

Detailed Functional Design

of the

Ferry Terminal Operations system
and Cargo movement system

TN REG 97-52

By

Computer Solutions BV.



Author

Jack Buis

Date

13 May, 1998

Revision

1.0

Index

<i>Index</i>	<i>ii</i>
<i>Introduction</i>	<i>1</i>
Project description	1
Scope of the document	1
Readers	1
Addresses	2
<i>Functional design</i>	<i>3</i>
Introduction	3
Yourdon Structured Method	3
Context diagram	3
Entity Relationship diagram	3
Sources	3
Document structure	4
<i>Process description</i>	<i>5</i>
Introduction	5
Boundary	5
Process	5
Loading	5
Unloading	6
Break down	6
Computerized process	6
Loading	6
Pre-warning	7
Reception of goods	7
Stowage planning	7
Loading sequence	7
Manifest control	8
Information Exchange	8
Unloading	8
Customs	8
Unloading scheme	8
Release of goods	9
Dangerous goods	9
Context	9
Modules	9
<i>Reception and release of cargo module</i>	<i>11</i>
Introduction	11
Reception /Release of cargo	11
Reception of goods	11
The user interface	12

The screens	13
Release of goods	14
User interface	14
Fields	14
Historical data	14
Operations Module	15
Introduction	15
Context Diagram	15
Moving of cargo	15
Mobile terminals	15
Transportation functions	15
Stowage control	16
Warehouse functions/Yard Functions	16
Discharge and load module	16
Introduction	16
Allocation of Transport means	16
Load/Unload sequences	17
Reception and release of goods	17
Consignees	17
Registration of movements	17
Stowage module	18
Introduction	18
Context	18
Rules	18
Interface	19
Trip	19
Screens	19
Management information module	20
Introduction	20
Goals	20
Reports	20
User interface	21
Ad-Hoc reports	21
Head Quarter Manifest Control	22
Introduction	22
Controlling	22
Loading / Unloading	22
Hazardous cargo	22
Customs	22
Manifest Control	23
Documentation Module	23

Dangerous goods	23
Railways	23
Customs	23
<i>Yard operations module</i>	24
Introduction	24
Equipment	24
Labor	24
Storage of goods	24
Screens	25
<i>EDI module</i>	26
Introduction	26
EDIFACT	26
The stowage planning	26
BAPLIE	26
Message Header	27
Message body	27
Occupied places	29
Dangerous goods in the BAPLIE	33
Dangerous Cargo Notification	34
<i>Hazardous Cargo</i>	36
Introduction	36
Rules	36
Yard operations	36
Stowage planning	36
EDI messages	36
Hazardous goods information	36
Treatment	37
Documents	37
Signs	37
Communication	37
<i>System Module</i>	38
Introduction	38
Users	38
Reference files	38
Ship layout	38
Yard layout	38
Security	38
Introduction	38
Security Levels	38
Interfaces	39
Illiychovsk – Poti	39
The port accounting system	39
The Customs EDP system -Poti	39
The customs EDP system - Illiychovsk	39

Interfaces to client systems	40
Future connections	40
Mobile Data communication	40
Functions	40
Security	40
Database layout	41
Introduction	41
Important properties	41
Diagram	41
Transport	41
Bill of Lading	42
Manifest	42
Tables	43
Contacts	43
Countries	43
Trip	43
Pre-warning	43
Transport	44
Loaded On	44
Truck	45
Container	45
Container Type	45
Mark of container	45
Wagon	45
Wagon Type	46
Yard	46
Reception/Release	46
Bill of lading	46
Bill of Lading Lines	47
Manifest	47
Ship	47
Decks	48
Track	48
Ship locations	48
Stowage plan	49
Loaded/Unloaded on Ship	49
Work list	49
Work Done	49
Terminals	50
Terminal Group	50
Cargo type	50
Package type	51
Passengers	51
Drivers	51
Cargo moved	51
Cargo on Yard	52
Berths	52
Berth Usage	52
Equipment	52
Equipment planned	53
Equipment usage	53
Labor planned	53
Labor usage	54
Labor	54
Dangerous Goods	54
Label	55

Introduction

Project description

This document is the functional description of the software for the Ferry Terminal Cargo Movement System. As such it is part of the TN REG 97-52 project to establish a ferry cargo movement system for the port of Illiychovsk and the port of Poti.

The ultimate objective of this project is to supply to the ports of Poti and Illyichevsk with a dedicated and easy to use ferry cargo movement information system and to supply the necessary computer and communication equipment.

Scope of the document

This document is meant to give an insight in the way the software for the ferry terminal operation is going to work. The document has two main purposes the first on is to give an detailed insight in the way the ferry cargo movement system is going to work. This is especially useful for the people that are going to work with the system. On the other hand the document is meant as a starting point to develop the software. This means the document is a basis for the technical design.

In the overall objective of this project it is stated that an easy to use ferry cargo movement information system must be build. This is exactly where this document is about. The computer and communication equipment is not described in this document.

The document handles only about the software that has to be build for this project. Other parts of the project, such as the network are not included in this document.

The document assumes knowledge about the operations of a ferry terminal, especially with Ro-Ro ferries. This document describes the software in detail, however small adjustments can be made to the functionality after agreement between the project supervisor and the Computer Solutions.

This document is composed after talks with different people in the Port of Poti, the port of Illiychovsk, UKRFerry, customs and railways. The current situation is such that the ferry terminals in both Poti and Illiychovsk are not operating at full capacity. Due to this, efficiency is not so important and more over there is no clear picture what to expect from an automated system. This functional description is therefore a mixture between the real situation and the expected situation.

Readers

This document is meant for everybody that is interested in the project. Of course the details that are presented here are only of interest for the people that know the operation of the ferry terminals in Poti and Illyichevsk.

The information in this document is presented in a way that makes it possible for every body that is interested in the ferry cargo movement system to read at least parts of it. The first chapters of this document are only concerned with the description of the processes of the ferry terminal.

The document is specially meant for the people that are ware of the day to day operation of the ferry terminal.

Risks

The risks of this project are stated in several other documents. Some of the risks however are special for the software part of the project.

- ☐ The acceptance of a computerized system will be difficult because people are not used to it and they will use all other arguments possible if necessary.
- ☐ Changes in the organization will be needed and these will not come easily.
- ☐ The need for a system will only be seen if there is a need for efficiency again

Addresses

Port of Poti
52, David Agmashenebeli Street
Poti
GEORGIA
Contact : Pavel Zabolotsky (Manager of Communication Department)

Port Of Illiychovsk
6, Pl. Truda
Illiychovsk
2790901 UKRAINE
Contact: Mr. Strebkov (President)

UKRFERRY
4, Deribasovskaya Str
270026 Odessa
UKRAINE
Contact: Mr Kurlyan (President)

HPTI –Hamburg Port Training Institute GmbH
Überseezentrum
Schmacherwerder
20457 Hamburg
GERMANY
Contact : Helga Wagner (Project Supervisor)

Computer Solutions
Teteringsedijk 9
4817 MA Breda
HOLLAND
Contact : Jack Buis (Project Manager)

Functional design

Introduction

This chapter will give an insight in the way the functional description is put together and the techniques that are used. Since the functional design is the intermediary between the technical software development and the users of the system it is important that both parties can understand most part of the functional description.

The software consists of different modules. The modular character of the software is essential for the success of the software. During the implementation phase it must be possible to use the different parts of the software independently. The modular character of the software gives the possibility for a step by step introduction of the software in the ferry terminal.

The functional design is made with the help of the Yourdon Structured Method.

Yourdon Structured Method

The Yourdon structured Method consists of a set of tools to describe the software from the functional design, the technical design and the implementation phase. In this document two sets of diagrams from this method are used. The context diagram is used to describe the context of the system and the Entity Relationship diagram are used to describe the relation between the data elements.

Context diagram

The context diagram consists of terminators (squares) which give the outside of the system. The "terminators" in the diagram are mostly the users of the system. A big bulb represents the system itself. In the context diagram no further specification is given for the system. The working of the system is described in the text. Between the terminators and the system (the bulb) arrows represent the exchange of information between these elements. The arrow indicates the flow of the information.

Entity Relationship diagram

An entity relationship diagram presents the reader with the information about the database. The data elements are represented by squares and the relation between the data elements is given in the diamonds. In some case the relation between the elements is a table on it self. In that case the from the diamond an arrow is given to the table that describes the relation between the elements.

Sources

The functional design is based on talks with different people in both ports. Different people from the ports provided information and documentation. But also people of UKRFerry, agents, customs and the railways where contacted (and provided) information.

The functional description however is not only based on the talks but also on the ideas about how the ferry terminals can be made more efficient. Especially the situation in The Port of Poti is difficult in this respect because in this port there is hardly any experience with the operations of a ferry terminal.

The specification is build upon 2 models. The first one is the business process model. In both ports there have been talks about the processes that are involved in operating

the ferry terminal. The second way is the data collection in the port. On the basis of the different needs of data a model is derived for the database.

Normally the first thing to talk about should be organizational structure of the Ferry Unit. In the ferry terminal in Poti there is hardly any organizational structure in place for the ferry terminal. In Illyichevsk there is a organizational structure but this may be expected to change whit in the near future.

Document structure

The document begins with an overall description of the processes that take place in the ferry terminal. After that the system is divided in different modules that are used for the different steps in the processes of the ferry terminal. The different modules are all explained in detail. In the last chapters the layout of the database is presented and the possible connections with other systems.

Process description

Introduction

This chapter describes the processes that take place at the ferry terminal. Because of the complex situation it is not always the current situation. Special attention is addressed to the way the situation could be in the near future.

This chapter begins with telling what the boundaries of the system are. The next paragraphs tell about the processes on the ferry terminal.

Boundary

In the day to day operations of the ferry terminal a lot of parties are involved, the ferry owner, the expeditors, the agents, the railways, the customs etc. To have an efficient operation it is important to have a clear picture of every bodies task.

The boundaries between the different parties involved are not very clear yet. In this document it is supposed that the ferry terminal only provides the necessary services for the ship-owner. That is the loading and unloading of the ship. The ferry terminal is not acting as an agent or as a ship owner. The software will focus around the efficient handling of the cargo on the ferry terminal. The current situation is not as described here, but in the near future these clear boundaries will create a better relation between the ferry terminal and the ship owner and a better relation will make the boundaries clearer.

Important in the respect of the process of the ferry terminal is that the ferry terminal is not the operator for the ferries. This means that the ferry terminal itself is only concerned with the loading and unloading of the ferries.

The customers of the ferry terminal are the ferry owners. The ferry terminal is in this respect only part of the chain to move cargo for a customer. The ferry terminal has no other customers then the ship owners. The ferry terminal only does the loading and unloading of the ship and if necessary the storing of the goods until the goods are necessary. The ferry terminals do not work as anything else but a terminal. All the orders that the terminal gets are from the ferry owners. The ferry owners have all the contacts with the customers and agents.

Process

The process of the ferry terminal can be split up in the two main tasks of the ferry terminal. The first one is the loading of the ferry the second the unloading.

Loading

The loading of the ferry starts with the question of what should be loaded on the ferry. This information comes from the ferry owner. On the basis of this information the ferry is loaded. After receiving this information the reception of the goods starts. On the gate every truck is registered. Some of the goods are already on the yard because they were stored temporarily. On the basis of the cargo list from the ferry owner a stowage plan is made. The stowage plan is handed to the captain and he can make the last changes to it. If the stowage plan is agreed upon the loading of the vessel can start. The wagons are loaded on the ferry according to the stowage plan. The railways do the assembling of the wagon chains. In the process of loading the use of the elevators on board of the ferry is the bottleneck in the process. After the wagons the trucks,

containers etc. are loaded. After the vessel is loaded the manifest is handed over to the captain.

