SUMMARY PROJECT FICHE

1. BASIC INFORMATION

1.1 Desirée number: BG 0012.01

1.2 Title: Vessel Traffic Management and Information System (VTMIS)

1.3 Sector: Transport

1.4 Location: Bulgarian Black Sea Coastal waters, Port approaches, Inland Waterways and Ports

2. OBJECTIVE

2.1 Wider Objectives:

The wider objectives of the project are to promote:

• marine safety in the Bulgarian territorial waters

• economic development through improvement of transport through Bulgarian Ports and through industrial development in Bulgaria

• protection of the (marine) environment on Bulgarian territorial waters (prevention of damage to the quality of surface water and air by shipping in the Bulgarian coastal area, harbour basins and navigable inland waters)

2.2 Immediate Objectives

• To create the technical means of a VTMIS as an integrated instrument to achieve the Bulgarian Government’s objectives with regard to marine safety, protection of the environment and economic development

• To develop technical and institutional capabilities in Bulgaria to realise and maintain the VTMIS

• To use and operate the VTMIS in an optimal way.

2.3 Accession Partnership and NPAA priority

Relevant AP priorities:
• Align maritime transport and inland waterways

Relevant NPAA priorities:
• Further alignment of Bulgarian maritime legislation with the EU legislation in compliance with the development of EU policy for the sector;
• Further harmonisation of technical requirements and requirements for maritime safety; improvement of safety navigation

3. DESCRIPTION

3.1 Background and Justification

Bulgaria and specifically the Bulgarian ports need to be integrated in the multi-modal transport chain via the relevant transport corridors and the Traceca route. This requires among other things a policy of promotion of short-sea and sea-river shipping connections with the hinterland corridors. To support this policy, there is a need to improve the efficiency of the transport corridors in Bulgaria.

Governments and ports are facing increased safety and environment pressure, due to ongoing increase of the density of waterborne transport, growth of transportation of dangerous goods and increasing environment consciousness in the world. A safe port, effective port management, protection of the environment and efficient port operations make a port attractive and will increase the cargo throughput. In order to keep their competitive position and to anticipate changing requirements, world and regional ports need a flexible, market oriented organisation, a well conceived service package and above all adequate, tailor made management tools.

Tailored to the port’s characteristics and following the IMO and IALA Guidelines, Vessel Traffic Services (VTS) can be an effective management tool. It constitutes an excellent answer to safety and environments pressures and moreover contributes to better port performance through the possibility of integrating facility planning and through serving as a source of information for the entire ports industry. A VTS moreover, provided that it consists of a well-balanced organisation, has a sound legal basis and well-conceived technical means, is an efficient management tool. It enables the ports to make a better use of existing, capital intensive facilities and services, at comparatively low investments and operational costs.

For that reason and particularly in view of the vulnerable Black Sea, the Bulgarian ports and coastline, one of the conditions for the improvement of the Bulgarian transport chain is the realisation of VTS systems for the Sea Ports of Burgas and Varna and along the coast in the Bulgarian territorial waters.

By electronically interconnecting these VTSs and introducing the capability to interconnect to other VTS in the Black Sea region as well as to the MRCC and other data processing systems or data networks, an integrated VTMIS is realised.

At present, guidance and monitoring of vessels in Bulgaria are not considered to be efficient and do not yet meet European directives and IMO standards. This has not only a direct negative trade consequence, but also entails a higher risk of pollution. Hence, the development of adequate navigational facilities along the coast in the Bulgarian territorial waters, in ports and inland fairways, is of utmost importance specifically in view of the increase in the transport volume.

The Bulgarian maritime policy is directed at the development of a sustainable tool to achieve the objectives regarding maritime safety and efficiency. In this process three separate, but interdependent, components are distinguished:
(1) **Traffic Observation and Information**

The primary sensor required for a VTS is generally radar. This trajectory is directed at the procurement of VTS traffic image- and data base equipment, such as radar systems, computers for data processing and display, equipment for radio direction finding, traffic centres and radar stations including outfit, but excluding communication equipment. It serves for a reliable and accurate vessel traffic image of the relevant areas, including the required vessel particulars, enabling the continuous traffic surveillance, the detection of conflict situations, the collection of data for traffic guidance and assistance in search and rescue operations.

(2) **Telecommunication**

The communication trajectory is directed at the procurement of the VHF radio stations and all communication links along the Bulgarian coast. Communication is the backbone of the VTMIS. It ensures continuous radio communication with the shipping in the Bulgarian region, enabling the supply of traffic information and traffic guidance, to transmit general hydro-meteo data, give assistance in search and rescue operations, etc. Moreover it serves for the transmission of traffic image data from radar stations to traffic centres, data exchange between traffic centres and for exchange of information between the VTMIS and other institutions involved in ship and cargo handling.

The Phare co-financing contribution referred to in this fiche is focusing on the implementation of the Telecommunications component, which includes procurement of equipment, building and outfitting radio base stations, communication links, together with the necessary supporting computer hardware, software and technical training for the system. The total Phare cost is given as 2B in the table above and the detailed breakdown set out hereunder:

(3) **Institutional Building**

Institutional building is directed at the development of the VTS organisational set up, the development of the legal framework and the establishment of the necessary instruments to achieve the required professional level for VTS personnel. The institutional building has to follow the International standards and guidelines.

