SUSTAINABLE PORTS & SHIPPING

The Sustainable Ports and Shipping Network

www.portsandshipping.net

Global & Profesional Industry Network

Another Environmental or Sustainable Club ? NO

(there are sufficient)

Marine transport as the primary global transport system is instrumental to globalisation. We must be aware of our role(s) and responsibilities.

How to deal with our responsibilities ?

Agenda

- Background
- Alternative cooperation
  - ✓ Background CINS Network
  - ✓ Lack of data and standards
  - ✓ Industry Requirements
- Cooking Ingredients:
  - Operational Safety, Security, Health
  - Efficient Safeguarding Energy
  - Efficiency gains from integrated system design
  - Standardized data and form design
  - Integrated transport, port and vessel design

Sustainable Ports & Shipping

A. Background

- **The CINS Network**
- Lack of data and standards
- Industry Requirements

Sustainable Ports & Shipping

The 13th UNCTAD Conference Qatar
Doha, Wednesday 25th of April 2012

Special Session on CINS

CINS

The Cargo Incident Notification System & Organisation

Hosted by the Container Owner Association on behalf of participating Carriers

Anti-trust & Competition Law

All participants in this CINS session must abide by the anti-trust laws and associated regulations.

Any activities during this session which appear to be in violation with these anti-trust laws and associated regulations must be reported immediately to:

- Mr. Dirk Vande Velde, President CINS, or
- Mr. Patrick Hicks, Secretary General COA, or
- Any CINS Committee representative.

Code of Conduct

Code of Conduct

Within the Carrier's Cargo Incident Notification System Organisation our Members shall:

1. Support the implementation of, the development of, and encourage compliance with, appropriate standards, procedures, systems and control-security procedures for the related information and information systems. As such a formal commitment to a set of guiding principles is to be signed by each separate member.
2. Perform their duties with objectivity, due diligence and professional care, in accordance with professional standards, best practice and the decisions made by the Steering Committee. In this respect a series of codes, guidance notes and checklists are at the members' disposal
3. Serve in the interest of stakeholders in a lawful and honest manner, while maintaining high standards of conduct and character, and not engage in acts discreditable to the shipping industry. Inherent to the project is an open communication between members and other interested parties, both inside and outside the industry.
4. Maintain the privacy and confidentiality of information obtained in the course of their duties unless disclosure is required by legal authority or approved by the Steering Committee. Such information shall not be used for personal benefit or released to inappropriate parties. All disclosure of information to third parties needs to be approved by the Steering Committee.
5. Inform appropriate parties, including but not limited to the President Chairman and Vice president of CINS, of the results of work performed; revealing all significant facts known to them and sharing views and experiences.
6. Support the professional education of stakeholders in enhancing their understanding of the related policies, procedures and systems, including the security of the information and control of the data delivered to the CINS.
7. Consider of how best to encourage all member companies to commit themselves to, and participate in, CINS.
8. Be aware that any disciplinary measures will be investigated and submitted to disciplinary meeting among the Steering Committee and the accused party. Once majority believe disciplinary activity will affect other CINS member's interest, then the Steering Committee may issue injunction order against the party.
9. Comply with and respect all legally required anti-trust rules at all time. We refer to the respective anti-trust policy. The CINS Organisation commits to comply with the U.S. Sherman Act, Article 101 and 102 of EU treaty and any other nation's similar regulation of Antitrust, Competition or Cartel. No price fixing, capacity management and other commercial issues are allowed to be raised within the CINS Organisation.

Introduction (1)

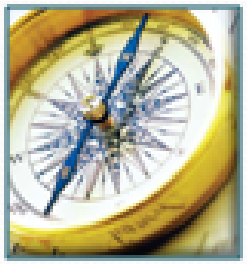
At the heart of the CINS initiative are CSR carriers

"Corporate Social Responsible Carriers"

With a main concern
for the safety of our people,

on board
&
ashore

Introduction (2)



But, as carriers, we also encounter:

- An increasingly globalising, more complex and demanding risk environment,
- Society's "zero tolerance" for failure,
- Increasing demands by customers,
- Stricter regulatory requirements and regimes,
- Shipping Industry's history of serious incidents,
- Mandatory Risk Management .

Did we forget?

The Notice to Mariners
of the Admiralty

inspired a joint ship owner safety taskforce to initiate
a similar notification system for cargo incidents

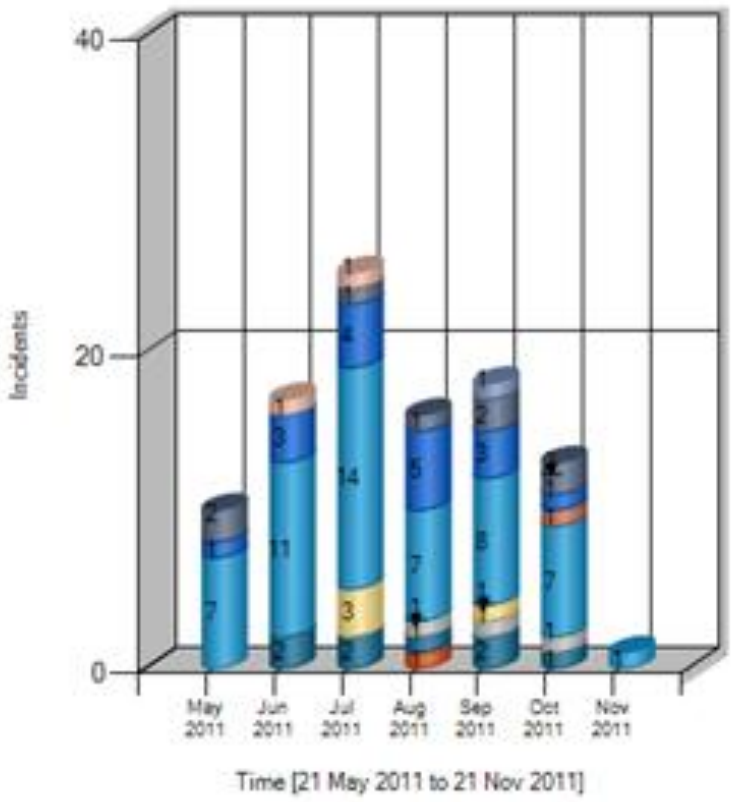
Scope

Incidents reported will be defined as follows:

"Any incident which causes or has potential to cause:

1. Injury or loss of life
2. Loss or serious damage of assets
3. Environmental concerns "

CINSNET Incidents Grouped by Incident Type



Key	Name	Total Incidents
	Temperature Controlled Unit Malfunction	0
	Tank Container Structural Integrity Failure	0
	Smuggling - weapons arms ammunition drugs ...	1
	Radiological Contamination	0
	Overpressure Valve Gas Release	2
	Other	8
	Official Certification Failure	0
	Mis-declared	17
	Legal Documentation Failure	1
	Leakage	55
	Inspection	4
	Illegal Waste Transport	0
	Flexytank Structural Integrity Failure	3
	Fire	8
	Explosion	1
	Bulk Container Structural Integrity Failure	0
	BK2 Non Compliant Equipment	0