Unloading

The process of unloading starts with the knowledge of every wagon, truck etc that is on board of the vessel. Of course for the trucks the unloading is easy because the trucks themselves drive off the vessel and leave the terminal. The wagon unloading is also not very difficult. The wagons are unloaded exactly the way they were loaded. They are handed over to the railways. In future also trailers and containers can be handled with the special equipment.

Break down

The process described above can be broken down in a couple of different process.

The first one is the reception of the information on what should be loaded on the ferry.

The second is the reception of the goods that should be loaded. At the entrance of the port the cargo is received for the loading of the ferry. This is of course only for the cargo that is not on railway wagons. The railway wagons only come to the territory of the port on the moment they are loaded on the ferry.

The third process is the storing of the goods on the yard of the ferry terminal. In between there is the control of the goods by the customs but since this is not an action of the ferry terminal this is not considered in this report.

The fourth step is the loading of the ferry. All the trucks and the wagons are loaded on the ferry according to the stowage planning. Tallymen control the loading, especially the weight of the cargo.

The next step is the unloading of the ferry. Important in this step of the process is the control of the received goods. All the goods that come of the ferry have to be controlled. Tallymen also control the unloading.

The next step can be that the goods are stored again on the terminal until the customer comes to pick up the cargo.

The seventh step is the release of the cargo. The trucks are leaving the ferry terminal through the entrance (exit) and the wagons are again handed over to the railways.

Besides the wagons and the trucks it is also possible to handle containers. A special crane that is capable of putting the containers on the ferry can load these containers. It is also possible to load a container on a wagon and then load it on the ferry. On the other hand the containers have to come to the port by truck (or by wagon) and they have to be taken off the truck and have to be stored on the yard..

Computerized process

The computerized process will be somewhat different from the process as it goes on now. This is due to the effect that the exchange of information is far easier. But it may also be expected that the ferry terminal is expected to have a lot more cargo to move which makes it necessary to operate more efficiently.

Loading

The first step is the reception of a pre-warning of the cargo to expect.

Pre-warning

The pre-warning is given for every trip that the ferries make. This means that the pre-warning always consist of the trip information, the date and time of the expected departure of the ferry, the destination and the name of the ferry. The pre-warnings that arrive have to be handled by the dispatcher. Only after he agrees a new trip can be entered into the system and the pre-warning can then be assigned to this new trip. The pre-warning can of course also be assigned to an existing trip.

The pre-warning consist of for pieces of information, the information about wagons, about trucks, about containers and about other cargo.

After the pre-warning the actual reception of the goods take place.

Reception of goods

The trucks, containers and other goods are received at the entrance of the ferry terminal.

Actually there are three ways the goods can enter the ferry terminal, the first is by rail, the second is by road and the third is by another ferry. The third method means the goods are in transit.

If the goods come to the ferry by rail, the wagons only arrive on the yard for the loading of the ferry. Which means the railways have to notify the ferry terminal whether all the expected railway wagons really arrived.

If the goods enter by road, at the entrance of the ferry terminal the reception of the cargo is registered. This is only a preliminary registration. After the registration of the entrance of the trucks an indication of the next step for the cargo is made. Mostly this will be the inspection by the customs. At the entrance the name of the driver(s) and the truck number and nationality is entered. If necessary it is also possible to enter the number of the trailer from the truck.

If the cargo that arrives at the entrance of the ferry terminal is not registered in the system this means that there is no pre-warning of this cargo. This could mean that a pre-warning has to be made or that the goods will not be allowed to enter the ferry terminal. It is also possible that the goods have to be stored at that ferry terminal for a while and only after a while they have to be shipped.

At every time it is possible to see what goods are already on the terminal premises for a certain trip.

Stowage planning

After the pre-warning has arrived the dispatcher can start the process of making a stowage plan. Of course, it depends on the reliability of the pre-warning how good the stowage plan is. The later the stowage plan is made the better the dispatcher can see how many of the cargo is already on the premises of the ferry terminal.

Loading sequence

After the stowage planning is made, the dispatcher can start two other processes. The first one is the notification of the railways for putting together the chains of wagons and the second one is the loading sequence.

For the cargo that is not on railway wagons a list is made how it should be loaded. The list gives details about where the cargo comes from and who (cranes, persons, etc.) are responsible for loading the cargo. All the trucks that are waiting can be instructed to drive to the ferry in a certain order.

Cranes and forklifts can get orders to get cargo somewhere on the premises and bring it to the ferry.

Manifest control

Everything that is loaded on the ferry is controlled when it is loaded on the ferry. This means that it should be impossible to put something on the ferry that is not in the manifest. In the end it is possible to control that everything that is on the manifest is on board of the ferry.

With the help of the mobile terminals it is also possible to check the manifest. If there are differences between the "should be" manifest and the real cargo on board, it is possible to adjust the manifest. After this control the manifest is handed over to the captain of the ferry and the ferry can leave the port.

The last part is the passengers boarding the ferry. Since they are already registered it is only necessary to check that everyone is going on board.

Information Exchange

As soon as the dispatcher has told the system that the ferry has left the port, the system makes an EDIFACT message (BAPLIE) to send to the other port or the system makes a list on the printer. The list can then be faxed to the destination port or the BAPLIE message can be sent by telephone to the destination port. If dangerous cargo is loaded a notification of this dangerous cargo can be sent to the port of destination.

Unloading

The unloading starts with the reception of the loading scheme of the ferry. Every thing on board of the ferry that is expected to come is sent either by fax or by EDIFACT message. If the manifest and the stowage plan is sent by fax it has to be entered into the system.

Customs

The system has special options to inform the customs about the arriving of the ferry. The system can make the manifest and copies of the Bill of Ladings that are to be expected on the ferry. This way the customs can prepare the inspection of the ferry before hand.

Unloading scheme

After the complete stowage planning of the ship is received or entered in the system, the dispatcher can start making a work scheme for unloading. As with the loading this can be done for the different mobile terminals and a list of it can be made.

The unloading of the ferry can be controlled by means of the mobile terminals. If something is wrong with the goods that are received a special report can be printed and the captain has to sign that the goods are not received properly. Differences with the sent manifest can also be seen by the system and a special sheet can be printed for this. On this report there will also be a list of drivers and passengers.

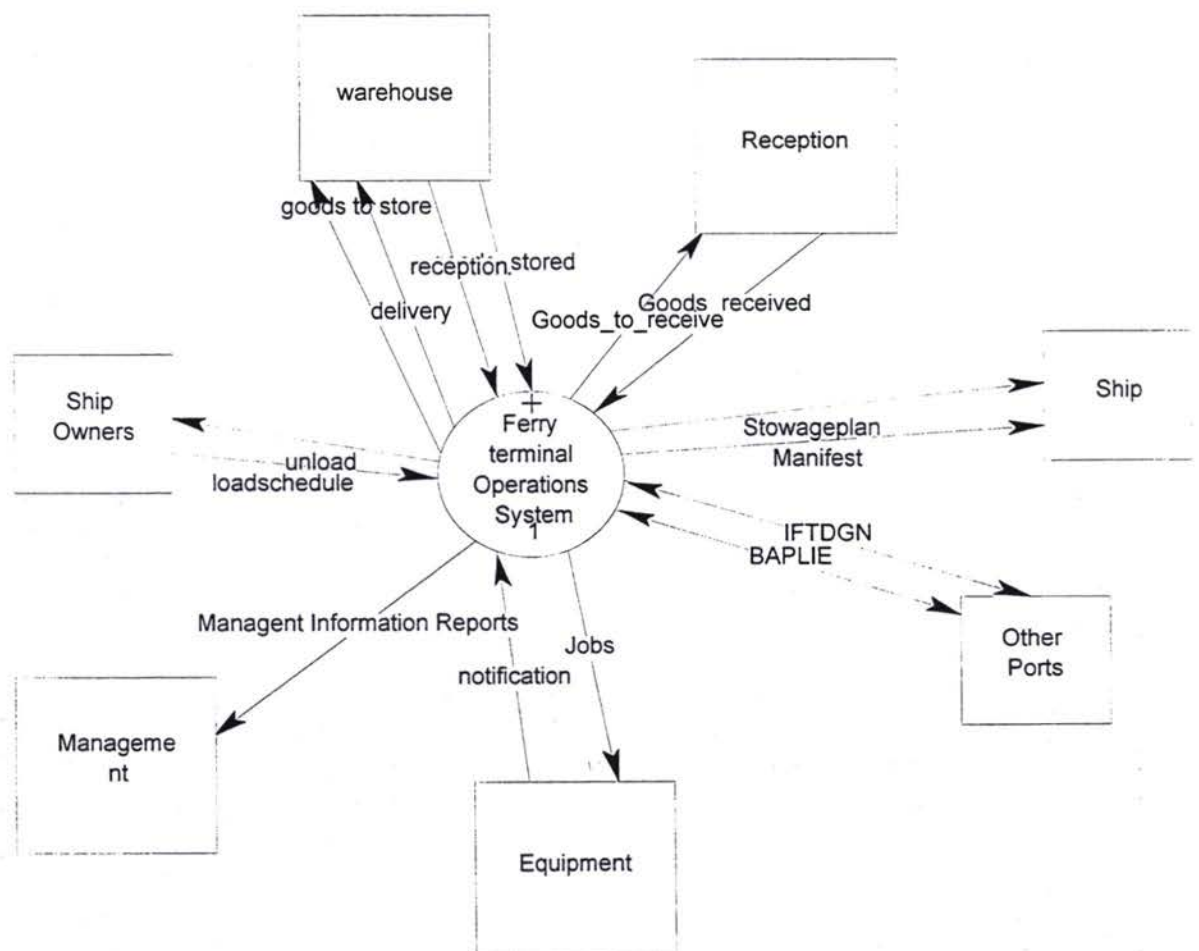
Release of goods

After the goods are unloaded they can be handed over either to the railways or the agent for further transportation. The wagons are directly handed over to the railways. Trucks are sent to the customs area and controlled by the customs. As long as they are on the premises it is registered by the system.

Dangerous goods

Dangerous goods can be indicated in the system and as soon as it is known that they have to be transported with a ferry a notification of this can be given to the port of destination. Of course in a later stage this can also be seen on the BAPLIE message that is sent to the port of destination.

Context



Modules

Every step that is mentioned in the above process has its own module that supports the tasks that have to be fulfilled.

The software shall be divided into different modules to support the different parts of the process. Besides the parts mentioned for the handling of the cargo there are two other parts, the communication module on the basis of EDI and the system management module.

Reception and release of cargo module

Introduction

Everything entering the port by boat has to be released once by land. (For the program it actually doesn't matter where the goods came from or go to) This means that the system has to register the goods leaving or coming in by land.