3.2 **Linked Activities**

The **Varna Initial System** (VIS) now going on, is the first step in the Traffic Information and Observation trajectory. It contributes to the development of sustainable transport by involving technical assistance, hardware and software provided by the Netherlands. The technical assistance part of the Varna Initial System project comprises: assistance in defining the VTMIS development strategy, including feasibility and cost benefit assessment; preparation of the Varna Initial System functional and technical specification; and implementation management and evaluation of the performance, of a VTS-Varna Initial System for the VARNA port approach, which will be an integral part of a future VTMIS.

The required equipment is partly financed by the Netherlands Government and partly by the Bulgarian Government.
The short-term objectives of the Varna Initial System project are:
- to develop an overall strategy to arrive at the envisaged VTMIS
- to realise a basis for the development of such a system, by implementing a sub-system for the port of Varna;
- to allow the Bulgarian parties to gain experience with the implemented system;
- to transfer knowledge on system use and maintenance management;

The Government of Bulgaria embarked on the *EMONA-Project*, directed to the development of the shore based VHF GMDSS maritime system in pursuance of the IMO SOLAS convention and in accordance with the ITU radio Regulations. It is intended to correspond to the standards concerning the GMDSS A1 Area. The Emona-Project, formally started in January 1996, and resulted in the realisation of a substantial part of the infrastructure (Base Stations and equipment) by the end of 1998. It was the first step of the development of the Telecommunication trajectory. The Emona project is currently being revitalised within the scope of the VTMIS Project.

3.3 Results

The results that can be expected from the VTMIS Project are as follows:

- Improvement of safety of shipping and protection of the environment in ports, port approaches and coastal areas by providing information to the shipping, vessel guidance, navigation assistance (if required) and assistance in search and rescue. World-wide experience has shown that VTS, provided they are carefully designed to meet the local operational needs and requirements and are manned by adequately trained personnel, are an effective tool to promote safety of shipping. Improvements can be derived from the decrease in the number of conflict situations, near misses and accidents. Continuous analysis of these occurrences is required, to check system performance and to identify future modifications in procedures, education and technical means.

- Improvement of efficiency of vessel traffic in port and approaches by providing information to the shipping and contributing to port resource planning (berths, pilots, tugboats, fairways, etc.). A VTS or a vessel traffic management system, provided it is designed to meet requirements for data storage and retrieval and for active resource planning, has demonstrated to be an effective tool to reduce the vessel transit time (roads to berth and vice versa) and efficient use of port resources. Continuous analysis of waiting time of vessels, waiting time for resources, transit times, etc. is required to check system performance, again for future modifications.

- Improve efficiency of the transport through (electronically) providing traffic data to other links in the transport chain. Although the experience with VTMIS as nodal point in a global transport information system is still limited, the positive effect on the turnaround time for ships can be considerable. Performance can be measured through analysis of vessel turnaround time, waiting time for pre- and on-carriers, storage time for cargoes, etc.

3.4 Activities

*(1) Input for traffic image component*
- Local operational personnel, such as harbourmasters, pilots, tugboat operators for reviews and expert opinions.
- Local institutions such as National Maritime Academy and Maritime Training Centre, for reviews and expert opinions.
- International consultants with hands on experience in design and implementation of complex systems in a European Union Port user environment and in accordance with the IMO/IALA guidelines, for strategy development, system design and implementation, funded by Netherlands PSO programme.
- Funds from the Bulgarian Government.

(2) **Input telecommunication component**

- Local Institutions like Navigation Maritime Bulgare, communication department and Bulgaria Telecom, for design and implementation.
- Local operational personnel, such as harbourmasters, pilots, tugboat operators for expert opinion.
- Equipment suppliers and local building contractors for system installation and testing.
- Funds from the Bulgarian Government.
- Funds from Phare.

(3) **Input in Institutional component**

- Maritime administration, National Maritime Institute Centre and international consultants, for development of the legal framework.
- International consultants for advisory tasks concerning the legal framework.
- Maritime Administration for organisational set up and organising the required personnel. Maritime Training Centre, international consultants for development of VTS procedures, design of VTS training equipment and training of Bulgarian VTS trainers.
- Equipment suppliers, for the installation and testing of the VTS operator training equipment.
- Funds from Bulgarian Government.
- Funds from Netherlands Government.

**4. INSTITUTIONAL FRAMEWORK**

The Law on Maritime Spaces, Inland Waterways and Ports in the Republic of Bulgaria came into force in the beginning of 2000 and sets out the legal framework for the requirements on maritime safety and eventually the basis for the VTMIS organisation.

The Executive Agency "Maritime Administration" is a legal body under the Ministry of Transport and Communications in charge of policy development and overall maritime safety management. The newly established Executive Agency "Port Administration" under the Ministry will be in charge of ensuring the security and safety of ports, keeping of registers, statistics, control of access etc.