Development

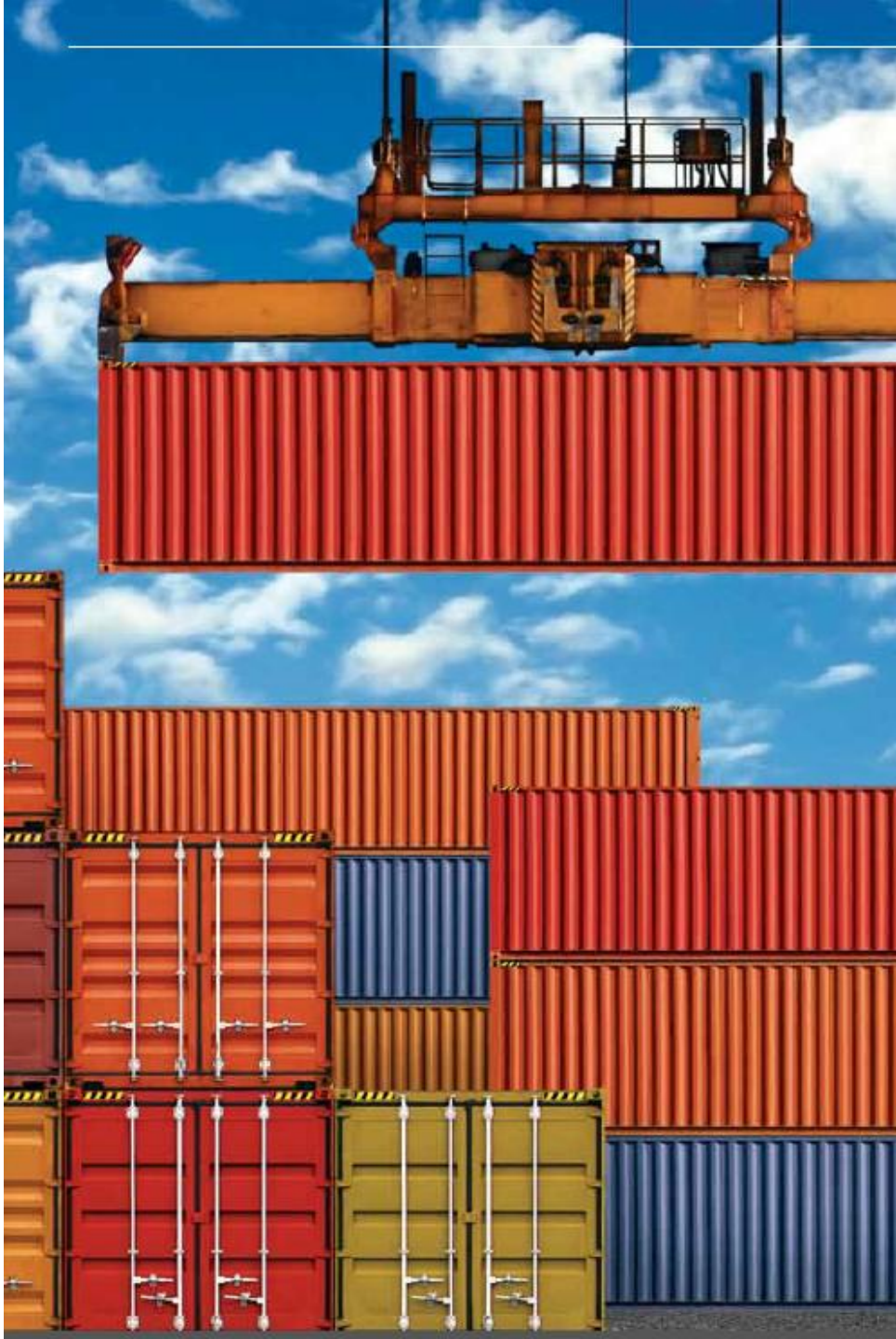
The CINS project intention is to develop and use a **continuous improvement model** to enhance the safety of carriage of cargo in the supply chain and reduce the risk to people involved, assets and the environment.

e.g. IAEA and Fukushima / Tepco consequences.


CINSNET
WWW.CARRIERS-CINS.ORG
WWW.CINSNET.ORG

A. Background

- The CINS Network
- **Lack of data and standards**
- Industry Requirements



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Worldwide, we all agree (unbelievable, but true)

- Answer: Possibly Yes (see price-volume diagram)
- More policy attention
- pathway to sustainability?
- Lack of data/assessment tools that are indicator-based
- Urgent need for a set of core indicators to help policymak
- OECD

EUROPEAN COMMISSION
Community research

Life Cycle Thinking is essential but …

- No common or authoritative basis to ensure consistency and quality
- Limited compatibility of data from different sources and countries (methods, formats, …)
- Dependence on expertise of single consultants/contractors
- Increasing number of inconsistent schemes, life cycle data, methods, …

- Growing global demands for LCT/LCA but conflicting messages
- Limited confidence in studies and instruments amongst some stakeholders

COOPERATION

The most urgent emission factors to reduce are the gaseous emissions (CO2, NOx, SOx) from thermal primary energy conversion.

This pres… describes technologies – both …isting and proven and those on the brink of realisation – for minimization of gaseous emissions from ships in order to achieve a global and sustainable transportation syst…

EUROPEAN COMMISSION
Community research

Benefits of consistent, robust, quality-assured life cycle data and methods

- Coherence across business and policy instruments
  - Consistent messages for decision support
  - "Level playing field", especially for product comparisons
- Reduction in hidden bias and unfounded claims
- Reduced dependence on single contractors
- Reduction in reporting requirements
- Better data availability / reduced costs

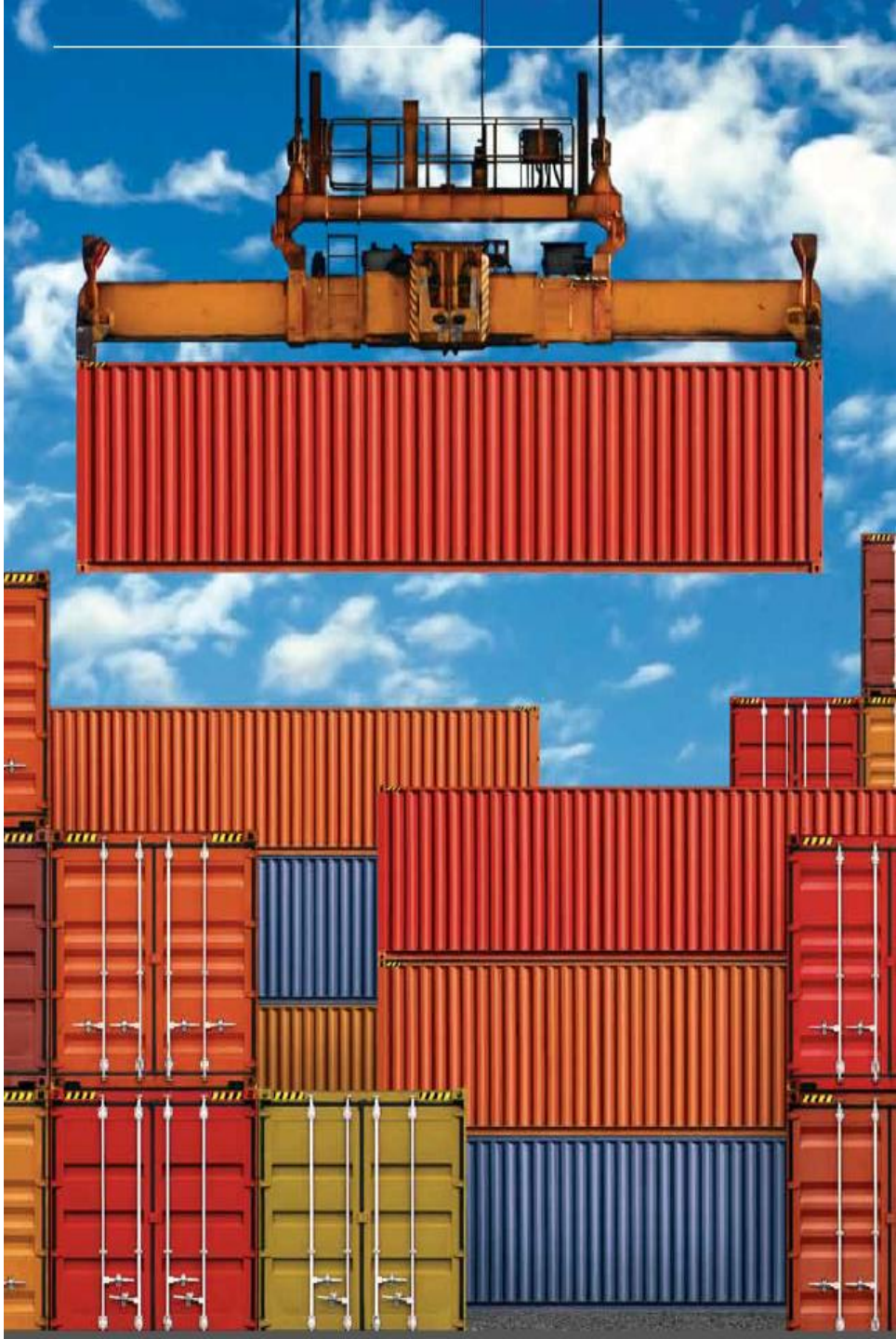
➢ Increased stakeholder acceptance

➢ More sustainable consumption and production patterns

COOPERATION

A. Background

- The CINS Network
- Lack of data and standards
- **Industry Requirements**



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- While writing our policies and management procedures, we remarked the different requirements from our industry