Reception /Release of cargo

The cargo can come or leave in two ways, by rail or by road. Besides the handling of the cargo this means there has to be an administrative procedure for the release and reception of the cargo. The procedure that is most likely to be implemented as follows:

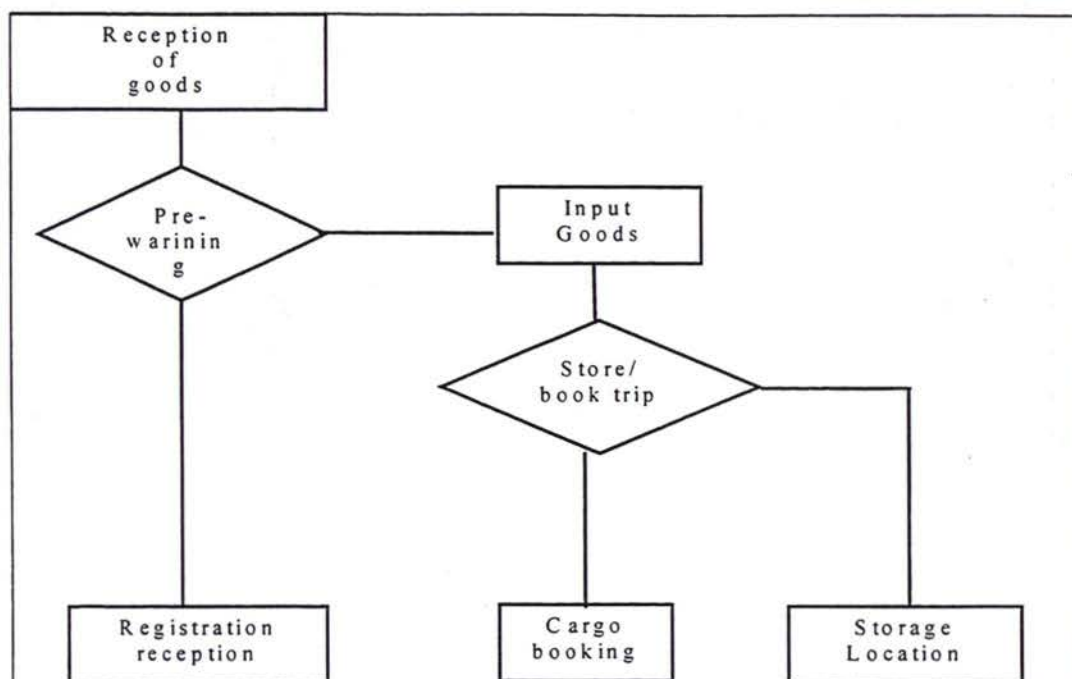
When somebody wants to pick up some goods in the port he has to go to the administration, there he gets an paper that he can pick up the goods (could be that he only gets the paper after he has paid). With this paper he goes to port operations and gets the goods he wanted, at the gate of the port he has to show the paper and the goods concerned.

When somebody wants to deliver goods to the port it works more or less in the same way. Starting with at the gate where the goods are received they are checked and inputted into the system

The above procedure is of course only valid for the reception of small amounts of goods. It is impossible to implement it on the goods that are leaving the port by rail.

Reception of goods

At the gate goods come in by truck. In that moment there are two possibilities. The first one is that there is already a pre-warning of the cargo that will arrive. The second one is that there is no pre-warning. The second one can result in two possibilities again. The cargo has to be booked on a ferry or the cargo has just to be stored on the ferry terminal and when it has to be shipped is not yet cleared.



The above diagram gives the choices that have to be made at the reception of goods.

The user interface

The user interface for the reception of goods has the possibilities to indicate that the goods have arrived. First of all the pre-warning for the goods has to be searched. After that, the necessary data has to be entered into the system. The pre-warning does not necessarily contain all the needed information. If the pre-warning is, for instance, of a truck with goods, the license plate and the drivers that go along with the truck have to be added to the systems information (or at least they have to be checked).

The pre-warning merely consists of an indication of the goods that are expected, this is the number of the bill of lading, the type of goods the weight of the goods and the type of transportation (truck, container, wagon).

It is possible to enter the bill of lading data directly, but not necessary.

After this it is possible to indicate in the system where the truck has to go. A report can be printed which then belongs to the cargo and can accompany the cargo all the way on the ferry terminal. The first step for trucks will almost certainly be the customs area.

If there is no pre-warning the situation is somewhat more complicated. If it is cargo that has to be stored on the ferry terminal the ferry terminal can handle it totally. If it is cargo that has to be put on a trip then first the Ferry Company has to make the booking for this cargo. The agent can give a clearance for this booking and then the reception can take place the same as if the pre-warning was there.

If the cargo has to be stored an indication can be given where to store it and a precise location will be given.

The screens

The module for the reception of goods consists of screen for entering a pre-warning, a bill of lading and printing of the reception sheet. Besides this locations can be allocated and transport means can be given. The user should however always start with a screen to search the pre-warning.

Pre-warning

On this screen it is possible to search for the pre-warning on the basis of the unique bill of lading number or to search for the trip information and then later for the correct cargo.

After the search for the information the extra data that is needed has to be entered and the location where to put the cargo.

Fields

From every reception of goods it is registered

- ☐ Date/time of registration
- ☐ Bill of lading number
- ☐ Location where to go.

The rest of the fields are free. But the system has to be supplied with at least this information.

Bill of Lading

Every field from the Bill of lading can be entered. If the bill of lading is already present in the system it is possible to denote which part of the cargo has come in from the Bill of Lading.

Registration

The registration of the trucks containers etc is also done in this part of the system. If the driver of a truck is coming along with his truck also the driver details are entered here.

Printing

After the registration of the reception of goods a form can be printed. On this form it says the cargo description and the bill of lading number. It also tells where the cargo has to go.

Location information

The system helps the user by selecting a spot where the cargo has to go to. It suggests a place to store the goods, the user can when he wants of course change this location and take any other location he/ she wants.

Release of goods

The most important thing when releasing the goods is the registration of the release. This means that on the moment cargo leaves the ferry terminal it is possible to register this. For this registration it is possible to print a report and make the people sign for it. After this it can be marked that it has left the ferry terminal

User interface

The user interface makes it possible to search on the unique bill of lading number and to search for the certificate the cargo got when it entered the ferry terminal. This might be a unique number when it was sent from another ferry terminal with the same system.

Fields

The release of goods is a very simple action, the user has only to denote what is going to leave the ferry terminal.

Historical data

All the reception data and the release data will be stored for use in future. Different screens have access to this historical data.

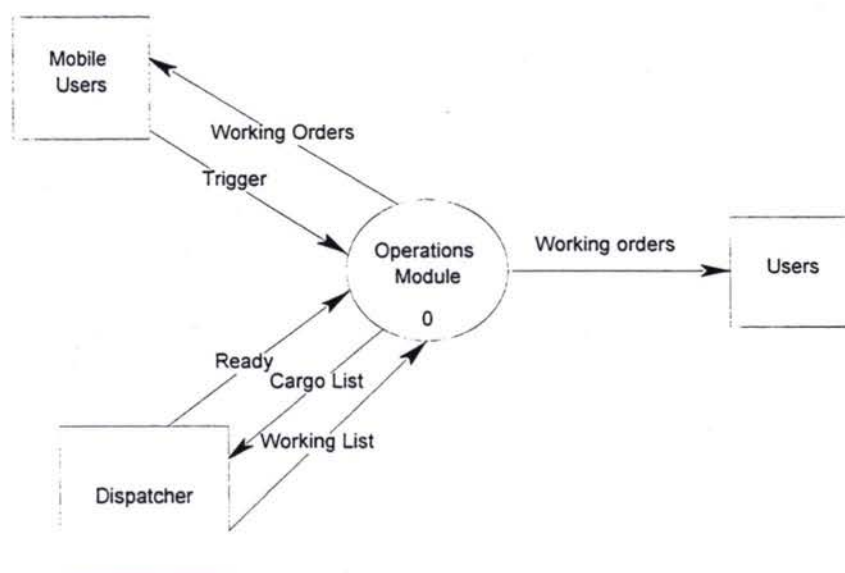
Operations Module

Introduction

The operations module is the heart of the software system. All the movements of the cargo and the planned movements are handled by this part of the system. This means on the one hand that all the activities can be planned in this system, on the other hand all the activities that take place are registered by this module.

Context Diagram

This paragraph describes the context of the operations module.



The above context diagram shows merely that the dispatcher makes the working list and the user of the mobile terminals or other users can work with this list.

Moving of cargo

All the movements of the cargo on the yard of the ferry terminal are registered in the system. On the one side everything moved have to be registered in the system on the other hand all the movements can be controlled by the system. With the mobile communication equipment it is possible to register all the movements of cargo directly as they are moved. On the other hand the mobile equipment gives the possibility to give orders to the users of this equipment. The cranes and the forklifts etc. and the handheld terminals can receive orders. On this way the cargo movement control can be even more direct.

Mobile terminals

Transportation functions

The mobile terminals give orders to the users of the mobile terminals. A crane driver for the container crane can use it to know what his orders are.

The user of the mobile equipment tells the systems that he/she is ready for the next job (this can also be the first job). The art of the work has to be described to the system and then the first job that is in the job list is given to the mobile terminal.

Stowage control

The mobile terminals are able to control the stowage planning. The terminals have 2 ways of doing this. The first one is to indicate the wagon number and then the user should indicate what is the cargo that is located on this spot. The second one is the terminal that indicates the cargo and the user should indicate the spot the cargo is located on.

The control of the stowage is meant to control the loading and the unloading of the ship. The cargo that is on board of the ferry is checked. This check can be performed for a ferry that has to be unloaded, the stowage planning that is received from the port of loading can be controlled in this way. This check can also be performed for the ships that leave the port, to make sure the stowage plan is really what is on board of the ship.

Warehouse functions/Yard Functions

The mobile terminals are designed to help with the inventory control and the warehouse storage. The mobile terminals can indicate what should be on which spot on the yard. The user can enter the spot and then the system will tell what should be stored on this spot.

The mobile terminals are able to indicate free space on the yard. The user of a mobile terminal can ask the system for a free space on the yard, the system will then ask for the type of spot and will indicate the free spot. If the user wants he/she can ask for the next spot that is free.

The mobile terminals can indicate where goods are stored. The user can ask the system on different ways where goods are stored. Entering the Bill of Lading Number or the license plate of the truck can do this for instance. After this the system will indicate where the cargo is stored on the yard.

Discharge and load module

Introduction

This part of the software is concerned with port operations directly. The loading and unloading of the ferry can be monitored on a real time basis. This gives the possibility to change the working plan. It is even possible to change the working plan without going out to tell the drivers of the cranes.

Allocation of Transport means

The loading and the unloading of the vessel start with the assigning of the equipment needed. Which equipment is used for the loading depends on two matters. The first one is the cargo that is on board of the vessel (or has to be put on board of the vessel) the second one is the availability of the equipment. Of course the equipment can only be used if it is not busy somewhere else or in repair.

The system has a list of all available equipment and for loading or unloading of the vessel the necessary equipment can be chosen.

Load/Unload sequences

The system has the possibility to make list of the way to load or unload of the ship. There are two different ways of doing this.

System makes a list.

The system has a preferred way of unloading the ship and does so. The working list established this way is maybe not an optimal one, but afterwards the user is able to modify the list.

User makes a list.

The user can make the whole list, the system only gives the items that have be unloaded from the ship and the user can pick them and put them on the list.

One other difference that can be distinguished is by transport means.

Per equipment type.

The (un) loading sequence can be split up per equipment type, the big advantage of this is that for instance 2 forklifts can be busy on the same job. When one of them finishes of with sub-job they just can go on with the next job. It is no problem when

Per piece of equipment

every crane and every other piece of equipment gets its own list to work with.

Of course the work lists mentioned here are best used with the handheld terminals or the vehicle mounted terminals. For the operation of work list without the terminals, they have to be printed out and distributed, this makes it difficult to change and to control.

Reception and release of goods

The registration of the reception and the release of goods also takes place in the operation module.

Consignees

Since it may be expected that the consignees are for 80% known consignees. It is possible to input this consignees in the system. On the Bill of Lading a choice can be made from the existing consignees.

Registration of movements

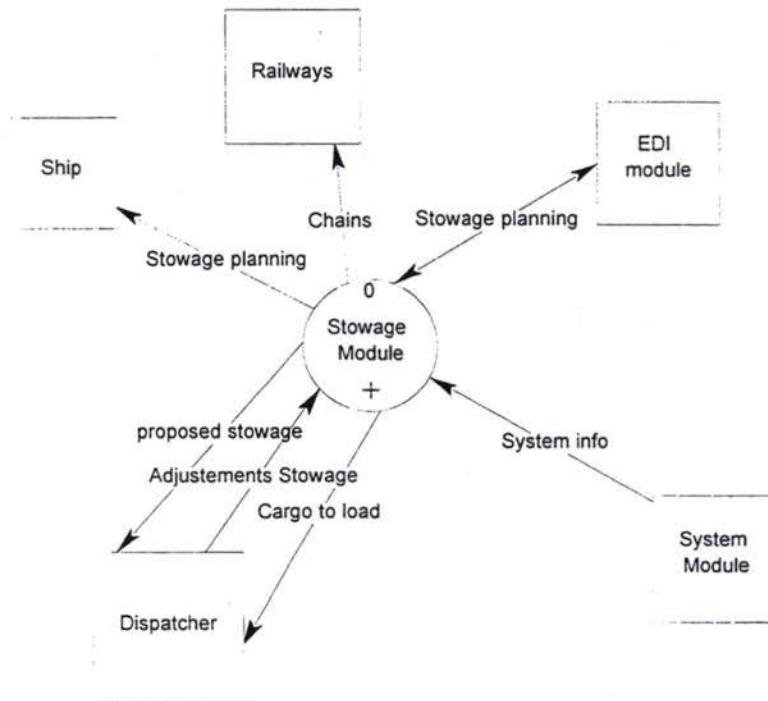
Every movement of the cargo on the ferry terminal is registered. This makes it possible to follow the cargo throughout the ferry terminal. Most of the movements of the cargo are done by the use of the mobile terminals.