The responsibilities, competencies and tasks in relation with promotion of safe and expeditious ship traffic in the regions concerned, however will be formalised in an agreement between the concerned public institutions and authorities, or existing agreements will be adapted to ensure the efficient operation of the VTMIS. The respective responsibility, competencies and tasks will be fully defined and formalised as an integral part of the overall project.
5. DETAILED BUDGET

<table>
<thead>
<tr>
<th>Components</th>
<th>Phare Support</th>
<th>Support Institution</th>
<th>(in Euro)</th>
<th>National Co-financing*</th>
<th>Other *</th>
<th>TOTAL</th>
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</thead>
<tbody>
<tr>
<td>1. VTS Traffic Observation &amp; information</td>
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<td>1.A Varna Initial System</td>
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<td>750 000</td>
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<td>1.B Full VTS Varna / Burgas Ports</td>
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<td>1.C Coastal Area coverage</td>
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<td>3. Institutional building</td>
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<td>3.A Framework Law</td>
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<td>3.B Various Acts</td>
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<tr>
<td>3.C VTS &amp; Port efficiency training</td>
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<td>500 000</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>3 250 000</strong></td>
<td><strong>150 000</strong></td>
<td><strong>3 400 000</strong></td>
<td><strong>7 100 000</strong></td>
<td><strong>1 000 000</strong></td>
<td><strong>11 500 000</strong></td>
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</tbody>
</table>

* Netherlands 1999 & 2000 programmes

6. IMPLEMENTATION ARRANGEMENTS

6.1 Implementing Agency

All contractual and financial issues will be the responsibility of the CFCU, which will be the Implementing Agency.

The Ministry of Transport and Communications, executive agency "Maritime Administration" - being the beneficiary - will be responsible for the technical implementation of the project. It will provide all required technical specifications and actively participate in the procurement process in selecting suppliers.

The Ministry will appoint a Senior Project Officer for the Phare funded component of the overall VTMIS project with extensive experience in Phare procedures. He/she will work in close cooperation with the VTMIS Project Director in order to assure implementation being fully coordinated and consistent.

The Ministry of Transport and Communications, "Maritime Administration", has appointed a Project Director for the overall VTMIS project who, on behalf of the Ministry of Transport and Communications, safeguards the technical quality, planning control and budget control. He is the formal contact officer for the VTMIS Project and is supported by members of a Project Bureau of the Ministry of Transport and Communications.

The Senior Project Officer and the Project Director will direct the project on a day-to-day basis on behalf of the Ministry of Transport and Communications; co-ordinate the efforts of the Bulgarian parties; attend/preside project meetings; and report to the Ministry.

They will ensure that a system maintenance management department will be set up in close co-operation with the system suppliers, prior to the end of the warranty period for the VTMIS or parts of the VTMS. The maintenance management department will be
responsible for the system technical and operational quality management and for the management of system maintenance contracts.

The contact persons responsible from the Ministry's "Maritime Administration" for the implementation of the project and all project related issues are:

Contact persons: Mr Marin Petrov, Director General
Mr Zlatko Kuzmanov, Senior Inspector and Project Director
Address: Ministry of Transport and Communications, Maritime Administration
9, Levski str.; 1000 Sofia, Bulgaria
Tel/Fax: +359-2-9300910/+359-2-9885537

6.2 Non-standard aspects

There are no non-standard procedures envisaged for the implementation of the project.

6.3 Contracts

One contract is expected with a value of around € 3.4 million

7. IMPLEMENTATION SCHEDULE

7.1 Start of tendering: January 2001
7.2 Start of project activity: May 2001
7.3 Project completion: February 2003

8. EQUAL OPPORTUNITY

Equal participation in the project by men and women will be assured. There will be no restrictions as of gender, ethnic, religious, or political belonging.

9. ENVIRONMENT

The impact of the realisation of the system on the environment is limited. VTS Centres will partly be realised in existing buildings. If not, the size of the buildings is moderate and will hardly have impact on the town and country planning.

Single objectives of the VTMIS are:
• to contribute to the protection of the marine environment through reducing accident probabilities and hence to reduction of probabilities of spills of fuel and cargo;
• to contribute to the prevention of illegal discharges of ship and cargo wastes;
• to promote efficient use of port resources which can in turn have a positive effect on energy consumption.

In these respects the VTMIS has a positive impact on the environment.

10. RATES OF RETURN

Not applicable
11. INVESTMENT CRITERIA

11.1. Catalytic effect:

Without Phare co-financing assistance, the communication backbone of the project would have encountered serious delays and thereby significantly reduced the performance and capabilities of the overall VTMIS project.

11.2. Co-financing:

The project is co-financed by national budget resources and the Dutch assistance programme in a total amount of € 8.1 million, which will provide 70% of the total cost of the project.

11.3. Additionality:

No other financing sources from the private sector or from IFIs were available for financing this project.

11.4. Project readiness and Size:

The preliminary studies are completed and the implementation of the project can start according to the implementation chart (Annex 2). The project complies with the 2 Meuro minimum Phare allocation requirement.