- While implementing our systems, we learned that there are actually **no standardized**

1. **Marine Safety Module(s)**
2. **Marine ECO Module(s)**
3. **Port & Ship Emergency Response Module(s)**
4. **Port & Ship Security Module(s)**

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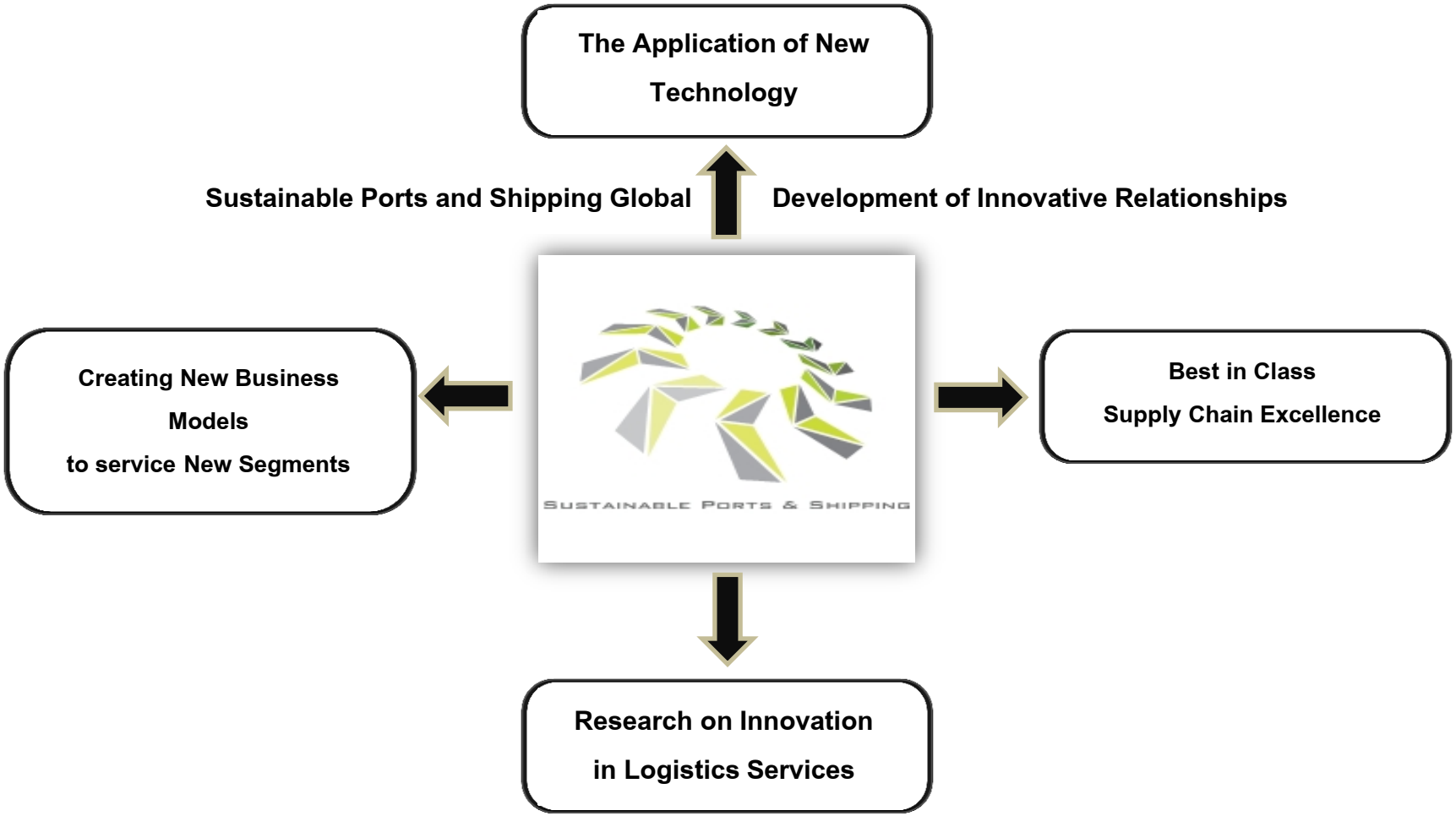
- **The Safety Module(s) is including**
  - One World DC System
  - IMDG cargo Management tools
  -
- **The ECO Module(s) is including**
  - EDI of Bunker Delivery Messages
  - IAPH & WPCI utilities
  - IMO MEPC EEDI, EEOI, SEEMP (on-line = dynamic)
- **The Port Safety Module(s) is including**
  - Emergency Response Systems
  - Including Port Restrictions @ global level
- **The Port & Ship Security Module(s) contains**
  - Including ISPS level control @ global level

Global Collaboration, Standardisation, Innovation, Integration



Business Leadership Today

- World Wide
- Fast Implementation
- Low Administration
- Cost Efficient
- Industry Driven
- Result Oriented
- Innovative and Creative
- Sustainable Approach
- Base Line Control
- Correct Data Quality

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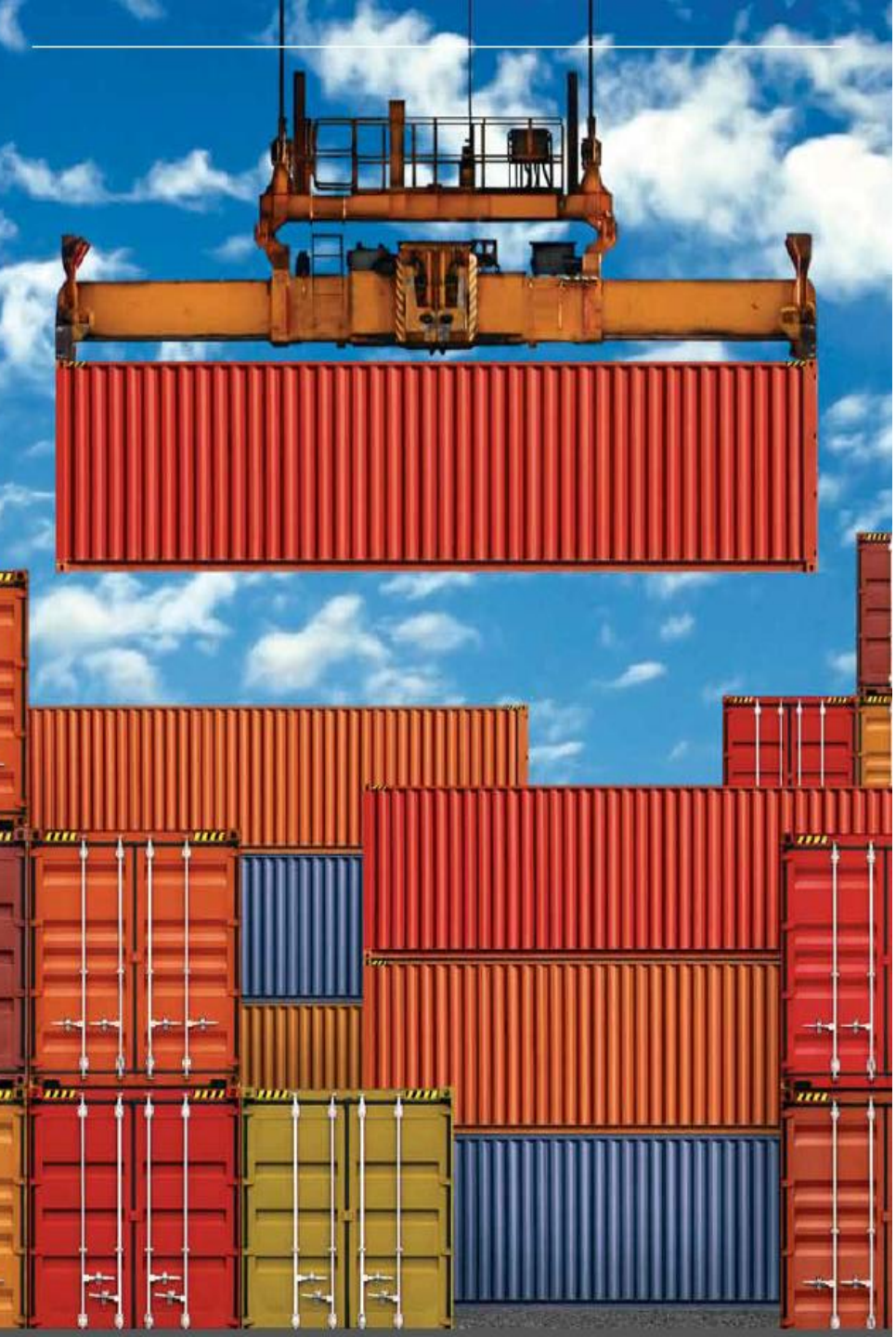

