarers with the information about the:

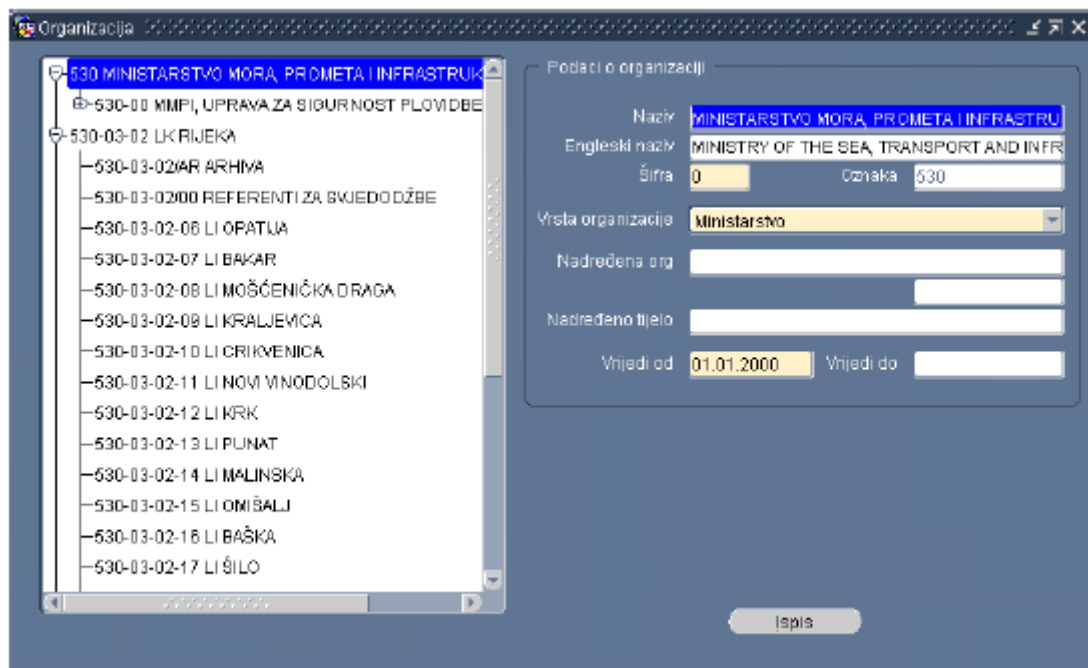


- Crew Member Personal Details (Name, Date and Place of birth, Parents and Childrens, Qualification, etc...),
- The Health Insurance and Pension Fund Details,
- Ship, Date and Port of Embarkation,
- Ship, Date and Port of Disembarking,

3.7.3 CIMIS Indexes

To handle the CIMIS Vessel and Personal (Crew) Application sequent indexes are available:

- Organisation and Customers
 - o HMO
 - o HMO Branch Offices
 - o Addresses
 - o Authorised Users of CIMIS System



Organizacija

530-03-02-17 LI ŠILO

Podaci o organizaciji

Naziv: MINISTARSTVO MORA, PROMETA I INFRASTRUKTURA

Engleski naziv: MINISTRY OF THE SEA, TRANSPORT AND INFRASTRUCTURE

Šifra: 0 Oznaka: 530

Vrsta organizacije: Ministarstvo

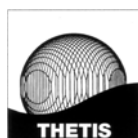
Nadređena org.:

Nadređeno tijelo:

Vrijedi od: 01.01.2000 Vrijedi do:

Ispis

- Persons and Territorial Organisation
 - o Persons Index by Name
 - o Towns
 - o County



- o Country
- o Post Numbers

Unos osobe

Šifra: 980210 Naziv / Prezime: PASSENGER Ime fizičke osobe: ROBERT Tip: Fizička MB / MBG: Mbs: Kontrola? ☒ Upotreba? ☒

Podaci o fizičkoj osobi

Datum rođenja: 10.06.1950 Spol: Muško

Ime roditelja: Država rođenja: Mjesto rođenja: Strano m.j.rođ: GUGGITZORABEN Državljanin: AUSTRIJA Isprava: E 0489878 0

Adresa sjedišta / prebivališta

Država: AUSTRIJA Pošta: Naselje: Strano nas: 8042 GRAZ Ulica: Eichenweg 17 Kbr: Kontakt: Telefon: Telefaks: E-mail: Uloge: ☐ Brodogradilište ☐ Posrednik ☐ Brodar ☐ Agent ☐ Državno tijelo ☐ Kompanija ☐ Lučka uprava

Napomena: Povoljest

- Vessel Type and Information
 - o Type of Vessel
 - o Registration Offices
 - o Flags
 - o Automation
 - o Navigation Areas
 - o Lines

Vrste pomorskih objekata

Naziv	Engleski naziv	Tip objekta	DZS šifra	Opta	Tanker?	Kućna?	Prevozna?	Upotreba?
JAVNI BROD		Brod	90					
BROD ZA OPSKRBU	Supply vessel	Brod	42					
BRODOLSKI BROD	Training ship	Brod	48					
TEGLAČ	Tug	Brod	43					
BROD POSEBNE NAMJENE		Brod	32					
RIBARSKI BROD	Fishing vessel	Brod	41	Ribarski brod				
BROD (OSTALO)		Brod	49					
TEHNIČKI PLOVNI OBJEKT		Brod	90					
JARUŽALO	Dredger	Brod	49					
KLAPETA S UREĐAJEM ZA RASTVA	Split hopper barge	Brod	90					
SA MOISKRČAVAJUĆA Klapeta	Selfunloading hopper barge	Brod	90					
PLOVEĆA DIZALICA	Floating crane	Brod	49					
PREVRTALJKA	Dump barge	Brod	90					
TEGLENICA-TERET NA PALUBI		Brod	34					
TEGLENICA-RASUTI TERET U SKL	Barge-solid bulk cargo in cargo	Brod	34					
TEGLENICA-TEKUĆI TERET U TAN	Barge-liquid bulk cargo in cargo	Brod	10	Za tekući teret				
PLUTAJUĆI DOK	Floating dock	Plutajući objekt	90					
PLUTAJUĆA ELEKTRANA	Floating power plant	Plutajući objekt	90					

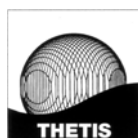
- Crew Qualifications



- o Type of School
- o Qualifications
- o Matriculation
- Cargo Types
 - o Type of Cargo
 - o Type of Cargo on Board
 - o Dangerous Goods

[illegible]

- Index of Ports



Šifra	Naziv	Engleski naziv	Država	Naziv države	Vrijedi od	Vrijedi do
NOTOB	Tromsø/Buik		NO	NORVEŠKA	01.01.2000	
NOTOV	Tovik		NO	NORVEŠKA	01.01.2000	
NOTRA	Trana		NO	NORVEŠKA	01.01.2000	
NOTRD	Trondheim/Flakk		NO	NORVEŠKA	01.01.2000	
NOTRY	Tranøy		NO	NORVEŠKA	01.01.2000	
NOTSX	Tysseidal		NO	NORVEŠKA	01.01.2000	
NOTUS	Tustna		NO	NORVEŠKA	01.01.2000	
NOTVE	Tvedestrand		NO	NORVEŠKA	01.01.2000	
NOTYF	Tysfjord/Kjøpsvik		NO	NORVEŠKA	01.01.2000	
NOTYN	Tysnes		NO	NORVEŠKA	01.01.2000	
NOTYV	Tysvær		NO	NORVEŠKA	01.01.2000	
NOULL	Ullensvang		NO	NORVEŠKA	01.01.2000	
NOULS	Ulstein		NO	NORVEŠKA	01.01.2000	
NOUSD	Uskedal		NO	NORVEŠKA	01.01.2000	
NOUTE	Utsira		NO	NORVEŠKA	01.01.2000	
NOUVG	Ulvåg		NO	NORVEŠKA	01.01.2000	
NOUVK	Ulvik		NO	NORVEŠKA	01.01.2000	
NOVAB	Varangerbotn		NO	NORVEŠKA	01.01.2000	

3.8 Existing interconnection

At present the ADS system is not interconnected with other systems.

3.9 Next development

A new upgrade of the Sw related to Arrival and Departure Application is planned in the next 6 months (end of 2008). The upgrade is related mainly to:

- Permission to ship agency to access the system,
- Possibility from ship agency to input document as "Notice of arrival and departure information".
- New forms related to:
 - o Ballast
 - o IMDG
 - o ISPS
 - o Waste

3.10 Main conclusions

The main conclusions are the following:



- the operator input data in the system, but not in real time,
- The present CIMIS system is used mainly for statistical data; has to be improved for operational use in ports,
- Data of CIMIS are according to NOA reporting (refer to par 6.4),
- Data of CIMIS are not in line with EU directives (refer to par 6.4),
- The system is not integrated with others (like AIS database, therefore upgrade shall be done manually),
- Data of NOA are not in line with EU directives (refer to par 6.4),
- The system is not available in English version.



4 AIS system

AIS subsystem as a part of future VTMS is under implementation with AIS Main Control Centre in Rijeka MRCC and 17 AIS shore-based base stations.

The AIS system connection is described on the "CVTMS system design description", where an AIS database will be made available. Data management will be connected to the VTS system directly where the database will be available.

It follows a short description of the existing AIS system.

AIS Shore-base stations are connected to Control Centre Rijeka through leased lines with the capacity of 128Mbit/s of permanent connectivity from national telecommunications provider. AIS base stations ensure coverage with AIS signal in the territorial sea and extraterritorial sea (Traffic Separation Schemes, Search and Rescue Area of Responsibility) as well as approached to main ports (Rijeka, Ploče, Split, Dubrovnik, Zadar, Šibenik, Pula).

National Control Center in Rijeka is designed for collecting of all the data coming from base stations, its processing, viewing, saving and storing, as well as distributing to users. National Control Center in Rijeka has the production and back – up IT support equipment, components layout for the AIS system center.

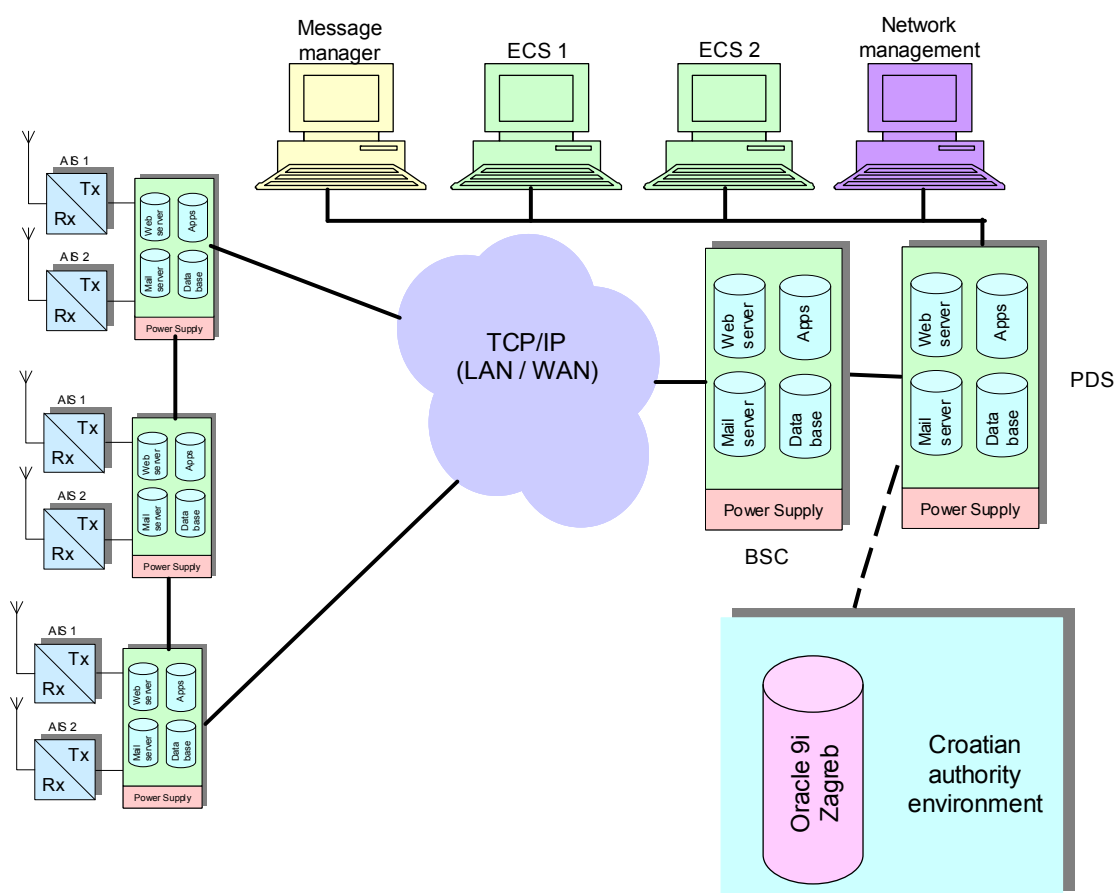


AIS system components in the National Control Centre are (as shown in the scheme):

- Network System Controller, production and back-up



- Control Server, production and back-up
- User Server
- Network Interface
 - o Network Control Console
- Operators' Interfaces
 - o Message Composer
 - o ECDIS





5 Existing system in Croatian ports

5.1 Introduction

Existing or planned system in main ports are:

- VTMISS/PMIS in PA Rijeka (planned 6/08)
- PCS in PA Rijeka (under specification, planned in production 2010)
- VTMISS/PMIS in Port of Ploče (under specification)
- PCS in Port of Ploče (under specification, planned in production 2010)
- PMIS Split, there is a limited PMIS (with arrival and departure information), and a AIS system
- ERP systems in all main ports

5.2 VTMISS / PMIS system in Rijeka (PA Rijeka)

5.2.1 Description

The main objectives for the Port of Rijeka VTMISS/PMIS system are:

- o . Effective surveillance providing an integrated maritime picture for the described area.
- o . High system availability, built in redundancy to reduce single point of failure items.
- o . Provide useful information to vessels in difficulty.
- o . Provide immediate assistance in case of emergency.
- o . Support for planning, coordination, management and supervision of PRA operations.
- o . Support prevention of infringements to the Port rules and National and International laws.
- o . Providing information flows among different Users by means of a suitable network.
- o . Improve efficiency, one Traffic Control Centre for the service area.
- o . Provision of Information based Vessel Traffic Service.
- o . The system will take advantage of the existing facilities without waste of previously installed equipment and labour.
- o . The system solution has low complexity and cost, easy to maintain and provide highly effective operation of Rijeka harbour.
- o . The system has external interface to databases and Port Management systems and the maritime picture.
- o . Feature system management functionality for effective maintenance and management of failures.



5.2.2 System Configuration

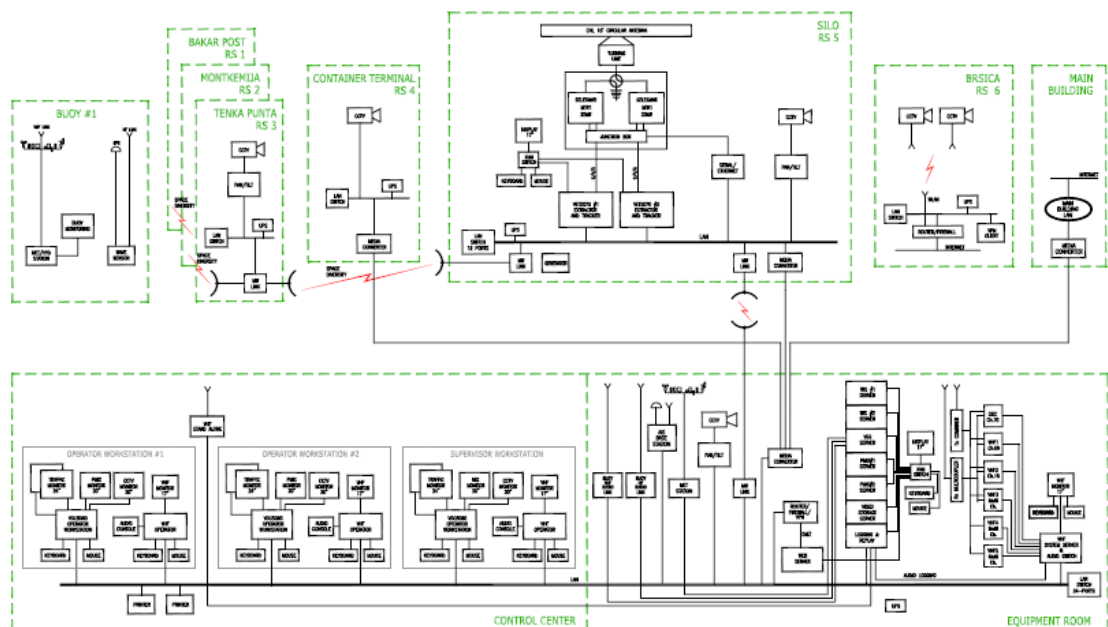
The solution has been designed to avoid single point of failure items and to meet the requirements for availability, reliability and serviceability. The design is based on supplier experience with port and coastal surveillance and includes the following functions and configurations:

- o . Vital servers duplicated and configured as hot standby
- o . Radar Video Extractor and Tracker at Radar Site
- o . Flexible configuration of responsibility areas to meet operational requirements
- o . Multi sensor fusion, with easy expansions

The system has the following components:

- o . n.1 Control centre
- o . n.5 remote CCTV sites
- o . n.1 remote radar and CCTV site
- o . n.1 meteorological/hydrological buoy
- o . n.System network infrastructure

The system has a modular, flexible and expandable design with focus on reliability and future upgrades.





5.3 PCS system in Rijeka (PA Rijeka)

The PA Rijeka PCS Project is in phase of tender documentation specifications, planned to finish the tender process in 4Q 2008, and to finish the implementation of the solution in 2010.

The objectives of the Project are to:

- o reengineer and streamline existing procedures within the port community to meet the mandate of the various stakeholders more efficiently;
- o electronically integrate PCS members into an efficient logistic network that tracks cargo shipments from origin to destination within port's operations;
- o establish a centralized PCS using collaborative and co-operative approach to achieve process unification and message exchange for the benefit of PCS members;
- o enable interconnection with other IT systems along the Pan-european Transport Corridor Vc;
- o connect PCS members to facilitate secure and reliable exchange of information resulting in improvement in the overall efficiency of trade and transportation cycles;
- o enable replacement of paper documents with electronic messages in RPA for commercial, administrative, port operations logistics activities;
- o implement as much European (international) standard procedures as possible;
- o enable statistical reporting system of port and corridor activities;
- o generate regular port operations performance reports;
- o reduce transaction costs and turnaround time;
- o eliminate data errors and enhance data processing;
- o improve coordination across PCS members.

The main benefits of the system should be as stated:

Easy access to all integrated logistics information;

Higher quality and improved customer service;

Cost efficiency;

Secure transactions, using digital signature and data encryption technology;

One-stop access and communication carriers;



Minimized data redundancy, misinterpretations and data errors;

Ease of use providing standard applications, communication, tracking and generation of electronic documents.

5.3.1 Rijeka Port Community Members And Roles

The term “Rijeka Port Community” refers to all public and private organizations participating in port operations in the Rijeka port area.

The Port of Rijeka Authority (PRA)

- o Port infrastructure development and management
- o Assignment of concessions to commercial companies for port operations and additional services. Presently, more than 50 companies do their business in the Port of Rijeka area based on concession agreements with PRA.
- o Traffic control in Port of Rijeka Area
- o Safety control and management
- o Dangerous cargo management (from 2005)
- o Port operation coordination

Harbour Master

- Sea traffic safety, documentary and physical control of ships entering/staying in Rijeka sea area

Maritime Police

- Police vehicle, crews and passengers control of the maritime border cross.
- Together with Harbour Master and Customs representing Port Authorities.

The Customs

Main document regarding control of goods transportation between Croatia and foreign customs territories is Croatian “Customs Law”. Another regulatory document significant for seaport activities is “Customs procedures regulation in international transport in seaports, river ports and airports”.

To speed up the customs procedure, Croatian Customs have introduced Web application for electronic submission of uniform customs declaration since year 2000. A signed hard copy of customs declaration is required as well. Although there are no legal obstacles (“Electronic Signature Law” from, year 2002) for usage of electronic documents as a valid legal documents, Customs are still insisting on hard copies.

Port Operators (Stevedores)

Under priority concession agreement, LR is providing stevedoring and other commercial services for all dry cargos. Oil terminal in Omišalj is operated by JANAF. LR’s daughter company Adriatic Gate j.s.c operates container terminal.



Agents

Nearly 30 maritime agencies (ship's agents, port agents, shipping agents) presently render their services in the Port of Rijeka.

Main roles:

- Ship announcement
- Ship operations arrangement
- Serving all ship crew/passenger needs, organize and purchase ship supplies and all other services needed (ship's agent)
- Cargo booking and control

Forwarders

There are some 20 forwarders doing business regularly in Port of Rijeka organizing cargo shipments as representatives of cargo owners, importers or exporters. As main purchaser of cargo handling operations in Port of Rijeka, forwarders prepare Port Operation and Services Order (POSO) and transport documents.

Railways

Croatian Railways (HŽ) is the only railway operator in Croatia.

- Timely announcement of rail cars and rail cargo is of essential importance for port operations planning and optimization. Currently, the Railway list containing announcements of rail cars from HŽ rail tracking system is not quite accurate and it is revised on regular daily coordination meetings in LR.

Road carriers

The road transport is organized and controlled mainly by forwarders.

- The lack of information interchange between Port Terminals and carriers about truck arrival and estimated time of operations cause a lot of problems, especially in crowd Container terminal.

Piloting, Towing and Mooring

- Pilotage (performed by Croatia pilot d.o.o.) is obligatory for all vessels larger then 500 GRT during their entrance/departure from Port of Rijeka.
- The only concessionaire performing towing services in port of Rijeka is Jadranski Pomorski Servis d.d. (JPS)
- There are two mooring companies offering mooring services in Port of Rijeka.