Stowage module

Introduction

This module is responsible for the stowage planning of the ferry. This module will support the dispatcher by proposing a stowage planning and give the possibility to make adjustments to them..

Context



Rules

All the planning is done on the basis of wagons. This means that on the current ferries there are 108 places for wagons. If the goods are not stowed in a wagon, the user has to indicate which goods together can be looked at as a wagon or the user should plan this goods himself.

The rules for the stowage planning are the following in this order

- ☐ Dangerous cargo can only be stored in places that are indicated as capable of carrying dangerous goods.
- ☐ Heavy wagons in the hatch.
- ☐ The Hatch is filled first, next the top deck is filled and only after that the middle (main) deck is filled with wagons.
- ☐ The main deck is used for storing other cargo, this means that trucks and other cargo can only be placed on the main deck.

Interface

Once the system has made a stowage planning for the goods that have to be stored on the ferry, the user can adjust this stowage planning. The system can generate a stowage planning as often as necessary. If the user has not changed anything in the planning, the planning can be generated again. If the user has changed the system generated planning the, planning has first to be removed from the database, after that the system can generate a new planning.

The first table gives the ships information. A ship can be seen as a large cubic form. The cubic form consists of the maximum length of the tracks that could possibly be on board of the ship and the number of decks and the maximum number of decks.

Every deck has a name and a number of tracks on it. Every track can hold a certain number of wagons. This results in a wagon spot. The track number, deck and ship and a number for every spot identify a wagon spot. This number also indicates a place in the cubic form. The cubic form has more spot that in reality are on the ship.

Trip

Every trip is registered in the system. For every trip the date and time of leaving and the date of time of arrival is registered. Also the actual time of leaving/arrival can be registered.

Screens

The screens for the stowage module consist of a graphical representation of the vessel. The graphical representation is given per deck. On this screen the user can call the list of cargo (that is all the transport means) that are booked on this trip and then drag it to its place on the ferry.

The user can also see whether the cargo has already arrived in the port. The user can always stop the process of making a stowage plan and go on with it whenever he likes.

Management information module

Introduction

The aim of this module is to give the management information about the operations of the ferry terminal. In this module it is possible to generate different reports on the work done. Beside the standard reports it is possible to define ad hoc reports on the database.

Goals

The goals for this module can be separated in two different goals. The first one is a operational goal. The second one is the management goal.

The operational goal is to control the process of loading and unloading. The figures that can be presented with this module are used for the optimization of the terminal operations. The day to day operations can be checked and compared with other operations. This ways the operations can be checked and necessary actions can be taken to make the operations more efficient.

The management goals are that of control of the operation on the long term. The management does not want directly to control the day to day operation but wants to have an insight on the weekly or monthly figures. The differences in these figures can tell the management about the global operations of the ferry terminal.

Reports

Different reports can be made:

- ☐ The number of arrivals and departures of the ferries.
This report can be made for any period, for a month for a year etc. The reports indicate the number of arrivals and departures split up for every destination.
- ☐ The number of arrivals for one ferry and the tons of cargo moved.
Again this can be made for any period. The tons of cargo are split up in wagons, trucks, trailers, containers and other cargo.
- ☐ For every piece of equipment the hours worked, split up for every trip.
- ☐ Statistics for the type of cargo.
Per period of time a report can be made of the different types of cargo. The report is split up for every destination.
- ☐ Statistics for the different transport means.
The report states the number of wagons, trucks, containers etc for a period and is split up for every destination.
- ☐ A overview over the year
A report which states per week the tons of cargo (Net and Brut) over a period of time.
- ☐ An overview of the types of cargo per trip.
This overview can be made for any period of time and gives per trip the types of cargo that are moved.

- ☐ Cargo Received
All the cargo that has been received in the ferry terminal per period
- ☐ Cargo loaded
All the cargo loaded in the terminal
- ☐ Cargo Moved
The total of movements of cargo in the terminal
- ☐ Cargo on the yard
The cargo that is stored on the yard
- ☐ Cargo expected
The cargo that was expected and that really has come
- ☐ Storage time of cargo
Average time that cargo spent in the port.
- ☐ Loading time of ferries/Unloading time
Loading time of ferries

User interface

The user interface to make all the reports is such that different periods of time can be selected and depending on the report other criteria can be selected. For the cargo loaded for instance a ferry company can be selected. The user will be guided through the selection criteria.

Ad-Hoc reports

The Sybase database has different methods of making ad-hoc reports. The database will have different views that make it easier to make reports. If the main purpose of the report is to have extra figures the report can be made with the help of a SQL interface. If the purpose of the report is more the presentation different ways are possible. The first is with the help of Infomaker a Sybase product. The second is with the help of for instance Microsoft Excell.

Head Quarter Manifest Control

Introduction

The manifest can be controlled by the Head Quarters of the ferry terminal.

Controlling

This module gives the differences between the cargo that is on the ferry and the cargo that should be on the ferry. Besides this it is possible to check the ferry load with the help of the mobile terminals.

The screens used for this give the possibility to see in one screen the differences between the loaded cargo and the cargo that should be loaded.

Loading / Unloading

During the loading and the unloading of the ferry everything that goes on board or goes off board is registered. This can be done very efficiently by means of the handheld terminals. After the loading a control can be made by the terminals and a check can be made by comparing the planning against the real load/unload of the ship. The system will generate a list of differences between the planning and the real load. If necessary, it is possible to check the whole load of the ship with the handheld terminals.

It is also possible to indicate directly the difference while loading the ship. If during the loading of the ship differences are noticed this can be indicated as well on the handheld terminals as on the PC's. Only people that have the right permissions can indicate a definite difference. It is also possible to indicate in the system that the cargo is damaged and other special circumstances.

Hazardous cargo

Especially for the dangerous cargo it is possible to make a list with all the dangerous cargo that is on board of the vessel. This list also gives information about the way that the dangerous cargo should be handled. Every type of dangerous cargo has a special code. On the basis of this code the system will give information about the way the cargo should be handled where the cargo has to be stored, what kind of documentation should go with this cargo and what kind to do in case of an emergency.

Customs

The customs need different types of information for the control of the cargo.

The manifest is also the basis for the forms that are needed by the customs.

For transit the customs need the following information from the ferry terminal :

- ☐ Bill Of Lading
- ☐ Order for the port, where the cargo has to go.
- ☐ Manifest

Manifest Control

The goods that are brought on board are registered through the hand terminals or the vehicle mounted terminals. This gives the possibility to control the manifest automatically. In fact the manifest is controlled on both sides, as well the loading is controlled as the unloading. Of course the control only is on a container level or a wagon level. Although the manifest will also tell what is in the wagon or container no special checking is done for the goods in containers or wagons.

Documentation Module

The documentation module is capable of making the necessary documents. This is the Manifest, a copy of the Bill of Lading from the cargo that is on the ship, the difference sheet, the list per consignee, a list per consigner, and a list per agent/forwarder.

The documentation module can be used for different reasons. One of the important reasons is the exchange of information with the ferry owner, the railways and the customs.

Dangerous goods

Dangerous goods can be accompanied by special dangerous goods documentation. Special shipping documents for dangerous goods can be made on which is stated what type of goods it are, what classification then goods have, what UN number the goods have what quantity and the number of packages.

Railways

The railways are an important party in the transport of cargo by the ferry because it may be expected that a lot of cargo is coming by rail. In this module there is a possibility to print different reports that can be used by the railways. Since there is a data communication connection between the port of Illiychovsk and the port of Poti it is possible to give information to the railways about what goods (and how many) are arriving before hand.

Customs

The ferries going to Illiychovsk or coming from Illiychovsk have not only a manifest that is readily available when the ship enters the port but also has a complete list of the exact place on the ship where everything is loaded. Also the consignee and the shipping agent are known hours before the ferry enters the harbor.

Yard operations module

Introduction

The yard operation module is closely connected to the load/unload module. The entire operations in the yard are monitored by the system. Actually the system consists of three main parts.

First off all the loading and unloading of the goods from the ferry.

Secondly, entering and leaving of the goods by land.

Third, the yard operations module.

The yard operations again have two parts the storage of goods and the moving of goods. Both can be split into the moving of containers, wagons, and single pieces of goods for instance pallets.

Equipment

The registration of all the movements of the cargo on the yard can be done with this part of the software. For the equipment that has a terminal mounted on, all the registrations take place automatically.

All the planning of the usage of equipment can be done with this module. This means that all the equipment that is needed to unload a ferry can be planned.

For the planning of the loading and unloading of the vessels the capacity of the equipment and labor has to meet the amount of cargo.

Labor

Not only the registration and planning can be done but also the planning of the labor can take place with this module.

The registration of the work has to be done by hand because it is not automatically known who has done what.

Storage of goods

An important part of the yard operations module is that it can tell on any time, which goods are on the terminal and where the goods are. The module can also indicate free places. The goods that are stored for a longer period can be found to check whether nothing is forgotten.

The yard layout can be displayed on the screen to help the dispatcher and other people to show the status of the yard.

The yard locations that are specially designed to store dangerous goods are marked as such. When goods are stored on these locations they can easily be selected and the type of precautions that are necessary to transport them and to store them can be shown to the user.

Screens

The user interface for this module allows the registration in as much detail as possible. The planning is done on the basis of a special request for a customer or on the basis of a trip. The user can enter all the equipment that is needed for the unloading of a ferry. This way it will be possible for other users to see what has been planned. The registration afterwards can be done on the basis of the whole trip but it can also be done for the different cargo.

Introduction

This paragraph will denote the messages that will be exchanged between the ferry Terminal in Illiychovsk and the ferry terminal of Poti. The purpose of these messages is to inform the ferry terminal as soon as possible about the cargo that is coming on the ferry. Besides the normal cargo there is also a need to inform the port about the dangerous cargo that could be coming into the port.

As soon as information is electronically transmitted from one computer system to another, we speak about EDI. For EDI to be successful however, the messages transmitted should be standardized. A worldwide standardization of EDI-messages is known as EDIFACT, which stands for Electronic Data Interchange For Administration, Commerce and Transport. The set of EDIFACT -messages is still growing as well as its worldwide acceptance. The EDIFACT -message for transmitting location information on a vessel is called BAPLIE.

EDIFACT

The standard message type that is exchanged in the international transport is the so-called EDIFACT. This is a standard message structure that is maintained by working groups from the UN. Not all messages that are used have reached their final structure. For the stowage planning the message used is BAPLIE, this message has reached the highest status. For the dangerous cargo the IFTDGN message is used.

The stowage planning

When a loaded ferry leaves the port, the destination port should be informed about the cargo on board and where and how this cargo is stored. The destination port needs this information to prepare the discharge procedures of the vessel and be ready for unloading as soon as the vessel reaches the harbor.