B. Port & Ship Safety Tool Box

- ✓ **IMO control**
- ✓ Ship Emergency
- ✓ Port Emergency
- ✓ Q-Data Availability

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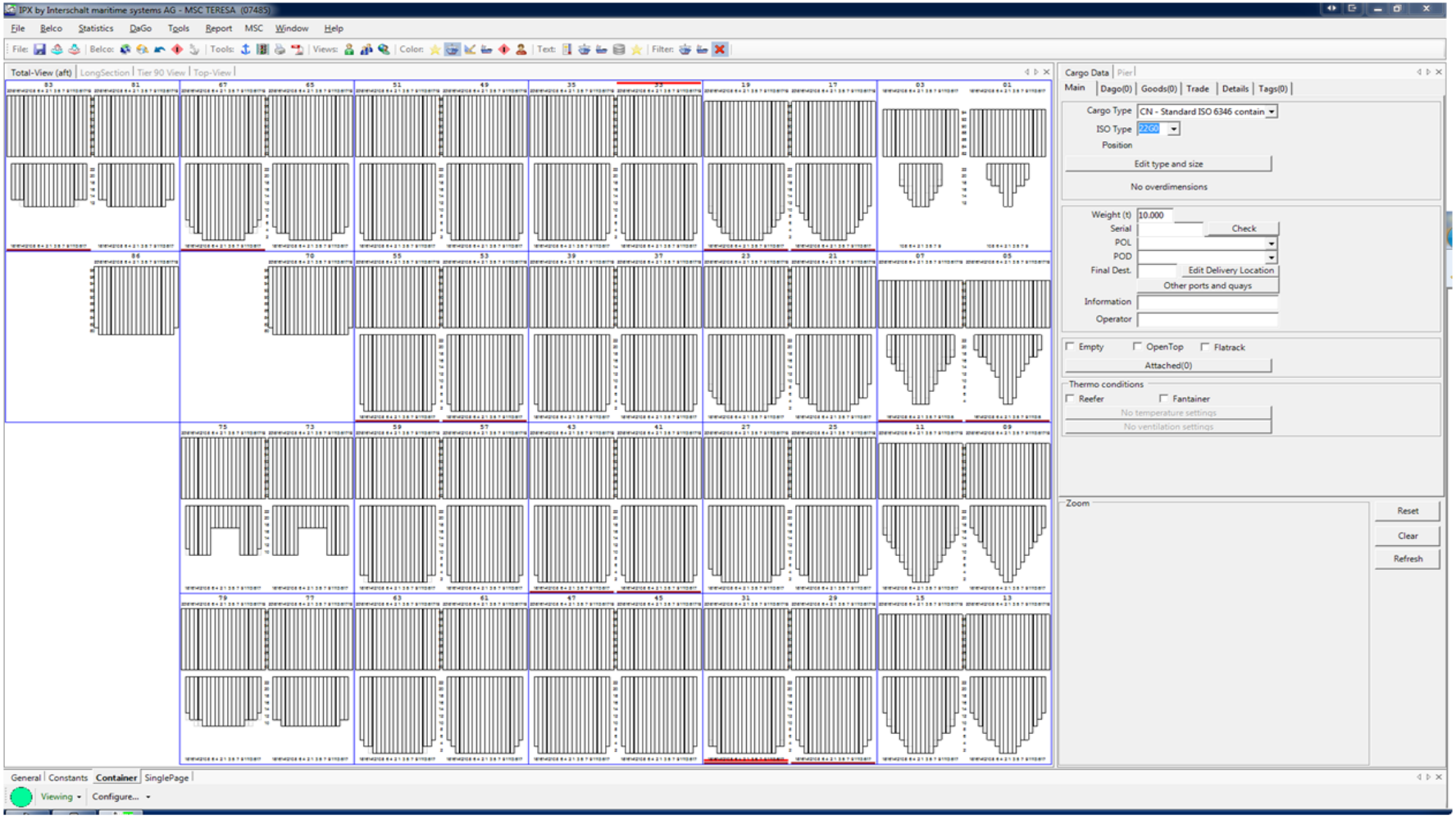
Utilities of the Safety Tool Box

The IMDG Check



IPX by Interschalt maritime systems AG - MSC TERESA (07485)

File Belco Statistics DaGo Tools Report MSC Window Help

Http Settings...
MAXS Settings..
Load Vessel Profile
Load CASP file from CASP Planning System
Check Current Condition
Load provisional BAPLIE from Terminal
Load provisional CASP file from Terminal
Load final Baplie from Terminal
Load final CASP from Terminal
Search Serial number
Save Casp

Total-View (aft) | LongSection | Tier 90 View | Top-View

Cargo Data | Pier

Main | Dago(0) | Goods(0) | Trade | Details | Tags(0)

Cargo Type: CN - Standard ISO 6346 contain
ISO Type: 22G0
Position
Edit type and size
No overdimensions

Weight (t): 10.000
Serial: Check
POL:
POD:
Final Dest.: Edit Delivery Location
Other ports and quays
Information:
Operator:

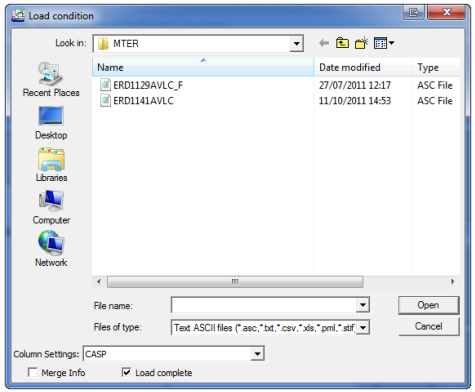
Empty OpenTop Flatrack
Attached(0)