11.5. Sustainability:

Maintenance and operation costs will initially be born by the budgetary authorities. The medium term aim is, however, to generate income from the ship traffic.

11.6. Compliance with state aids provisions:

The project respects the state aids provisions.

12. CONDITIONALITY AND SEQUENCING

The need for a comprehensive legal framework, containing regulations for the vessels traffic has been identified. The Ministry of Transport and Communications shall take appropriate measures including the use of technical assistance as required in order to prepare appropriate draft legislation and its adoption by the Council of Ministers before the signing of the contract.

Furthermore, the responsible Bulgarian authorities will be required to reorganise and create as appropriate the institutional structures necessary structures for the efficient management and operation of the new system before the start of the project implementation. This shall include clarification and agreement on inter-institutional responsibilities.
The Bulgarian Government shall assure the full and timely co-financing required for the completion of the overall VTMIS project.

Institution building measures needs to be given appropriate priority including in other areas of maritime safety where the Bulgarian track record calls for significant improvement in particular in relation to Port State Control.

The VTMIS Project has been split up in three separate components. The results of each component are determining for the other ones, e.g.:

The VTS Burgas and Varna can not be put in operation without a sound institutional set up and well-trained VTS-Operators.
Efficient EDI will not be possible without an operational communication backbone.

Risks involved could be:
Obtaining permissions for building, installation and operation; all permits are easily available (minor risk).
Obtaining funds from the Bulgarian Government; the Government is prepared to invest, operate and maintain the VTMIS (political risk, involving delay).
Obtaining funds from other sources; Some funds have been granted already, but timely availability remains a risk, probably causing deviation from the intended programme.
ACRONYMS AND EXPRESSIONS

1. Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>EDI</td>
<td>Electronic Data Interconnection; computer-computer connection of two data processing systems.</td>
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<tr>
<td>GMDSS</td>
<td>Global Marine Distress Signal System</td>
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<td>IALA</td>
<td>International Association of Lighthouse Authorities</td>
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<tr>
<td>ITU</td>
<td>International Telecommunication Union</td>
</tr>
<tr>
<td>IMO</td>
<td>International Maritime Organisation</td>
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<tr>
<td>MRCC</td>
<td>Maritime Rescue Co-ordination Centre</td>
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<tr>
<td>SOLAS</td>
<td>Safety Of Life At Sea, IMO convention.</td>
</tr>
<tr>
<td>VTS</td>
<td>Vessel Traffic Services; a service implemented by a Competent Authority, designed to improve the safety and efficiency of Vessel traffic and to protect the environment. The service should have the capability to interact with the traffic and to respond to traffic situations developing in the VTS area.</td>
</tr>
<tr>
<td>VTMS</td>
<td>Vessel Traffic Management System; a VTS, which in addition to VTS safety tasks has the capability to co-ordinate port resources like pilot service, tugboat services, boatmen services, berths, reception facilities and government services (Customs &amp; Immigration) through communication with the service providers. At berth the vessel is not participating in the system.</td>
</tr>
<tr>
<td>VTMIS</td>
<td>Vessel Traffic Management &amp; Information System; a VTMS, which in addition to the VTMS tasks has the capability to respond to public and private demand for information to facilitate ship and cargo handling operations, through electronic communication with other VTS and Data Processing Systems in a region. The vessel participates in the system from the moment that her arrival has been announced until the moment she leaves the VTS area on the way to her next port of call.</td>
</tr>
</tbody>
</table>
List of Annexes to Project Fiche

1. Log-frame matrix
2. Detailed Implementation Chart.
3. Contracting and Disbursement Schedule.
4. Reference to feasibility /pre-feasibility study
### Annex 1

#### ANNEX I: Logframe Planning Matrix

<table>
<thead>
<tr>
<th>Wider Objectives</th>
<th>Indicators of achievement</th>
<th>Sources of information</th>
<th>Assumptions and Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Promotion of marine safety in the Bulgarian territorial waters</td>
<td>- Reduction in accident rates and effects</td>
<td>- the EC-Directives 93/C-271/01, 2158/93, 94/57/EC and 95/21/EC,</td>
<td>- Bulgaria’s drive towards an open and competitive market economy is maintained</td>
</tr>
<tr>
<td></td>
<td>- Increased cargo throughput of Bulgarian ports</td>
<td>- the IMO Resolution A.857 (20) and SOLAS 74/78 convention,</td>
<td>- Continued EU and IFI support</td>
</tr>
<tr>
<td></td>
<td>- Promotion of the protection of the (marine) environment on Bulgarian territorial waters.</td>
<td>- ITU-GMDSS.</td>
<td>- Risks:</td>
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<tr>
<td></td>
<td>- Reduction in accidental and illegal spills</td>
<td>- New VESSEL ACTIVITY DATABASE</td>
<td>- Political and economical instability in South-Eastern Europe</td>
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<td></td>
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<td>- Loss of support from financial institutions and lending agencies</td>
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</table>