Exchange of this information (which we call the stowage plan) can be done by several ways. One could for instance deliver the stowage plan by post, or one could send the stowage plan by fax or transmit the stowage plan electronically from one computer-system to the other. In the last case we speak about Electronic Data Interchange (EDI). The great advantage of EDI is that no human intervention is needed to process the stowage plan. The sender-computer automatically generates the EDI-message and the receiver-computer automatically translates the EDI-message to internal data-formats and stores the information in the local database.

BAPLIE

Although most of the EDIFACT-messages are under development and are changing from time to time, BAPLIE has reached status 2, which means that the message is stable and officially released for general use.

The functional definition of the BAPLIE-message is:

"A message to transmit information about equipment and goods on a means of transport, including their location on the means of transport. The message can be exchanged between (liner's) agents, tonnage centers, stevedores and ships masters/operators."

This means that the message is intended to be used to transmit information about occupied and empty locations on a vessel and to give detail information regarding carrier, equipment and goods.

The message contains the following general information regarding a specific vessel/voyage combination:

Message Header

Message identification code	<i>Descr:</i>	Message header
	<i>Format:</i>	
	<i>Values:</i>	BAPPLIED96BUN
Date and time of the preparation of the message	<i>Descr:</i>	
	<i>Format:</i>	YYMMDD
	<i>Values:</i>	
Reference to the cargo manifest	<i>Descr:</i>	Identification number
	<i>Format:</i>	CHAR 35
	<i>Values:</i>	
Version number of the manifest	<i>Descr:</i>	To uniquely identify a reference by its revision number.
	<i>Format:</i>	CHAR 35
	<i>Values:</i>	
Date and time of the manifest	<i>Descr:</i>	
	<i>Format:</i>	YYMMDD
	<i>Values:</i>	

Message body

Name and adress of shipper	<i>Descr:</i>	Identifaction of the liner service operating or responsible for a particular vessel/voyage
	<i>Format:</i>	Shipper name CHAR 35
		Shipper address, street and number/P.O. Box CHAR 35
		Shipper address, city CHAR 35
		Shipper address, country (coded) CHAR 3
	<i>Values:</i>	
Contactperson/Department identification, coded	<i>Descr:</i>	Code specifying the function of a contact (e.g. department or person)
	<i>Format:</i>	CHAR 17
	<i>Values:</i>	Internal identification code.
Department	<i>Descr:</i>	To identify a department to whom communication should be directed.
	<i>Format:</i>	CHAR 35
	<i>Values:</i>	
Phonenumber of contactperson	<i>Descr:</i>	To identify a communication number of a department or a person to whom communication should be directed.
	<i>Format:</i>	CHAR 512
	<i>Values:</i>	
Communication channel qualifier, coded	<i>Descr:</i>	Code identifying the type of communication channel being used.
	<i>Format:</i>	CHAR 3
	<i>Values:</i>	AA Circuit switching

A process that, on demand, connects two or more data terminal equipments and permits the exclusive use of a data circuit between them until the connection is released (ISO).

- AB SITA
Communications number assigned by Societe Internationale de Telecommunications Aeronautiques (SITA).
- AC ARINC
Communications number assigned by Aeronautical Radio Inc.
- AD AT&T mailbox
AT&T mailbox identifier.
- AE Peripheral device
Peripheral device identification.
- CA Cable address
Self explanatory.
- EI EDI transmission
Number identifying the service and service user.
- EM Electronic mail
Creating/sending/receiving of unstructured free text messages or documents using computer network, a mini- computer or an attached modem and regular telephone line or other electronic transmission media.
- EX Extension
Telephone extension.
- FT File transfer access method
According to ISO.
- FX Telefax
Device used for transmitting and reproducing fixed graphic material (as printing) by means of signals over telephone lines or other electronic transmission media.
- GM GEIS (General Electric Information Service) mailbox
Self explanatory.
- IE IBM information exchange
Self explanatory.
- IM Internal mail
Internal mail address/number.
- MA Mail
Postal service document delivery.
- PB Postbox number
Self explanatory.
- PS Packet switching
The process of routing and transferring data by means of addressed packets so that a channel is occupied only during the transmission; upon completion of the transmission the channel is made available for the transfer of other packets (ISO).
- SW S.W.I.F.T.
Communications address assigned by Society for Worldwide Interbank Financial Telecommunications s.c.
- TE Telephone
Voice/data transmission by telephone.
- TG Telegraph
Text transmission via telegraph.
- TL Telex
Transmission of text/data via telex.
- TM Telemail
Transmission of text/data via telemail.
- TT Teletext
Transmission of text/data via teletext.
- TX TWX
Communication service involving Teletypewriter machines connected by wire or electronic transmission media. Teletypewriter

machines are the devices used to send and receive signals and produce hardcopy from them.

XF X.400
CCITT Message handling system.

Carrier name

Descr: Name of party undertaking or arranging transport of goods between named points.

Format: CHAR 35

Values:

Ferry identification

Descr: Identification of the means of transport

Format: CHAR 35

Values:

Port of departure identification

Descr: Port, airport or other location from which a means of transport is scheduled to depart or has departed.

Format: CHAR 25

Values:

Port of destination identification

Descr: Next port which the vessel is going to call upon.

Format: CHAR 25

Values:

Departure date and time

Descr: Date (and time) of departure of means of transport.

Format: YYMMDDHHMM

Values:

Arrival date and time

Descr: Date/time when carrier estimates that a means of transport should arrive at the port of discharge or place of destination.

Format: YYMMDDHHMM

Values:

Loading voyage number

Descr: Reference number assigned by the carrier or his agent to the voyage of the vessel.

Format: CHAR 35

Values:

Occupied places

For each occupied location on the ferry, the following information is transmitted:

Location coordinates

Descr: User coded coordinates.

Format: CHAR 25

Values:

Number of packages

Descr: Number of individual parts of a shipment either unpacked, or packed in such a way that they cannot be divided without first undoing the packing.

Format: NUM 8

Values:

Nature of cargo, coded

Descr: Code indicating the type of cargo as a rough classification.

Format: CHAR 3

Values:

1 Documents

Printed, typed or written matter including leaflets, pamphlets, certificates etc., which are not subject to import duties and taxes, restrictions and prohibitions.

2 Low value non-dutiable consignments

Imported consignments/items/goods in respect of which Customs

- duties and other taxes are waived as they are below a value determined by the Customs administration.
- 3 Low value dutiable consignments
Imported consignments/items/goods in respect of which Customs duties and other taxes are payable are below a certain amount as determined by the Customs administration.
 - 4 High value consignments
Imported consignments/items/goods which are determined as having a value above a certain amount fixed by the Customs administration, which may or may not attract duties and taxes.
 - 5 Other non-containerized
Non-containerized cargo which cannot be categorized by any of the other nature of cargo code.
 - 6 Vehicles
Vehicles which are not stowed in containers.
 - 7 Roll-on roll-off
Cargo transported or to be transported on roll-on roll-off vessels and which is transportable on its own wheels or stowed on special heavy duty trailers.
 - 8 Palletized
Non-containerized cargo which is palletized.
 - 9 Containerized
Cargo stowed or to be stowed in a container.
 - 10 Breakbulk
Non-containerized cargo stowed in vessels' holds.
 - 11 Hazardous cargo
Cargo with dangerous properties, according to appropriate dangerous goods regulations.
 - 12 General cargo
Cargo of a general nature, not otherwise specified.
 - 13 Liquid cargo
Cargo in liquid form.
 - 14 Temperature controlled cargo
Cargo transported under specified temperature conditions.
 - 15 Environmental pollutant cargo
Cargo is an environmental pollutant.
 - 16 Not-hazardous cargo
Cargo which is not hazardous.

Free text

Descr: Free text field available to the message sender for information.
Format: Max 3150 bytes
Values:

Weight

Descr: self explanatory
Format: CHAR 18
Values:

Equipment dimensions: length, width, height

Descr: The external dimensions of transport equipment
Format: NUM 15
Values:

Storage temperature (if applicable)

Descr: The temperature at which the cargo is to be kept while it is in storage.
Format: NUM 3
Values:

Transport temperature (if applicable)

Descr: The temperature at which cargo is to be kept while it is under transport.
Format: NUM 3
Values:

Cargo operating temperature (if applicable)

Descr: The temperature at which cargo is to be kept during cargo handling.

Format: NUM 3
Values:
 Transport emergency temperature (if applicable)
Descr: The temperature at which emergency procedures apply for the disposal of temperature-controlled goods.
Format: NUM 3
Values:
 Transport control temperature (if applicable)
Descr: The maximum temperature at which certain products can be safely transported.
Format: NUM 3
Values:
 Transport temperature range (if applicable): min temperature, max temperature
Descr: The temperature range at which cargo is to be kept while it is under transport.
Format: NUM 18
Values:
 Equipment pre-tripping temperature range (if applicable): min temperature, max temperature
Descr: The temperature range at which the equipment is to be brought to in preparation for the loading of cargo.
Format: NUM 18
Values:
 Reference to Bill of lading
Descr: Reference number assigned to a bill of lading.
Format: CHAR 35
Values:
 Equipment type, coded
Descr: Code identifying type of equipment.
Format: CHAR 3
Values: CN Container
 Equipment item as defined by ISO for transport. It must be of:
 A) permanent character, strong enough for repeated use;
 B) designed to facilitate the carriage of goods, by one or more modes of transport, without intermediate reloading;
 C) fitted with devices for its ready handling, particularly.
 RR Rail car
 Registered identification number of railway wagon
 TE Trailer
 A vehicle without motive power, designed for the carriage of cargo and to be towed by a motor vehicle.
 PA Pallet
 A platform on which goods can be stacked in order to facilitate the movement by a forklift or sling.
 CH Chassis
 A wheeled carriage onto which an ocean container is mounted for inland conveyance.
 Country of equipment, coded
Descr: Identification of the name of a country or other geographical entity as specified in ISO 3166.
Format: CHAR 3
Values: Use ISO 3166 two alpha country code.
 Equipment identification number
Descr: Marks (letters and/or numbers) which identify equipment e.g. unit load device.
Format: CHAR 17
Values:
 Equipment supplier, coded
Descr: To indicate the party that is the supplier of the equipment.
Format: CHAR 3
Values: 1 Shipper supplied

- 2 The transport equipment is supplied by the shipper.
Carrier supplied
- 3 The transport equipment is supplied by the carrier.
Consolidator supplied
- 4 The equipment is supplied by the consolidator.
Deconsolidator supplied
- 5 The equipment is supplied by the deconsolidator.
Third party supplied
- The equipment is supplied by a third party.

Equipment status, coded

Descr: Indication of the action related to the equipment.
Format: CHAR 3
Values:

- 1 Continental
Self explanatory.
- 2 Export
Transport equipment to be exported on a marine vessel.
- 3 Import
Transport equipment to be imported on a marine vessel.
- 4 Remain on board
Transport equipment arriving on a marine vessel is to remain on board.
- 5 Shifter
Transport equipment is to be shifted from one stowage location on a marine vessel to another on the same vessel.
- 6 Transhipment
Transport equipment is to be transferred from one marine vessel to another.
- 7 Shortlanded
Transport equipment notified to arrive which did not arrive on the means of transport.
- 8 Overlanded
Transport equipment not notified to arrive but which did arrive on the means of transport.

Full/empty indicator, coded

Descr: To indicate the extent to which the equipment is full or empty.
Format: CHAR 3
Values:

- 1 More than one quarter volume available
Self explanatory.
- 2 More than half volume available
Self explanatory.
- 3 More than three quarters volume available
Self explanatory.
- 4 Empty
Self explanatory.
- 5 Full
Self explanatory.
- 6 No volume available
Self explanatory.
- 7 Full, mixed consignment
Indicates that the equipment is fully loaded, and includes a number LCL (Less Than Container Load) consignments.
- 8 Full, single consignment
Indicates that the container is fully loaded with a single FCL (Full Container Load) consignment.