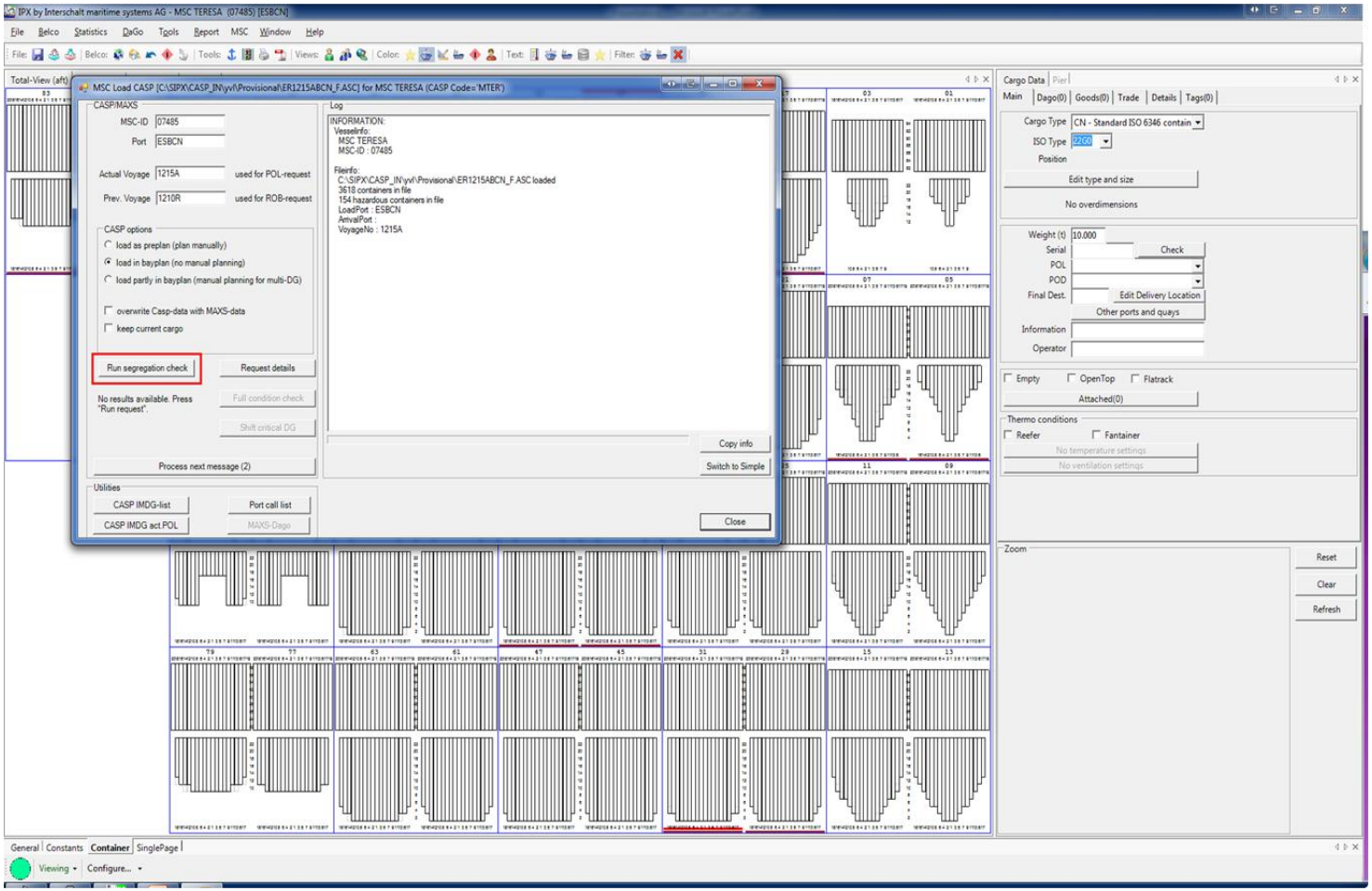
Thermo conditions
Reefer Fantainer
No temperature settings
No ventilation settings

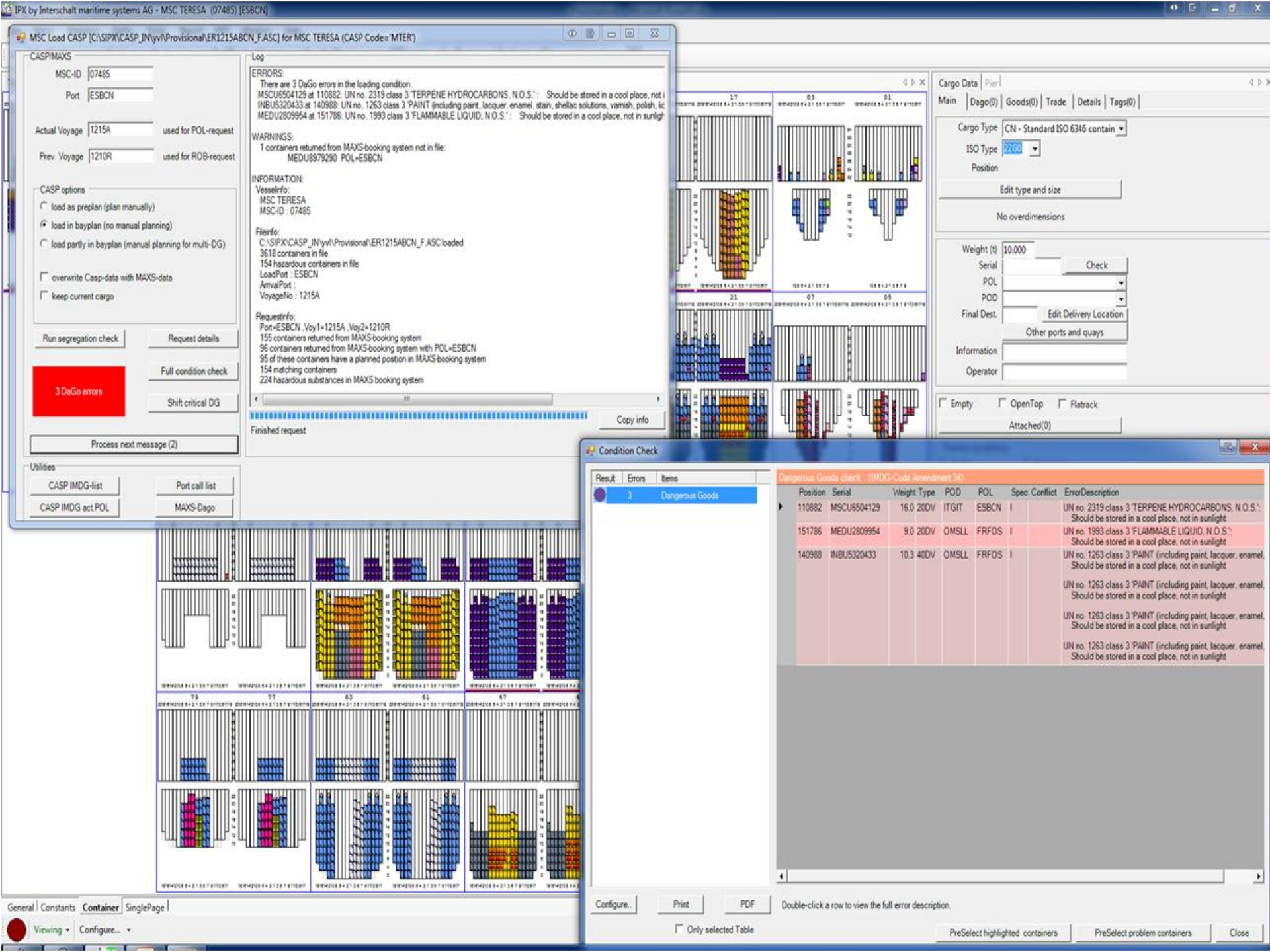
Zoom
Reset
Clear
Refresh

General | Constants | Container | SinglePage

Viewing | Configure...


Load condition
Look in: MTER
Name
Date modified
Type
ERD1129AVLC_F
27/07/2011 12:17
ASC File
ERD1141AVLC
11/10/2011 14:53
ASC File
Recent Places
Desktop
Libraries
Computer
Network
File name:
Files of type:
Text ASCII files (*.asc,*.txt,*.csv,*.xls,*.pml,*.stif
Open
Cancel
Column Settings: CASP
Merge Info
Load complete