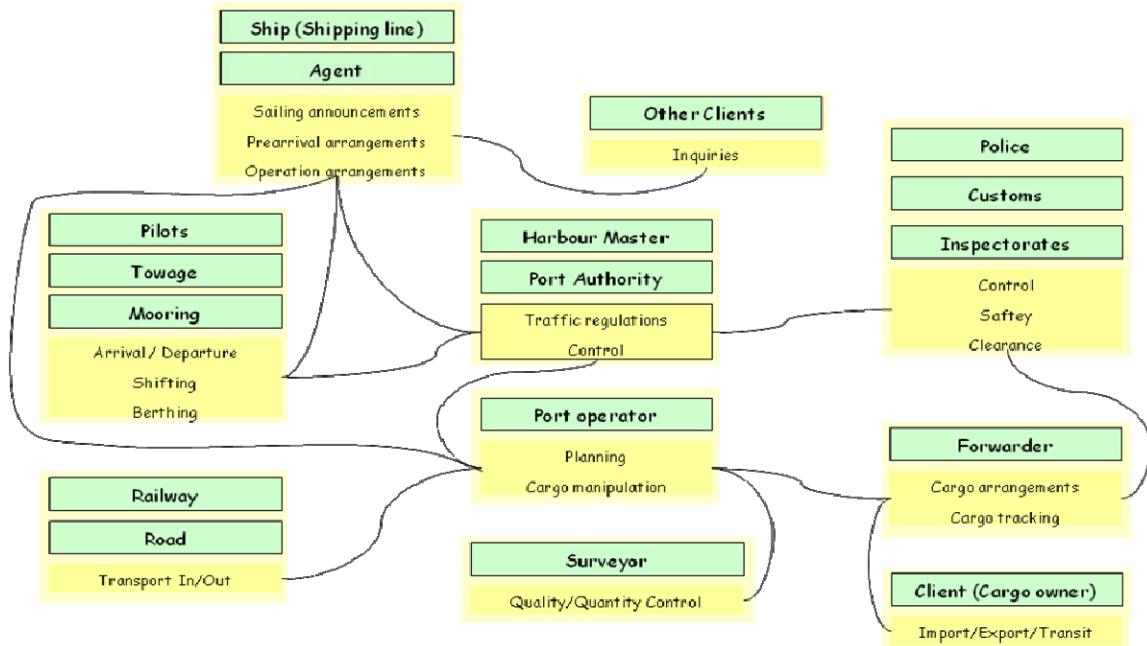
Quality and quantity merchandise control

- 8 companies have concession agreement

Waste Collection and Disposal

- Dry and liquid waste collection and disposal is offered by 5 concessionaires

Ship Chandlers



- Dry and liquid waste collection and disposal is offered by 5 concessionaires.

Bunker Supply

- Fuel supply to the vessels is offered by Jadranski pomorski servis d.d.

Inspectorates

Sanitary, veterinary and phyto-patological control is performed by respective state organizations responsible for health protection.

5.4 VTMIS / PMIS system in Port of Ploče

The Port of Ploče with PA Ploče are in early phase of documentation specification.

5.5 PCS system in Port of Ploče

The Port of Ploče with PA Ploče are in phase of tender documentation specifications by a Holland Consultants Company, planned to finish the tender process in 2009, and to finish the implementation of the solution in 2010.

The new and existing container terminal application is in phase of extending with the Arrival and Departure database, but awaiting for a SafeSeaNet specification and MSTI regulations.

Luka Ploče and the Croatian system integrator have signed a contract about delivery of Port Container Management System (PCM) in September last year (2007). This contract implies computer networking, system room and system infrastructure construction, and also design and



development of the application itself. System integrator has the role of projector and implementer of system, network and application part of the System.

Port Container Management System is completely implemented in agreed time limit, in late January this year. PCM enables more efficient, much faster and simpler monitoring and planning of container traffic. Besides, full informatization of internal business inside Luka Ploče and on-line approach of all container business participants, improve communication and integration of Luka Ploče with other container business participants (agents, transporters, Duane, police...).

The system has designed and implemented completely adjusted to the technology and needs of Luka Ploče and it is based upon IBM technology (Java, WebSphere) and Oracle base.

5.6 PCS system in Port of Split

Limited PMIS and AIS System are available in Port of Split covering for a moment some general arrival and departure information. Have to be considered.

5.7 ERP systems in all main Ports

All main Croatian Ports (Rijeka, Ploče, Split, Dubrovnik) either in Port Company and/or Port Authorities have developed their own ERP solution that met the general or at least accountant needs.



6 Analysis of data collected

6.1 Introduction

Data has been collected during:

- Meeting held with representative of the Ministry of Sea, Transport and Infrastructure,
- Throught delivery of questionnaires.

About questionnaire, a full evaluation has been presented on documents exchange and information flows based on questionnaire received by:

- HO Rijeka
- HO Ploče
- HO Split
- HA Pula
- HA Šibenik
- PA Split
- PA Ploče
- PA Dubrovnik
- PA Pula
- PA Zadar
- Customs
- Border Police Ploče

It follow a description of the main results.

6.2 Document exchange in ports

6.2.1 List of documents

After detailed analysis done, we stated that there are mainly 38 documents in use and exchanged between the Authorities (HMO, PA, Police, Customs, Inspectorate).

The further analysis stated that we may recognize this documents individually and split it into two main categories – the main list that are the list of 20 documents exchanged between the Authorities and are mandatory for ship/agent to receive an inward and outward clearance, and the extended list - next 18 documents that are Authority-dependent, and are mandatory only for some of Authorities.



6.2.1.1 Documents or actions that are always requested and mandatory for ship/agent to receive an inward and outward clearance

6.2.1.1.1 Open Sea

- (1) Pre-Notice of Arrival
- (2) Notification of Dangerous Goods (DCR Form)
- (3) Waste Notification
- (4) Maritime Declaration of Health (
- (5) Ballast Water Reporting (BWR Form)
- (6) ISPS Pre-Arrival Notification

6.2.1.1.2 Approaching Port

- (7) Ship Call (VHF Call – not a document)

6.2.1.1.3 In Port

- (8) Arrival Information Notice
- (9) Crew List (in)
- (10) Passenger List (in)
- (11) IMO Ship's Store Declaration
- (12) IMO Crew's Effects Declaration (in)
- (13) Change of Berth
- (14) Permission for a Vessel to have Communications with the Shore

6.2.1.1.4 Departure

- (15) Declaration of Departure
- (16) Crew List out
- (17) Passenger List out
- (18) Stability Calculation
- (19) Dangerous Cargo Plan
- (20) Permission of Vessel's Departure

6.2.1.2 Authority dependent documents

- (21) Visitors List (PA Dbk)
- (22) Cruise Ship Record (PA Dbk)



- (23) Stowage Plan (PA Zadar)
- (24) Cargo Manifest (Customs)
- (25) Bill of lading (Customs)
- (26) Ships Store List (in) (Customs)
- (27) Bonded Store (in) (Customs)
- (28) Ship's Medicine Inventory List (Customs)
- (29) Narcotic Lists (Customs)
- (30) Arms and Ammunition List (Customs)
- (31) Stowaway Search Check List (Customs)
- (32) List of Live Animals (Customs)
- (33) NIL List (no such goods on ship – ord. 29,30,31,32) (Customs)
- (34) Cargo manifest Specification on Personal Data (Customs)
- (35) Summary Declaration – following legal Customs procedure (Customs,Phytosanitary)
- (36) Certificate of Deratization (sanitary inspection)
- (37) Request for Check (sanitary, phytosanitary inspection)
- (38) Phytosanitary certificate (phytosanitary inspection)

6.2.2 Authorities involved

The list of all involved authorities in Port Documents Exchange is the following:

- Harbour Master Offices and branch offices
 - HMO Pula
 - Umag
 - Novigrad
 - Poreč
 - Rovinj
 - Raša
 - Rabac
 - HMO Rijeka
 - Mošćenička Draga
 - Opatija
 - Bakar
 - Kraljevica



- Crikvenica
- Novi Vinodolski
- Omišalj
- Malinska
- Krk
- Punat
- Baška
- Šilo
- Cres
- Mali Lošinj
- Mali Lošinj - Nerezine
- Susak
- Rab
- HMO Senj
 - Sveti Juraj
 - Jablanac
 - Karlobag
 - Novalja
- HMO Zadar
 - Biograd n/m
 - Novigrad
 - Starigrad Paklenica
 - Pag
 - Preko
 - Sali
 - Božava
 - Ist
 - Silba
 - Privlaka
- HMO Šibenik
 - Murter
 - Tisno
 - Vodice



- Primošten
- Rogoznica
- HMO [Split](#)
 - Trogir
 - Omiš
 - Makarska
 - Rogač
 - Supetar
 - Milna
 - Sumartin
 - Hvar
 - Jelsa
 - Stari Grad
 - Sućuraj
 - Vis
 - Komiza
 - Bol
 - Kaštel
- HMO [Ploče](#)
 - Metković
- HMO [Dubrovnik](#)
 - Cavtat
 - Slano
 - Sobra
 - Ston
 - Trpanj
 - Korčula
 - Vela Luka
 - Lastovo
 - Trstenik
 - Odjeljak - Gradska luka
 - Odjeljak - Marina Komolac
- Port Authorities
 - **STATE PORT AUTHORITIES**
 - Port authority Rijeka
 - Port authority Zadar
 - Port authority Šibenik
 - Port authority Split
 - Port authority Ploče



Port authority Dubrovnik

• **COUNTY PORT AUTHORITIES**

Port authority County of Zadar
 Port authority County of Šibenik-Knin
 Port authority County of Split-Dalmatia
 Port authority County of Dubrovnik-Neretva
 Port authority UMAG-NOVIGRAD
 Port authority PULA
 Port authority RABAC
 Port authority ROVINJ
 Port authority POREČ
 Port authority NOVI VINODOLSKI
 Port authority CRIKVENICA
 Port authority BAKAR-KRALJEVICA
 Port authority OPATIJA-LOVRAN
 Port authority KRK
 Port authority CRES
 Port authority MALI LOŠINJ
 Port authority RAB
 Port authority SENJ
 Port authority NOVALJA
 Port authority KORČULA
 Port authority DUBROVNIK
 Port authority VELA LUKA

- Main Border/Maritime Police
 - Postaja pomorske policije Pula
 - Postaja pomorske policije Rijeka
 - Postaja pomorske policije Zadar
 - Postaja pomorske policije Split
 - Postaja pomorske policije Dubrovnik
- Customs
 - Carinarnica Pula
 - Carinarnica Rijeka
 - Carinarnica Zadar
 - Carinarnica Šibenik
 - Carinarnica Split
 - Carinarnica Dubrovnik
 - Carinarnica Ploče
- Inspections
 - HMO Offices Inspectorate



- Phytosanitary Inspection – Ministry of Health
- MRCC Rijeka - Maritime Rescue Coordination Centre

The total number of user of the system expected is about 120.

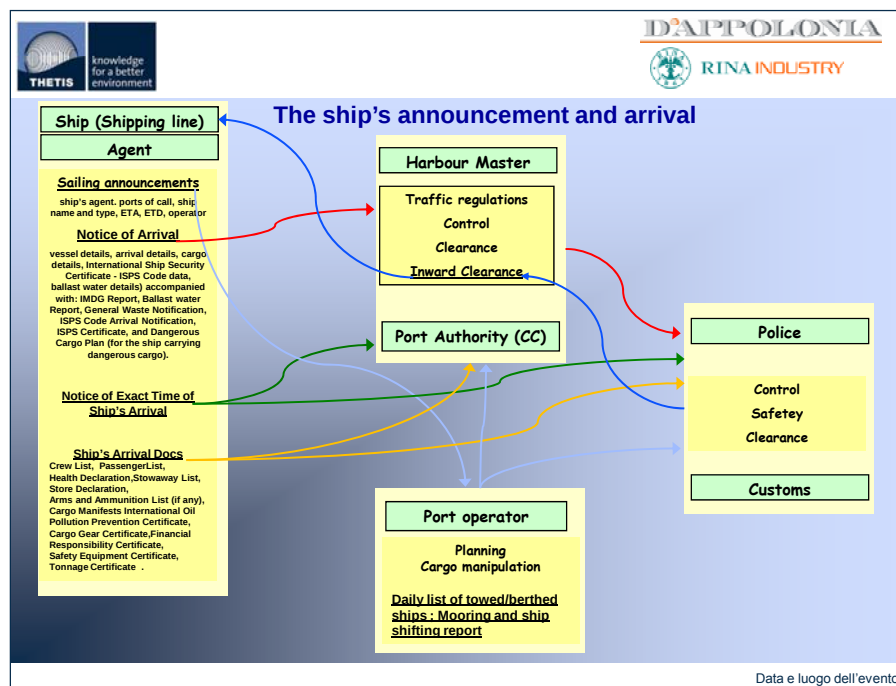
The total number of agencies expected are about 100.

6.3 Information flow in Croatian Ports

6.3.1 Documentation Flow in Croatian Ports Overview

The current information flows in all Croatian ports are quite similar due to Croatian law regulating port operations. Slight differences among them arise from local organizational rules and practice.

6.3.1.1 Announcement of Vessels Arrival, Arrival and Berthing



Announcement of Vessel Arrival

Ship Agent's Sailing announcements are the basic source of information for Sailing List issued by Port operator. It includes following data: ports of call, ship name and type, ETA, ETD, operator and ship's agent.

The information flow for the Port is usually generated by the ship's agent who contacts forwarder (recipient, shipper) and Port operator pre-announcing the vessel arrival enabling them to prepare



documents and to plan cargo operations. Agent contacts the ship-owner in order to prepare the arrival documents.

The agent notifies the Harbour Master Office about the vessel arrival 48 hours before the estimated arrival and Port control centre at least 24 hours before estimated arrival (at least 48 hours before entering the port for ship carrying dangerous cargo). If the ship's voyage is shorter than 24 hours, a ship arriving from abroad shall send a Notice of Arrival before arriving within the territorial waters of the Republic of Croatia, and, if arriving from a domestic port, immediately on departure.

According to the regulations the arrival notification shall include filled predefined forms: Notice of Arrival (vessel details, arrival details, cargo details, International Ship Security Certificate - ISPS Code data, ballast water details) accompanied with: IMDG Report, Ballast water Report, General Waste Notification, ISPS Code Arrival Notification, ISPS Certificate, and Dangerous Cargo Plan (for the ship carrying dangerous cargo).

The master of the ship shall notify the CC operator (by VHF) the exact time of ship's arrival at the anchorage or pilot boarding station at least 2 (two) hours before the ship's arrival. Upon receipt of the notice on the exact time of the ship's arrival, the CC operator instructs Ship Master about berth allocation passing him on to pilot. Berths are allocated to ships according to the berth allocation plan specifying the name of the port basin, berth, and position of the ship in relation to neighbouring berths and time of berthing.

If the vessel is to be berthed outside the port border crossing boundaries, the agent shall obtain the permission from the Authorities.

The cargo announcement data (type and quantity of cargo), Stowage plan for loading/discharge, Cargo plan, Cargo manifest, Bill of lading and other commercial documents needed regarding to the type of cargo are communicated to the Port operator for the cargo handling planning purposes.

Dangerous cargo announcement procedure

For all dangerous cargo operations the permission has to be obtained from Harbour Master Office. Agent shall present predefined Declaration of Dangerous or Polluting Goods and other obligatory ship certificates (IOPP, SLC, SCC). IMDG inspector shall receive cargo documents from agent for dangerous cargo discharge and from forwarder for dangerous cargo loading.

Vessel Arrival, Towage and Mooring

Vessel towage and mooring are planned according ship's agent announcements. Planned services are confirmed at daily coordination meetings where all interested parties of PC are presented (Port operator, Agent, Forwarder, Authorities, PRA, Control Company, Railway). The received orders are to be executed according to the Ship agent's instructions (unless in the case of "force major").

Daily overview of the work accomplished is delivered to the Port operations, including:

- the list of towed/berthed ships,
- mooring and ship shifting report.

Immediately upon berthing, or on roads if berthing is postponed for more than 24 hours, ship's Agent shall invite the Authorities to make inward clearance. Relevant ships and cargo documents

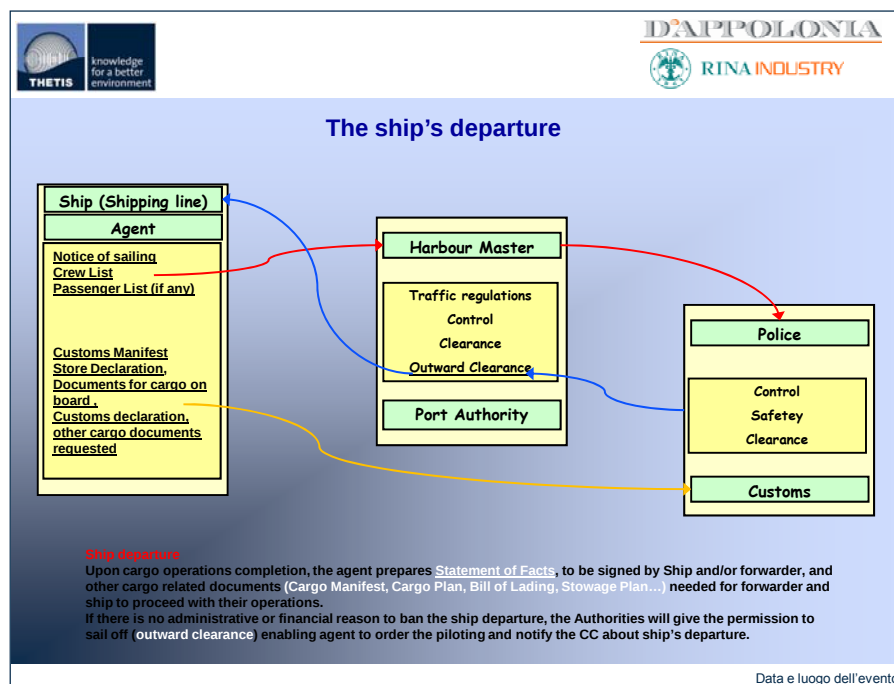


(Crew List, Passenger List, Bill of Lading Copies, Manifests...) and certificates have to be prepared and presented to the Authorities to obtain inward clearance.

6.3.1.2 Ship departure

Upon cargo operations completion, the agent prepares Statement of Facts, to be signed by Ship and/or forwarder, and other cargo related documents (Cargo Manifest, Cargo Plan, Bill of Lading, Stowage Plan...) needed for forwarder and ship to proceed with their operations.

If there is no administrative or financial reason to ban the ship departure, the Authorities will give the permission to sail off (outward clearance) enabling agent to order the piloting and notify the CC about ship's departure.



After detailed analysis with HMO offices the number of documents used are reduced to the first 20 (above in green), but not used by HMO from this list are the documents No. 4,7,11,12,13,21-38.



6.3.2 General Usage List and Documentation flow by Croatian Authorities (HMO, PA, Police, Custom and Inspectorate)

Here is a list a summary of all the documents and the Authorities involved.

Doc No.	Document type	HMO	PA	CUSTOM	POLICE	HEALTH INSPECTION	Note
1	Pre-Notice of Arrival	X	X	X	X		OPEN SEA
2	Notificaton of Dangerous Goods (DCR Form)	X	X				OPEN SEA
3	Waste Notification	X	X				OPEN SEA
4	Maritime Declaration of Health	X	X		X	X	OPEN SEA
5	Ballast Water Reporting (BWR Form)	X	X				OPEN SEA
6	ISPS Pre-Arrival Notification	X	X				OPEN SEA
7	Ship Call	X*	X				Approaching Port
8	Arrival Information Notice	X	X				In Port
9	Crew List (in)	X	X	X	X		In Port
10	Passenger List (in)	X		X	X		In Port
11	IMO Ship's Store Declaration	X*		X			In Port
12	IMO Crew's Effects Declaration (in)	X*		X			In Port
13	Change of Berth	X	X				In Port
14	Permission for a Vessel to have Communications with the Shore	X					In Port
15	Declaration of Departure	X	X		X		Departure
16	Crew List out	X	X	X	X		Departure
17	Passenger List out	X	X	X	X		Departure
18	Stability Calculation	X	X				Departure
19	Dangerous Cargo Plan	X	X				Departure
20	Permission of Vessel's Departure	X					Departure
21	Visitors List (Dbk)		X				OPEN SEA
22	Cruise Ship Record (Dbk)		X		X		OPEN SEA
23	Stowage Plan (Zadar)		X				OPEN SEA



24	Cargo Manifest			X			Approaching Port
25	Bill of lading			X		X	Approaching Port
26	Ships Store List (in)			X			Approaching Port
27	Bonded Store (in)			X			Approaching Port
28	Ship's Medicine Inventory List			X			Approaching Port
29	Narcotic Lists			X	X		Approaching Port
30	Arms and Amunition List			X	X		Approaching Port
31	Stowaway Search Check List			X	X		Approaching Port
32	List of Live Animals			X	X		Approaching Port
33	NIL List (no such goods on ship – ord. 29,30,31,32)			X	X		Approaching Port
34	Cargo manifest Specification on Personal Data			X			In Port
35	Summary Declaration – following legal Customs procedure(Phytosanitary)			X		X	In Port
36	Certificate of Deratization (sanitary inspection)					X	In Port
37	Request for Check (sanitary, phytosanitary inspection)					X	In Port
38	Phytosanitary certificate (phytosanitary inspection)					X	In Port

* not implemented in all ports



6.3.3 Detailed Analysis of Document Flow by Document (Document Layout and Flow)

A detailed analysis of document flow by each document, considering layout and flow has been carried out. Details are contained in the document enclosed in Annex 1.

6.4 NOA form and CIMIS database vs. EU directives and SafeSeaNet

The informative comparison on a field level were done between the Notice of Arrival Croatian Forms and CIMIS database from one side versus the EU regulative 2002/59-EU, 2002/6-EU (IMO FAL), and SafeSeaNet database and forms on the other.

The resulting tables and analysis from comparison were viewable below.

The overview list is for information purposes only.

Fields in red have to be added or updated in NOA forms design or CIMIS database to be compatible with the EU regulative and SSN listed above.

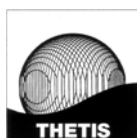
6.4.1 Directive 2002/59-EU vs. NOA/CIMIS

The following table shows a comparisons of data required by the Directive 2002/59-EU with respect to the NOA and the CIMIS.