Name and address of owner of equipment

Descr: Free form name and address description.
Format:

Owner name	CHAR 35
Owner address, street and number/P.O. Box	CHAR 35
Owner address, city	CHAR 35
Owner address, country (coded)	CHAR 3

Values:

Dangerous goods in the BAPLIE

If the goods are qualified as dangerous goods, the following information is also provided:

Hazard code identification

Descr: Code indicating the regulation, international or national, applicable for a means of transport.

Format: CHAR 7

Values:

UNDG Number

Descr: Unique serial number assigned within the United Nations to substances and articles contained in a list of the dangerous goods most commonly carried.

Format: NUM 4

Values:

Dangerous goods flashpoint, if applicable

Descr: Lowest temperature, in the case of dangerous goods, at which vapour from an inflammable liquid forms an ignitable mixture with air.

Format: CHAR 8

Values:

Shipment flashpoint, if applicable

Descr: Temperature in centigrade determined by the closed cup test as per ISO 1523/73 where a vapor is given off that can be ignited.

Format: NUM 3

Values:

Packing group, if applicable, coded

Descr: Identification of a packing group by code.

Format: CHAR 3

Values:

- 1 Great danger
Packaging meeting criteria to pack hazardous materials with great danger. Group I according to IATA/IMDG/ADR/RID regulations.
- 2 Medium danger
Packaging meeting criteria to pack hazardous materials with great danger. Group II according to IATA/IDMG/ADR/RID regulations.
- 3 Minor danger
Packaging meeting criteria to pack hazardous materials with great danger. Group III according to IATA/IDMG/ADR/RID regulations.

EMS Number

Descr: Emergency procedures for ships carrying dangerous goods.

Format: CHAR 6

Values:

MFAG

Descr: Medical first aid guide.

Format: CHAR 4

Values:

Trem card number

Descr: The identification of a transport emergency card giving advice for emergency actions.

Format: CHAR 10

Values:

Hazard identification number, upper part

Descr: The id. number for the Orange Placard (upper part) required on the means of transport.

Format: CHAR 4

Values:
 Substance identification number, lower part
Descr: The number for the Orange Placard (lower part) required on the means of transport.
Format: CHAR 4
Values:

Dangerous goods label marking
Descr: Marking identifying the type of hazardous goods (substance), Loading/Unloading instructions and advising actions in case of emergency.
Format: CHAR 12
Values:

Packing instruction, coded
Descr: Code defining the quantity and the type of package in which a product is allowed to be shipped in a passenger or freight aircraft.
Format: CHAR 3
Values: User specified code.

Free text (FTX, 4440)
Descr: Free text field available to the message sender for information.
Format: Max 3150 bytes
Values:

Dangerous Cargo Notification

EDIFACT has also defined a special dangerous goods notification message, described as IFTDGN. The International Forwarding and Transport Dangerous Goods Notification message is a message from the party responsible to declare the dangerous goods (e.g. carrier's agent, freight forwarder) to the party acting on behalf of the local authority performing the checks on conformance with the legal requirements on the control of dangerous goods, normally Port Authority, conveying the information relating to one conveyance/voyage of a means of transport such as a vessel, train, truck or barge, on the dangerous goods being loaded, unloaded, and/or in transit.

1. One message relates to one conveyance/voyage of a means of transport. Remark: the message structure is aligned with the IFCSUM message (Forwarding and consolidation summary message).
2. One message is to be suitable to declare both the dangerous goods to be discharged and loaded and the dangerous goods that remain on board (in transit). Only one handling operation per IFTDGN message can be reported, or a handling operation can be specified per consignment in IFTDGN.
3. One message may relate to all dangerous goods information that the sender of the message is responsible for or to a certain part of that information; the information may be split in different messages, e.g. as it known at different times or the discharging information is sent separately from loading information or the information is split up in different messages for the different dangerous goods classes.
4. One message is to be based on the local legal information requirements regarding the notification of dangerous goods to the (port) authority.
 N.B. This may mean that in a certain port the condition for a data element (or qualifier) that is conditional according to this specification, is that the data element (or qualifier) becomes mandatory for that port.
5. A dangerous goods notification message may contain several consignments.

6. A consignment may contain several goods items/dangerous goods classes.
7. Each goods item can only contain one dangerous goods class. A goods item reflects the operational description of the goods.
8. A dangerous goods class may be transported in one or more equipment and single equipment may contain one or more dangerous goods classes.
9. The message has to cater for the provision of sending updates (change, deletion or cancellation).

Remark: To cover all dangerous goods information relating to one conveyance/voyage of a means of transport might imply accumulation of several Dangerous Goods Notification messages from the same or several agents/forwarders.

The IFTDGN-message contains much of the same information as is provided in the BAPLIE-message but is extended with the following information:

Handling instructions, coded

Descr: Identification of the instructions on how specified goods, packages or containers should be handled.

Format: CHAR 3

Values: User or association defined code.

Handling instructions, description

Descr: Instructions on how specified goods, packages or containers should be handled.

Format: CHAR 70

Values:

Equipment identification number

Descr: To specify the placement of goods in relation to equipment.

Format: CHAR 17

Values:

Number of packages

Descr: Number of individual parts of a shipment either unpacked, or packed in such a way that they cannot be divided without first undoing the packing.

Format: NUM 8

Values:

Hazardous Cargo

Introduction

This module is concerned with the dangerous cargo. The module has 2 main tasks. The first is to support the handling of hazardous cargo. The second is the information about the dangerous cargo that is transported to other ports.

The system should support the dangerous cargo handling for the users of the system. This means that the system should help the user while loading the dangerous cargo, while handling the dangerous cargo on the yard and with the stowing of the dangerous cargo.

Rules

The rules for dangerous cargo that have to be implemented are the rules from the IMO. The IMO has a guide book for dangerous cargo. The system has to support the user by the implementation of these rules. This is done in three ways, for storing the hazardous good on the yard, for stowing the goods on the ferry and by implementing the EDI messages for the notification of dangerous goods to the next port.

Yard operations

For all the locations of the yard it is possible to indicate what kind of dangerous goods can be stored on these locations.

Stowage planning

During the making of the stowage planning it is indicated which spots on the ship are capable of carrying dangerous goods. During the generation of the stowage planning it is taking into account that only on these spots dangerous cargo may be stored. If the stowage planning is made or adjusted by the dispatcher the system will indicate the system will indicate the dangerous cargo and the spots that are available for these cargo. The user can however ignore these signs and put the cargo on a other spot.

EDI messages

As soon as the dispatcher indicates that dangerous cargo is going to be shipped he can choose to print out a fax form on which the information about the cargo is stated or to send an EDIFACT message to the receiving port.

Hazardous goods information

The system not only supports the user by implementing the rules for dangerous cargo but also helps the user finding the information about the dangerous cargo and the handling of this cargo.

If cargo is indicated as dangerous the user can ask the system what the rules for this kind of cargo are. The rules for every kind of cargo can be given to the system. This means that, the rules for storing, stowing and handling of the cargo can be found in the system.

Treatment

For the port authorities it is important to know how they should treat the dangerous cargo. Every cargo type can have its own regulations for the treatment of the cargo. All necessary information about the dangerous cargo can be put into the system.

Documents

The system can give information about the documents that are needed for the hazardous cargo.

Signs

The system can indicate the type of signs that are needed on the dangerous cargo. The international standard describes two signs that can accompany the cargo. Both signs can be indicated by the system.

Communication

The most important thing with the hazardous cargo is the exchange information. Mostly this is done by EDIFACT a protocol based upon EDI. Since the communication between the two ports is between systems that have the same software it is not needed to exchange the information with EDIFACT but it could be a good idea to use this anyway.

System Module

Introduction

Besides the modules that are necessary for the direct operations of the ferry terminal there is also a module for the system maintenance. In this module it is possible to add users to the system and change reference files.

Users

The first system module is the user module. Every system user has to have an access code to get into the system. The system manager can add or delete the users. The system manager must indicate also to which screens the users have access to.

Reference files

The different reference files all can be maintained in the system module. To change the different reference files you need special permissions. People with the right permission may only alter the reference files.

Ship layout

The ship layout can be changed in this part of the system module. This task is very specialized. It happens only very rarely that a ship has to be added/ removed or changed. The layout of ships can of course only be changed or added by authorized people. The describing the ship locations is pointed out in more detail in the stowage module.

Yard layout

The yard layout can be adjusted in this part of the systems module. It happens only very seldom. The yard is described in the yard module. The locations on a yard have three degrees of freedom, the height the row and the depth of the locations can be indicated. This is specially done for the storage of containers.

Security

Introduction

In the paragraphs above is spoken about an open system. Maybe it is not expected in an open system to talk about security, but actually it is what makes the system open.

Security Levels

In the system that is developed there are different levels of security:

Database access.

On every table in the database, groups regulate the access. Every table is shielded by the maximum security. Views are made for the different groups of users.

This part of the security is given when the system is installed and it should not be necessary to change anything after the installation.

System Access

This layer protects the system from being used at all. A user always has to get access

to the system (e.g. the network) to do anything at all. Giving the right access permission on the NT- network does this.

Program access.

Before you are able to get access to the program you need to give your username and password. Depending on your username the first screen is started. Whether access is allowed to the other screens is depending on your username also. The system module gives the system administrator the possibility to give all the permissions necessary for this.

The system administrator can add new users. If a new user is added the administrator has two different possibilities. He can give the user right per screen or he can first generate the permissions according to a certain format and latter change the permission from this user.

The system administrator can also change the formats for the different formats. The formats are however only used if the user is added after that the permissions are given for every user individually.

Interfaces

The system is capable of sending EDIFACT messages to another system. The receiving of this messages takes place automatically. The sending has to be initiated by the proper person. After the messages are received this is indicated to the proper persons. The translation of the message into the database can be started, this process is controlled by the dispatcher.

Illiychovsk - Poti

The interface between Illiychovsk and Poti consist of a modem connection (dial-up line). The connection is used to exchange the Stowage planning and the Dangerous cargo messages.

The port accounting system

The system will be able to produce sheet on a regular basis of all the action that have taken place for a ferry or a ferry line. With this sheet the invoices to the ferry owner can be made.

The Customs EDP system -Poti

The custom procedures are not yet worked out in detail this means that the customs are not standardized. A report dating from 1996 gives an impression of the state of the customs computerization. It is stated in the report that the customs in the different countries along the TRACECA route should standardize on one package for the customs control. On this moment the situation is that the customs have different systems all trough the country. This means that for the ferry system it is not applicable to implement a customs interface. This means the customs are provided with copies of the Manifest and the Bill of Lading on paper or if they want to they can get the same information in an ASCII file. The big advantage of the system is that the customs control can get the information very soon after the ferry leaves the Port of Illiychovsk.

The customs EDP system - Illiychovsk

The customs in Illiychovsk use several PC's to handle the information of the ferry cargo. On this moment they do not receive any information about the cargo that is coming. They are very happy if they can receive the information that they need on a floppy disk. This means the situation is more or less the same as in Poti. The customs can get information on paper or on a floppy disk.

Interfaces to client systems

The only client for the ferry terminal on this moment is UKRFerry. The ferry line will send the pre-warnings to the ferry terminal. On the basis of this pre-warning the ferry terminal can make a planning of the loading of the ferry. UKRFerry only has information available on the wagons and trucks to expect without much detail about the cargo. This information can be entered into the system by hand or by supplying the system with a comma separated ASCII file.

Future connections

The system is such that in future it can easily be extended with other interfaces and with more EDIFACT messages.

Mobile Data communication

The mobile data communication is very important part of the system but it can operate without the data communication. The mobile data communication makes sure the system is much easier to use and there are fewer mistakes with data entry.

Functions

The main goal is the transportment of cargo to the right place. This is done by sending a cargo description and location to the terminals and tell the user where the cargo has to go to. Besides this also the control of the cargo and locations can take place with the terminals.

Besides this the dispatcher will be able to send message to terminals or groups of terminals.

The terminals are divided into groups, worklists can be assembled per group or by individual terminal. If a task is for a group of terminals the next assignment is the one that is for the next group. If there are individual assignments they are always the first that are received on the terminal.