IPX by Interschalt maritime systems AG - MSC TERESA (07485) [ESBCN]
File Belco Statistics DaGo Tools Report MSC Window Help
MSC Load CASP [C:\SIPX\CASP_IN\yvl\Provisional\ER1215ABCN_F.ASC] for MSC TERESA (CASP Code='MTER')
CASP/MAXS
MSC-ID 07485
Port ESBCN
Actual Voyage 1215A
used for POL-request
Prev. Voyage 1210R
used for ROB-request
CASP options
load as preplan (plan manually)
load in bayplan (no manual planning)
load partly in bayplan (manual planning for multi-DG)
overwrite Casp-data with MAXS-data
keep current cargo
Run segregation check
Request details
No results available. Press "Run request".
Full condition check
Shift critical DG
Process next message (2)
Log
INFORMATION:
VesselInfo:
MSC TERESA
MSC-ID : 07485
FileInfo:
C:\SIPX\CASP_IN\yvl\Provisional\ER1215ABCN_F.ASC loaded
3618 containers in file
154 hazardous containers in file
LoadPort : ESBCN
AntvalPort :
VoyageNo : 1215A
Copy info
Switch to Simple
Utilities
CASP IMDG-list
Port call list
CASP IMDG act.POL
MAXS-Dago
Close
Total-View (aft)
Cargo Data
Main
Dago(0)
Goods(0)
Trade
Details
Tags(0)
Cargo Type
CN - Standard ISO 6346 contain
ISO Type
22G0
Position
Edit type and size
No overdimensions
Weight (t)
10.000
Serial
Check
POL
POD
Final Dest.
Edit Delivery Location
Other ports and quays
Information
Operator
Empty
OpenTop
Flatrack
Attached(0)
Thermo conditions
Reefer
Fantainer
No temperature settings
No ventilation settings
Zoom
Reset
Clear
Refresh
General
Constants
Container
SinglePage
Viewing
Configure...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load as preplan (plan manually)
load in bayplan (no manual planning)
load partly in bayplan (manual planning for multi-DG)
overwrite Casp-data with MAXS-data
keep current cargo
Run segregation check
Request details
3 DaGo errors
Full condition check
Shift critical DG
Process next message (2)
Utilities
CASP IMDG-list
Port call list
CASP IMDG act.POL
MAXS-Dago
Log
ERRORS:
There are 3 DaGo errors in the loading condition.
MSCU6504129 at 110882: UN no. 2319 class 3 'TERPENE HYDROCARBONS, N.O.S.' : Should be stored in a cool place, not i
INBU5320433 at 140988: UN no. 1263 class 3 'PAINT (including paint, lacquer, enamel, stain, shellac solutions, varnish, polish, lic
MEDU2809954 at 151786: UN no. 1993 class 3 'FLAMMABLE LIQUID, N.O.S.' : Should be stored in a cool place, not in sunligh
WARNINGS:
1 containers returned from MAXS-booking system not in file:
MEDU8979290 POL=ESBCN
INFORMATION:
VesselInfo:
MSC TERESA
MSC-ID : 07485
FileInfo:
C:\SIPX\CASP_IN\yvl\Provisional\ER1215ABCN_F.ASC loaded
3618 containers in file
154 hazardous containers in file
LoadPort : ESBCN
ArrivalPort :
VoyageNo : 1215A
RequestInfo:
Port=ESBCN ,Voy1=1215A ,Voy2=1210R
155 containers returned from MAXS-booking system
96 containers returned from MAXS-booking system with POL=ESBCN
95 of these containers have a planned position in MAXS-booking system
154 matching containers
224 hazardous substances in MAXS booking system
Copy info
Finished request
Cargo Data
Pier
Main
Dago(0)
Goods(0)
Trade
Details
Tags(0)
Cargo Type
CN - Standard ISO 6346 contain
ISO Type
22G0
Position
Edit type and size
No overdimensions
Weight (t)
10.000
Serial
Check
POL
POD
Final Dest.
Edit Delivery Location
Other ports and quays
Information
Operator
Empty
OpenTop
Flatrack
Attached(0)
Condition Check
Result
Errors
Items
3
Dangerous Goods
Dangerous Goods check (IMDG-Code Amendment 34)
Position
Serial
Weight
Type
POD
POL
Spec
Conflict
ErrorDescription
110882 MSCU6504129 16.0 20DV ITGIT ESBCN I
UN no. 2319 class 3 'TERPENE HYDROCARBONS, N.O.S.':
Should be stored in a cool place, not in sunlight
151786 MEDU2809954 9.0 20DV OMSLL FRFOS I
UN no. 1993 class 3 'FLAMMABLE LIQUID, N.O.S.':
Should be stored in a cool place, not in sunlight
140988 INBU5320433 10.3 40DV OMSLL FRFOS I
UN no. 1263 class 3 'PAINT (including paint, lacquer, enamel,
Should be stored in a cool place, not in sunlight
UN no. 1263 class 3 'PAINT (including paint, lacquer, enamel,
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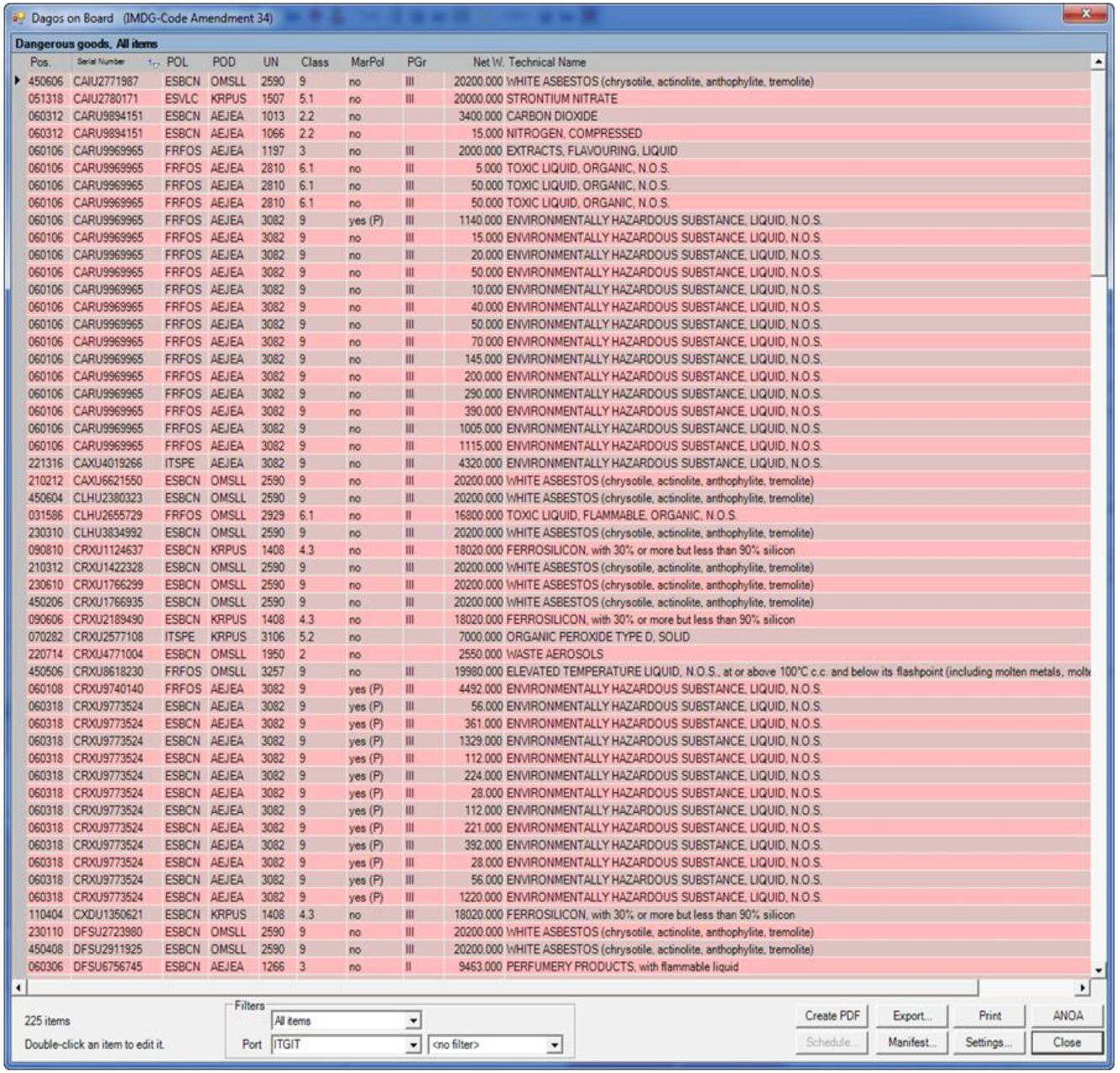
UN no. 1263 class 3 'PAINT (including paint, lacquer, enamel,
Should be stored in a cool place, not in sunlight
UN no. 1263 class 3 'PAINT (including paint, lacquer, enamel,
Should be stored in a cool place, not in sunlight
Configure..
Print
PDF
Double-click a row to view the full error description.
Only selected Table
PreSelect highlighted containers
PreSelect problem containers
Close
General
Constants
Container
SinglePage
Viewing
Configure...