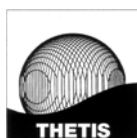
DIRECTIVE 2002 / 59 / EU VS. ADS AND NOA				
DATA REQUIRED	ANNEX 1 - 1. LIST OF INFORMATION TO BE NOTIFIED Article 4 GENERAL INFORMATION			
	DIR 2002 / 59 / EU	1. ARRIVAL / DEPARTURES OF SHIPS	2. NOTICE OF ARRIVAL	NOTE
VESSEL NAME	YES	YES	YES	+
CALL SIGN	YES	YES	YES	+
IMO NUMBER	YES	YES	YES	+
MMSI	YES	YES	YES	+
PORT OF DESTINATION	YES	YES	YES	+
ETA	YES	YES	YES	+



ETD	YES	NO	NO	1 / 2
NUMBER OF PERSONS ON BOARD	YES	YES / NO	NO	1 / 2
DATA REQUIRED	ANNEX 1 - 2. INFORMATION TO BE NOTIFIED Article 12 - CARGO INFORMATION			
	DIR 2002/59/EU	1. ARRIVAL / DEPARTURES OF SHIPS	2. NOTICE OF ARRIVAL	NOTE
DG TECHNICAL NAME	YES	NO	NO	1 / 2
UNNO	YES	NO	YES	1
IMO CLASS	YES	NO	YES	1
SHIP CLASS FOR INF CGO	YES	YES	YES	+
CGO INFO ADDRESS	YES	NO	NO	1 / 2
DATA REQUIRED	ANNEX 1 - 3. INFORMATION TO BE NOTIFIED Article 13 - A. General information			
	DIR 2002/59/EU	1. ARRIVAL / DEPARTURES OF SHIPS	2. NOTICE OF ARRIVAL	NOTE
VESSEL NAME	YES	YES	YES	+
CALL SIGN	YES	YES	YES	+
IMO	YES	YES	YES	+
MMSI	YES	YES	YES	+
PORT OF DESTINATION	YES	YES	YES	+
ETD	YES	NO	NO	1 / 2
ETA	YES	YES	YES	+
TOTAL NUMBER OF PERSONS ON BOARD	YES	YES / NO	NO	1 / 2
DATA REQUIRED	ANNEX 1 - 3. INFORMATION TO BE NOTIFIED Article 13 - B. Cargo information			
	DIR 2002/59/EU	1. ARRIVAL / DEPARTURES OF SHIPS	2. NOTICE OF ARRIVAL	NOTE



DG TECHNICAL NAME	YES	NO	NO	1 / 2
UNNO	YES	NO	YES	1
IMO CLASS	YES	NO	YES	1
LOADING PLAN OR MANIFEST OB	YES	NO	NO	1 / 2
ADDRESS OF DETAILED INFO	YES	NO	NO	1 / 2
DATA REQUIRED	ANNEX 1 - 4. INFORMATION TO BE NOTIFIED Article 5 Mandatory reporting system			
	DIR 2002/59/EU	1. ARRIVAL / DEPARTURES OF SHIPS	2. NOTICE OF ARRIVAL	NOTE
VESSEL NAME	YES	YES	YES	+
CALL SIGN	YES	YES	YES	+
IMO	YES	YES	YES	+
MMSI	YES	YES	YES	+
DATE AND TIME	YES	NO	NO	1 / 2
POSITION (LAT-LONG)	YES	NO	NO	1 / 2
COURSE	YES	NO	NO	1 / 2
SPEED	YES	NO	NO	1 / 2
PORT OF DESTINATION AND ETA	YES	YES	YES	+
CARGO (QUANTITY AND IMO CLASS FOR DG)	YES	YES / NO	YES	1
ADDRESS FOR COMMUNICATION OF CGO INFO	YES	NO	NO	1 / 2
TOTAL NUMBER OF PERSONS OB	YES	YES / NO	NO	1 / 2
VARIOUS INFO	YES	YES	YES	+
CHARACTERISTICS AND QUANTITY OF BUNKER FUEL FOR	YES	NO	YES / NO	1 / 2



SHIPS CARRYING MORE THAN 5.000 T OF BUNKER				
NAVIGATIONAL STATUS	YES	NO	NO	1 / 2

6.4.2 Directive 2002/6-EU vs. NOA/CIMIS

The following table shows a comparisons of data required by the Directive 2002/6-EU with respect to the NOA and the CIMIS.

Note: Fal Form 4 – IMO Crew's Effects Declaration is not in use by HMO but only by Customs
Fal Form 2 and 7 may be required by HMO but not defined in 2002/6

FAL VS. ADS AND NOA			
DATA REQUIRED	FAL FORM 1 - IMO General declaration	ARRIVAL / DEPARTURES OF SHIPS	NOTICE OF ARRIVAL
Name and type of ship	YES	YES	YES
IMO number	YES	YES	YES
Call sign	YES	YES	YES
Port of arrival/departure	YES	YES	YES
Date - time of arrival/departure	YES	YES	YES/NO
Flag State of ship	YES	YES	YES
Name of master	YES	YES	NO
Last port of call/Next port of call	YES	YES	YES
Certificate of registry (Port; date; number)	YES	NO	NO
Name and contact details of ship's agent	YES	YES	YES/NO
Gross tonnage	YES	YES	YES
Net tonnage	YES	NO	YES
Position of the ship in the port (berth or station)	YES	NO	NO
Brief particulars of voyage (previous and subsequent ports of call; underline where remaining cargo will be discharged)	YES	YES / NO	YES/NO
Brief description of the cargo	YES	YES	YES
Number of crew (incl. master)	YES	YES	NO
Number of passengers	YES	YES	NO
Remarks	YES	YES	YES
Attached documents (indicate number of copies)			
Cargo Declaration	YES	NO	NO
Ship's Stores Declaration	YES	NO	NO
Crew List	YES	NO	NO
Passenger List	YES	NO	NO

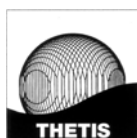


The ship's requirements in terms of waste and residue reception facilities	YES	NO	NO
Crew's Effects Declaration*	YES	NO	NO
Maritime Declaration of Health*	YES	NO	NO
Date and signature by master, authorized agent or officer	YES	NO	NO

FAL VS. ADS AND NOA			
DATA REQUIRED	FAL FORM 2	ARRIVAL / DEPARTURES OF SHIPS	NOTICE OF ARRIVAL
Arrival	YES	YES	YES
Departure	YES	YES	NO
Page No.	YES	NO	NO
Name and type of ship	YES	YES	YES
IMO number	YES	YES	YES
Call sign	YES	YES	YES
Port where report is made	YES	NO	NO
Flag State of ship	YES	YES	YES
Name of master	YES	YES	NO
Port of loading/Port of discharge	YES	YES	YES/NO
Marks and Nos.	YES	YES	NO
Number and kind of packages; description of goods or, if available, the HS code	YES	YES / NO	NO
Gross weight	YES	YES	YES
Measurement	YES	YES	YES
Date and signature by master, authorized agent or officer	YES	NO	NO

FAL VS. ADS AND NOA			
DATA REQUIRED	FAL FORM 3 - IMO Store Declaration	ARRIVAL / DEPARTURES OF SHIPS	NOTICE OF ARRIVAL
Arrival	YES	YES	YES
Departure	YES	YES	NO
Page No.	YES	NO	NO
Name of ship	YES	YES	YES
Port of arrival/departure	YES	YES	YES
Date of arrival/departure	YES	YES	YES/NO
Nationality of the Ship	YES	YES	YES
Last port of call/Next port of call	YES	YES	YES
Number of persons on board	YES	YES	NO
Period of stay	YES	YES	NO
Place of storage	YES	NO	NO
Name of Article	YES	YES	YES
For official use	YES	YES	YES
Date and signature by master, authorized agent or officer	YES	NO	NO

FAL VS. ADS AND NOA



DATA REQUIRED	FAL FORM 4 - IMO Crew's Effects Declaration	ARRIVAL / DEPARTURES OF SHIPS	NOTICE OF ARRIVAL
Page No.	YES	NO	NO
Name of ship	YES	YES	YES
Effect's that are dutiable or subject to prohibitions or restrictions	YES	NO	NO
Nationality of the Ship	YES	YES	YES
Number (Person)	YES	NO	NO
Family Name, Given Name	YES	YES	NO
Rank or rating	YES	YES	NO
Signature	YES	NO	NO
Date and signature by master, authorized agent or officer	YES	NO	NO

FAL VS. ADS AND NOA			
DATA REQUIRED	FAL FORM 5 - IMO Crew List	ARRIVAL / DEPARTURES OF SHIPS	NOTICE OF ARRIVAL
Arrival	YES	YES	YES
Departure	YES	YES	NO
Page No.	YES	NO	NO
Name of ship	YES	YES	YES
Port of arrival/departure	YES	YES	YES
Date of arrival/departure	YES	YES	YES/NO
Nationality of the Ship	YES	YES	YES
Last port of call/Next port of call	YES	YES	YES
Nature and No of identity document	YES	YES	NO
Number (Person)	YES	NO	NO
Family Name, Given Name	YES	YES	NO
Rank or rating	YES	YES	NO
Nationality	YES	YES	NO
Date and place of birth	YES	YES	NO
Date and signature by master, authorized agent or officer	YES	NO	NO

FAL VS. ADS AND NOA			
DATA REQUIRED	FAL FORM 6 - IMO Passenger List	ARRIVAL / DEPARTURES OF SHIPS	NOTICE OF ARRIVAL
Arrival	YES	YES	YES
Departure	YES	YES	NO
Page No.	YES	NO	NO
Name of ship	YES	YES	YES
Port of arrival/departure	YES	YES	YES
Date of arrival/departure	YES	YES	YES/NO
Nationality of the Ship	YES	YES	YES
Family Name, Given Name	YES	YES	NO
Nationality	YES	YES	NO



Date and place of birth	YES	NO	NO
Port of embarkation	YES	NO	NO
Port of disembarkation	YES	NO	NO
Date and signature by master, authorized agent or officer	YES	NO	NO

FAL VS. ADS AND NOA			
DATA REQUIRED	FAL FORM 7	ARRIVAL / DEPARTURES OF SHIPS	NOTICE OF ARRIVAL
Name	YES	YES	YES
IMO number	YES	YES	YES
Flag State of ship	YES	YES	YES
Master's name	YES	YES	NO
Voyage reference	YES	YES	YES
Port of loading	YES	YES	NO
Port of discharge	YES	YES	NO
Shipping agent	YES	YES	YES
Call sign	YES	YES	YES
Booking/Reference Number	YES	NO	NO
Marks & numbers Container id. No(s). Vehicle reg. No(s).	YES	YES / NO	NO
number and kind of packages	YES	YES	NO
Proper shipping name	YES	NO	NO
Class	YES	NO	YES
Un Number	YES	NO	YES
Packing group	YES	NO	NO
Subsidiary Risk(s)	YES	NO	NO
Flash -point (in °C,c.c.)	YES	NO	NO
Marine pollutant	YES	NO	NO
Mass (kg) gross/net	YES	YES	YES
Ems	YES	NO	NO
Stowage position on board	YES	NO	NO
Agent's signature	YES	NO	NO
master's signature	YES	NO	NO
place and date	YES	NO	NO

6.4.3 Safeseanet vs. NOA/CIMIS

The following table shows a comparisons of data required by the SAFESEANET with respect to the NOA and the CIMIS.

SafeSeaNet VS. ADS AND NOA				
DATA REQUIRED	ANNEX I - PORT NOTIFICATION INFORMATION - Vessel identification			
	SSN	1. ARRIVAL / DEPARTURES OF SHIPS	2. NOTICE OF ARRIVAL	NOTE
IMO NUMBER	YES	YES	YES	



SHIP NAME	YES	YES	YES	+
CALL SIGN	YES	YES	YES	+
MMSI	YES	YES	YES	+
DATA REQUIRED	ANNEX I - PORT NOTIFICATION INFORMATION - Voyage information			
	SSN	1. ARRIVAL / DEPARTURES OF SHIPS	2. NOTICE OF ARRIVAL	NOTE
NEXT POC	YES	YES	YES	+
ETA	YES	NO	NO	1 / 2
ETD FROM NEXT POC	YES	NO	NO	1 / 2
TOTAL NUMBER OF PERSONS OB	YES	YES / NO	NO	1 / 2

DATA REQUIRED	ANNEX II - SHIP (MRS) INFORMATION - Vessel identification			
	SSN	1. ARRIVAL / DEPARTURES OF SHIPS	2. NOTICE OF ARRIVAL	NOTE
IMO	YES	YES	YES	+
MMSI	YES	YES	YES	+
CALL SIGN	YES	YES	YES	+
SHIP NAME	YES	YES	YES	+
DATA REQUIRED	ANNEX II - SHIP (MRS) INFORMATION - Voyage information			
	SSN	1. ARRIVAL / DEPARTURES OF SHIPS	2. NOTICE OF ARRIVAL	NOTE
NEXT POC	YES	YES	YES	+



ETA	YES	NO	NO	1 / 2
TOTAL NUMBER OF PERSONS ON BOARD	YES	YES / NO	NO	1 / 2
REPORTING DATE AND TIME	YES	NO	NO	1 / 2
COG	YES	NO	NO	1 / 2
SOG	YES	NO	NO	1 / 2
NAVIGATIONAL STATUS	YES	NO	NO	1 / 2
CHARACTERISTICS AND QUANTITY OF BUNKER FUEL	YES	YES / NO	NO	1 / 2
SHIP POSITION (LAT-LONG)	YES	NO	NO	1 / 2
DATA REQUIRED	ANNEX II - SHIP (MRS) INFORMATION - Cargo information			
	SSN	1. ARRIVAL / DEPARTURES OF SHIPS	2. NOTICE OF ARRIVAL	
TYPE OF CARGO	YES	YES	YES	+
DG ON BOARD (Y/N)	YES	YES	YES	+
IF DG IMO CLASS AND QUANTITY	YES	NO	YES	1
ADDRESSES FROM WHICH DETAILED INFO ON THE CGO MAY BE OBTAINED	YES	NO	NO	1 / 2

DATA REQUIRED	ANNEX III - HAZMAT INFORMATION - Vessel identification			
	SSN	1. ARRIVAL / DEPARTURES OF SHIPS	2. NOTICE OF ARRIVAL	
IMO	YES	YES	YES	+
MMSI	YES	YES	YES	+



CALL SIGN	YES	YES	YES	+
SHIP NAME	YES	YES	YES	+
DATA REQUIRED	ANNEX III - HAZMAT INFORMATION - Voyage information			
	SSN	1. ARRIVAL / DEPARTURES OF SHIPS	2. NOTICE OF ARRIVAL	
NEXT POC	YES	YES	YES	+
ETA	YES	NO	NO	1 / 2
ETD FROM CURRENT PORT	YES	NO	NO	1 / 2
TOTAL NUMBER OF PERSONS ON BOARD	YES	YES / NO	NO	1 / 2
INF SHIP CLASS	YES	YES	YES	+
DATA REQUIRED	ANNEX III - HAZMAT INFORMATION - Cargo information			
	SSN	1. ARRIVAL / DEPARTURES OF SHIPS	2. NOTICE OF ARRIVAL	
DG/PG NO	YES	tbd	tbd	tbd
TECHNICAL NAME OF DG/PG	YES	NO	NO	1 / 2
UNNO OF DG/PG	YES	NO	YES	1
IMO CLASS (IMDG-IBC-IGC CODES)	YES	NO	YES	1
GROSS WEIGHT ()KILO / ()METRIC TONNE	YES	YES	YES	+
NETT WEIGHT ()KILO / ()METRIC TONNE	YES	NO	NO	1 / 2
LOCATION NO...OF GOODS (IF NOT IN CONTAINERS)	YES	NO	NO	1 / 2
LOCATION NO...OF CONTAINER (IF DG IN CONTAINER)	YES	NO	NO	1 / 2
CARGO TRANSPORT UNIT ID	YES	NO	NO	1 / 2
CONTAINER	YES	NO	NO	1 / 2

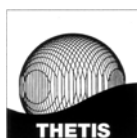


LOCATION				
ADDRESSES FROM WHICH DETAILED INFO ON THE CGO MAY BE OBTAINED	YES	NO	NO	1 / 2

6.4.4 ADRIREP vs. Directive 2002/59-EU

The following table shows a comparisons of data required by ADRIREP with respect to the directive 2002/59-EU.

DIRECTIVE 2002/59/EU VS. ADRIREP				
DATA REQUIRED	ANNEX 1 - 1. LIST OF INFORMATION TO BE NOTIFIED Article 4 GENERAL INFORMATION			
	DIR 2002/59/EU	1. ADRIREP	2. ADRIREP / PR-ER	NOTE
VESSEL NAME	YES	YES	YES	+
CALL SIGN	YES	YES	YES	+
IMO NUMBER	YES	YES	YES	+
MMSI	YES	NO	NO	1 / 2
PORT OF DESTINATION	YES	YES	YES	+
ETA	YES	YES	YES	+
ETD	YES	NO	NO	1 / 2
NUMBER OF PERSONS ON BOARD	YES	YES	NO	2
DATA REQUIRED	ANNEX 1 - 2. INFORMATION TO BE NOTIFIED Article 12 - CARGO INFORMATION			
	DIR 2002/59/EU	1. ADRIREP	2. ADRIREP / PR-ER	NOTE
DG TECHNICAL NAME	YES	YES	NO	2
UNNO	YES	NO	NO	1 / 2
IMO CLASS	YES	YES	NO	2



SHIP CLASS FOR INF CGO	YES	NO	NO	1 / 2
CGO INFO ADDRESS	YES	YES / NO	NO	1 / 2
DATA REQUIRED	ANNEX 1 - 3. INFORMATION TO BE NOTIFIED Article 13 - A. General information			
	DIR 2002/59/EU	1. ADRIREP	2. ADRIREP / PR-ER	NOTE
VESSEL NAME	YES	YES	YES	+
CALL SIGN	YES	YES	YES	+
IMO	YES	YES	YES	+
MMSI	YES	NO	NO	1 / 2
PORT OF DESTINATION	YES	YES	YES	+
ETD	YES	NO	NO	1 / 2
ETA	YES	YES	YES	+
TOTAL NUMBER OF PERSONS ON	YES	YES	NO	2
DATA REQUIRED	ANNEX 1 - 3. INFORMATION TO BE NOTIFIED Article 13 - B. Cargo information			
	DIR 2002/59/EU	1. ADRIREP	2. ADRIREP / PR-ER	NOTE
DG TECHNICAL NAME	YES	YES	NO	2
UNNO	YES	NO	NO	1 / 2
IMO CLASS	YES	YES	NO	2
LOADING PLAN OR MANIFEST ON	YES	NO	NO	1 / 2
ADDRESS OF DETAILED INFO	YES	YES	NO	2
DATA REQUIRED	ANNEX 1 - 4. INFORMATION TO BE NOTIFIED Article 5 Mandatory reporting system			
	DIR 2002/59/EU	1. ADRIREP	2. ADRIREP / PR-ER	NOTE
VESSEL NAME	YES	YES	YES	+
CALL SIGN	YES	YES	YES	+



IMO	YES	YES	YES	+
MMSI	YES	YES	NO	2
DATE AND TIME	YES	YES	YES	+
POSITION (LAT-LONG)	YES	YES	YES	+
COURSE	YES	YES	YES	+
SPEED	YES	YES	YES	+
PORT OF DESTINATION AND ETA	YES	YES	YES	+
CARGO (QUANTITY AND IMO CLASS FOR DG)	YES	YES	NO	2
ADDRESS FOR COMMUNICATION OF CGO INFO	YES	YES	NO	2
TOTAL NUMBER OF PERSONS ON	YES	YES	NO	2
VARIOUS INFO	YES	YES	YES	+
CHARACTERISTICS AND QUANTITY OF BUNKER FUEL FOR SHIPS CARRYING MORE THAN 5.000 T OF BUNKER	YES	NO	NO	1 / 2
NAVIGATIONAL STATUS	YES	YES	YES	+

Note : The last column is the status of the field – if exist (green) or have to be added/updated(red)

The number in a red is the missing field reference.

6.4.5 ADRIREP vs. NOA/CIMIS

The following table shows a comparisons of data required by ADRIREP with respect to the NOA and the CIMIS.



FORM ITEM	NOA PRENOTICE OF ARRIVAL	ADS ARRIVAL INFO NOTICE	ADRIREP
VESSEL NAME	YES	YES	YES
CALL SIGN	YES	YES	YES
IMO NUMBER	YES	YES	YES
MMSI	YES	YES	NO
FLAG	YES	YES	YES
PORT OF REGISTRY	YES	YES	NO
OWNER	YES	YES	YES
OPERATOR / CHARTERER	YES	NO	YES
CLASSIFICATION SOCIETY	YES	YES	NO
YEAR OF BUILD	YES	YES	NO
GROSS TONNAGE	YES	YES	YES
DEADWEIGHT	YES	YES	YES
TYPE OF SHIP	YES	YES	YES
LAST PORT	YES	YES	YES
LAST COUNTRY	YES	YES	NO
NETT TONNAGE	YES	NO	NO
SUMMER DISPLACEMENT	YES	NO	NO
LOA	YES	YES	YES



BEAM	YES	NO	NO
DRAFT ON ARRIVAL	YES	YES	YES
SUMMER DRAFT	YES	NO	NO
VESSEL'S AGENT	YES	YES	YES
LAST PORT STATE CONTROL	YES	NO	NO
PORT OF ARRIVAL	YES	YES	YES
DATE OF ARRIVAL	YES	YES	YES
NEXT PORT	YES	YES	YES
NEXT COUNTRY	YES	YES	YES
CARGO FOR DISCHARGE (TYPE)	YES	YES	NO
CARGO FOR DISCHARGE (WEIGHT)	YES	YES	NO
CARGO FOR LOADING (TYPE)	YES	YES	NO
CARGO FOR LOADING (WEIGHT)	YES	YES	NO
DANGEROUS CARGO ON BOARD	YES	YES	YES
ISPS CODE			
ISSUING AUTHORITY	YES	NO	NO
CERTIFICATE EXPIRY DATE	YES	NO	NO
SECURITY LEVEL	YES	NO	NO
SSO	YES	NO	NO



BALLAST WATER DETAILS			
BALLAST WATER MANAGEMENT PLAN ON BOARD	YES	NO	NO
PLAN IMPLEMENTED	YES	NO	NO
RESOLUTION A.868(20) ON BOARD	YES	NO	NO
ANY BALLAST WATER FOR DISCHARGE	YES	NO	NO
IMDG REPORTING FORM	YES	NO	NO
BALLAST WATER REPORTING FORM	YES	NO	NO
NOTIFICATION OF SHIP GENERATED WASTE DIR 2000 / 59 EU	YES	NO	NO
ISPS CODE ARRIVAL NOTIFICATION	YES	NO	NO
NUMBER OF CREW	NO	YES	YES
LINE NUMBER	NO	YES	NO
MASTER'S NAME	NO	YES	YES
CATEGORY OF NAVIGATION	NO	YES	NO
TURNUS NUMBER	NO	YES	NO
PASSENGER TRAFFIC			
PASSENGERS COUNTRY OF LOADING	NO	YES	NO
PASSENGERS PORT OF LOADING	NO	YES	NO
NUMBER OF PASSENGERS	NO	YES	YES
TYPE OF PASSENGER TRAFFIC	NO	YES	NO



CARGO TRAFFIC			
COUNTRY OF LOADING	YES	YES	NO
PORT OF LOADING	NO	YES	NO
DESTINATION	NO	YES	NO
TYPE OF CARGO	YES	YES	NO
WEIGHT	YES	YES	NO
DG TYPE	YES	YES (NOT ACCORDING IMO)	YES
CARGO CODE	NO	YES	NO
NUMBER OF UNITS	NO	YES	NO
INPUT TABLE DATA			
ENGINE POWER	NO	YES	NO
EX NAMES	NO	YES	NO
TYPE OF PROPULSION	NO	YES	NO
AUTOMATIZATION	NO	YES	NO
OWNERS ADDRESS	NO	YES	NO
OWNERS OFFICE	NO	YES	NO
SHIP NAME	YES	YES	YES



CALL SIGN	YES	YES	YES
IMO NUMBER	YES	YES	YES
MMSI	YES	YES	NO
PORT OF DESTINATION	YES	YES	YES
ETA	YES	YES	YES
ETD	NO	NO	NO
TOTAL NUMBER OF PERSONS ON BORD	NO	YES	YES
TECHNICAL NAME OF DG CARGO	NO	NO	NO
UN NUMBER	YES	NO	NO
IMO CLASS	YES	NO	YES
EMERGENCY CONTACT	NO	NO	YES
DATE AND TIME	N/A	N/A	YES
POSITION	N/A	N/A	YES
COURSE	N/A	N/A	YES
SPEED	N/A	N/A	YES
PORT OF DESTINATION AND ETA	YES	YES	YES
CARGO, QUANTITY AND IMO CLASSES	YES	YES	YES
VARIOUS INFO	YES	YES	YES
NAVIGATIONAL STATUS	N/A	N/A	NO



ETA NEXT CHECK POINT	N/A	N/A	YES

6.4.6 Conclusion

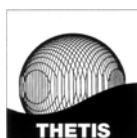
6.4.6.1 NOA form vs. 2002/59-EU, 2002/6-EU directives, SafeSeaNet

The analysis of the NOA form vs. Regulative stated that:

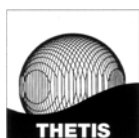
- There are gaps in comparison with all the compared regulative;
- The update have to be done on the existing NOA Form that require to change some fields and to add some more;
- Some of the regulative defined fields that are available in other forms that the Authorities receive like – Personal and Crew data with IMO Forms 4, 5 - that may be possible to integrate with a result in less effort and less fields to change/add.

