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Abschlussveranstaltung des MarLife Verbundforschungsprojekts

Bremen, 26. November 2008

Hazardous Material Monitoring

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Hazardous Material Monitoring - Motivation

- IMO-Aktivität: Erstellen einer Konvention zum sicheren und umweltfreundlichen Abwracken von Schiffen
- ein Schwerpunkt ist die Erfassung der im Schiff verbauten Schadstoffen
 - durch Werften beim Neubau (BMWV-Vorhaben ERVESIS)
 - durch Eigner in der Betriebsphase – Lifecycle-Thema ⇒ **MarLife**



Gründe für die IMO-Aktivitäten

- Unakzeptable Arbeitsbedingungen und fehlender Umweltschutz beim Abwracken (Bangladesh, Indien, Pakistan)
- Öffentlicher Druck (NGOs in Industrieländern)
- Problembewusstsein auf Seiten der „abwrackenden“ Länder:
 - Fehlende Schadstoffdokumentation ⇒ „Irrfahrten“
 - **“Clemenceau“** (Asbest)
 - Frankreich - Indien - Frankreich
 - **“Blue Lady“** - ex **“Norway“** (Asbest, PCB)
 - Deutschland - Bangladesh - Indien
 - **“Otapan“** (Asbest)
 - Niederlande - Türkei – Niederlande



Auswirkungen der Konvention

- Regelungsbereich:
 - Neubauten > 500GT und neue Installationen ab Inkrafttreten der Konvention
 - Bestandsschiffe > 500GT beim ersten Klasselauf nach Inkrafttretung
- Raumbezogene Erfassung der verbauten Schadstoffe in einem Schiff ist das Hauptproblem für Reeder
 - Wandisolierung in der Küche enthält 50 g Asbest
- Dokumentation wird in einer Richtlinie im Anhang zur Konvention vorgeschrieben
- Standardisiertes Format \Rightarrow Inventory of Hazardous Materials (IHM)



Inventory of Hazardous Materials (IHM)

- IHM wird Teil der Port State Control
- muss zertifiziert werden
- Zertifikat ist alle 5 Jahre zu erneuern

⇒ Pflege der Daten über die Lebensdauer



Umfang der IHM

Categories	Part 1 Structure & Equipment	Part 2* Operationally Generated Waste	Part 3* Stores
Table A Materials (Appendix 1 of convention) Obligatory for New and Existing Ships	X		
Table B Materials (Appendix 2 of convention) Obligatory for New Ships and new installations; voluntary for Existing Ships	X		
Table C Potentially Hazardous Goods		X	X
Table D Regular Consumable Goods			X

IHM: Hazardous Materials gemäß Table A

- **Tabelle A:**
 - für Neubauten,
 - Umbauten,
 - Neuinstallationen und
 - Erstaufnahme bei existierenden Schiffe

- **Tabelle B:**
 - für Neubauten,
 - Umbauten und
 - Neuinstallationen

No.	Materials	
A-1	Asbestos	
A-2	Polychlorinated Biphenyls (PCBs)	
A-3	Ozone Depleting Substances	CFCs
		Halons
		Other fully halogenated CFCs
		Carbon Tetrachloride
		1,1,1-Trichloroethane (Methyl chloroform)
		Hydrochlorofluorocarbons
		Hydrobromofluorocarbons
A-4	Organotin compounds	Methyl bromide
		Bromochloromethane
		Tributyl Tins
		Triphenyl Tins
		Tributyl Tin Oxide (TBTO)

No.	Materials
B-1	Cadmium and Cadmium Compounds
B-2	Hexavalent Chromium and Hexavalent Chromium Compounds
B-3	Lead and Lead Compounds
B-4	Mercury and Mercury Compounds
B-5	Polybrominated Biphenyl (PBBs)
B-6	Polybrominated Diphenyl Ethers (PBDEs)
B-7	Polychloronaphthalenes (more than 3 chlorine atoms)
B-8	Radioactive Substances
B-9	Certain Shortchain Chlorinated Paraffins (Alkanes, C10-C13, cl