#### Immediate Objectives

<table>
<thead>
<tr>
<th>Indicators of achievement</th>
<th>Sources of information</th>
<th>Assumptions and Risks</th>
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</thead>
<tbody>
<tr>
<td>- To create the technical means of a VTMIS as an integrated instrument to achieve the Bulgarian Government’s objectives with regard to marine safety, protection of the environment and economic development.</td>
<td>- Buildings, sensor equipment, data processing equipment, display equipment (computers and software), communication equipment.</td>
<td>- Support and confidence from management and staff</td>
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<td>- VTS legal and organisational framework</td>
<td>- Stable National economy</td>
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<td>- Training facility (VTS simulator computers &amp; software)</td>
<td>- Risks:</td>
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<td>- Training staff, maintenance management staff</td>
<td>- Failure to implement the necessary changes.</td>
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<td>- Certified VTS Operators</td>
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#### Results of the Project

<table>
<thead>
<tr>
<th>Indicators of achievement</th>
<th>Sources of information</th>
<th>Assumptions and Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Improvement of safety of shipping and protection of the environment in ports, port approaches and coastal areas by providing information to the shipping, vessel guidance, navigation assistance (if required) and assistance in search and rescue.</td>
<td>- Reduction in accident occurrences</td>
<td>- Vessel Traffic Management implemented according to the pre-defined operational requirements.</td>
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<td></td>
<td>- Reduction of accident effects</td>
<td>- Risks:</td>
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<td>- Reduction of near misses occurrence</td>
<td>- Failure to meet quality, planning and budget requirements.</td>
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<td></td>
<td>- Improvement of efficiency of vessel traffic in port and approaches by providing information to the shipping and contributing to port resource planning (berths, pilots, tugboats, fairways, etc.).</td>
<td>- Reduction in vessel transit time</td>
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<td>- Reduction in vessel turn around time</td>
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<td>- Reduction in waiting time marine services companies</td>
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<td>- Reduction in cargo storage time</td>
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<td>- Accident records</td>
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<td>- Near miss records</td>
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<td>- Statistical records</td>
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Annex 2

1 Implementation Chart

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<th>Year 2000</th>
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<td>A Preparation</td>
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<tr>
<td>1 Preparation of Tender Documents</td>
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<td>2 Approval of Tender Documents</td>
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<td>3 Publication of Tender Announcement</td>
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<td>4 Tender Period</td>
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<td>5 Tender Evaluation</td>
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<td>6 Contract Negotiation</td>
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<td>7 Endorsement of Contract</td>
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<td>8 Signature of Contract</td>
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<tr>
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<td>1 Initial engineering</td>
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<td>2 Radiolink Equipment</td>
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<td>a). FAT (Factory acceptant test)</td>
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<td>b). Delivery</td>
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<td>c). Installation</td>
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<td>d). SAT (Site acceptance test)</td>
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<td>3 Multiplex Equipment</td>
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<td>a). FAT (Factory acceptant test)</td>
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<td>c). Installation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d). SAT (Site acceptance test)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Management System - TMN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a). Delivery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b). Installation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c). SAT (Site acceptance test)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 VHF Radio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a). FAT (Factory acceptant test)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b). Delivery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c). Installation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d). SAT (Site acceptance test)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Delivery of Special Tools and Equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Delivery of Spare Parts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Training</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Final System Acceptance Test</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Annex 3

### Cumulative Quarterly Contracting Schedule in Euro / €

<table>
<thead>
<tr>
<th>Projects/Subprojects</th>
<th>Disbursement (Payment) Schedule (quarters)</th>
<th>Budget Allocation (Phare Funds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telecommunication Infrastructure Implementation</td>
<td>2001</td>
<td>2002</td>
</tr>
<tr>
<td></td>
<td>3,400,000</td>
<td></td>
</tr>
</tbody>
</table>

### Cumulative Quarterly Disbursement Schedule in Euro / €

<table>
<thead>
<tr>
<th>Projects/Subprojects</th>
<th>Disbursement (Payment) Schedule (quarters)</th>
<th>Budget Allocation (Phare Funds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telecommunication Infrastructure Implementation</td>
<td>2001</td>
<td>2002</td>
</tr>
<tr>
<td></td>
<td>340,000</td>
<td>990,000</td>
</tr>
</tbody>
</table>
Annex 4

EXECUTIVE SUMMARY OF THE FEASIBILITY STUDY

I. The position of the Feasibility Study

Scope
The feasibility study is an integral part of the Baseline Document (Baseline and feasibility study), which constitutes the second step of PHASE 1 in the development of the Vessel Traffic Management and Information System (VTMIS) as envisaged by the Government of Bulgaria for all the territorial waters. The first step, following in depth discussions in Varna and Sofia with the Bulgarian parties, December 4 through 13 1999 and January 6 through 10 2000, was the submission of the concept Inception Report of January 31.

The preparation of the Baseline including the feasibility study falls within the scope of a contract for PHASE 1, comprising studies, advisory services and supply of hardware and software connected to the development and implementation of the Varna Initial System (VIS). The contract was awarded on December 21, 1999 to a group of Dutch companies active in the field of Vessel Traffic Management System development and Port and Transport development.