Resultant fields that have to be updated/added on NOA vs Regulative comparison analysis are listed in this table:

Ministry of Sea NOA Form		SAFESEANET SSN_ICD_V1_Rev0	FAL (Directive 2002-6-EU)	Directive 2002-59-EU	Comments
Signature	Yes if Name		Name of Master (IGD.5) Date and signature of Master, agent or officer (IGD.21)		Acceptable!?
	No		Port Arrived from/Port of destination (IGD.6)(SSD.6)		Update
Port of Registry	Yes;No;No		Certificate of Registry (port;date; number) (IGD.7)		Update
Ships position and reporting time	Yes		Position of the Ship in the Port (berth or station) (IGD.11)	A5	Apx.2h before arrival-VHF - update and document required
	No		Number of Crew (incl.master) (IGD.14)(CED.4)(CL.7)		Update
	No		Number of passengers (IGD.15)		Add
Requested documents	Yes		Attached documents(IGD 17-20;22-23)		Update
	No	Total No.of persons on board(A1;A2;A3)	Number of persons on board (SSD.6)	Total No.of persons on board(GIA4,A5)	Add



	No		Period of stay(SSD.7)		Add
	No		Place of storage(SSD.8)		Not in the req.format-Update
	No		Effect which are dutiable or subject to prohibitions or restrictions (CED.2)		Add
	No		Family Name,given name (CED.5)(CL.8)		Add
	No		Family Name,given name (PL.5)		Add
	No		Rank or rating(CED.6)(CL.9)		Add
	No		Signature(CED.7)		Crew signature - Add
	No		Nature and No of identity document (seamans passport) (CL.6)		Add
	No		Nationality(CL.10)		Add
	No		Nationality(PL.6)		Add
	No		Date and place of birth(CL.11)		Add
	No		Date and place of birth(PL.7)		Add
	No		Port of Imbarkation(PL.8)		Add
	No		Port of disambarkion(PL.9)		Add
Vessels Agent	Yes, Address no		Name and address of Ship's Agent (IGD.8)		Address optional, Update
	No			Port of Destination(GIA4,GIA13)	Add
Next port	No,Yes		Port Arrived from/Port of destination (IGD.6)(SSD.6)	GIA13	Update
Next Country	No,Yes		Port Arrived from/Port of destination (IGD.6)(SSD.6)	GIA13	Update
	Yes/No	Reporting Date and Time(A2)			Datum Not fixed-Update
	No	COG (Course over Ground) (A2)		A5	Add
	No	SOG (Speed over Ground) (A2)		A5	Add
	No	Navigational Status		A5	Add
	No	Characteristic and estimated Q of bunker fuel(A2)		A5	Add
	No	Ships position (Latitude) (A2)		A5	Add



	No	Ships position (Longitude) (A2)		A5	Add
Cargo Weight	Yes		Quantity (SSD.10)	A5	Update
	CLASS[1, 2, 2.1, ...9]	A2;A3		Code IMDG, IBC, IGC (CIA12,CIA13,A5)	Add
	UNNO	A2;A3		CIA12,CIA13,A5	Add
	UN PAGE	A2;A3		CIA12,CIA13,A5	Add
	WEIGHT	A2;A3		CIA12,CIA13,A5	Add
	TOTAL WEIGHT	A2;A3		CIA12,CIA13,A5	Add
	No	Location no...of goods(if not in containers) A3		CIA12,CIA13,A5	Add
	No	Location no...of containers(if DG in containers) A3		CIA12,CIA13,A5	Add
	No	Cargo transport Unit ID (A3)		CIA12,CIA13,A5	Add
	No	Container location (A3)		CIA12,CIA13,A5	Add
	No			confirmation that a list or manifest or appropriate loading plan giving details of the dangerous or polluting goods carried and of their location on the ship is on board (CIA13,A5)	Add
	No	Address from which detailed info on cargo may be obtained (A2;A3)		CIA12,CIA13	Add

6.4.7 CIMIS database vs. 2002/59-EU, 2002/6-EU directives, SafeSeaNet and ADRIREP

The analysis of the CIMIS system vs EU Regulative stated that :

- Similar with the NOA comparison there are gaps in comparison with all the compared regulative,
- The general objection is the Croatian Only Interface of the CIMIS system,
- Regards the Directive 2002-59-EU the main gap is the ships position data that could be resolved with the future VTMS integration,

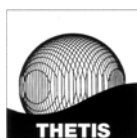


- The update have to be done on the existing CIMIS database structure that require to change some fields and to add some more.

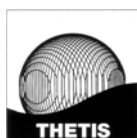
The comparison tables between the regulatives and the Croatian NOA/ADS(CIMIS) are listed in tables bellow:

Resultant fields that have to be updated/added on CIMIS vs Regulative comparison analysis are listed in the table bellow :

CIMIS		SAFESEANET SSN_ICD_V1_Rev0	FAL (Directive 2002-6-EU)	Directive 2002-59-EU	Comments
VESSEL DATA					
Zapovjednik(PB)	Yes		Name of Master (IGD.5) Date and signature of Master, agent or officer (IGD.21)		Acceptable
Vrijeme,Godina,Mjesec(PB)?	Yes		Position of the Ship in the Port (berth or station) (IGD.11)	A5	Update
	No		Brief particulars of voyage (IGD.12)		Add
	No		Attached documents(IGD 17-20;22-23)		Add
Broj posade(PB)+Broj putnika(P)	Yes/No	Total No.of persons on board(A1;A2;A3)	Number of persons on board (SSD.6)	Total No.of persons on board(GIA4,A5)	Update
Datum od/do (HL,SL)?	Yes		Period of stay(SSD.7)		Update
	No		Place of storage(SSD.8)		Add
	No		Effect which are dutiable or subject to prohibitions or restrictions (CED.2)		Add
Ime (O)	Yes		Family Name,given name (CED.5)(CL.8)		Update
Ime(O)	Yes		Family Name,given name (PL.5)		Update
Tip osobe(O)	Yes		Rank or rating(CED.6)(CL.9)		Update
	No		Signature(CED.7)		Crew signature
Datum rođenja(O) Str.mjesto rođenja(O)	Yes		Date and place of birth(CL.11)		Update
	No		Date and place of birth(PL.7)		Add
	No		Port of Imbarkation(PL.8)		Add
	No		Port of disembarkation(PL.9)		Add
ARRIVAL DATA					
	No			Port of Destination(GIA4,GIA13)	Add
	No	COG (Course over Ground) (A2)		A5	Add



	No	SOG (Speed over Ground) (A2)		A5	Add
	No	Navigational Status		A5	Add
	No	Characteristic and estimated Q of bunker fuel(A2)		A5	Add
	No	Ships position (Latitude) (A2)		A5	Add
	No	Ships position (Longitude) (A2)		A5	Add
CARGO DETAILS					
IMDG					
	No	A2;A3		CIA12,CIA13,A5	Add
	No	Location no...of goods(if not in containers) A3		CIA12,CIA13,A5	Add
	No	Location no...of containers(if DG in containers) A3		CIA12,CIA13,A5	Add
	No	Cargo transport Unit ID (A3)		CIA12,CIA13,A5	Add
	No	Container location (A3)		CIA12,CIA13,A5	Add
	No			confirmation that a list or manifest or appropriate loading plan giving details of the dangerous or polluting goods carried and of their location on the ship is on board (CIA13,A5)	Add
	No	Address from which detailed info on cargo may be obtained (A2;A3)		CIA12,CIA13	Add
Legenda: PO – Vessel PB – NOA T- Cargot TB – Ship Type O – Person(Crew) D – Country Z – Flag P – Pasanger SL – International Port HL – Croatian Port		Legend: A1-Annex I – Port Notification Information A2-AnnexII – Ship (MRS) Information A3-AnnexIII – HAZMAT Information	Legend: IGD – IMO General Declaration SSD – IMO Ship's Stores Declaration CED –IMO Crew's Effects Declaration CL - IMO Crew List PL - IMO Passenger List	Legend: GIA4 - General Information Article 4. CIA12 - Cargo Information Article 12. GIA13 - General Information Article 13. CIA13 - Cargo Information Article 13 A5 - Article 5.	



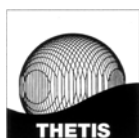
6.4.8 Summary of data of NOA updated

Resultant fields that have to be updated/added on NOA are listed in the table below :

Ministry of Sea NOA Form		SAFESEANET SSN_ICD_V1_Rev0	FAL (Directive 2002-6-EU)	Directive 2002-59-EU	Comments
Signature	Yes if Name		Name of Master (IGD.5) Date and signature of Master, agent or officer (IGD.21)		Update/Check
	No		Port Arrived from/Port of destination (IGD.6)(SSD.6)		Update
Port of Registry	Yes;No;No		Certificate of Registry (port;date; number) (IGD.7)		Update
Ships position and reporting time	Yes		Position of the Ship in the Port (berth or station) (IGD.11)	A5	Apx.2h before arrival-VHF - update and document required
	No		Number of Crew (incl.master) (IGD.14)(CED.4)(CL.7)		Update
	No		Number of passengers (IGD.15)		Add
Requested documents	Yes		Attached documents(IGD 17-20;22-23)		Update
	No	Total No.of persons on board(A1;A2;A3)	Number of persons on board (SSD.6)	Total No.of persons on board(GIA4,A5)	Add
	No		Period of stay(SSD.7)		Add
	No		Place of storage(SSD.8)		Not in the req.format- Update
	No		Effect which are dutiable or subject to prohibitions or restrictions (CED.2)		Add
	No		Family Name,given name (CED.5)(CL.8)		Add
	No		Family Name,given name (PL.5)		Add
	No		Rank or rating(CED.6)(CL.9)		Add
	No		Signature(CED.7)		Crew signature - Add
	No		Nature and No of identity document (seamans passport) (CL.6)		Add
	No		Nationality(CL.10)		Add
	No		Nationality(PL.6)		Add



	No		Date and place of birth(CL.11)		Add
	No		Date and place of birth(PL.7)		Add
	No		Port of Imbarkation(PL.8)		Add
	No		Port of disembarkation(PL.9)		Add
Vessels Agent	Yes, Address no		Name and address of Ship's Agent (IGD.8)		Address optional, Update
	No			Port of Destination(GIA4,GIA13)	Add
Next port	No,Yes		Port Arrived from/Port of destination (IGD.6)(SSD.6)	GIA13	Update
Next Country	No,Yes		Port Arrived from/Port of destination (IGD.6)(SSD.6)	GIA13	Update
	Yes/No	Reporting Date and Time(A2)			Datum Not fixed-Update
	No	COG (Course over Ground) (A2)		A5	Add
	No	SOG (Speed over Ground) (A2)		A5	Add
	No	Navigational Status		A5	Add
	No	Characteristic and estimated Q of bunker fuel(A2)		A5	Add
	No	Ships position (Latitude) (A2)		A5	Add
	No	Ships position (Longitude) (A2)		A5	Add
Cargo Weight	Yes		Quantity (SSD.10)	A5	Update
	CLASS[1, 2, 2.1, ...9]	A2;A3		Code IMDG, IBC, IGC (CIA12,CIA13,A5)	Add
	UNNO	A2;A3		CIA12,CIA13,A5	Add
	UN PAGE	A2;A3		CIA12,CIA13,A5	Add
	WEIGHT	A2;A3		CIA12,CIA13,A5	Add
	TOTAL WEIGHT	A2;A3		CIA12,CIA13,A5	Add
	No	Location no...of goods(if not in containers) A3		CIA12,CIA13,A5	Add
	No	Location no...of containers(if DG in containers) A3		CIA12,CIA13,A5	Add
	No	Cargo transport Unit ID (A3)		CIA12,CIA13,A5	Add

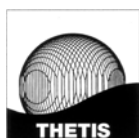


	No	Container location (A3)		CIA12,CIA13,A5	Add
	No			confirmation that a list or manifest or appropriate loading plan giving details of the dangerous or polluting goods carried and of their location on the ship is on board (CIA13,A5)	Add
	No	Address from which detailed info on cargo may be obtained (A2;A3)		CIA12,CIA13	Add

6.4.9 Summary of missing data - in CIMIS and NOA

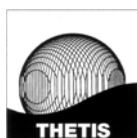
SUMMARY OF MISSING DATA 2002 / 59 vs CIMIS

DATA REQUIRED	ANNEX 1 - 1. LIST OF INFORMATION TO BE NOTIFIED Article 4 GENERAL INFORMATION			
	1. ARRIVAL / DEPARTURES OF SHIPS	2. NOTICE OF ARRIVAL		
ETD				
NUMBER OF PERSONS OB				
DATA REQUIRED	ANNEX 1 - 2. INFORMATION TO BE NOTIFIED Article 12 - CARGO INFORMATION			
	1. ARRIVAL / DEPARTURES OF SHIPS	2. NOTICE OF ARRIVAL		
DG TECHNICAL NAME				
UNNO				
IMO CLASS				
CGO INFO ADDRESS				
DATA REQUIRED	ANNEX 1 - 3. INFORMATION TO BE NOTIFIED Article 13 - A. General information			
	1. ARRIVAL / DEPARTURES OF	2. NOTICE OF ARRIVAL		



ETD				
TOTAL NUMBER OF PERSONS OB				
DATA REQUIRED	ANNEX 1 - 3. INFORMATION TO BE NOTIFIED Article 13 - B. Cargo information			
	1. ARRIVAL / DEPARTURES OF SHIPS	2. NOTICE OF ARRIVAL		
DG TECHNICAL NAME				
UNNO				
IMO CLASS				
LOADING PLAN OR MANIFEST OB				
ADDRESS OF DETAILED INFO				

DATA REQUIRED	ANNEX 1 - 4. INFORMATION TO BE NOTIFIED Article 5 Mandatory reporting system			
	ARRIVAL / DEPARTURES OF SHIPS	NOTICE OF ARRIVAL		
DATE AND TIME				
POSITION (LAT-LONG)				
COURSE				
SPEED				
CARGO (QUANTITY AND IMO CLASS FOR DG)				
ADDRESS FOR COMMUNICATION OF CGO INFO				
TOTAL NUMBER OF PERSONS OB				
CHARACTERISTICS AND QUANTITY OF BUNKER FUEL FOR SHIPS CARRYING MORE THAN 5.000 T OF BUNKER				
NAVIGATIONAL STATUS				



SUMMARY OF MISSING DATA
SSN vs NOA/ADS(CIMIS)

DATA REQUIRED	ANNEX I - PORT NOTIFICATION INFORMATION - Voyage information			
	1. ARRIVAL / DEPARTURES OF SHIPS	2. NOTICE OF ARRIVAL		
ETA				
ETD FROM NEXT POC				
TOTAL NUMBER OF PERSONS OB				
DATA REQUIRED	ANNEX II - SHIP (MRS) INFORMATION - Voyage information			
	1. ARRIVAL / DEPARTURES OF SHIPS	2. NOTICE OF ARRIVAL		
ETA				
TOTAL NUMBER OF PERSONS OB				
REPORTING DATE AND TIME				
COG				
SOG				
NAVIGATIONAL STATUS				
CHARACTERISTICS AND QUANTITY OF BUNKER FUEL				
SHIP POSITION (LAT - LONG)				
DATA REQUIRED	ANNEX II - SHIP (MRS) INFORMATION - Cargo information			
	1. ARRIVAL / DEPARTURES OF SHIPS	2. NOTICE OF ARRIVAL		
IF DG IMO CLASS AND QUANTITY				
ADDRESSES FROM WHICH DETAILED INFO ON THE CGO MAY BE OBTAINED				
DATA	ANNEX III - HAZMAT INFORMATION - Voyage information			



	1. ARRIVAL / DEPARTURES OF SHIPS	2. NOTICE OF ARRIVAL		
ETA				
ETD FROM CURRENT PORT				
TOTAL NUMBER OF PERSONS ON				

DATA REQUIRED	ANNEX III - HAZMAT INFORMATION - Cargo information			
	1. ARRIVAL / DEPARTURES OF SHIPS	2. NOTICE OF ARRIVAL		
DG/PG NO				
TECHNICAL NAME OF DG/PG				
UNNO OF DG/PG				
IMO CLASS (IMDG-IBC-IGC CODES)				
NETT WEIGHT () KILO / () METRIC TONNE				
LOCATION NO...OF GOODS (IF NOT IN CONTAINERS)				
LOCATION NO...OF CONTAINER (IF DG IN CONTAINER)				
CARGO TRANSPORT UNIT ID				
CONTAINER LOCATION				
ADDRESSES FROM WHICH DETAILED INFO ON THE CGO MAY BE OBTAINED				



SUMMARY OF MISSING DATA VTMS/ADRIAREP vs 2002/59

DATA REQUIRED	ANNEX 1 - 1. LIST OF INFORMATION TO BE NOTIFIED Article 4 GENERAL INFORMATION			
	1. ADRIAREP	2. ADRIAREP / PR-ER		
MMSI				
ETD				
NUMBER OF PERSONS ON				
DATA REQUIRED	ANNEX 1 - 2. INFORMATION TO BE NOTIFIED Article 12 - CARGO INFORMATION			
	1. ADRIAREP	2. ADRIAREP / PR-ER		
DG TECHNICAL NAME				
UNNO				
IMO CLASS				
SHIP CLASS FOR INF CGO				
CGO INFO ADDRESS				
DATA REQUIRED	ANNEX 1 - 3. INFORMATION TO BE NOTIFIED Article 13 - A. General information			
	1. ADRIAREP	2. ADRIAREP / PR-ER		
MMSI				
ETD				
TOTAL NUMBER OF PERSONS ON				
DATA REQUIRED	ANNEX 1 - 3. INFORMATION TO BE NOTIFIED Article 13 - B. Cargo information			
	1. ADRIAREP	2. ADRIAREP / PR-ER		



	1. ADRIREP	2. ADRIREP / PR-ER		
DG TECHNICAL NAME				
UNNO				
IMO CLASS				
LOADING PLAN OR MANIFEST OB				
ADDRESS OF DETAILED INFO				

DATA REQUIRED	ANNEX 1 - 4. INFORMATION TO BE NOTIFIED Article 5 Mandatory reporting system			
	1. ADRIREP	2. ADRIREP / PR-ER		
MMSI				
CARGO (QUANTITY AND IMO CLASS FOR DG)				
ADDRESS FOR COMMUNICATION OF CGO INFO				
TOTAL NUMBER OF PERSONS OB				
CHARACTERISTICS AND QUANTITY OF BUNKER FUEL FOR SHIPS CARRYING MORE THAN 5.000 T OF BUNKER				
NAVIGATIONAL STATUS				



SUMMARY OF MISSING DATA SSN vs ADRIREP

DATA REQUIRED	ANNEX I - PORT NOTIFICATION INFORMATION - Vessel identification			
	1. ADRIREP	2. ADRIREP / PR-ER		
MMSI				
DATA REQUIRED	ANNEX I - PORT NOTIFICATION INFORMATION - Voyage information			
	1. ADRIREP	2. ADRIREP / PR-ER		
ETD FROM NEXT POC				
TOTAL NUMBER OF PERSONS OB				
DATA REQUIRED	ANNEX II - SHIP (MRS) INFORMATION - Vessel identification			
	1. ADRIREP	2. ADRIREP / PR-ER		
MMSI				
DATA REQUIRED	ANNEX II - SHIP (MRS) INFORMATION - Voyage information			
	1. ADRIREP	2. ADRIREP / PR-ER		
TOTAL NUMBER OF PERSONS OB				
NAVIGATIONAL STATUS				
CHARACTERISTICS AND QUANTITY OF BUNKER FUEL				



DATA REQUIRED	ANNEX II - SHIP (MRS) INFORMATION - Cargo information			
	1. ADRIREP	2. ADRIREP / PR-ER		
TYPE OF CARGO				
DG ON BOARD (Y/N)				
IF DG IMO CLASS AND QUANTITY				
ADDRESSES FROM WHICH DETAILED INFO ON THE CGO MAY BE OBTAINED				
DATA REQUIRED	ANNEX III - HAZMAT INFORMATION - Vessel identification			
	1. ADRIREP	2. ADRIREP / PR-ER		
MMSI				

DATA REQUIRED	ANNEX III - HAZMAT INFORMATION - Voyage information			
	1. ADRIREP	2. ADRIREP / PR-ER		
ETD FROM CURRENT PORT				
TOTAL NUMBER OF PERSONS OB				



INF SHIP CLASS				
DATA REQUIRED	ANNEX III - HAZMAT INFORMATION - Cargo information			
	1. ADRIREP	2. ADRIREP / PR-ER		
DG/PG NO				
TECHNICAL NAME OF DG/PG				
UNNO OF DG/PG				
IMO CLASS (IMDG-IBC-IGC CODES)				
GROSS WEIGHT ()KILO / ()METRIC TONNE				
NETT WEIGHT ()KILO / ()METRIC TONNE				
LOCATION NO..OF GOODS (IF NOT IN CONTAINERS)				
LOCATION NO..OF CONTAINER (IF DG IN CONTAINER)				
CARGO TRANSPORT UNIT ID				
CONTAINER LOCATION				
ADDRESSES FROM WHICH DETAILED INFO ON THE CGO MAY BE OBTAINED				



6.5 Evaluation of additional potential users

In addition to the main users, as HM, agent, MRCC (National VTS), Maintenance operators, the following other authorities/users shall be considered for consultation and for cooperation to improve the efficiency and safety of operations in Coastal waters and ports:

- State Port Authority
- County Port Authority
- Industrial ports
- Custom
- Ministry of Interior - Police
- Health

These users are required for cooperation in ports for giving clearance on arrival and departure, and improving the efficiency and safety of operations. Consultation of arrival and departure data shall be available for their activities.

Others (external/registered), as Navy, fishery, environmental, veterinary Inspectorate, that shall be able to consult the arrival and departure data.

6.6 Improvement of data quality

One important task is to improve the quality of data available, due to:

- Information filled sometime are incomplete,
- used forms sometimes are not the “last version”,
- content sometime are incorrect,
- database not fully upgraded (for instance on request on ships MRCC need to send updated data to other members).

One solution is to use existing database in the market.

Here is a brief description of the main common database.