Security

The security of the mobile terminals is guaranteed in different ways. First of all the network access with the mobile terminals is controlled by the unique MAC address. This address is hard coded in the terminals and unique all over the world. Secondly the terminals have an IP-address that is checked when they try to make a connection. The third method of security is the user authentication. Before a user can use a terminal he/she has to supply a username password. Depending on this username the system manager can give rights to the user. Every user can have it own set of screens and so his own set of functionality. Even the startup screen for every user can be set differently by the system administrator.

Database layout

Introduction

This chapter gives an overview of the database. This chapter is merely meant for the completeness of the document. It starts with an ERD diagram of the database to give an overview of the data that is stored. The next paragraph describes the database in detail. This is the functional layout of the database the technical layout could be somewhat different but should give the same functionality. Because of the way the system is developed it is possible that minor changes will be made in the final program.

Important properties

The database is centered around two principles. The first one is that every piece of cargo for the database is always stored on a transport medium. Mostly this will be a truck, a wagon, a trailer or a container. But if necessary it can be a medium that is "NONE" if this is the case it means that the cargo is not actually stored on a transport medium but the system will consider it as one. On reception of the goods a unique number is then given to this load of cargo and a paper should always accompany the cargo.

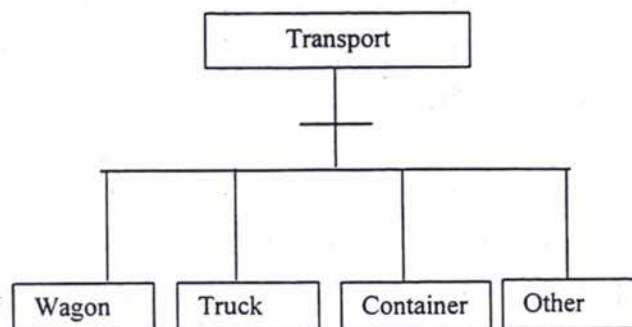
The second principle is that not the cargo is stored directly on the ferry terminal but that the means of transport is stored on the terminal (with the cargo on it). As long as the cargo is on the ferry terminal the means of transport will be somewhere stored on the yard.

All the movements of the cargo on the yard is registered and will be in the database even after the cargo has long left the ferry terminal.

Diagram

Because the total overview of the database is so complex the database will be presented in different pieces here.

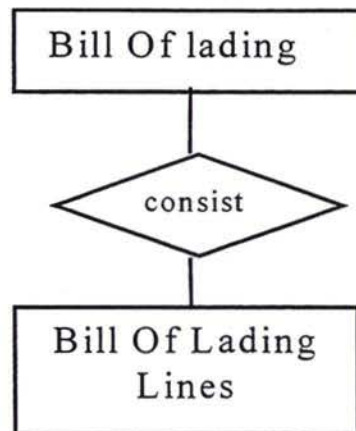
Transport



The diagram shows that every mean of transport can be one of Wagon, Truck, Container or other. Every transport means has it own set of special data. A truck has a

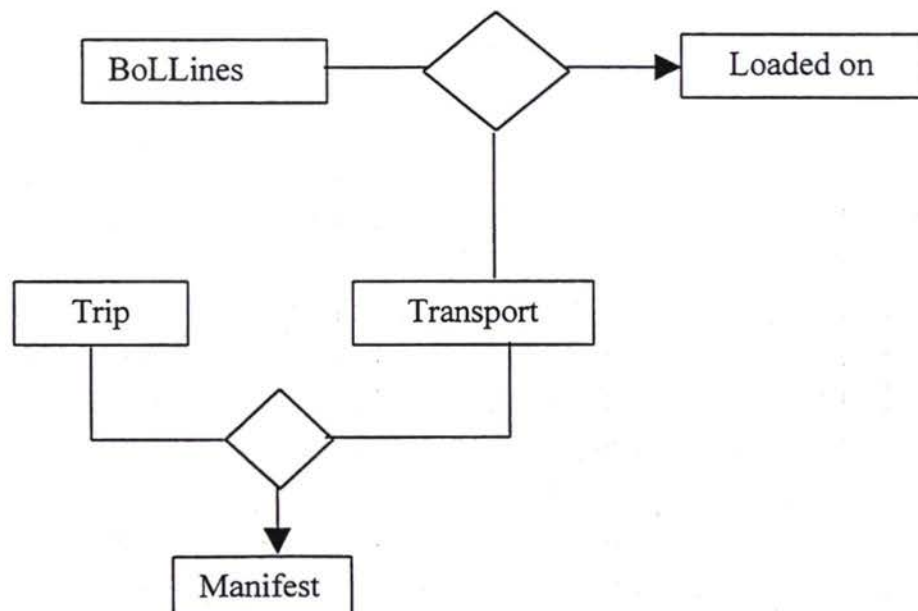
license plate and a container a unique container number but also a mark of the container.

Bill of Lading



The above diagram states that every bill of lading can consists of several lines. This means that one bill of lading can consist of several different cargo types which are all for the same consigner.

Manifest



The diagram shows that a Bill Of Lading line is loaded on a transport mean (which is a truck, container etc.) Because there is a separate table for what is loaded on f.i. a truck there are several possibilities. A truck can be loaded with one Lien of the Bill of lading, but a truck can also be loaded with several lines of the bill of lading (possibly all the lines of a bill of lading). A truck can be loaded with several Bill of Ladings but a truck can also be loaded with only a part of the cargo of a bill of lading. The manifest

states, which transport means, have to be loaded on which trip. If it is known which transport means have to be loaded it is also known (through the table LOADED ON) which cargo this is.

Tables

This paragraph will describe the different tables in detail. Every field that is in the tables will be described here.

Contacts

Field name	Type	Length	
Contact Id	Integer		Unique number
Company Name	Char	60	Name of Company
Contact Name	Char	60	Name of contact person
Address	Char	60	Street name and number
Zip	Char	8	Zip code
City	Char	60	City
Country	Refer	Countries	Country where company resides
Extra	Char	80	Extra information

This table is used for all the address that are in the system. Every time a address is needed it can be found in this table.

Countries

Field name	Type	Length	
Short	Char	6	Short country description
Long	Char	60	Long country name
Used	Boolean	1	Is this code still used ?
Extra	Char	80	Extra information

This table gives a list of countries for ship, cargo, passengers etc.

Trip

Field name	Type	Length	
Trip id	Char	10	System generated number
ETA/ETD	Date/time		Estimated time of arrival/Departure
ATA/ATD	Date/time		Actual time of arrival
Ship id	Refer	Ship	Ship
Form port	Refer	Port	From which port the ship leaves
To port	Refer	Port	To which port the ship goes
Departure/arrival	Boolean	1	Indicates whether this is a arrival or a departure
Extra	Char	80	Extra information

This table gives the general information about the trip.

Pre-warning

Field name	Type	Length
------------	------	--------

Field name	Type	Length	
Trip description	Char	60	Description of trip
Trip Id	Refer	Trip	The trip
Bill of Lading	Refer	BoL	Bill of lading Number
Bill of lading line	Refer	BoL line	Line number of bill of lading
Cargo	Char	40	Cargo description
Cargo Type	Refer	Cargo type	Cargo type
Weight	Integer		Brut Weight of the cargo
Net	Integer		Net weight of cargo
Package	Refer	Package type	Standard packaging
Package description	Char	40	Extra description of packages
Type transport	Refer	Transport type	Wagon/Truck/Trailer/Container
Dangerous	Boolean		Is it dangerous cargo?
Cancelled	Boolean		Is it cancelled ?
Expected Arrival	Date/Time		When does cargo arrive
Real Arrival	Date Time		When did cargo really arrive
Creation Date	Date/Time		When is this record created
Creator	Char	40	Who created this record
Extra	Char	80	Extra information

This table gives the notification of the bookings on the ferry.

Transport

Field name	Type	Length	
Transport id	Char	60	System generated ID
Type	Refer		Wagon/Truck/Container/None/Unknown
Weight	Integer		Total weight of cargo plus truck, container etc.
Length	Integer		Length of the truck or wagon
Equipment type	Refer		EDI type
Min/Max temp	Integer		Min max storage temp (EDI)
Full/Empty	Boolean		Full or Empty
Extra	Char	80	Extra information

This table gives the transport means on which the cargo is loaded. If the cargo is not loaded on a truck, trailer, wagon or container, this table is used to give the cargo an unique id within the system.

Loaded On

Field name	Type	Length	
Transport id	Char	60	System generated ID
Bill of lading	Refer		Reference to Bill of Lading
BoL Lines	Refer		Reference to lines of Bill of Lading
Weight	Integer		Number of tons
Number	Integer		Number of packages
Extra	Char	80	Extra information

This table denotes which (part of) the bill of lading is loaded on which transport medium.

Truck

Field name	Type	Length	
Transport id	Refer	Transport	Refernece to above table
License plate	char	10	License plate of truck or trailer
Nationality	Refer	Countries	Which nationality is the truck
Trailer no	Char	10	License plate of trailer
Extra	Char	80	Extra information

This table gives the extra information about the truck.

Container

Field name	Type	Length	
Transport ID	Refer	Transport	Reference to transport table
Container nr	Char	20	Unique container number
Mark	Refer	Mark	The mark of the container
Weight	Integer		Total weight of container
Type	Refer	Container type	20/40 feet
Extra	Char	80	Extra Information

This table gives the extra information about the container.

Container Type

Field name	Type	Length	
Container type	Char	60	20/40 feet
Container Weight	Integer		Weight of container
Extra	Char	80	Extra Information

This table gives the types of containers. The most common are the 20 or 40 feet container s but is also possible to indicate special container for liquid for instance.

Mark of container

Field name	Type	Length	
Mark	Char	6	Short mark name
Mark long description	Char	60	Long description
Extra	Char	80	Extra Information

This table gives a list of all the possible marks of the containers.

Wagon

Field name	Type	Length	
Transport id	Refer	Transport	Reference to transport table
Wagon nr	Char	20	Unique id of wagon
Wagon type	refer	Wagon Type	Reference to wagon types

Weight	Integer		Weight of the wagon
Tara	Integer		Tara weight of wagon
Net	Integer		Net weight of wagon
Extra	Char	80	Extra information

This table gives the detailed information about the wagons.

Wagon Type

Field name	Type	Length	
Wagon Type	Char	6	Short Type description
Description	Char	60	Long type description
Wagon Weight	refer		Weight of wagon
Extra	Char	80	Extra information

This table indicates al the possible types of wagons.

Yard

This table gives all the spot where goods can be stored.

Field name	Type	Length	
Yard name	Char	60	Description of yard
Row	Char	6	Number of the row on the yard
Height	Char	6	Height of yard place
Depth	Char	6	Depth of yard place
Type	Char	6	Type of place (container, truck etc.)
Dangerous	Refer	Dangerous	
Extra	Char	80	Extra information

Reception/Release

This table describes all the reception and the releases of goods that have taken place.

Field name	Type	Length	
Bill of lading	Refer	BoL	Number of the bill of Lading
Line	Refer	BoL line	Line of the bill of lading
Date/Time	Date/time		Date/time of reception
Transport ID	Refer	Transport	Relation with transport
Cargo	Char	40	Cargo description
Cargo Type	Refer	Cargo Type	Cargo type
Weight	Integer		Weight
Reception/Release	Boolean	1	Is it reception or release
Extra	Char	80	Extra information

Bill of lading

The header of the bill of lading.