The aim of the Baseline and feasibility study
The aim of the Baseline is:
- To establish objectives, starting points, main operational requirements, main owners requirements and operational choices for the envisaged future VTMIS;
- To prepare a feasible outline of the Vessel Traffic Services organisation, the Vessel Traffic Services geometry and the level of services provided;
- To outline the architecture of a system that can meet the Bulgarian Government objectives and which reflects the general thoughts of a Competent Authority (CA) regarding the tasks and main performances of the System;
- To outline the development and implementation of the future VTMS;
- To serve as a basis for judgement of the feasibility of the VTMIS project through a cost-benefit assessment;
- To establish the main operational requirements for the VIS as PHASE 1 in the VTMIS development;
- To serve as a basis for the Functional Requirements Specification of the VIS and the future VTMIS.

The Baseline has been approved by the Competent Authority. Changes in the approved Baseline will be formally introduced and processed.

The Baseline and feasibility study major parts
The Baseline consists of 3 mayor parts.
The first part is the VTMIS Definition. It describes in outline the aims of the VTMIS, starting points for the Legal and Institutional Framework, the System Architecture and how the VTMIS -mapped on the Bulgarian situation- is supposed to perform its tasks.
The second part contains the VTMIS development. The structure of the Training Program and the Macro Plan for the technical and operational development are described.

The third part contains the SYSTEM FEASIBILITY. It addresses development and implementation costs and the costs of operational use of the future VTMIS. The safety, efficiency and environment protection benefits are qualified and where possible quantified. Imponderables are mentioned. A Cost Benefit calculation is provided, based on the estimated costs and benefits, making use of a number of assumptions.

This part is of importance to providers of funds for VTMIS components.

II. The topics of the Baseline and Feasibility Study

The justification for installing a VTMIS

A VTMIS, tailored to the ports characteristics, is an effective management tool, constituting an excellent answer to safety and environment pressures and contributing to better port performance through the possibility of integrated facility planning and serving as a source of information for the entire ports industry. Such a system consisting of a well balanced organisation and well conceived technical means, is an efficient management tool, as it enables the ports to make a better use of capital intensive facilities and services, at comparatively low investments and operational costs.

The following direct effects can be achieved with the envisaged VTMIS:

- More and timely navigation information for vessels in the Vessel Traffic Services Area;
- More vessels (or vessel categories) can be served;
- More support can be given from the shore in addition to piloting;
- Improved rendering of services, through better planning of resources;
- Better government management support via a dedicated organisation;
- Effective Accident combating through co-ordinated rendering of services and faster verification of the accident situation;
- Simplified information flows, communication and data recording;
- Reliable and timely information for maritime trade networks;
- Accurate and timely statistical information on Port performance.

The VTMIS Mission Statement

The mission statement for the VTMIS has been formulated as follows.

“To carry out Vessel Traffic Services through:
- monitoring the vessel traffic in the Vessel Traffic Services area;
- communicating with the vessels in the Vessel Traffic Services area;
- communicating with organisational entities responsible for the safety of human life in Bulgarian territorial waters, protection of the (aquatic) environment and prevention of material damages.

To carry out management tasks through:
- co-ordinating Marine Services to the shipping;
- communicating with organisational entities involved in handling of cargo and passengers.”

The institutional Framework
The responsibilities, competencies and tasks of the involved Government Departments in the region concerned, in relation with promotion of safe and expeditious vessel traffic, will be formalised. This will be done in an agreement between these Government Departments along the lines as provided by the relevant (inter)national standards.

An effective tool for the Minister of Transport & Communications in undertaking his responsibilities with regard to safe, environment conscious and efficient vessel traffic is a well structured legal framework and an adequate Vessel Traffic Services (VTS) organisation, consisting of:
- a centralised Competent Authority, responsible for the development of the VTS policy;
- regional VTS-Authorities responsible for the carrying out of the VTS Policy in a certain (part of the) VTS-Area;
- Operational Units carrying out the operational VTS-tasks on behalf of the VTS-Authority in a certain (part of the) VTS-Area.

**The organisational set up**

An organisational set up for the VTMIS is envisaged, of three levels:

- **Director and staff**
  This is an overall management function that can be allocated in an existing management function of the Maritime Administration. This function represents the Competent Authority. It sets out the VTS-Policy for the Competent Authority. Staff functions are:
  - Control (Financial and Quality),
  - Administrative and
  - System Maintenance Management.

  This function will probably be centralised in Sofia.

- **The Acting (Regional) Director**
  This is an operational management function in a certain (part of the) VTS-Area. The Acting Director represents the Director in his region and reports to the Director. He is responsible for the performance of the Operational Unit, comprising:
  - **Planning and Co-ordination**
    This is a section of the regional “Operational Unit”, where the Planning and Co-ordination of traffic movements and Maritime Services originates. The function is carried out in a Co-ordination Centre (CC) on a 24-hour base. Activities at the CC will be concerned mainly with:
    - resource scheduling,
    - information exchange with shore based companies and
    - information exchange with government departments.