6.6.1 Lloyd register

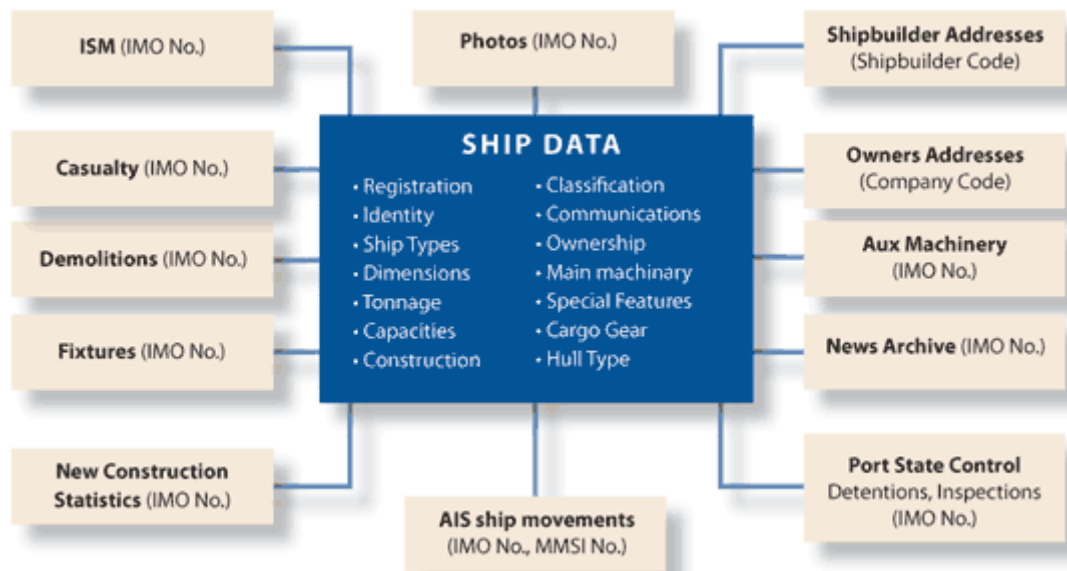
The system shall use and integrate Lloyd's register database for ship database for improving the quality of data; for instance information on Hull can be made available directly from this database and checked with the information collected from Agent;



Lloyd's Register - Fairplay's is highly structured and fully relational databases on ship and other maritime information (as company, movement and port related data). Full information are available in the website www.lr.org.

Customised extracts and data analysis from the databases can be supplied and updated in a variety of formats to allow to build in-house business applications, linking information and knowledge with our ship, company, movement and port related data. All ships over 100 GT are available (over 170,000 ships).

Main data available on ships are the ones as in the picture below.



6.6.2 ParisMoU

The ParisMoU webpage contains information that can be used for cross checking and improving the quality of data; for instance information on Banned data can be made available directly from this database and checked with the information collected from Agent or other users.

6.7 Main recommendations

Based on the results and conclusion from the analysis of data collected, main recommendation are the following:

- Considering that at present most of the communication are done using email and paper document, to computerize systems in ports in order to improve the data availability and exchange of data between the commercial port operators.
- Considering that ADRIREP mandatory reporting is done manually, to computerize system in order to simplify the data input and the delivery of the information to other Authorities; system



shall be able to send via fax or via email automatically data collected to the relevant authorities;

- With respect to ADRIREP, and the need to exchange data with other Member states, in order to improve efficiency, reduce risk of missing information to other authorities, and receive information in real time, we recommend to integrate the system into a Regional Mediterranean Information System for automatic data exchange, integrated into the Mediterranean AIS real time exchange system (prior bilateral agreement for exchanging information).
- To simplify data exchange and information flow in order to improve efficiency in ports and commercial data exchange, introducing a single window concept relevant to data management design, considering that at present:
 - o Agent need to report the same information to different authorities (NOA forms are sent from agent to PA, HM and other authorities, and shall filled just one time..)
 - o HM need to report the same information in several system (CIMIS, ParisMoU, other local DB)
 - o Several information are common to different documents.
- To improve the information exchange between authorities, main users and data integration, for instance:
 - o MRCC need to receive information in advance on ship planning and NOA related information and other data on ships available from HM in order to check for information from Master (example: the n. of people).
 - o Information to be upgraded on possible changes in ports (for instance of berth or ETA).
 - o To consult data easily in an efficient way, reducing the workload.
- To collect data on port notification that shall be available for all the main users (Port authorities, HM, custom, Police, etc) and port operators, providing in addition operational information as list of arrival and departure, status of ship, ETA data upgrade, etc.
- To upgrade the NOA form in order to collect additional data for EU requirements, as SafeSeaNet and FAL forms.
- To include in the NOA forms additional data necessary to proceed on port clearance and to be filled as “yes/no” under the responsibility of the relevant agency):
 - o double hull check
 - o ships in black list
 - o CLC
 - o PNI certificate (insurance)
- To improve the quality of the content filled in the documents, for the following reasons:
 - Information filled sometime are incomplete
 - used forms sometimes are not the “last version”



- content sometime are not correct
 - no easy way to check for correct information
 - database are not fully upgraded (for instance on ships MRCC need to send last data to other members on request).
- To use and integrate Lloyd's register database for ship database for improving the quality of data; for instance information on Hull can be made available directly from this database and checked with the information collected from Agent.
- To use and integrate the ParisMoU webpage for banned ship data, for improving the quality of data; for instance information on Banned data can be made available directly from this database and checked with the information collected from Agent.
- To made available the system to several authorities for consultation and to participate actively to the system and improvement if service:
 - o State Port Authority
 - o County Port Authority
 - o Industrial ports
 - o Custom
 - o Police
 - o Health
- To filter the data sent to an authority (not all data from forms are required).
- To integrate ad computerize the clearance process as a function for the data management system, considering that clearance process in ports are done with the use of email and paper document (under the HM responsibility).
- In order to have only one authority to give the final clearance for port permission.
- To evaluate the Port Clearance process on a procedure designed to assess the request to enter/departure a ship in order to allow the ship to enter a Community port, with the contribution of the several main authority that give intermediate clearance.
- To ask the master and the agent to provide information to the system by means of the port notification, data checked automatically in order to avoid to proceed uselessly in the compilation of data (for instance in case of ships in black list, double hull check).
- To send alert to agent in case of incomplete data or in case of blocking situation; only if data are filled and no blocking situation the agency can proceed with the compilation.
- To check easily the quality/accuracy of some information (for instance on double hull, ship in black list, etc).
- To ask the main authorities to assess the information for clearance and send back a confirmation as a traffic light (for instance PA assigning/confirming the berth and the port resources).



- To assign the final assessment and clearance to the Harbour Master (HM), for final communication of the clearance to the ship and the agent; if clearance is not received for instance from other authorities, as PA authority the process is stopped by the HM.
- Inspection process has to be integrated, for the introduction of relevant functions in the data management system, as planning and reporting related to inspection avoiding if possible multiple input of data (now different DB are used).
- Planning of port operation, Defining, co-ordinating and planning of nautical technical services (tugs, mooring, pilots, lock planning) are done using coordination meeting and with the use of email and paper document. It is recommended to maintain this functionality as PMIS system.
- To allow integration on existing / future PMIS or PCS system in ports, in order to exchange data automatically and avoid to input data twice.
- To provide assessment function on ballast water, with data to be updated at central level considering the origin of the water, in order to evaluate the relative risk.
- To provide assessment function possibly on ISPS and IMDG.
- To trace that a ship has been stopped by an authority (The Court, in case or order to MRCC and HM).
- To implement into the data management system as a first step the document process that is mandatory for ship/agent in order to receive inward and outward clearance.
- To provide a system available in English and Croatian language.
- To contact EMSA organization for SafeSeaNet training session; in that respect, connection is not available for non EU Countries, but training session are open to next Member States.
- A single point of contact (NCA) for SafeSeaNet is suggested.



7 Review of Client's requirements

7.1 Introduction

In this activity high level requirements will be established and a basic high level system design will be performed in response to the issues identified in data collected, addressing:

- The general requirement
- the identification of system users and user requirements;
- the tasks to be performed by Data management personnel;
- the responsibilities of involved parties;
- the type and level of services to be set;
- the categories of vessels which are required or expected to participate in the VTS;
- the integration with existing systems;
- the performance requirements.

7.2 General requirement

Main requirements for the future data management system are:

- receiving notifications from ships intending to enter/departure a port in Croatian ports and waters using a single windows concept
 - o Register arrival and departure prevision of the ship inside the Croatian ports and waters
 - o Data collection according to directive 2002/59 and directive 2002/6 and existing NOA
 - o Print NOA forms and other forms according to EU forms
 - o Ensure the directed distribution & action of derived messages to the port, other authorities (such as customs, immigration etc.) in order to simplify the delivery of information,
- Implement the clearance process (**arrival, stay and departure of ships**) electronically without the use of paper documents (Business to Government)
- Support the planning of the inspection process
- To use, exchange and integration of data with SafeSeaNet in line with the requirements of EU Directive 2002/59/EC
- Receive and register update information of each participant ship for operational use
- To use arrival and departure data for operational use
- To update data of arrival and departure data based on data received from the VTMS system



- To Provide Statistical data
- To Integrate with external database (as Lloyd and ParisMoU)
- To integrate the existing/future PMIS
- To consider possible upgrade of the existing ADS system

Architectural requirements are the following:

- The System shall utilize as possible a Commercial-Off-The-Shelf (COTS) solution
- shall use a relational distributed database based on commercial standard
- have an open architecture system design which should employ a variety of hardware and software
- Equipments and installation criteria shall conform to National regulations and/or European and International standards.
- System performance, reliability, flexibility, upward compatibility and expansion to meet future requirements shall be the basis for design.
- software shall be in English language, except for DBMIS web templates, that shall be in English and Croatian language

For the design of the system, according the study on Legal&organization design, shall be considered the following organization for VTS establishment:

NCC operators, at national level, with responsibilities for safety and SAR in internal waters, based in Zagreb (and data backup at Rijeka):

- o RCC operators, at regional level, with responsibilities for safety in approaching waters, based in Rijeka, Šibenik, Split
- o LCC - Local operators at port level, and represented by HM, with responsibilities for safety, SAR and clearance, in port waters of Rijeka, Pula, Senj, Zadar, Sibenik, Split, Dubrovnik, Ploce.

7.3 System users

General Entity	Entity	Main tasks and responsibilities
NCC MRCC	National Control Center VTS/MRCC Rijeka	National Control Center of Maritime search and Rescue Coordination Centre / VTS Adriatic (SRS for ship carrying dangerous goods)
RCC MRCC	Regional Control Center VTS/MRCC in the	Regional Control Center of Maritime search and Rescue Coordination Centre / VTS Adriatic (SRS for ship carrying



	ports of Rijeka, Šibenik, Split	dangerous goods)
LCC MRCC	Local Control Center VTS/MRCC in the HMO offices of Rijeka, Pula, Senj, Zadar, Šibenik, Split, Dubrovnik, Ploče	Local Control Center of Maritime search and Rescue Coordination Centre / VTS Adriatic (SRS for ship carrying dangerous goods). The Harbourmaster's office shall supervise safety and order in the port. The Harbourmaster's office shall provide final clearance for arrival and departure.
SSN Operator	NCA Authority within National VTS Authority	It assume the overall responsibility for proper functioning of the SafeSeaNet system and interconnection at national level. It is the only national authority in contact with the European Union Institutions for matters related to SafeSeaNet. Recognise or propose any named geographical place as a location for inclusion in the list of UN/LOCODEs check port procedures for raising and processing alert notifications manage SSN users only use communication networks identified in the SSN ICD for communications with SafeSeaNet maintain communication links with the SafeSeaNet EIS for the distribution of message and System information as shown in ICD
Port Authority	State and County Port Authority in the main ports	The responsibilities of the port Authorities are: - to build, maintain, manage, protect and improve maritime demesne representing the port demesne (land, facilities, infrastructures, devices and equipment) - to ensure ruled, safe navigation and port traffic - to provide services of common interest - to coordinate and supervise operations of trading companies and economic activities in the port area - to manage the free zone. Provide clearance for ship arrival/departure.



		Provide detailed information for arrival/departure planning.
SHIP Master	Ship Master	The master of the ship
Agent	Ship agent	Represent the Ship owner; provide information on arrival / departure according to NOA forms
Custom	Custom in port	Provide clearance for ship arrival/departure
Police	Police in port	Provide clearance for ship arrival/departure
Health	Ministry of Health for phytosanitary inspection	Provide clearance for ship arrival/departure
Lloyd data base	Lloyd data base	Provide database of ships
ParisMoU database	ParisMoU database	Provide data on banned ships
SafeSeaNet	SafeSeaNet	European Platform for Maritime Data Exchange between Member States' maritime authorities, a network/Internet solution based on the concept of a distributed database
VTS	Future CVTMIS system	Provide information on: - ship arrival in Croatian water - ETA
PMIS	Existing / future PMIS - port management information system systems in port Authorities	Provide clearance and detailed information on arrival and departure planning.
Maintenance	At national, regional and local level	Provide maintenance and configuration of the system

The users shall be classified in two types:

- consulting users, able to consult the database
- updating users, able to carry out in addition consultation.

The main updating users of data management application will be the following:



- arrival/departure data
 - Harbour Master in 8 ports and branch offices (can do update if required)
 - Agencies in ports
- Clearance process
 - Harbour Master in 8 ports and branch offices
 - State port authority
 - County port authority
 - Industrial ports
 - Health
 - Custom administration
 - Ministry of interior (Police)

The main consulting users of data management application will be the following:

- Port Authority
- Minister of Sea, transport and Infrastructure for statistical data (usually monthly)
- State port authority
- County port authority
- Industrial ports
- Health
- Directorate for environmental protection
- Custom administration
- Ministry of interior (police)
- Navy
- Agency

7.4 Task to be performed

The system users (actors) and the services they request from or offer to the system will be represented by Use Cases with the UML (Unified Modelling Language).

There are two types of actors involved in the VTMISS process:

- Primary actor is a person, authority or other system that requests a service from VTMISS
- Supporting actor is a person, authority or (usually) other system that provides a service to VTMISS.

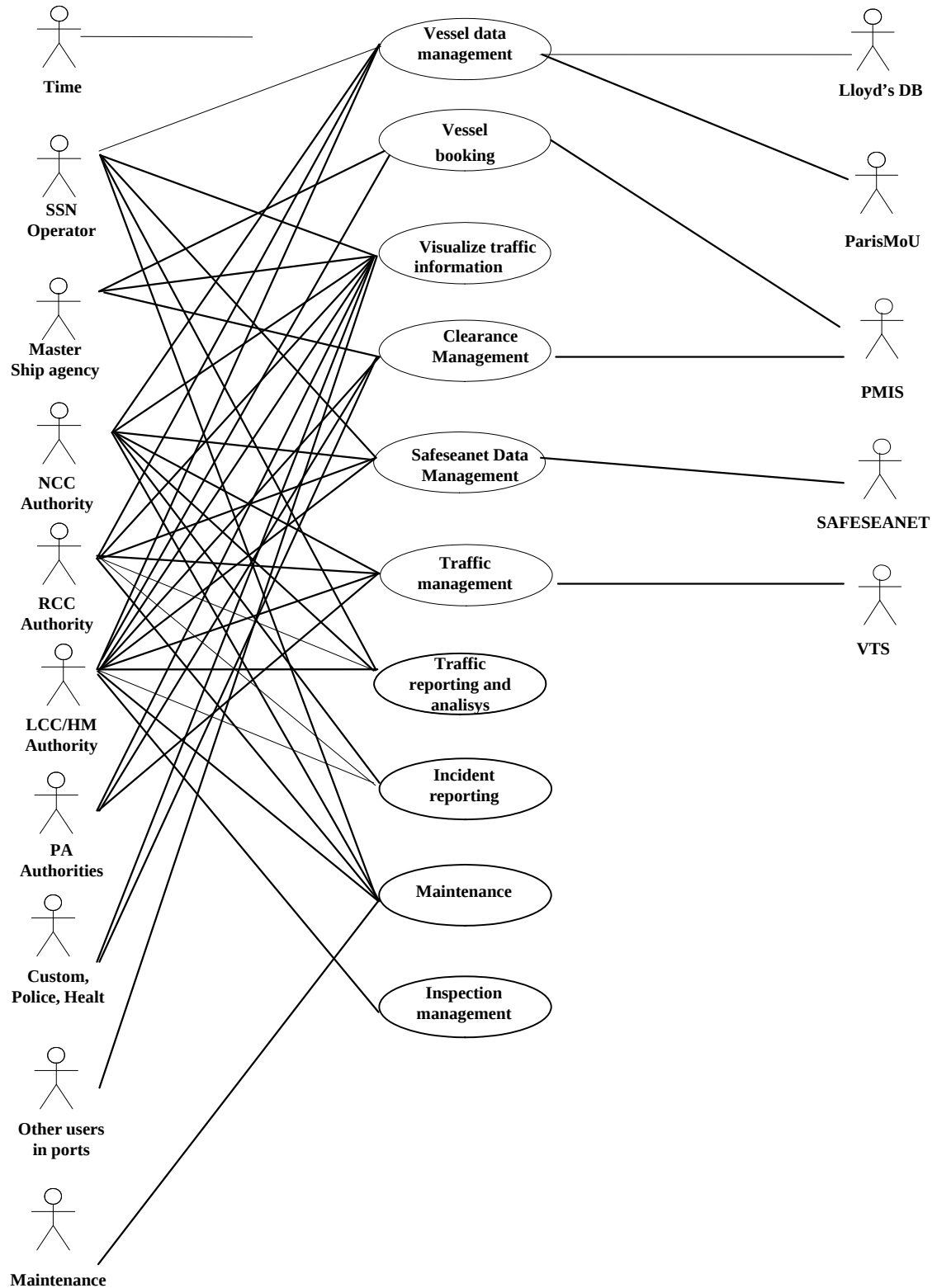
The ADS functions and actors interactions are represented in the following figure.



PRIMARY ACTORS

MAIN FUNCTIONS

SUPPORTING ACTORS





The main functions expected are the following:

Function	Description
Vessel data management	to enter, update, search vessel, location, user, etc data
Vessel booking	to enable agents to enter or update the Voyage Booking
Visualize traffic information	to visualize and search vessel voyages
Clearance Management	To manage the clearance process in ports
SafeSeanet data management	To enter / search data to safeSeanet
Traffic management	to update voyages
Traffic reporting and analysis	to display / print reports on PMIS and historical data
Inspection management	to enter, update, search inspection vessel data for planning purpose
Incident reporting	to enter and track incidents information
Maintenance	to allow configuration and maintenance of the system

The main tasks of SSN operator are:

- o vessel data management, for data access and update
- o SafeSeaNet data management, as supervisor and solving conflicts,
- o Visualize traffic information
- o Traffic reporting and analysis
- o Maintenance, receiving alert in case of fault or system/data not available

The main tasks of Ship agency are:

- o Vessel booking, for data required for arrival and departure
- o Clearance management, receiving clearance
- o Visualize traffic information

The main tasks of NCC Authority are:

- Vessel data management, for data upgrade and visualization
- Visualize traffic information
- SafeSeaNet Data management
 - o Ask/visualize information



- Traffic Reporting and Analysis
- Incident management
- Maintenance, receiving alert in case of fault or system/data not available

The main tasks of RCC Authority are:

- Vessel data management, for data upgrade and visualization
- Visualize traffic information
- SafeSeaNet Data management
 - o Ask/visualize information
- Traffic Reporting and Analysis
- Incident management
- Maintenance, receiving alert in case of fault or system/data not available

The main tasks of LCC/HM Authority are:

- Vessel data management, for data upgrade and visualization
- Visualize traffic information
- Clearance management
- SafeSeaNet Data management
 - o Ask/visualize information
- Traffic Reporting and Analysis
- Inspection management
- Incident management
- Maintenance, receiving alert in case of fault or system/data not available

The main tasks of Port authority are:

- o Clearance management,
 - o Receive list of arrival/departure for clearance
 - o Send clearance to HM, confirming berth, pilots, services required and data input from agency, (using PMIS as Resource management, if any)
- o Visualize traffic information
- o Traffic management

The main tasks of Custom, Health, Police are:



- o Clearance management,
 - o Receive list of arrival/departure for clearance
 - o Send clearance to HM
- o Visualize traffic information

The main tasks of maintenance operator are:

- o monitoring the operational status and for the technical maintenance of the system.
Extraordinary and corrective maintenance will also be performed by the maintenance operator, eventually with the Vendor's support.
- o User access control
- o handling of system back-ups,
- o user account management,
- o problem solving.

Other primary users shall be able to Visualize traffic information.

7.5 Type and level of services

The overall objective of the project is to strengthen administrative and operational capacity to implement the control of ship arrival and departure:

- To provide a modern system capable of implementing some services to maritime traffic;
- To provide a modern system capable of gathering and presenting the integrated scenario of the ship arrival and departure in the Croatian waters and ports for all the authorities in port;
- To implement the clearance process in ports;
- To report to SafeSeaNet system.

The VTS should allow effective gathering, presenting, reporting, supervision, upgrade and management of the data management, while complying with the internationally accepted standards.

The project has a dual focus:

- attention to safety of human life (e.g. search and rescue), improvement of vessel traffic efficiency, protection of the environment;
- control and management of vessel traffic in the Croatian waters.

The equipment must operate continuously (24h/7d) under all weather conditions, with minimum maintenance and repair cost.



7.6 Categories of vessels required to participate in the ADS system

According to directive 2002/59/EC, the following categories of vessels expected to participate in the Data management are at least the ships of 300 gross tonnage and upwards, unless stated otherwise, and shall not apply to:

- warships, naval auxiliaries and other ships owned or operated by a Member State and used for non-commercial public service;
- fishing vessels, traditional ships and recreational craft with a length of less than 45 metres;
- bunkers below 5 000 tons, ships' stores and equipment for use on board ships.

Definitely, other categories of vessel can participate in the data management, as for instance the once required for ADRIREP.

7.7 Integration with existing systems

The **Data Management System** should be able to integrate the following existing system/data

Full Integration of data from :

- Existing **CIMIS** System (**Arrivals and Departures of Ships Database** (DOB or ADS)

Integration (parsing) data via XML of the sequent systems:

- Croatian **VTMS** system data
- **SafeSeaNet** system data (on a national level)

Integration of external databases in consulting mode (via URL links on the relevant screen)

- HMO Croatian Inspection consulting databases
 - o ParisMOU SIRENAC database consulting - web page
(<http://www.parismou.org/ParisMOU/Inspection+Database/Basic+Search/xp/menu.3975/default.aspx>)
 - o Globallast IMO Ballast water database consulting -
<http://globallast.imo.org/index.asp?page=bwdirectories.htm&menu=true>
 - o P&I database consulting - <http://www.american-club.com/go.cfm/vessels> (or similar)
 - o Double/Single Hull database – EMSA/Lloyd database consulting
- Lloyd database as consultant database (may be done either in full/xml integration)

Optional integration with the existing **CIMIS** databases like:

- Svjedodžbe (database of all crews matriculations, exams, etc)
- Strane Jahte (database of arrival of small -boats/yachts from international water to Croatian territorial water)
- Croatian Crew Database



- Registry of Croatian Vessels

Optional integration on defined requests with the external sources

- through XML messaging to existing and future systems of :
 - o VTMISS/PMIS in PA Rijeka (planned 6/08)
 - o PCS in PA Rijeka (unders specification, planned in production 2010)
 - o VTMISS/PMIS in Port of Ploče (unders specification)
 - o PCS in Port of Ploče (unders specification, planned in production 2010)
 - o ERP systems in all main ports

7.8 Performance requirements

7.8.1 Availability of the system

The equipment must operate continuously (24h/7d) under all weather conditions, with minimum maintenance and repair cost. Operator shall be required 24h/7d.