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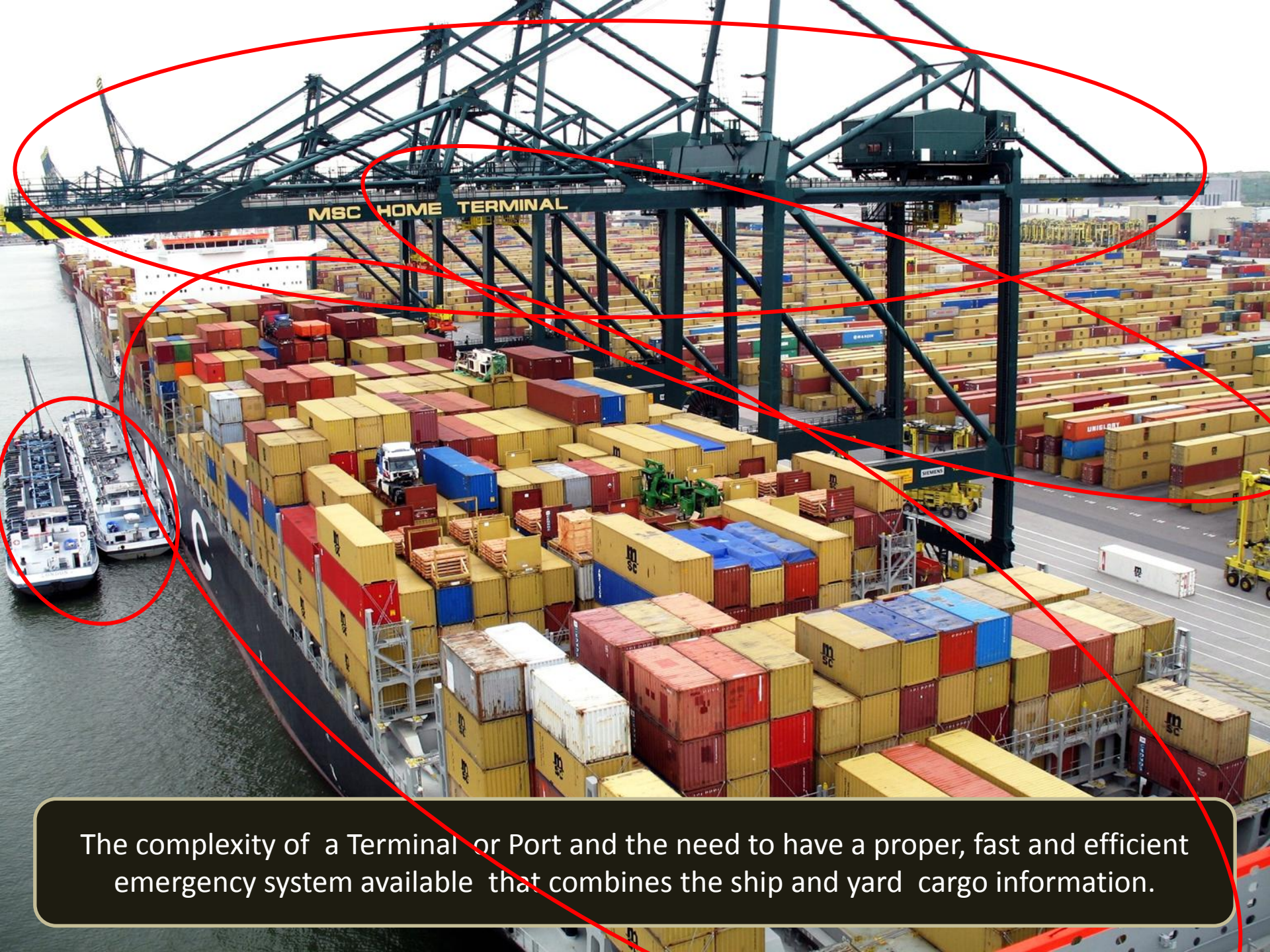
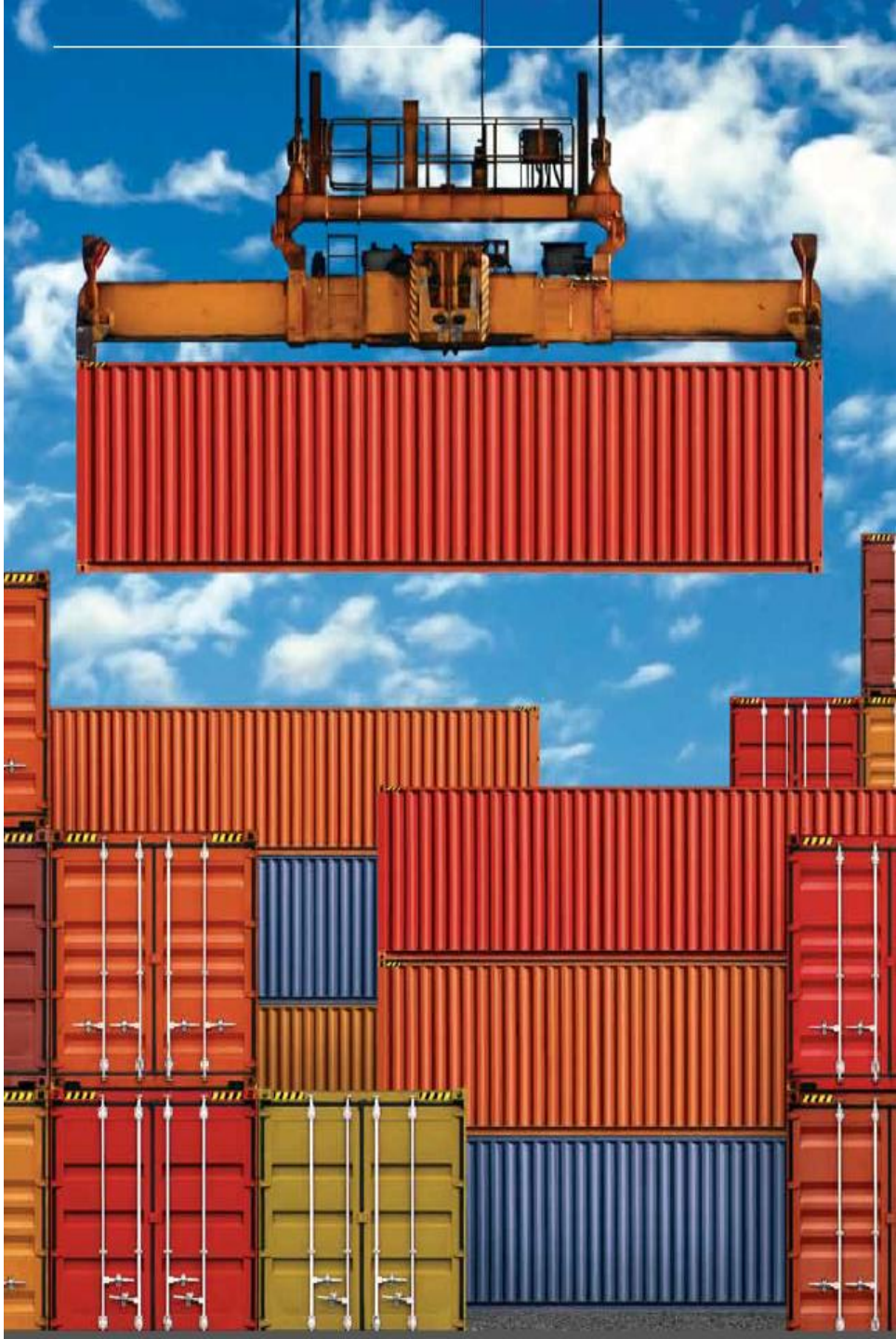


The complexity of a Terminal or Port and the need to have a proper, fast and efficient emergency system available that combines the ship and yard cargo information.