    This function is carried out regionally in or near so named “Traffic Centres”.
  - **Traffic Guidance**
This is a section of a regional Operational Unit where Vessel Traffic Services-Operators will exchange information with the shipping and carry out traffic surveillance on a 24 hours base. The tasks originate in the Traffic Centres. Each Traffic Centre is responsible for a part of the VTS-Area. Three possible parts so far have been identified:

- Varna approach, entrance, port area and fairway to West Port;
- Burgas approach, entrance and port area;
- Coastal Area excluding the VTS-areas of Varna and Burgas.

**The legal Framework**

A comprehensive Vessel Traffic Act, containing regulations for the vessel traffic in the territorial waters along the lines as described in the Baseline and feasibility study will be designed for:

- authorising VTS-Operators and protecting liability and responsibility of the Bulgarian Administration in agreement with existing international legal standards;
- establishing the legal relation with traffic participants approaching, present in, or leaving the VTS-Areas in the Bulgarian Territorial waters;
- establishing standards for VTS-Operator training.

**Training**

Recruiting and training of future VTS-Operators and supervisors depend on the tasks, duties and responsibilities and hence depend on the scope and level of the services to be rendered by the VTS-Authority. Training will be provided according to a training programme as described in outline in the Baseline and feasibility study.

**The System Architecture**

The ultimate VTMIS will probably consist of the following integrated and interdependent Sub-systems:

- A Radar Tracking System providing a traffic image of the coastal part of the territorial waters and specifically the approaches and entrances of Varna and Burgas ports, including the fairway to the Varna West Port;
- A TV System in VARNA, providing a traffic image in the channel to the West Port.
- A Radio Direction Finding System for vessel identification purposes in the Varna and Burgas approaches;
- A Control & Monitoring System, enabling remote control and status management of the technical components;
- A VHF Communication System for communication with vessels, with at least full coverage of the Bulgarian territorial waters;
- A Data Processing System for vessel data and vessel voyage data;
- A Data Network;
- Fully equipped Operational Centres;
- Capability for computer-computer links with external systems;
- Capability for integration of Automatic Identification Services (AIS Transponder System).

The set up is described in more detail in this Baseline and feasibility study.

**The Macro Plan**
The Maritime Administration wishes to:
- procure the major tools and equipment required, enabling the development of a VTMIS in the Bulgarian Territorial waters in a period of 6 - 8 years.
- have the VIS as outlined, technically available in August/September 2000.

A macro plan for the development from VIS to VTMIS within the prevailing boundary conditions is presented hereafter.

As starting professional VTS operations will take considerable time it is the intent of the Maritime Administration to start with basic VTS tasks, being the monitoring of shipping traffic in the VTS-Area and communicating with vessels in that area. The “learn by doing” period will take at approximately a year.

**Cost Benefit Assessment**

In order to judge the feasibility of the project, an assessment of costs and estimates of benefits have been prepared encompassing the following:
- Investment costs;
- Operational costs;
- Safety, environmental and efficiency benefits qualified and where possible quantified.

**INVESTMENT COSTS**

The investment costs have been estimated through an addition of the estimates for the following components of the future VTMIS:
- Civil works
- Buildings outfit (traffic centres and radar stations)
- Radar/tracking system (10 radars, processing & display partly funded by The Netherlands)
- Data Base System
- Communication System
- Radio Direction Finding system (2 stations and link with radar system)
- Hydro-Meteo System (2 stations)
- Closed Circuit TeleVision system (1 system in Varna inland channel)
- System Control & Monitoring System (remote control and system status control)
- Emergency Power System (emergency generators, etc)
- Document Management System (for storage retrieval and management of system documents)
- Installation of equipment
- Spare Parts
- Services (development strategy, design documents, funded by The Netherlands)
- Project management
- Publications & Promotion
- Project Organisation of the Maritime Administration
- System changes
- Warranty
- Procurement costs
- VTS Training facility and Train the Trainers course
The investment than ads up to: **Euro 11,500,000**

**OPERATIONAL COSTS**
The operational costs for the full VTMIS are composed of estimations of the following components:
- Staffing & Training
- Maintenance
- Publications and promotion
- Consumables (energy, water, paper, communication, etc.)

The exploitation ads up to: **Euro 1,190,000** annually.

**BENEFITS**
An assessment of the safety benefits has been made through a qualification and quantification of safety and efficiency effects of a future VTMIS.
As no properly filed accident records are available for the Bulgarian territorial waters, the traffic situation in that area has been compared to traffic situations in other European waters for which risk analyses have been carried out and risk figures have been calculated. The effect of VTS on the risk level as generally acknowledged then results in a safety effect on ships and complement for collisions and strandings of 20 Million Euro in 2010 and in addition 7.7 million Euro for people living in and around the VTS-Area in Bulgaria.
Efficiency benefits, although easily qualified, at the moment can not be quantified as no waiting time statistics are available and moreover the present day traffic density is not representative for the Bulgarian ports, but specifically in ports where the resources are scarce, the effects can be considerable.
Environment benefits and imponderables have been mentioned but can not yet be quantified.