The system design shall have inherent redundancy for critical units.

All the Server and database equipment shall provide a degree of redundancy to ensure the highest availability of the System. The second unit will be on hot standby such that on detection of a fault in the on-line unit, automatic switch over to the backup unit will be performed. The Servers have to be in power redundancy and hot swap modules capability.

Supporting equipment for main power supply such as UPS (Un-interruptible Power Supply) shall be used to guarantee the system service during power failures and power protection against power outages, surges, sags, brownouts, and over-voltage conditions.

The system availability shall be 99,9%.

The MTBF calculation shall be provided according to the standard MIL-HDBK-217F

The MTTR shall be as follow:

- 98% Critical Failures MTTR= 2 h
- 98% Non Critical Failures (Meteo system and optical sub-systems) MTTR= 48 h

7.8.2 SafeSeaNet performance

The data management system receiving a Port notification from a ship operator, agent or master shall notify the SafeSeaNet EIS:

- o at least twenty-four hours in advance of the Estimated Time of Arrival, or
- o as soon as the LCA/NCA has received the notification if the voyage time is less than twenty-four hours, or the port of call is not known, or it is changed during the voyage.



The EIS shall reply with a message of acknowledgement within one minute after having received the message.

The data management system collecting a ship notification from a ship entering its area of competence shall forward a "Ship Notification" message to the SafeSeaNet EIS within 15 minutes. The EIS shall reply with a receipt message within one minute after having received the message.

The data management system receiving HAZMAT notification from a ship operator, agent or master shall notify the SafeSeaNet EIS:

- o as soon as the LCA/NCA has received the notification; or
- o at least at the time when or before the ship leaves the Port of Departure.

The EIS shall reply with a receipt message with a maximum delay depending upon the system response time.

An data management system generating an Alert message shall begin forwarding an "Alert notification" message to the EIS within 15 minutes. The EIS shall reply with a message of acknowledgement within one minute after having received the message.

Other requirements are available in the document SSN ICD.

7.8.3 Environmental conditions

Environmental conditions in Croatia are that of Mediterranean climate, with mild winter and dry summers along coast, and continental climate inland. Sample data sheets recorded by the Meteorological Services can be provided to Tenderers. However, in order to have a common reference baseline for the bids evaluation, the following assumptions shall be made only for demonstrating system performances.

Nominal Environmental conditions to be used only for system performance evaluation shall be the following:

PROPAGATION PARAMETERS	VALUE
Atmospheric Pressure	1020 hPa
Relative Humidity	70%
Rain	5 mm/hr
Air Temperature	25°C
Water Temperature	18°C
Sea Salinity	35‰
Sea State	3
Ducting Conditions	Not Present



7.8.4 Telecommunications network

When communications with SafeSeaNet fail, after five attempts the data management system shall inform the SafeSeaNet Helpdesk by any available means (telephone, facsimile).

In cases of communication failure between the data management system and the EIS:

- o the data management system shall store and transmit the SSN messages when communications are restored; and
- o the EIS shall retry sending messages over 2 seconds for a maximum of 5 times.

When the EIS receives a corrupted message, an error message shall be produced and forwarded to the data management system.

When SafeSeaNet emits a corrupted message, the data management system shall inform the SafeSeaNet Helpdesk.

7.9 Other requirements

7.9.1 Localization requirement

The Data management system shall be based on:

- o A National Control Centre located in Zagreb,
- o All other users as shall access the system through web interfaces, as:
 - o Regional Control Centres located in Rijeka, Dubrovnik and Split,
 - o eight Local Control Centres located in the HMO offices the main Croatian ports: Rijeka, Pula, Senj, Zadar, Sibenik, Split, Dubrovnik, Ploce.



8 System set up

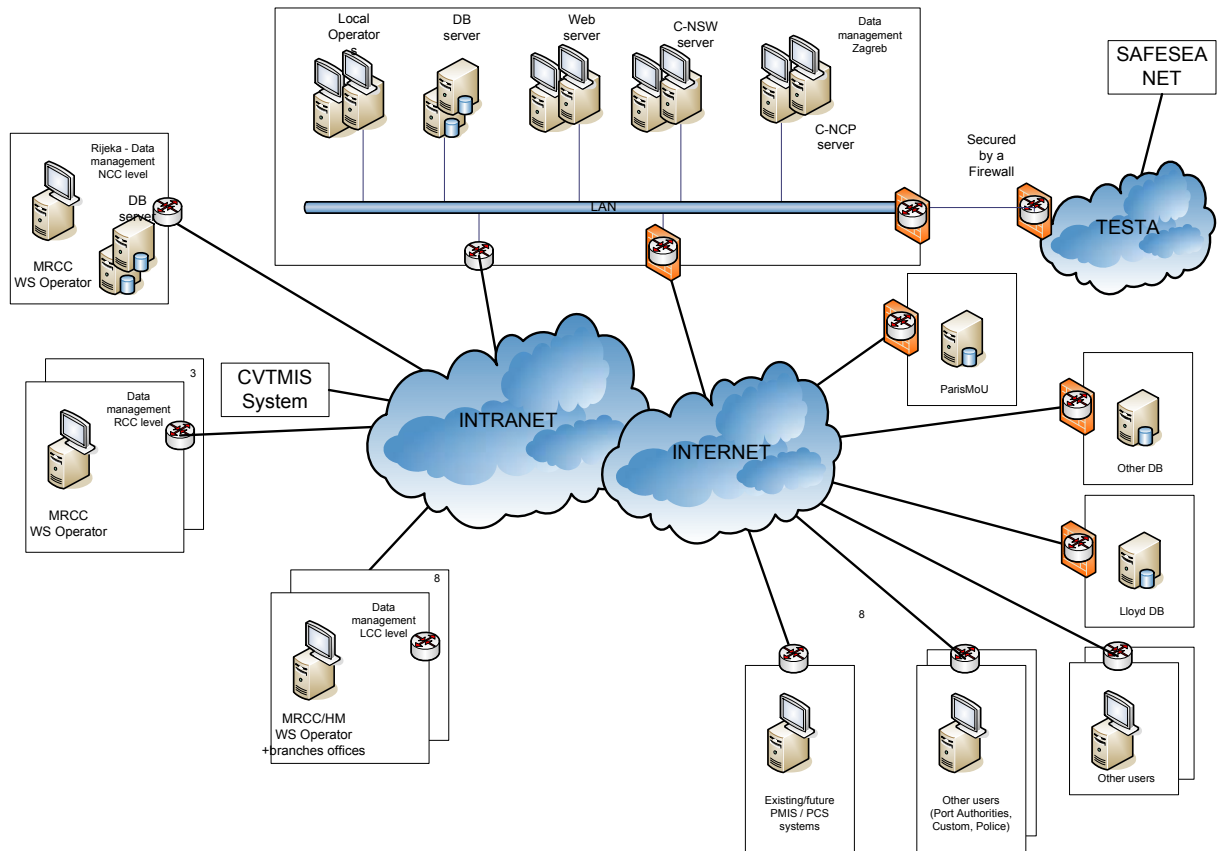
8.1 Architecture

The Data management system architecture is hierarchically composed of the following elements, as shown in the figure above:

- 1 Data Management National Control Centre, located in Zagreb, and connected to the SafeSeaNet;
- 1 data back up system shall be located in Rijeka;
- Provision of web access for:
 - o Data Management Regional Control Centres, located in Rijeka, Šibenik, Split;
 - o Local Data Management Control Centres, located in Rijeka, Pula, Senj, Zadar, Sibenik, Split, Ploce, Dubrovnik;
- Provision of web access to the NCC from other authorities for statistical data through internet
- Provision of web access to the LCC from all the ports authorities assigned to the relative Local Control Centres through internet
- Provision of web access to the LCC from agencies through internet
- Access the external databases, as Lloyds register and ParisMoU through internet

In each Local Control Centres located in the main Croatian ports, data of arrival/departure is collected from agencies and clearance is given, with contribution with the main authorities. Web pages shall be made available for all users, agencies, for data collection, and for the main authorities, for clearance and collection of additional information. Data shall be collected from all the ports that belong to the Local Control Centre. Data shall be available for operational use, and upgrade manually or automatically from the VTS system.

The National Control Centre will collect arrival/departure data and other relevant data coming from LCC, for statistical and operational use for NCC and RCC operators (according to the responsible area), and will re-distribute the information to the SafeSeaNet. Data of SafeSeaNet shall be available at each level.



The detailed configuration of the Data management system sites shall comply with the following requirements.

8.1.1 National Control Centre Zagreb

Configuration system and auxiliary equipments

The detailed configuration of National Control Centre in Zagreb shall comply with the following configuration:

- One duplicated central data management server sub-system in hot standby configuration, with Data management software licence
- One duplicated Database server sub-system in hot standby configuration, with Database software licence
- One duplicated central Message server sub-system in hot standby configuration, for connection to SafeSeaNet, working as C-NCA server
- One duplicated web server for local/remote users
- Data management Operators Consoles sub-systems, each equipped with one 21" LCD monitor



- A colour laser printers 600x600 dpi, min. 20 ppm in B/W and 5 ppm in colour
- One UPS for 12KVA
- A C-NSW software module
- A C-NCA software module, for interconnection to SafeSeaNet

The equipment room and the Operation room in the Control Centre need to be equipped with an air conditioning system.

Infrastructural Constraints

The following provisional infrastructural constraints are reported as reference.

The following table reports location and altitude above sea level.

SITE	COORD. (N,E)	A.S.L (m)	NOTES	ID
National Control Centre c/o Ministry of the sea, Transport and Infrastructure	45°47'26", 15°58'08"	5		NCC-Z

Civil Work Requirements

At the Control Centre the Contractor shall take on the works for installation of the indoor equipment, including works required for power supply and LAN connections.

Power Supply

A main power source 230 Vac is available at the National Control Centre Zagreb (NCC-Z). The Contractor shall provide all works and accessories required for equipments connection to the mains. Each group of equipments shall be connected by means of a separate electric line.

All the AC powered equipment of the Control Centre shall be capable of accepting and being operated at 230V 50Hz.

Supporting equipment such as UPS shall be used to guarantee the whole system service during power failures and power protection against power outages, surges, sags, brownouts, and over-voltage conditions. The equipments shall be able to work up to 15 minutes after power interruption.

LAN connection

The LAN is available in each site. The Contractor shall provide all works and accessories required for the connection to the LAN networking device in DMZ area.

The bandwidth available is 20 Mbps.

8.1.2 National Control Centre Rijeka

Configuration system and auxiliary equipments



The detailed configuration of National Control Centre in Rijeka shall comply with the following configuration:

- One duplicated Database server sub-system in hot standby configuration, with Database software licence
- Data management Operators Consoles sub-systems, each equipped with one 21" LCD monitor
- A colour laser printers 600x600 dpi, min. 20 ppm in B/W and 5 ppm in colour
- One UPS for 8KVA

The equipment room and the Operation room in the Control Centre need to be equipped with an air conditioning system.

Infrastructural Constraints

The following provisional infrastructural constraints are reported as reference.

The following table reports location and altitude above sea level.

SITE	COORD. (N,E)	A.S.L (m)	NOTES	ID
Regional Control Centre c/o Harbour Master office in Rijeka	45°19'25", 14°26'27"	5		NCC

Civil Work Requirements

At the Control Centre the Contractor shall take on the works for installation of the indoor equipment, including works required for power supply and LAN connections.

Power Supply

A main power source 230 Vac is available at the National Control Centre Rijeka (NCC). The Contractor shall provide all works and accessories required for equipments connection to the mains. Each group of equipments shall be connected by means of a separate electric line.

All the AC powered equipment of the Control Centre shall be capable of accepting and being operated at 230V 50Hz.

Supporting equipment such as UPS shall be used to guarantee the whole system service during power failures and power protection against power outages, surges, sags, brownouts, and over-voltage conditions. The equipments shall be able to work up to 15 minutes after power interruption.

LAN connection

The LAN is available in each site. The Contractor shall provide all works and accessories required for the connection to the LAN networking device in DMZ area.

The bandwidth available is 20 Mbps.



8.1.3 Regional Control Centre (RCC)

Configuration system and auxiliary equipments

Regional Control Centres shall access the central system through a web browser application already available on existing consoles.

The detailed configuration of Regional Control Centres shall comply with the following configuration:

- Data management Operators Consoles sub-systems, each equipped with one 21" LCD monitor
- A colour laser printers 600x600 dpi, min. 20 ppm in B/W and 5 ppm in colour
- One UPS for 6KVA

The equipment rooms in the Regional Control Centres are not equipped with an air conditioning system so the air conditioning system have to be implemented.

Infrastructural Constraints

The following provisional infrastructural constraints are reported as reference.

The following table reports location and altitude above sea level.

SITE	COORD. (N,E)	A.S.L (m)	NOTES	ID
Regional Control Centre c/o Harbour Master office in Rijeka	45°19'25", 14°26'27"	5		RCC1
Regional Control Centre c/o Harbour Master office in Šibenik	43°44'03", 15°53'24"	5		RCC2
Regional Control Centre c/o Harbour Master office in Split	43°30'23", 16°25'56"	5		RCC3

Civil Work Requirements

At the Regional Control Centre the Contractor shall take on works for installation of the indoor equipment, including works required for power supply and LAN connections.

Power Supply

A main power source 230 Vac is available at the Regional Control Centre (RCC). The Contractor shall provide all works and accessories required for equipments connection to the mains. Each group of equipments shall be connected by means of a separate electric line.

All the AC powered equipment of the Control Centre shall be capable of accepting and being operated at 230V 50Hz.



Supporting equipment such as UPS shall be used to guarantee the whole system service during power failures and power protection against power outages, surges, sags, brownouts, and over-voltage conditions.

The equipments shall be able to work up to 15 minutes after power interruption.

LAN connection

The LAN is available in each site. The Contractor shall provide all works and accessories required for the connection to the LAN networking device in DMZ area.

Connection to internet is required. The bandwidth required is 2 Mbps.

8.1.4 Local Control Centre (LCC)

Configuration system and auxiliary equipments

Local Control Centres shall access the central system through a web browser application already available on existing consoles.

The detailed configuration of Local Control Centres shall comply with the following configuration:

- Data management Operators Consoles sub-systems, each equipped with one 21" LCD monitor
- A colour laser printers 600x600 dpi, min. 20 ppm in B/W and 5 ppm in colour
- One UPS for 6KVA

The equipment rooms in the Local Control Centres are not equipped with an air conditioning system so the air conditioning system have to be implemented.

Infrastructural Constraints

HM office shall be the location for the equipment installation.

Civil Work Requirements

At the Local Control Centres the Contractor shall take on the works for installation of the indoor equipment, including works required for power supply and LAN connections.

Power Supply

A main power source 230 Vac is expected available at the Local Control Centre (LCC). The Contractor shall provide all works and accessories required for equipments connection to the mains. Each group of equipments shall be connected by means of a separate electric line.

All the AC powered equipment of the Control Centre shall be capable of accepting and being operated at 230V 50Hz.



Supporting equipment such as UPS shall be used to guarantee the whole system service during power failures and power protection against power outages, surges, sags, brownouts, and over-voltage conditions. The equipments shall be able to work up to 15 minutes after power interruption.

LAN connection

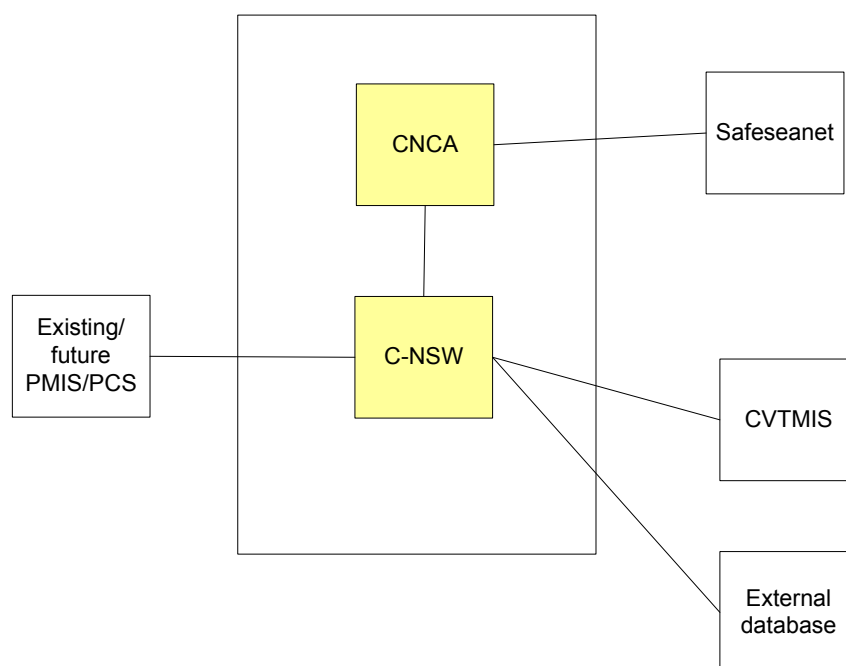
The LAN is available in each site. The Contractor shall provide all works and accessories required for the connection to the LAN networking device in DMZ area.

Connection to internet is required. The bandwidth required is 2 Mbps.

8.2 Data management software requirements

The software architecture is a distributed solution in order to increase the availability of the system and shall be based on:

- o National single windows software (C-NSW),
- o Croatian LCA for SafeSeaNet (C-NCA).



8.2.1 C-NSW - National single windows software requirements

The Croatian National Single windows shall be able to provide the following functions:

- o Vessel Data management
- o Vessel booking
- o Clearance management



- o Visualize traffic information
- o Traffic Management
- o Incident reporting
- o Inspection management
- o Other management
 - o Waste management
 - o Berthing management
 - o Risk management
- o Traffic Reporting and Analysis
- o User access control (maintenance)
- o System supervision (maintenance)
- o Recording & archiving
- o Interoperability with external systems.

In the following sections the required features are listed for each of the basic functions identified, together with the required allocation of the functions to the main systems components.

8.2.1.1 Vessel Data management

- This function will provides an easy to use facility for a data administrator to manage base data. Base data are is any data elements that may be associated with a voyage or a vessel, as locations (such as berths, anchorages, and locations), vessel types, cargoes, contacts (such as agents or pilots).
- The ship database shall be populated and updated manually by operators and automatically at least from the Lloyds Register database and ParisMoU.
- A vessel table shall store the vessel specifications (owner, GRT, IMO, MMSI, call sign, flag, length, draught, etc.) and any other data and remarks directly related to the vessel.
- The data administrator is allowed to add, update or delete any record unless referential integrity would be compromised.
- This functionality includes a search facility, allowing the user to search for data, for instance a vessel based on Vessel Name, IMO Number, Call sign
- data shall be stored in the local database and in the National database
- Additional data of present CIMIS shall be added
- Database will be a relational distributed database based on commercial standard



8.2.1.2 Vessel booking

- This function will allow access for agents or other authorized user to add and update data concerning the expected vessels in the port such as arrivals and departures of ships to or from ports in Croatia or passing the Maritime Traffic Control Area of Croatia including data elements that are associated with a Sailing Plan, type of cargo (classification such as HazMat), crew, draught for each movement in the port, etc, according to NOA forms and the other EU directives
- Data entered shall be automatically checked for conflicts, for instance for double hull and banned ships
- a simple and intuitive user interface shall facilitate ease of data entry
- data shall be used for the clearance function: all voyages booked from the booking module will go into a 'Pending' list waiting for clearance from port authority
- data shall be stored in the local database and in the National database
- Database will be a relational distributed database based on commercial standard

8.2.1.3 Visualize traffic information

- o The function will show the traffic movement of ship arrival and departure planned and active at least per day, next 24/48 hours
- o The functions allow to print the traffic movement
- o All the operators and supervisors operating at the NCC, RCC and LCC Control Centres shall be provided with the capability to access the information, according to the privileges granted and area of responsibilities
- o Authorized external systems/operators shall be able to access the Database and exchange data in accordance to the agreement signed with the Customer. It shall be foreseen that authorized external system/operator can access only to selected section of the Database.

8.2.1.4 Clearance management

- This function shall provide a arrival and departure clearance
- allows for Authorities in ports to visualize all the pending voyages to be Acknowledged
- All voyages booked go into a 'Pending' list. From here, port staff of the relevant Authority need to verify the data and give approval (Voyage Acknowledgment), or if necessary make any amendments/upgrade data to the Clearance authority (HM).
- HM have an arrival/departure visualization for clearance with a sort of “traffic light” for clearance process involving the users
 - o Agency



- o Custom
 - o Police
 - o Immigration
 - o Health
 - o Port authority
- Once approved by HM/LCC, the voyage will enter the database and all the movements will appear in the movement list
- RCC is granted authority to approve communicate final clearance to vessels leaving/approaching anchor/berth and shall communicate with vessels in approaching/leaving patterns
- Automatic conflict detection for data missing
- Shall be able to display and print information according to NOA and FAL forms
- reporting/remarks for corrective actions

8.2.1.5 Traffic Management

- The facility will allow to update voyages
- Shall be possible to easily manage the progress of a movement, changing the status of the ship (for instance from planned to active, in port area, etc, using colour code to differentiate different status), manually or automatically, through:
 - o Automatic correlation of ships in registered forecasts based on available AIS information (MMSI or IMO number).
 - o Automatic correlation of ships when in certain areas or when a border/linked track passes through defined reporting areas (for instance for ADRIREP)
 - o Manual correlation of ships for status upgrade up to the port area
 - o Manual correlation of ships in registered forecasts based on existing Radar track information (if AIS data are not available).
 - o Automatic MRS according to EU directive
- About ADRIREP shall be possible to:
 - o filter data according to ADRIREP
 - o Search for ship voyage and information;
 - o acknowledge that the ship transmit the required reports and cross check for the information received
 - o Assign manually a Mandatory Position Reporting
 - o delivery of the information to the relevant authorities



- All the operators and supervisors operating at the NCC / RCC / LCC Control Centres shall be provided with the capability to access the information, according to the privileges granted and area of responsibilities

8.2.1.6 Inspection management

- This function will allow access for VTS operators to plan inspections of vessels
 - Add new planned inspection
 - Search for vessels inspection, and modify the inspection dates
- It shall be possible to store last inspection dates,
 - provide list of coming inspections (at least per weeks, per month)
 - be alerted if arrival of expected vessels to be inspected is booked
 - provide a flag as requiring an inspection if last inspection has expired or is close to be expired
- for each inspection, the user shall enter and store basic information on inspections,
- data shall be stored in the National database
- Consultation of historical data shall be provided
- a simple and intuitive user interface shall facilitate ease of data entry

8.2.1.7 Incident reporting

- o This function will enable the management of incidents or accidents
- o The users will be provided with a facility to add new incident records or update incident records which are not closed.
- o The users may search for open and closed incidents based on Incident No, vessel name, location or within a time range.
- o The users may search information located in the SafeSeaNet database
- o Data such as vessel name, location, weather, and type may be logged. In addition, a facility to classify the severity of the incident is provided. This feature logs persons injured, any casualties, business impact and further actions

8.2.1.8 Waste management

- The Waste Management allow users to log any on board on arrival and waste discharge operations while the vessel is in port.