MSC

C. Eco Ship & Port Tool Box

- ✓ **Energy Efficiency (SPS)**
- ✓ Bunker ITL EDI Messages
- ✓ IMDG MEPC
  - ➢ EEDI
  - ➢ EEOI
  - ➢ SEEMP
- ✓ WPCI – ESI
- ✓ LNG bunker logistics



The ECO Tool Box for the Maritime Industry

Energy Efficiency Eco Design Research Development

Sustainable Ports & Shipping

ECO Design, Research & Development

Data Standardisation & Optimalisation
Environmental Risk Assessment
Sustainability and Eco Design & Research
Energy Efficiency in the Maritime & Transport Industry

2012-03-20

Sustainable Ports & Shipping

Necessary documents

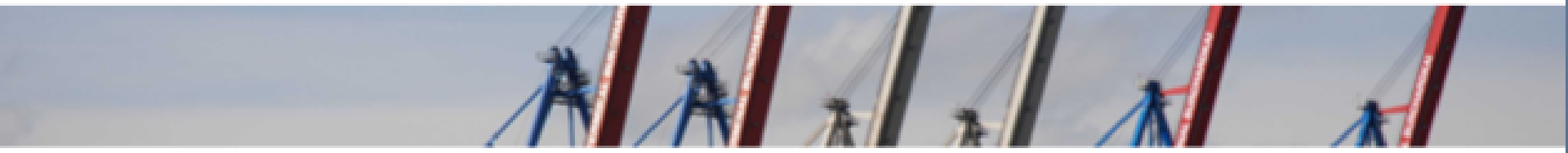
- NOx Technical File(s)
- (Finial) Trim and Stability Booklet
- Light weight certificate (if applicable)
- Sea trial report
- Model test report/results

Mission

- The Network is an **International Collaborative Group of Ports, Terminals, Carriers, In-land Transporters, Classification Societies and if required Consultants** with a general or specific expertise in areas where companies, local and national governments can **improve the socio-environmental performance** of their supply chains or transport infrastructure**.**

- Our focus is **to collect accurate, complete, consistent and transparent quality data of contaminants to land, sea or air**.

- Further **to calculate the amount and impact of these contaminants** caused by logistics activities and **to provide a wide range of effective and equitable solutions** to reduce energy use and emissions from logistics activities in the total supply chains.



- The second objective is to work in an international and scientific environment. This means that methodologies are valued, corrected, fine-tuned and improved within an on-line and empiracly controlled data system.

- The third objective of the organisation is to detect abnormal emissions to land, sea or air. This can be done via the set up of a Traffic Control System that alerts consequently the appropriate authorities whom can plan actions as per registered mandate.

- This ecologic-socio-economic performance control system of the supply chains or transport logistics can improve all related logistics activities on a world wide basis via proper analytics and steared research, design and or related development

ENERGY EFFICIENCY DESIGN INDEX INPUT

1.	**SHIP TYPE**		
1.1.	Ship type	5. Container ship	
1.2.	Ship name	MSC HEIDI	
2.	**FUEL**		
2.1.	Ship fuel, main engines	Heavy fuel oil (HFO)	
2.2.	Ship fuel, auxiliary engines	Diesel/gas oil (MGO)	
3.	**SHIP SPEED**		
3.1.	Ship speed (consistent to P_{ME} and Capacity)	21.23 knots	
4.	**CAPACITY**		
4.1.	Ship capacity in DWT (at deepest operational draught)	107,898 DWT	
5.	**POWERING**		
5.1.	Total installed main engine MCR power	93,120 kW	
5.2.	Installed power take out from main engine	68,250 kW	
5.3.	Efficiency of PTO generator	95.0 %	
5.4.	Installed power take in on propeller shaft(s)	0 kW	
5.5.	Weighted averaged efficiency of the generators	95.0 %	
5.6.	Main engine power reduction due to innovative technology	0 kW	
5.7.	Auxiliary engine power reduction due to innovative tehcnology	0 kW	
5.8.	Calculational auxiliary engine power for cargo ships	12824 kW	
	If actual elecric power differs considerably, value to be used	0 kW	
6.	**SPECIFIC FUEL CONSUMPTION**		
6.1.	Specific fuel consumption of main engines (as in EIAPP cert tech file)	156 g/kWh	
6.2.	Specific fuel consumption of auxiliary engines (as in EIAPP cert tech file)	167 g/kWh	
7.	**POWER CORRECTION FACTOR FOR SHIP SPECIFIC DESIGN ELEMENTS**		
7.1.	Ship ice class (Finnish-Swedish)	no ice class	
7.2.	Ship length between perpendiculars (if ice class)	263 m	
8.	**CAPACITY CORRECTION FACTOR FOR SHIP SPECIFIC DESIGN ELEMENTS**		
8.1.	Capacity factor for any technical/regulatory limitation on capacity	1.000 (dimensionless)	
9.	**DECREASE OF SPEED IN REPRESENTATIVE SEA CONDITIONS**		
9.1.	Coefficient for decrease of speed in representative sea conditions	1 (dimensionless)	
10.	**AVAILABILITY OF INNOVATIVE TECHNOLOGIES**		
10.1.	Availability factor for innovative tehcnologies (Peff)	1 (dimensionless)	

EEDI Parameters

Baseline	= 139.38 · Capacity^-0.2166
C_{FME}	= 3.1144
C_{FAE}	= 3.206
V_{ref}	= 21.23
Ca	
P_{PTI}	= 1
P_{eff}	= 0
P_{eeff}	= 0
P_{AE}	= 12,82
SFC_{ME}	= 156
SFC_{AE}	= 167
f_j	= 1.000
f_i	= 1.000
f_w	= 1
f_{eff}	= 1

SUSTAINABLE PORTS & SHIPPING

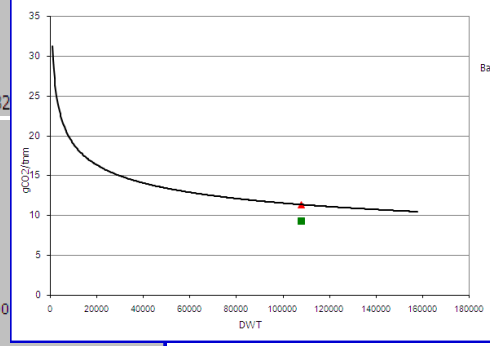
CALCULATION OF THE ENERGY EFFICIENCY DESIGN INDEX

$$EEDI = \frac{f_j \cdot (P_{ME} \cdot C_{FME} \cdot SFC_{ME}) + (P_{AE} \cdot C_{FAE} \cdot SFC_{AE}) + ((f_j \cdot P_{PTI} - f_{eff} \cdot P_{AEeff}) \cdot C_{FAE} \cdot SFC_{AE}) - (f_{eff} \cdot P_{eff} \cdot C_{FME} \cdot SFC_{ME})}{f_i \cdot Capacity \cdot V_{ref} \cdot f_w}$$

$$EEDI = \frac{1 \cdot (29429\,kW \cdot 3.1144\,gCO2/g \cdot 156\,g/kWh) + (12824\,kW \cdot 3.206\,gCO2/g \cdot 167\,g/kWh) + ((1 \cdot 1\,kW - 1 \cdot 0\,kW) \cdot 3.206\,gCO2/g \cdot 167\,g/kWh) - ((1 \cdot 0\,kW \cdot 3.1144\,gCO2/g \cdot 156\,g/kWh)}{1 \cdot 107898.1\,t \cdot 21.23\,nm/h \cdot 1}$$

$$EEDI = \frac{14297974\,gCO2 + 6865995.248\,gCO2 + 401.5515\,gCO2 - 0\,gCO2}{2290677\,t{\cdot}nm} = \frac{21164371\,gCO2}{2290677\,t{\cdot}nm} = \mathbf{9.239\ gCO2/t{\cdot}nm}$$

OBTAINED EEDI AND COMPARISON WITH BASELINE



Baseline = 139.38 · Capacity ^ - 0.2166

Baseline requirement = 11.325 gCO2/t·nm

MSC HEIDI = 9.239 gCO2/t·nm

Difference = -2.086 units

Difference = -18.4 %

More to come

- Modules are developed and managed
  - ✓ **centralised manner → regulation and data update**
  - ✓ **i.f.o. the needs of stakeholders and members**
  - ✓ **and verified by academic people**

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