**Retribution or tax**
In view of the number of vessels that will make use of the future VTMIS (estimated at some 100 calls per day on Bulgarian ports in 2010), a retribution for the VTMIS services can be considered as an option to get a return on investments and operational costs. A careful analysis of what the market can bear in the various trades (ferry services, dry bulk, general cargo, container & Ro-Ro liquid bulk, etc.) is needed to establish the VTMIS tariff policy. The retribution and the services rendered need to be related. If this is not possible tax can be an option. The options will be further investigated in the coming months.

On the next tables for the total costs for the VTMIS are provided over a time horizon of 10 years.
- Table 1 shows a split up of the total investment costs over the contributing parties. The basis for the cost benefit calculation are the investment costs for the Bulgarian party;
- Table 2 provides the Bulgarian share of the total investment related to procuring the equipment needed to facilitate a development into a VTMIS;
- Table 3 provides the yearly operating costs (excluding depreciation) and relates these to the number of vessels and the number of passengers calling at the Ports of Varna and Burgas and
- Table 4 assesses the total benefits per year and relates these.
If one compares the annual cost and benefits for the Bulgarian VTMIS system one can state, despite the rough calculation method used, that the investment in a VTMIS for the Bulgarian area is profitable.

### Table 1: Split up of total investment costs

<table>
<thead>
<tr>
<th>Total investment costs</th>
<th>11,500,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grant Phare</td>
<td>3,400,000</td>
</tr>
<tr>
<td>Grant Dutch Government (Senter)</td>
<td>500,000</td>
</tr>
<tr>
<td>Additional support Senter (Instit. Building, estimated)</td>
<td>500,000</td>
</tr>
<tr>
<td>Remaining investment costs</td>
<td>7,100,000</td>
</tr>
</tbody>
</table>

### Table 2: Bulgarian share of total investment needed for the VTS¹

<table>
<thead>
<tr>
<th>Annual cost (totals in millions):</th>
<th>Year 1</th>
<th>..... Year 5</th>
<th>..... Year 10</th>
<th>Total in 10 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment costs</td>
<td>650,000</td>
<td>1,550,000</td>
<td>-</td>
<td>7,1</td>
</tr>
<tr>
<td>Annual increase operating costs</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>Operating costs</td>
<td>390,000</td>
<td>1,250,000</td>
<td>1,940,000</td>
<td>13,6</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td>20,7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹based on depreciation of 10% per year in 10 years

### Table 3: Annual cost of VTMIS calculated per Vessel

<table>
<thead>
<tr>
<th>Vessel calls</th>
<th>Passengers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total “paying” arrivals in ports VTS area</td>
<td>30,000</td>
</tr>
<tr>
<td>VTS costs per vessel (rounded Euro’s)</td>
<td>69</td>
</tr>
</tbody>
</table>

### Table 4: Annual savings with VTMIS

<table>
<thead>
<tr>
<th>y 2000</th>
<th>y 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of transits to and from + passing traffic</td>
<td>50,00</td>
</tr>
<tr>
<td>Collisions per year (number)</td>
<td>1.0</td>
</tr>
<tr>
<td>Groundings per year (number)</td>
<td>0.2</td>
</tr>
<tr>
<td>Total annual costs of accidents (million Euro)</td>
<td>40.2</td>
</tr>
<tr>
<td>Total annual cost of accidents to people (million Euro)</td>
<td>1.5</td>
</tr>
<tr>
<td>Total annual costs (million Euro)</td>
<td>41.6</td>
</tr>
<tr>
<td><strong>20% savings with VTMIS (million Euro)</strong></td>
<td><strong>8.3</strong></td>
</tr>
</tbody>
</table>

### IV Conclusions
From a cost-benefit point of view, the project is feasible. Although the benefit assessment is based on a number of assumptions, the margin leaves ample room for down grading without hampering the outcome.

The technical and operational feasibility of the VTMIS has been demonstrated in a number of situations elsewhere in the world, is in line with the IMO and IALA VTS guidelines and is in accordance with the relevant EU directives.

A step by step development will be followed starting with the VIS and a period of learning by doing, via the development of a full VTS for Varna and Burgas respectively and gradually extending to a VTMIS for the Bulgarian territorial waters. This approach enables the Maritime Administration to make the necessary operational and technical adjustments in order that the future VTMIS fits to the Bulgarian situation.

The investment scheme for the VTMIS is feasible, the maritime safety and protection of the environment having the highest priority of the Ministry of Transport & Communications. Investments moreover have been spread over a period of 4 to 5 years.

The set up of the legal framework, being of paramount importance for VTS operations can run parallel to the revision of the Bulgarian Maritime Code, the Government has embarked on. Support in developing the development of the legal framework has been applied for via The Netherlands pre-accession programme of SENTER.

The availability of a facility for education, training and permanent quality of VTS- Operators and Staff is essential for a sustainable system. In order to have the facility available at the earliest possible moment, endeavours are being undertaken to allocate additional funds for the implementation of a VTS training simulator and a training course for VTS Trainers.

The integral approach, encompassing the development of the VTS legal framework, the VTS organisation, the logistic support and the VTS technical means, ads to the feasibility and sustainability of this project.

Macro Plan for the VTMIS-project