- The data shall be logged according to NOA forms for each waste on arrival (for instance) waste category, waste type, quantity or for each discharge operation (for instance: waste category, waste type, quantity and location).

8.2.1.9 Berthing management

- provides berthing information based on planned and active vessel voyages
- to support operator with graphical interface of berth occupancy.

8.2.1.10 Risk management

- It helps in the validation of any vessel movements against a set of predefined business rules.
- Examples of such scenarios may be:
 - a vessel has been designated a berth not big enough to harbour the vessel,
 - the tide level is not sufficient to move the vessel from A to B at the current point in time.
- If any such rule is contravened a message will be raised and the user may be forced to take corrective actions.

8.2.1.11 Traffic reporting and analysis

- Operators shall be able to query, sort and filter data in order to display information of the ship traffic in the port during a certain selectable time period and/or to reduce the number of targets to a manageable subset. It shall be possible to store pre-defined filters.
- Configurable filtering shall be available based on combination of certain IALA-defined fields, such as name, call sign, MMSI number, speed, pilot, berth, agent, time ranges, etc.
- Reports shall show the vessels in the port, the expected traffic, the newly arriving and departing ships, historic data overview, statistical reporting etc.
- It shall be possible to print all the reports, preview the printouts, and export the reports to common spreadsheet formats.
- Traffic Analysis and display of the historic trail shall be available for one or more ships which passed through the Maritime Traffic Control Area.

8.2.1.12 User access control

- o provides a facility for a system administrator to manage user accounts and to manage user group privileges. The User Management function also provides a list showing all logged on users. The system provides an easy to use facility to log a user out of the system
- o Access control shall be enforced through the use of user names and passwords via SSL encryption (HTTPS) to safely and uniquely identify the servers and the clients (for agents is the must)



- o A facility for a system administrator to manage password validity, length and interval shall be provided
- o Administrators shall be able to define user roles to limit the amount of information accessible or the amount of detail available to a specific user.
- o Access rights for individual users shall be defined on these pre-configured roles.
- o Every document sent via an e-mail system have to be digitally signed (Verisign, eTrust, FINA, etc....)

8.2.1.13 System Supervision

- o The operator consoles shall monitor and report the status of the application and equipment located in the port area. The following functions shall be performed:
 - o Automatic or on demand acquisition of diagnostics and status reports coming from each equipment and devices of the Data management system;
 - o Reporting and recording of equipment and devices status (test, maintenance, operating, not operating, not available, training).
- o All the Operator Consoles at a given hierarchical level shall provide network administration functions, user profiles management functions, authentication, setting of access rights, control and record of users accesses for all the system resources located at lower hierarchical level.

8.2.1.14 Recording and archiving

- o The National single windows C-NSW shall provide recording and archiving facilities at every Control Centres.
- o The Database will be a relational distributed database based on commercial standard.
- o All the operators and supervisors operating at the Control Centres shall be provided with the capability to access, edit and update database information, according to the privileges granted.
- o Authorized external systems/operators shall be able to access the Database and exchange data in accordance to the agreement signed with the Customer. It shall be foreseen that authorized external system/operator can access only to selected section of the Database.
- o Security procedure to guarantee access to database only to authorized subjects shall be foreseen; each subject will be identified by a unique profile that shall define the type and amount of data that the subject can use.
- o The database management function shall allow continuous collection and update, in automatic or manual mode, of data necessary for execution of the system tasks including:
 - o data management, archiving, logging, and statistics;
 - o real time link with cooperative clients;



- o resource management;
- o other system specific data processing;
- o service to external client, data exchange with external Information System
- o The database shall be structured in:
 1. Ship Database, containing both identified and unidentified target, consisting of:
 - o **Static ships data**, including MMSI, call sign, name, flag, IMO number, length and beam, ship type, height over keel;
 - o **Dynamic ships data**, including Position, Position Time, Course over Ground (COG), Speed over Ground (SOG), heading, navigational status, rate of turn (ROT)
 - o **Voyage related information**, including at least ships draught, hazardous cargo, destination and ETA, route plan (waypoints), number of persons on board.
 - o **Ancillary**, including Alarm signals and their kinds, List of Infractions, List of Emergency, List of additional data providing target information, Log books including user actions and system malfunctions.
 2. any other base data, as locations, pilots, agencies, etc
 3. data of arrival and departure notification for all ships, as List of ships in port (IMO number, call sign, flag, name, company), list of dangerous goods on-board for each of the ships in port (IMO number, quantity), arrival and departure notification (IMO number, date and time), approaching plan (IMO number, flag, ETA), etc.
 4. incident reporting
- o Recorded information shall be available, at least, for 1 year;
- o it shall be possible to store recording on standard electronic media (tape, CD and DVD) for long-term archiving.

8.2.1.15 Interoperability with external system

The software shall be able to integrate through the C-NSW national single windows the following existing system:

Full Integration of data from :

- Existing **CIMIS System (Arrivals and Departures of Ships Database (DOB or ADS)**

Integration (parsing) data via XML of the sequent systems:



- Croatian VTMS system data
- **SafeSeaNet** system data (on a national level)

Integration of external databases in consulting mode (via URL links on the relevant screen)

- HMO Croatian Inspection consulting databases
 - o ParisMOU SIRENAC database consulting - web page
(<http://www.parismou.org/ParisMOU/Inspection+Database/Basic+Search/xp/menu.3975/default.aspx>)
 - o Globallast IMO Ballast water database consulting -
<http://globallast.imo.org/index.asp?page=bwdirectories.htm&menu=true>
 - o P&I database consulting - <http://www.american-club.com/go.cfm/vessels> (or similar)
 - o Double/Single Hull database – EMSA/Lloyd database consulting
- Lloyd database as consultant database (may be done either in full/xml integration)

Optional integration with the existing CIMIS databases like:

- Svjedodžbe (database of all crews matriculations, exams, etc)
- Strane Jahte (database of arrival of small -boats/yachts from international water to Croatian territorial water)
- Croatian Crew Database
- Registry of Croatian Vessels

Optional integration on defined requests with the external sources

- through XML messaging to existing and future systems of :
 - o VTMS/PMIS in PA Rijeka (planned 6/08)
 - o PCS in PA Rijeka (unders specification, planned in production 2010)
 - o VTMS/PMIS in Port of Ploče (unders specification)
 - o PCS in Port of Ploče (unders specification, planned in production 2010)
 - o ERP systems in all main ports

8.2.2 Croatian NCA software requirements

The Croatian NCA shall be the interface to the SafeSeaNet system and implement the Data reporting to Safeseanet.

The main functions shall be the following:

- o Manually and automatic reporting
- o Traffic Reporting and Analysis
- o User access control



- o System supervision
- o Recording & archiving
- o Interoperability with external systems.

In the following sections the required features are listed for each of the basic functions identified, together with the required allocation of the functions to the main systems components.

8.2.2.1 Manually and automatic reporting

Data of arrival and departure shall be available locally manually or automatically, through the C-NSW.

A web-browser interface shall be available for:

- o manually send notification to SafeSeaNet (filling in web forms), in case the automatic reporting is not properly working:
 - Send a Port notification to the SafeSeaNet system
 - Send a Ship - MRS notification to the SafeSeaNet system
 - Send a Hazmat notification to the SafeSeaNet system
 - Send a Security notification to the SafeSeaNet system
 - Send an Alert notification for an identified ship to the SafeSeaNet system
 - Send an Alert notification for an identified ship to the SafeSeaNet system
 - Send an Alert notification for a not-identified ship to the SafeSeaNet system
 - Send an E-mail notification after an alert notification
- o Manually ask for information:
 - Find information regarding a ship: Latest notifications
 - Find information regarding a ship: Cargo manifest
 - Find information regarding a ship: Voyage history
 - Find information regarding a ship: Incidents history
 - Find information regarding a port
 - Find information regarding a port: Latest ETA notifications
 - Find information regarding an area
 - Find information regarding an area: identified ships
 - Find information regarding an area: not identified ships
- o Provide statistical information, be capable of counting for all messages, received or transferred through its system;



- o Manually view detailed information about previously sent notifications (by filling in web forms and viewing results and status)
- o Provide alert to the operator:
 - When the EIS receives a corrupted message, an error message shall be produced and forwarded to the LCA/NCA.
 - When SafeSeaNet emits a corrupted message, the LCA/NCA shall inform the SafeSeaNet Helpdesk.

8.2.2.2 User access control

- o provides a facility for a system administrator to manage user accounts and to manage user group privileges. The User Management function also provides a list showing all logged on users. The system provides an easy to use facility to log a user out of the system
- o Access control shall be enforced through the use of user names and passwords via SSL encryption (HTTPS) to safely and uniquely identify the servers and the clients (for agents is the must)
- o A facility for a system administrator to manage password validity, length and interval shall be provided
- o Administrators shall be able to define user roles to limit the amount of information accessible or the amount of detail available to a specific user.
- o Access rights for individual users shall be defined on these pre-configured roles.
- o Every document sent via an e-mail system have to be digitally signed (Verisign, eTrust, FINA, etc....)

8.2.2.3 System Supervision

- o The operator consoles shall monitor and report the status of the application and equipment located in the national area. The following functions shall be performed:
 - o Automatic or on demand acquisition of diagnostics and status reports coming from each equipment and devices of the Data management system;
 - o Reporting and recording of equipment and devices status (test, maintenance, operating, not operating, not available, training).
- o All the Operator Consoles at a given hierarchical level shall provide network administration functions, user profiles management functions, authentication, setting of access rights, control and record of users accesses for all the system resources located at lower hierarchical level.
- o monitor the performance of the communication system within its service area to determine degradation of its operational capability and provide alerts;
- o monitor the message timing requirements for notifications, alerts and requests



- o monitor the communication link with SafeSeaNet. The C-NCA's communication link may be actively monitored (i.e. sending periodic test messages), or passively monitored (e.g. monitoring the time delay between the forecast message at the SPW/NSW and the reception of the message at the C-NCA, or the SPW/NSW message transfer time); When communications fail, after five attempts the NCA shall inform the SafeSeaNet Helpdesk by any available means (telephone, facsimile). In cases of communication failure between the C-NCA and the EIS:
 - o the C-NCA shall store and transmit the SSN messages when communications are restored; and
 - o the EIS shall retry sending messages over 2 seconds for a maximum of 5 times.
- o monitor its own operation to ensure availability and to avoid distributing unreliable or corrupted messages;

8.2.2.4 Recording and archiving

- o The National single windows shall provide recording and archiving facilities at C-NCA.
- o The Database will be a relational distributed database based on commercial standard (can be the same used for C-NSW).
- o Security procedure to guarantee access to database only to authorized subjects shall be foreseen; each subject will be identified by a unique profile that shall define the type and amount of data that the subject can use.
- o The database management function shall allow continuous collection and update, in automatic or manual mode, of data necessary for SafeSeaNet:
- o Recorded information shall be available, at least, for 18 months;
- o it shall be possible to store recording on standard electronic media (tape, CD and DVD) for long-term archiving.

8.2.2.5 Interoperability with external system

The software shall be able to integrate the SafeSeaNet system and C-NSW system:

- o send XML messages to SafeSeaNet according to ICD specified in document [SSN ICD] and related to ships bound for ports in Croatia, indicating that it holds more detailed information about these notifications (except in the case of port notification messages). The detailed information is then made available on request
- o send back to SafeSeaNet the detailed information in XML format to the EIS. SafeSeaNet will then send the XML response to the Data Requester
- o send request through XML message-based application to the Central Index database, according to SSN ICD



- o receive XML messages from SafeSeaNet according to ICD specified in document [SSN ICD] and related to ships, ports and area, to be available for PSW/NSW
- o provide a C-NCA single address (URL) for sending and receiving XML messages to SafeSeaNet.
- o receive information from PSW/NSW according to the reporting required;
- o store vessel and incidents information locally in the Croatian C-NCA, according to the SSN ICD, and received from the PSW/NSW system;
- o The C-NCA shall properly validate the information notified to the EIS in order to guarantee its conformity and ensure that any Hazmat notification contains the identified place of destination in accordance with ICD;
- o The C-NCA communication system must be available on a 24 hours a day, 7 days a week basis. Immediately notify the SafeSeaNet system if it is unable to receive, process, and transmit data according to ICD specifications.
- o Security requirement shall be implemented at least according to [SSNICD] document
- o performance requirement shall be implemented at least according to [SSNICD] document

8.3 DB structure

The DBMIS sub-system shall be based on an open database structure conform to SQL:1999 standard (ISO/IEC 9075) or higher.

DBMIS database schema will follow the Entity-Relationship model (E-R). By means of tables (entities) and foreign keys (relationships) this model will enable miscellaneous data representation.

The Contractor shall provide the database structure and the communication protocols for data exchange with external applications. The communication protocols shall use XML-based messages to exchange data over the network.



8.3.1 General Database Technical requirements

8.3.1.1 Data General Requirement

The General Requirement of the Database is to support the present and the future data flow regarding the Traffic Management system and other subsystems.

Analysis of the Nautical traffic in Croatian Adriatic waters are estimated on 200.000 vessel units a year with a tendency to growth.

So, the general Traffic database needs to handle at least 3-year statistic data for 700-800.000 Vessels, plus other functionalities as Personal and Crew Data, which may result in database size of more then 20 GB.

8.3.1.2 Message Repository (Messages Database)

To communicate with other processes, a process may post a message to a message repository (database). Other processes may, at regular or irregular intervals, search the message repository for new messages that have been posted to the repository since the last search, and retrieve those new messages. Processes may post and retrieve messages relative to the message repository by invoking methods provided by an application programming interface (API).

By posting a message to the message repository, a particular process can inform other interested processes proactively of actions that the particular process has taken, is taking, or will take.

By retrieving messages from the message repository, a process can determine what actions other processes have taken, are taking, or will take, and adjust accordingly.

8.3.1.3 Archive

Three tiered architecture. RDBMS Architecture shall the following:

- o Secure Application access (Smart Card identification)
- o PKI infrastructure integration
- o Possibility for Digital signature of documents
- o Intuitive and "user-friendly" web graphical interface
- o Reporting and statistical data extraction
- o Scalable solution

8.3.1.4 Dates

Date format is dd.mm.yyyy.



8.3.1.5 Technical Reliability Requirements

System must be designed to be reliable and scalable.

8.4 External Interfaces

The system shall be able to integrate the following systems:

- Safeseanet
- VTS/VTMIS
- PMIS
- PCS/other system
- METOC system

A description of the interface communication is provided.

8.4.1 SafeSeaNet interface

The SafeSeaNet system enables exchange of maritime traffic information.

SafeSeaNet provides two different interfaces to enable Member States to communicate with their Servers:

- An XML message-based interface;
- A default browser-based web interface.

As the browser-based web interface is an operator intervention-only interface the XML message-based interface has to be used.

XML message-based interface enable the C-NCA applications of Member States to communicate programmatically with the SafeSeaNet system. The XML message-based interface consists of a set of XML messages fulfilling the needs of both Data Requester and Data Provider. The list of prerequisites to fulfill this requirements are defined in SSN-ICD V1.Rev_0 document (see reference [SSNICD]).

The purpose of the SafeSeaNet Interface Control Document (SSN ICD) is to describe the system in terms of the message scenarios, the message functions and relationships between the messages. This document details the message timing, performance, as well as the data interchange protocol and parameters. It specifies the data content of the required message functions and describes those messages.

Four different types of messages are exchanged within SafeSeaNet;

- o **Notification** sent by Member States when they have information to notify the EIS.
 - o *Port Notification,*



- o *Ship Notification,*
- o *Hazmat Notification,*
- o *Alert Notification*
- o **Request** sent by Member States to the EIS when they need information.
 - o Ship
 - Latest notifications;
 - Voyage history;
 - Incident history details about a given vessel
 - o Port
 - latest information on ships bound for the port
 - o Area
 - overview of all alert messages transmitted in a given geographical area (Atlantic, North Sea and Channel, Mediterranean West and East part)
- o **Receipt** confirmation sent by the EIS, acknowledging receipt of a request.
- o **Response** sent by Member States to another user through the EIS when they are asked to respond to a request

The ICD mapping have to be done regarding the SSN directives.

8.4.2 VTS/VTMIS interface

ICD to the VTS/VTMIS in adjunction to the VESSEL DATA as an Index shall have at least the following data exchange through XML message-based interface:

- Static ship data, including MMSI, call sign, name, flag, IMO number, length and beam, ship type, height over keel;
- List of ships in port (IMO number, call sign, flag, name, company);
- List of dangerous goods on-board for each of the ships in port (IMO number, quantity);
- Arrival and Departure notification (IMO number, date and time);
- Approaching plan (IMO number, flag, ETA).
- Automatic notification of the ships and related information when in the AIS/radar coverage area (or selected areas) from VTS
- Automatic or on request notification of AIS data of ship in the coverage area from VTS
- Automatic notification of ETA upgrade from VTS

Here is an example XML with the required fields:



- VESSEL DETAILS

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<Vessel>
```

```
<VesselDetails>
```

```
<VesselName>I IPL</VesselName>
```

```
<VesselTypeID>44</VesselTypeID>
```

```
<VesselTypeCode>101</VesselTypeCode>
```

```
<Callsign>VSUJ5</Callsign>
```

```
<IMONo>845342</IMONo>
```

```
<MMSI>12345432</MMSI>
```

```
<YearBuilt>2004</YearBuilt>
```

```
<Beam>10</Beam>
```

```
<Height>12</Height>
```

```
<Draught>8</Draught>
```

```
<Length>15</Length>
```

```
<DWT>6</DWT>
```

```
<GrossTonnage>500</GrossTonnage>
```

```
<Propellers>2</Propellers>
```

```
<CountryCode>100</CountryCode>
```

```
<CountryName>CHINA</CountryName>
```

```
<Owner>Bruslie</Owner>
```

```
<Agent>Jetlie</Agent>
```

```
</VesselDetails>
```

```
<VesselDetails>
```

```
<VesselName>A CHENG</VesselName>
```

```
<VesselTypeID>45</VesselTypeID>
```

```
<VesselTypeCode>102</VesselTypeCode>
```

```
<Callsign>VSUJ6</Callsign>
```

```
<IMONo>845343</IMONo>
```



```

<MMSI>12345445</MMSI>
<YearBuilt>2005</YearBuilt>
<Beam>12</Beam>
<Height>14</Height>
<Draught>10</Draught>
<Length>17</Length>
<DWT>8</DWT>
<GrossTonnage>600</GrossTonnage>
<Propellers>3</Propellers>
<CountryCode>100</CountryCode>
<CountryName>CHINA</CountryName>
<Owner>HANG BO</Owner>
<Agent>SHUI YUN</Agent>

```

```
</VesselDetails>
```

```
</Vessel>
```

The Vessel name and IMO number should be not null. IMO number should be unique.

- VOYAGE DETAILS

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<Voyage>
```

```
<VoyageInformation>
```

```
<VoyageDetails>
```

```

<VesselName>Cape Eagle</VesselName>
<IMONNumber>5678494</IMONNumber>
<VoyageStatus>Planned</VoyageStatus>
<Action>Arrival</Action>
<ArrivalDate>12/18/2006 11:00AM</ArrivalDate>
<DepartureDate>12/25/2006 10:00AM</DepartureDate>
<BookingDate>12/15/2006 12:00PM</BookingDate>
<PortofArrival>Aalborg </PortofArrival>

```



```
<BerthofArrival>Bamlets Wharf </BerthofArrival>

<OriginatingPort>Bartin </OriginatingPort>

<DestinationPort>Baton Rouge </DestinationPort>

<Draught>6</Draught>

<URL/>

</VoyageDetails>

<CargoDetails>

  <cargo>

    <CargoName>Iron</CargoName>

    <Quantity>100</Quantity>

  </cargo>

  <cargo>

    <CargoName>Alluminium</CargoName>

    <Quantity>200</Quantity>

  </cargo>

</CargoDetails>

<PilotDetails>

  <Pilot>

    <PilotName>A.G.Gillie</PilotName>

    <StartDate>12/16/2006 11:00 AM</StartDate>

    <EndDate>12/18/2006 14:15PM</EndDate>

    <Remarks>This is First class Pilot</Remarks>

  </Pilot>

  <Pilot>

    <PilotName>John Sinha</PilotName>

    <StartDate>12/16/2006 13:00 AM</StartDate>

    <EndDate>12/18/2006 14:15PM</EndDate>

    <Remarks>This is second class Pilot</Remarks>

  </Pilot>

</PilotDetails>

<TugDetails>

  <Tug>
```



```

<TugName>Admas</TugName>

<StartDate>12/16/2006 11:00 AM</StartDate>

<EndDate>12/18/2006 14:15PM</EndDate>

<Remarks>This is Test tug1</Remarks>

</Tug>

<Tug>

  <TugName>Alcedo</TugName>

  <StartDate>12/16/2006 11:00 AM</StartDate>

  <EndDate>12/18/2006 14:15PM</EndDate>

  <Remarks>This is Test tug2</Remarks>

</Tug>

</TugDetails>

</VoyageInformation>

</Voyage>

```

The voyage information must contain the associated vessel name and its IMO number.

8.4.3 PMIS interface

Interface to the existing or future PMIS shall have at least the following data exchange:

- The vessel details (vessel data - see app.6.4.8)
- Detailed arrival / departure ship data to PMIS, according to NOA data (voyage data - see app. 6.4.8)
- Berth information, arrival of ship, from PMIS (same as voyage data – see. App 6.4.8)

An XML message-based interface is required for data exchange.

8.4.4 PCS/other system interface

Interface to the existing or future PCS or other system shall have at least the following data exchange:

- Detailed arrival / departure ship data to PMIS, according to NOA data (voyage data - see app. 8.5)
- Possibility to deliver any other additional data from database (voyage data - see app. 8.5)



An XML message-based interface is required for data exchange.