Field name	Type	Length	
Id	Char	10	Unique ID of Bill of lading
Port loading	Refer	Port	Where is the cargo loaded

Field name	Type	Length	
Port Destination	Refer	Port	Where does the cargo go
Country Loading	Refer	Country	Where does the cargo come from
Country Destination	Refer	Country	Where does the cargo go to
Next Port	Refer	Port	What is the next port of destination
Previous Port	Refer	Port	What was the previous port
Pre carriage	Char	20	Who/what was the transport before?
After Carriage	Char	20	Who/what is the transport after?
Weight	Integer		Weight of the total cargo
Measurement	Refer		What is the size
Volume	Integer		What is the volume
Package type	Refer		What is the package type
Shipper	Refer		Who is the shipper
Notify Address	Refer	Contact	
Agent	Refer	Contact	
Consignee	Refer	Contact	
Consigner	Refer	Contact	
Extra	char	80	Extra information

Bill of Lading Lines

Detail information of the goods on the bill of lading.

Field name	Type	Length	
BOL Id	Refer	BoL	
Line	Integer		Unique system defined number for different lines
Cargo	Char	60	Description of cargo
Cargo type	Refer	Cargo type	
Weight	Integer		Weight of this part of the cargo
Measurement	Integer		Size of this part of the cargo
Volume	Integer		Volume of this part of the cargo
Package type	Refer	Package type	
Nature of Cargo	Refer	Nature	EDI type
Dangerous	Refer	Dangerous	
Extra	Char	80	Extra Information

Manifest

Field name	Type	Length	
Transport ID	Refer	Transport	Reference to the transport information
Trip ID	Refer	Trip	Reference to the trip information
Extra	Char	80	Extra information

Table that tells what is loaded on which ship.

Ship

This table gives the possible ship that can arrive in the ferry terminal.

Field name	Type	Length
------------	------	--------

Field name	Type	Length	
Ship ID	Integer		Unique number for ship
Ship short	char	8	Short name of ship
Ship name	Char	40	Long name of ship
Owner	Char	40	Name of Owner
Nationality	Refer	Country	Flag of ship
Length	Integer		Length of ship
Width	Integer		Width of ship
Decks	Integer		Number of decks
Extra	Char	80	Extra Information

Decks

Field name	Type	Length	
Deck id	Integer		Unique number for the deck
Ship id	Refer	Ship	The ship to which this deck belongs
Deck No	Integer		Unique number for the deck
Deck Name	Char	20	The name of the deck
Extra	Char	40	Extra information

Information about the deck of the ferry

Track

Field name	Type	Length	
Track Id	Integer		Unique Number for this track
Deck Id	Integer		To which deck does this belong
Track name	Char	40	Name of the track
Track number	Integer		Number of the track (sequence)
Track Length	Integer		Length of the track
Begin	Integer		Starting point of the track
End	Integer		And point of the track
Extra	Char	40	Extra information

Information about every track on the ferry.

Ship locations

Field name	Type	Length	
Spot Id	Integer		Unique number
Track ID	Refer		On which track is the spot
Spot number	Integer		Number of the spot
Location	Char	6	Name of the location
Dangerous	Refer	Dangerous	
Extra	Char	80	Extra Information

Information about every wagon location on the ferry.

Stowage plan

Field name	Type	Length	
Spot Id	Refer	Ship loc	Unique number
Transport ID	Refer	Transport	On which track is the spot
Trip id	Refer	Trip	Number of the spot
Dangerous	Refer	Dangerous	
Extra	Char	80	Extra Information

Information about the stowage of a vessel per trip.

Loaded/Unloaded on Ship

Field name	Type	Length	
Load id	Integer		Unique number
Spot Id	Refer	Location	On which spot is it placed
Transport ID	Refer	Transport	Which transport Medium was loaded
Trip	Refer	Trip	For which trip was the loading
When	Date/Time		When was the cargo loaded
Weight	Integer		What weight was actually loaded
Extra	Char	80	Extra Information

Information about the cargo that is really loaded.

Work list

Field name	Type	Length	
Work list Id	Integer		Unique identifier
Terminal no	Refer	Terminal	Number of the terminal
Group number	Refer	Group	Group of the terminal
Type	Refer	Term type	Type of terminal
Transport ID	Refer	Transport	Identifier of the cargo to move
From	Refer	Yard	Location from which the cargo has to be moved
To	Refer	Yard	To where the cargo has to be moved
Previous	Integer		Previous order (if one)
Next	Integer		Next order (if one)
Extra	Char	80	Extra description

Information about the work that has to take place.

Work Done

Field name	Type	Length	
Work Id	Integer		Unique ID
Terminal no	Integer		Terminal number that did the work
Type	Integer		Type of terminal
Transport ID	Integer		Transport ID that was moved
From	Refer		From which location
To	Refer		To which location

Field name	Type	Length	
Previous	Integer		Previous job
Next	Integer		Next Job
Date/Time start	Date		Start date
Date/Time end	Date		End date
Extra	Char	80	Extra information

Information about the work that has actually taken place.

Terminals

Field name	Type	Length	
Terminal Id	Integer		Unique terminal ID
Group	Refer		To which groups belongs this terminal
Terminal no	Char	10	Logical terminal Identification
User	Refer		Which user is allowed at this terminal
Used	Boolean		Can this record still be used ?
Extra	Char	80	Extra information

Information on every terminal

Terminal Group

Field name	Type	Length	
Group Id	Integer		Unique group ID
Group	char	10	Logical group
Description	Integer		Description
Extra	Char	80	Extra information

Information about the different groups of mobile terminals

Cargo type

Field name	Type	Length	
Id	Integer		Unique ID
Short	Char	8	Short cargo description
Long	Char	40	Long cargo description
Dangerous	Boolean		Is cargo dangerous ??
Extra	Char	80	Extra information

If the cargo is dangerous it can also be found in the list with dangerous cargo.

Package type

Field name	Type	Length	
Id	Integer		
Short	Char	6	Short description of package type
Long	Char	20	Long description of package type
Used	Boolean		Is the type still used ??
Extra	Char	80	

Information on all the types of packages that are possible.

Passengers

Field name	Type	Length	
Trip Id	Integer		
Name	Char	40	Name of the passenger
First name	Char	20	First name
Passport no	Char	20	Passport number
Nationality	Refer		Nationality
Extra	Char	80	Extra information

Information on passengers that are on board of a ferry.

Drivers

Field name	Type	Length	
Id	Integer		
Pasport no	Char	20	Passport number of the driver
Name	Char	40	Name of the driver
First name	Char	20	First name of the driver
Transport ID	Refer		Id of the system for the transport
Country	Refer		Country of the drivers
Extra	Char	80	Extra information

Information about the drivers that are on board of the ferry.

Cargo moved

This table is meant for historical data.

Field name	Type	Length	
Id	Integer		Unique ID
Yard id From	Refer	Yard	Id from the place on the yard
Yard id To	Refer	Yard	Id to which the cargo was moved
Arrival	Date/time		Date of arrival on ferry terminal
Departure	Date/time		Date of departure on ferry terminal
Loaded on ship	Refer	Ship	Date when loaded on ship

Unloaded from ship	Refer	Ship	Date when unloaded from ship
BoL	Refer	BoL	BoL number
Bol line	Refer	Bol Lines	Line
Transport ID	Char	40	Transport reference
Cargo Type	Refer	Cargo Type	Type of cargo
Cargo	Char	40	Description of cargo
Weight	Integer		Weight of the cargo
Dangerous	Refer	Dangerous	Was it dangerous cargo?
Customer	Refer	Contacts	Which customer was it meant for
Date stored	Date/time		Date on which the cargo was stored on this place
Extra	Char	80	Extra information

Cargo on Yard

Field name	Type	Length	
Id	Integer		Unique ID
Yard id	Char	20	Id from the place on the yard
Transport ID	Char	40	Id from the cargo
Date stored	Date/time		Date on which the cargo was stored on this place
Extra	Char	80	Extra information

Information on all the cargo that is stored on the yard.

Berths

Field name	Type	Length	
Berth Id	Integer		Berth Number
Berth Description	Char	60	Description of berth
Extra	Char	80	Info on Berth

Information on the berths.

Berth Usage

Field name	Type	Length	
Berth ID	Integer		Id from berth
Trip	Char	20	Id from trip
Date arrival/Departure	Date/time		Date of ships Arrival
Arrival/Departure	Boolean		Is it arrival or departure
Extra	Char	80	Extra information

Information on the berths usage.

Equipment

Field name	Type	Length	
------------	------	--------	--

Field name	Type	Length	
Id	Integer		Unique ID
Description	Char	20	Equipment description
Available	Boolean		Is Equipment available
Extra	Char	80	Extra information

List of available equipment.

Equipment planned

Field name	Type	Length	
Id	Integer		
From	Date/Time	20	Planned starting time
To	Date/Time	40	Planned ending time
Trip ID	Refer		Indication of trip
Customer	Refer		Address of customer if equipment not used for ferry
Extra	Char	80	Extra information

Information on the planned equipment usage.

Equipment usage

Field name	Type	Length	
Id	Integer		
Equipment	Refer	Equipment	What equipment has been used
From Location	Char	20	Location from where cargo is moved
To Location	Char	40	Location where cargo is moved
From	Date/Time		Time started
To	Date/Time		Time ended
Trip ID	Refer		Indication of trip
Customer	Refer		Address of customer if equipment not used for ferry
Extra	Char	80	Extra information

Information on the real usage of equipment.

Labor planned

Field name	Type	Length	
Id	Integer		
Labor	Refer	Labor	Who has planned work
From	Date/Time	20	Planned starting time
To	Date/Time	40	Planned ending time
Trip ID	Refer		Indication of trip
Customer	Refer		Address of customer if equipment not used for ferry
Extra	Char	80	Extra information

Information on the planned usage of labor.

Labor usage

Field name	Type	Length	
Id	Integer		
Labor	Rerer	Labor	Who has done the working
From Location	Char	20	Location from where cargo is moved
To Location	Char	40	Location where cargo is moved
From	Date/Time		Time started
To	Date/Time		Time ended
Trip ID	Refer		Indication of trip
Customer	Refer		Address of customer if equipment not used for ferry
Extra	Char	80	Extra information

Information on the real usage of labor.

Labor

Field name	Type	Length	
Id	Integer		
First name	Rerer	Labor	First name of employee
Last Name	Char	20	Last name of employee
Function	Char	40	Function of employee
Extra	Char	80	Extra information

Information about he employees.

Dangerous Goods

Field name	Type	Length	
Id	Integer		
Classification	Refer	Class	UN classification
Cargo name	Char	40	Name of cargo
Chemical name	Char	40	Fi H-2 O
Fire Symptoms	Char	400	What symptoms occur during fire
Fire Prevention	Char	400	What way is fire prevention performed
Fire aid	Char	400	What aid is needed in case of fire
Inhalation Symptoms	Char	400	What are the symptoms after inhalation
Inhalation Prevention	Char	400	What is the prevention after inhalation
Inhalation Aid	Char	400	What aid can be given after inhalation
Exposure Skin	Char	400	What happens in case of skin exposure
Exposure Eyes	Char	400	What happens in case of eye exposure
Exposure Ingestion	Char	400	What happens in case of ingestion
Spillage	Char	400	What should be done in case of spillage
Storage	Char	400	What kind of storage is needed
Label	Refer	Label	What kind of label is needed
Labeling	Char	400	Extra label description
Safety Cards	Char	400	First safety card needed
Safety Card	Refer	Safety	Second safety card needed

Safety Card	Refer	Card	Third safety card needed
Properties	Char	400	Properties of cargo
Notes	Char	400	Extra notes
ICSC code	Char	40	
CAS code	Char	40	
Emergency warning	Char	400	What warning can be given in case of emergency
Emergency Form	Char	40	What form should be used in case of emergency
Extra	Char	80	Extra information

Information about the dangerous cargo.

Label

Field name	Type	Length	
Id	Integer		
Short Description	Char	20	Location from where cargo is moved
Long Description	Char	40	Location where cargo is moved
Extra	Char	80	Extra information

The possible label for the dangerous cargo.

Card

Field name	Type	Length	
Id	Integer		
Short Description	Char	20	Location from where cargo is moved
Long Description	Char	40	Location where cargo is moved
Extra	Char	80	Extra information

The cards that should accompany the dangerous cargo.