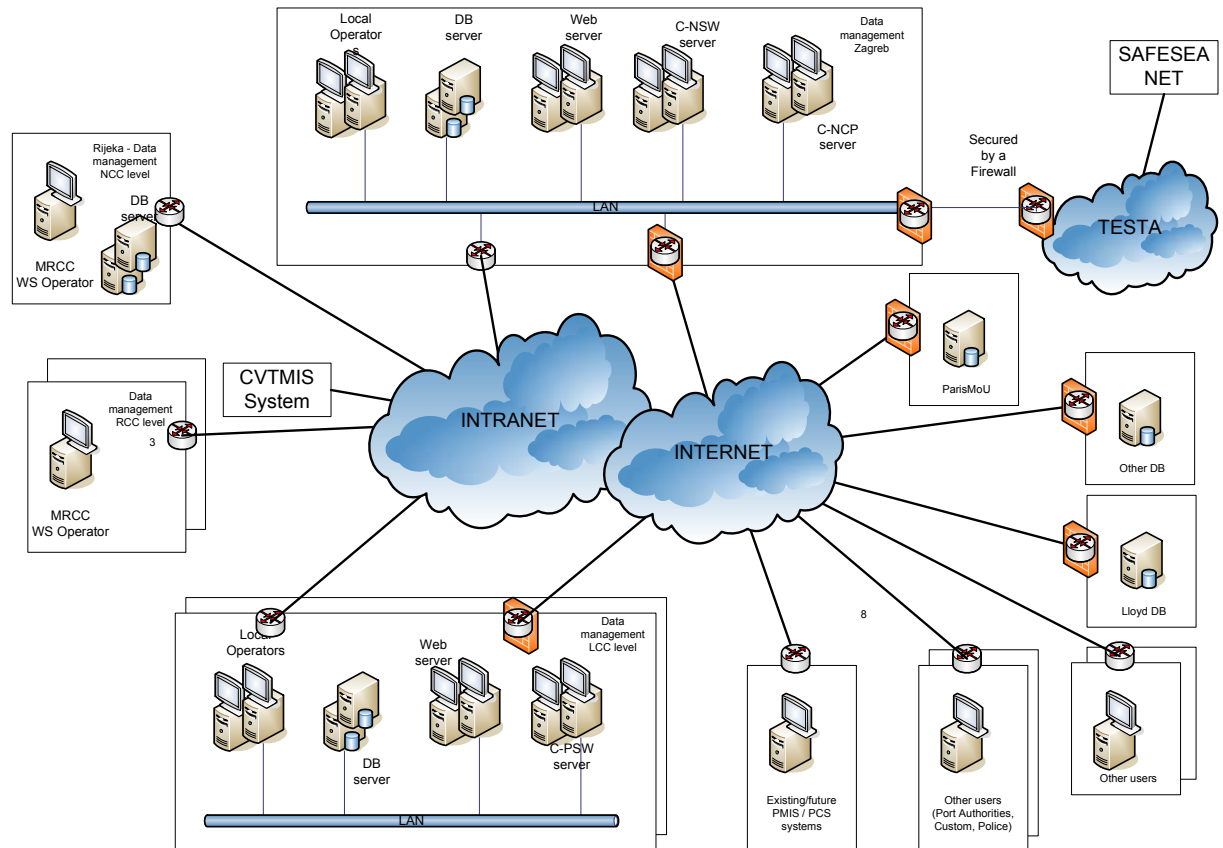
8.5 Architecture based on a distributed system

As optional architecture, in order to increase the availability of the system in ports, the system can be based on a two level architecture as shown in the figure above:

- 1 Data Management National Control Centre, located in Zagreb, and connected to the SafeSeaNet;
- 1 data back up system shall be located in Rijeka;
- 3 Data Management Regional Control Centres, located in Rijeka, Šibenik, Split;
- 8 Local Data Management Control Centres, located in Rijeka, Pula, Senj, Zadar, Sibenik, Split, Ploce, Dubrovnik;
- Provision of web access to the NCC from other authorities for statistical data
- Provision of web access to the LCC from all the ports authorities assigned to the relative Local Control Centres through internet
- Provision of web access to the LCC from agencies through internet
- Access the external databases, as Lloyds register and ParisMoU

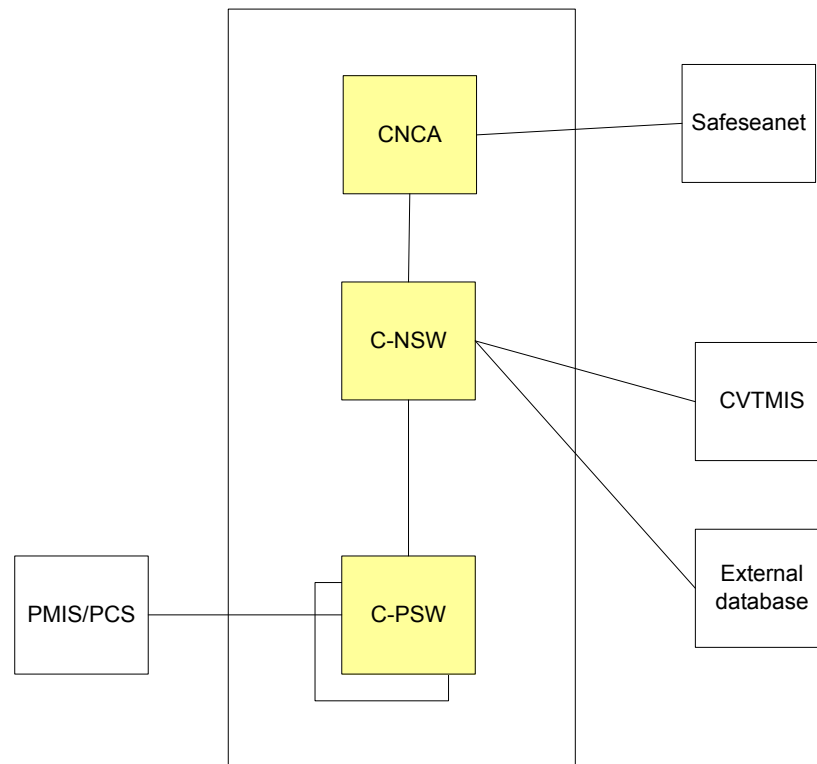
In each Local Control Centres located in the main Croatian ports, data of arrival/departure is collected and clearance is given, with contribution with the main authorities. Web pages shall be made available for agencies, for data collection, and for the main authorities, for clearance and collection of additional information. Data shall be collected from all the ports that belong to the Local Control Centre. Data shall be available for operational use, and upgrade manually or automatically from the VTS system.

The National Control Centre will collect arrival/departure data and other relevant data coming from LCC, for statistical and operational use for NCC and RCC operators (according to the responsible area), and will re-distribute the information to the SafeSeaNet. Data of SafeSeaNet shall be available at each level.



The software architecture is a distributed solution in order to increase the availability of the system and shall be based on:

- o Port single windows software (C-PSW),
- o National single windows software (C-PSW),
- o Croatian LCA for SafeSeaNet (C-NCA).



The Croatian Port Single windows shall be able to provide the same functions as at national level.

The detailed configuration of the Data management system sites shall comply with the following requirements.

8.5.1 National Control Centre Zagreb

Configuration system and auxiliary equipments

The detailed configuration of National Control Centre in Zagreb shall comply with the following configuration:

- One duplicated central data management server sub-system in hot standby configuration, with Data management software licence
- One duplicated Database server sub-system in hot standby configuration, with Database software licence
- One duplicated central Message server sub-system in hot standby configuration, for connection to SafeSeaNet, working as C-NCA server
- One duplicated web server for local/remote users
- Data management Operators Consoles sub-systems, each equipped with one 21" LCD monitor



- A colour laser printers 600x600 dpi, min. 20 ppm in B/W and 5 ppm in colour
- One UPS for 12KVA
- A C-NSW software module
- A C-NCA software module, for interconnection to SafeSeaNet

The equipment room and the Operation room in the Control Centre need to be equipped with an air conditioning system.

Infrastructural Constraints

The following provisional infrastructural constraints are reported as reference.

The following table reports location and altitude above sea level.

SITE	COORD. (N,E)	A.S.L (m)	NOTES	ID
National Control Centre c/o Ministry of the sea, Transport and Infrastructure	45°47'26", 15°58'08"	5		NCC-Z

Civil Work Requirements

At the Control Centre the Contractor shall take on the works for installation of the indoor equipment, including works required for power supply and LAN connections.

Power Supply

A main power source 230 Vac is available at the National Control Centre Zagreb (NCC-Z). The Contractor shall provide all works and accessories required for equipments connection to the mains. Each group of equipments shall be connected by means of a separate electric line.

All the AC powered equipment of the Control Centre shall be capable of accepting and being operated at 230V 50Hz.

Supporting equipment such as UPS shall be used to guarantee the whole system service during power failures and power protection against power outages, surges, sags, brownouts, and over-voltage conditions. The equipments shall be able to work up to 15 minutes after power interruption.

LAN connection

The LAN is available in each site. The Contractor shall provide all works and accessories required for the connection to the LAN networking device in DMZ area.

The bandwidth available is 20 Mbps.

8.5.2 National Control Centre Rijeka

Configuration system and auxiliary equipments



The detailed configuration of National Control Centre in Rijeka shall comply with the following configuration:

- One duplicated Database server sub-system in hot standby configuration, with Database software licence
- Data management Operators Consoles sub-systems, each equipped with one 21" LCD monitor
- A colour laser printers 600x600 dpi, min. 20 ppm in B/W and 5 ppm in colour
- One UPS for 8KVA

The equipment room and the Operation room in the Control Centre need to be equipped with an air conditioning system.

Infrastructural Constraints

The following provisional infrastructural constraints are reported as reference.

The following table reports location and altitude above sea level.

SITE	COORD. (N,E)	A.S.L (m)	NOTES	ID
National Control Centre c/o Harbour Master office in Rijeka	45°19'25.51", 14°26'27.32"	5		NCC

Civil Work Requirements

At the Control Centre the Contractor shall take on the works for installation of the indoor equipment, including works required for power supply and LAN connections.

Power Supply

A main power source 230 Vac is available at the National Control Centre Rijeka (NCC). The Contractor shall provide all works and accessories required for equipments connection to the mains. Each group of equipments shall be connected by means of a separate electric line.

All the AC powered equipment of the Control Centre shall be capable of accepting and being operated at 230V 50Hz.

Supporting equipment such as UPS shall be used to guarantee the whole system service during power failures and power protection against power outages, surges, sags, brownouts, and over-voltage conditions. The equipments shall be able to work up to 15 minutes after power interruption.

LAN connection

The LAN is available in each site. The Contractor shall provide all works and accessories required for the connection to the LAN networking device in DMZ area.

The bandwidth available is 20 Mbps.



8.5.3 Regional Control Centre (RCC)

Configuration system and auxiliary equipments

Regional Control Centres shall access the central system through a web browser application already available on existing consoles.

The detailed configuration of Regional Control Centres shall comply with the following configuration:

- Data management Operators Consoles sub-systems, each equipped with one 21" LCD monitor
- A colour laser printers 600x600 dpi, min. 20 ppm in B/W and 5 ppm in colour
- One UPS for 6KVA

The equipment rooms in the Regional Control Centres are not equipped with an air conditioning system so the air conditioning system have to be implemented.

Infrastructural Constraints

The following provisional infrastructural constraints are reported as reference.

The following table reports location and altitude above sea level.

SITE	COORD. (N,E)	A.S.L (m)	NOTES	ID
Regional Control Centre c/o Harbour Master office in Rijeka	45°19'25", 14°26'27"	5		RCC1
Regional Control Centre c/o Harbour Master office in Šibenik	43°44'03", 15°53'24"	5		RCC2
Regional Control Centre c/o Harbour Master office in Split	43°30'23", 16°25'56"	5		RCC3

Civil Work Requirements

At the Regional Control Centre the Contractor shall take on works for installation of the indoor equipment, including works required for power supply and LAN connections.

Power Supply

A main power source 230 Vac is available at the Regional Control Centre (RCC). The Contractor shall provide all works and accessories required for equipments connection to the mains. Each group of equipments shall be connected by means of a separate electric line.

All the AC powered equipment of the Control Centre shall be capable of accepting and being operated at 230V 50Hz.



Supporting equipment such as UPS shall be used to guarantee the whole system service during power failures and power protection against power outages, surges, sags, brownouts, and over-voltage conditions.

The equipments shall be able to work up to 15 minutes after power interruption.

LAN connection

The LAN is available in each site. The Contractor shall provide all works and accessories required for the connection to the LAN networking device in DMZ area.

The bandwidth available is 2 Mbps.

8.5.4 Local Control Centre (LCC)

Configuration system and auxiliary equipments

The detailed configuration of National Control Centre in Rijeka shall comply with the following configuration:

- One duplicated central data management server sub-system in hot standby configuration, with Data management software licence
- One duplicated Database server sub-system in hot standby configuration, with Database software licence
- One duplicated web server for local/remote users
- Data management Operators Consoles sub-systems, each equipped with one 21" LCD monitor
- A colour laser printers 600x600 dpi, min. 20 ppm in B/W and 5 ppm in colour
- One UPS for 12KVA
- The equipment room and the Operation room in the Control Centre need to be equipped with an air conditioning system.

Infrastructural Constraints

HM office shall be the location for the equipment installation.

Civil Work Requirements

At the Local Control Centres the Contractor shall take on the works for installation of the indoor equipment, including works required for power supply and LAN connections.

Power Supply

A main power source 230 Vac is available at the National Control Centre (NCC). The Contractor shall provide all works and accessories required for equipments connection to the mains. Each group of equipments shall be connected by means of a separate electric line.



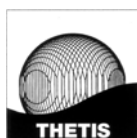
All the AC powered equipment of the Control Centre shall be capable of accepting and being operated at 230V 50Hz.

Supporting equipment such as UPS shall be used to guarantee the whole system service during power failures and power protection against power outages, surges, sags, brownouts, and over-voltage conditions. The equipments shall be able to work up to 15 minutes after power interruption.

LAN connection

The LAN is available in each site. The Contractor shall provide all works and accessories required for the connection to the LAN networking device in DMZ area.

Connection to internet is required. The bandwidth available is 2 Mbps.



9 Scope of Supply, Cost Estimation

Based on the results of the previous sections, the following tables report the defined scope of supply for the data management system, together with budget estimation for the implementation.

The National Control Centre in Zagreb scope of supply is reported here below.

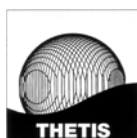
SYSTEMS	EQUIPMENTS	TOTALS	UNITARY COST	UNIT PRICE	TOTAL PRICE	BUDGETARY ESTIMATE
Data management Equipments and TLC NETWORK						€ 730.500
C NCP	CNCO server	2	€ 10.000	€ 15.000	€ 30.000	€ 405.000
	NCP software licence	1	€ 250.000	€ 375.000	€ 375.000	
C NSW	C NSW server Processor	2	€ 10.000	€ 15.000	€ 30.000	€ 286.500
	Web server	2	€ 10.000	€ 15.000	€ 30.000	
	Database Server	2	€ 10.000	€ 15.000	€ 30.000	
	C NSW software licence	1	€ 80.000	€ 120.000	€ 120.000	
	Supervisor Console	1	€ 4.000	€ 6.000	€ 6.000	
	Operator safeseanet console	2	€ 4.000	€ 6.000	€ 12.000	
	O.S. License	6	€ 2.500	€ 3.750	€ 22.500	
	Database SW License (server)	2	€ 10.000	€ 15.000	€ 30.000	
	21" LCD Monitors	3	€ 1.000	€ 1.500	€ 4.500	
	GPS Clock	1	€ 1.000	€ 1.500	€ 1.500	
Racks and Power Generation	Rack Control Centre	2	€ 6.000	€ 9.000	€ 18.000	€ 36.000
	Cables & Connectors (set)	1	€ 2.000	€ 3.000	€ 3.000	
	UPS 12KVA	1	€ 10.000	€ 15.000	€ 15.000	
	Batteries 12V 305 Ah	0	€ 500	€ 750	€ 0	
	Diesel Generator 12 KVA	0	€ 15.000	€ 22.500	€ 0	
TLC Network	Switch	1	€ 2.000	€ 3.000	€ 3.000	€ 3.000
TOTAL SUPPLY AND INTEGRATION						€ 730.500
Engineering and After Sales	Design, Engineering and Management				€ 34.821	€ 166.311
	Warranty and After Sales Services for 2 Years				€ 116.880	
	Risks, Insurances and Contingencies				€ 14.610	
TOTAL BUDGET FOR SYSTEM IMPLEMENTATION						€ 896.811

The budget for the National Control Centre in Rijeka is reported here below.



SYSTEMS	EQUIPMENTS	TOTALS	UNITARY COST	UNIT PRICE	TOTAL PRICE	BUDGETARY ESTIMATE
Data management Equipments and TLC NETWORK						€ 115.500
NCC rijeka	C NSW server Processor	0	€ 10.000	€ 15.000	€ 0	€ 91.500
	Web server	0	€ 10.000	€ 15.000	€ 0	
	Database Server	2	€ 10.000	€ 15.000	€ 30.000	
	C NSW software licence	0	€ 80.000	€ 120.000	€ 0	
	Supervisor Console	0	€ 4.000	€ 6.000	€ 0	
	Operator NCC MRCC console	3	€ 4.000	€ 6.000	€ 18.000	
	O.S. License	2	€ 2.500	€ 3.750	€ 7.500	
	Database SW License (server)	2	€ 10.000	€ 15.000	€ 30.000	
	21" LCD Monitors	3	€ 1.000	€ 1.500	€ 4.500	
	GPS Clock	1	€ 1.000	€ 1.500	€ 1.500	
Racks and Power Generation	Rack Control Centre	1	€ 6.000	€ 9.000	€ 9.000	€ 21.000
	Cables & Connectors (set)	1	€ 2.000	€ 3.000	€ 3.000	
	UPS 8KVA	1	€ 6.000	€ 9.000	€ 9.000	
	Batteries 12V 305 Ah	0	€ 500	€ 750	€ 0	
	Diesel Generator 12 KVA	0	€ 15.000	€ 22.500	€ 0	
TLC Network	Switch	1	€ 2.000	€ 3.000	€ 3.000	€ 3.000
TOTAL SUPPLY AND INTEGRATION						€ 115.500
Engineering and After Sales	Design, Engineering and Management				€ 5.506	€ 26.296
	Warranty and After Sales Services for 2 Years				€ 18.480	
	Risks, Insurances and Contingencies				€ 2.310	
TOTAL BUDGET FOR SYSTEM IMPLEMENTATION						€ 141.796

The budget for the implementation of each of the Regional Control Centres is shown in the table below.



SYSTEMS	EQUIPMENTS	TOTALS	UNITARY COST	UNIT PRICE	TOTAL PRICE	BUDGETARY ESTIMATE
Data management Equipments and TLC NETWORK						€ 36.750
RCC	C NSW server Processor	0	€ 10.000	€ 15.000	€ 0	€ 24.000
	Web server	0	€ 10.000	€ 15.000	€ 0	
	Database Server	0	€ 10.000	€ 15.000	€ 0	
	C NSW software licence	0	€ 120.000	€ 180.000	€ 0	
	Supervisor Console	0	€ 4.000	€ 6.000	€ 0	
	Operator console	3	€ 4.000	€ 6.000	€ 18.000	
	O.S. License	0	€ 2.500	€ 3.750	€ 0	
	Database SW License (server)	0	€ 10.000	€ 15.000	€ 0	
	21" LCD Monitors	3	€ 1.000	€ 1.500	€ 4.500	
	GPS Clock	1	€ 1.000	€ 1.500	€ 1.500	
Racks and Power Generation	Rack Control Centre	1	€ 3.000	€ 4.500	€ 4.500	€ 11.250
	Cables & Connectors (set)	1	€ 500	€ 750	€ 750	
	UPS 4KVA	1	€ 4.000	€ 6.000	€ 6.000	
	Batteries 12V 305 Ah	0	€ 500	€ 750	€ 0	
	Diesel Generator 12 KVA	0	€ 15.000	€ 22.500	€ 0	
TLC Network	Switch	1	€ 1.000	€ 1.500	€ 1.500	€ 1.500
TOTAL SUPPLY AND INTEGRATION						€ 36.750
Engineering and After Sales	Design, Engineering and Management				€ 1.752	€ 8.367
	Warranty and After Sales Services for 2 Years				€ 5.880	
	Risks, Insurances and Contingencies				€ 735	
TOTAL BUDGET FOR SYSTEM IMPLEMENTATION						€ 45.117

The budget for the implementation of each of the Local Control Centres is shown in the table below.

SYSTEMS	EQUIPMENTS	TOTALS	UNITARY COST	UNIT PRICE	TOTAL PRICE	BUDGETARY ESTIMATE
Data management Equipments and TLC NETWORK						€ 36.750
LCC	C NSW server Processor	0	€ 10.000	€ 15.000	€ 0	€ 24.000
	Web server	0	€ 10.000	€ 15.000	€ 0	
	Database Server	0	€ 10.000	€ 15.000	€ 0	
	C NSW software licence	0	€ 120.000	€ 180.000	€ 0	
	Supervisor Console	0	€ 4.000	€ 6.000	€ 0	
	Operator console	3	€ 4.000	€ 6.000	€ 18.000	
	O.S. License	0	€ 2.500	€ 3.750	€ 0	
	Database SW License (server)	0	€ 10.000	€ 15.000	€ 0	
	21" LCD Monitors	3	€ 1.000	€ 1.500	€ 4.500	
	GPS Clock	1	€ 1.000	€ 1.500	€ 1.500	
Racks and Power Generation	Rack Control Centre	1	€ 3.000	€ 4.500	€ 4.500	€ 11.250
	Cables & Connectors (set)	1	€ 500	€ 750	€ 750	
	UPS 4KVA	1	€ 4.000	€ 6.000	€ 6.000	
	Batteries 12V 305 Ah	0	€ 500	€ 750	€ 0	
	Diesel Generator 12 KVA	0	€ 15.000	€ 22.500	€ 0	
TLC Network	Switch	1	€ 1.000	€ 1.500	€ 1.500	€ 1.500
TOTAL SUPPLY AND INTEGRATION						€ 36.750
Engineering and After Sales	Design, Engineering and Management				€ 1.752	€ 8.367
	Warranty and After Sales Services for 2 Years				€ 5.880	
	Risks, Insurances and Contingencies				€ 735	
TOTAL BUDGET FOR SYSTEM IMPLEMENTATION						€ 45.117



The following assumptions have been made in the estimation of the project budget:

- The workstations for remote connection from the HM branches offices and other authorities are not included;
- The telecommunications network supply is not quoted;
- A single integration contract is assumed to be awarded.

In conclusion, the budget estimation for the implementation of the system is reported in the tables below.

SYSTEM SITE	TOTAL SUPPLY AND INTEGRATION	ENGINEERING AND AFTER SALES	TOTAL	QUANTITY	TOTAL BUDGET FOR SYSTEM IMPLEMENTATION
NCC-Z	€ 730.500	€ 166.311	€ 896.811	1	€ 896.811
NCC	€ 115.500	€ 26.296	€ 141.796	1	€ 141.796
RCC	€ 36.750	€ 8.367	€ 45.117	3	€ 135.350
LCC	€ 36.750	€ 8.367	€ 45.117	8	€ 360.934
TOTALS					€ 1.534.890

Based on past experience a range of +/- 30% can be expected depending on specific technologies/products and applied market conditions.