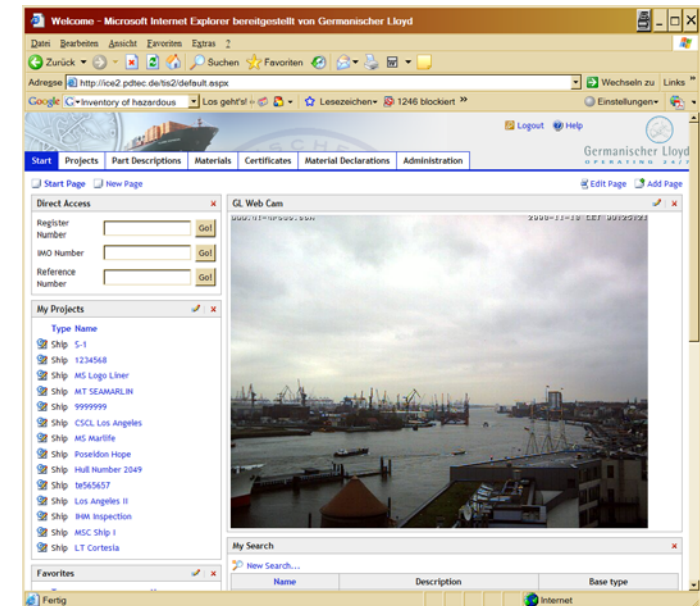
Hazardous Material Monitoring System (GL-HMMS)

- **Anforderungen:**

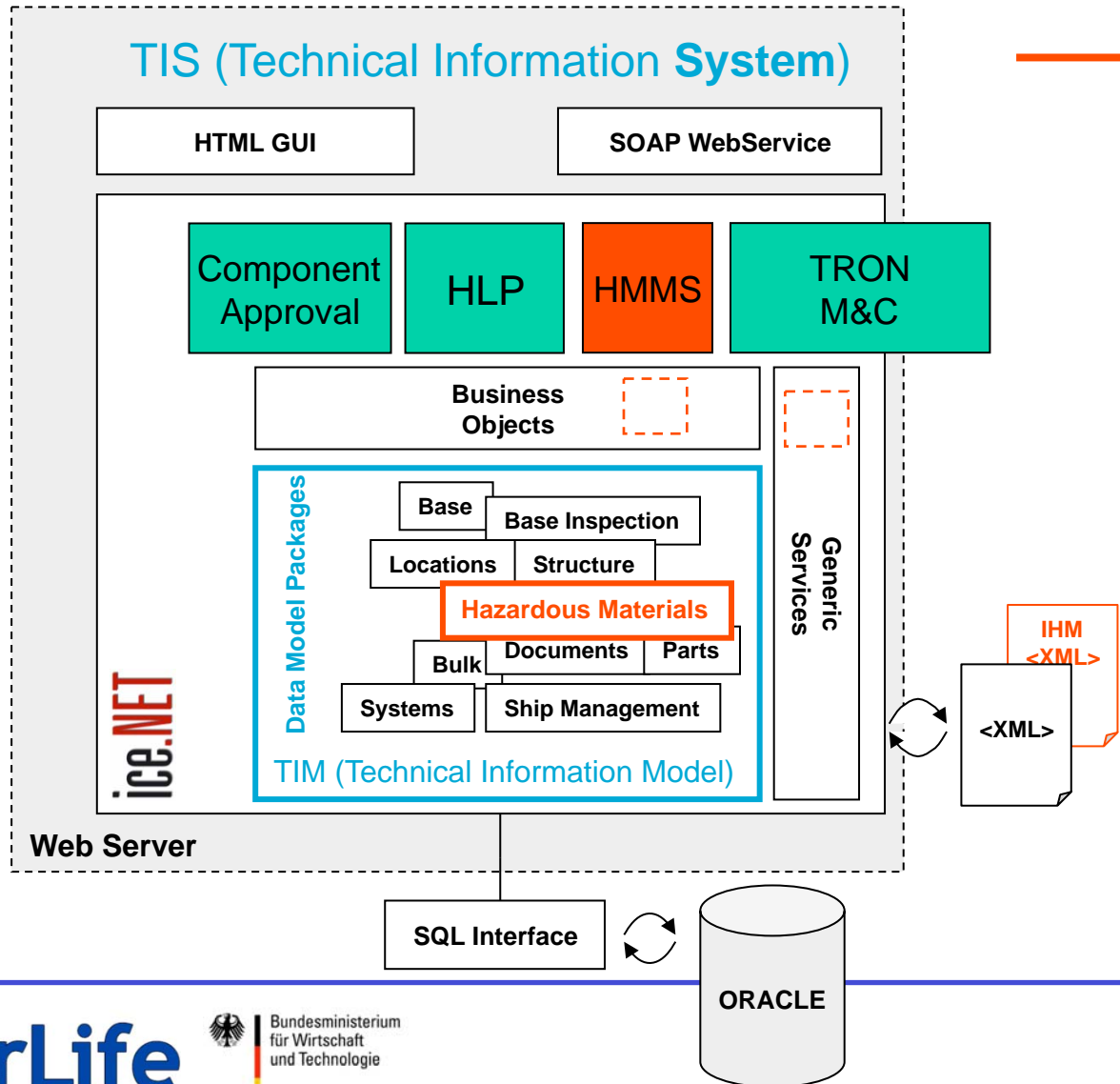
- Lifecycle-gerechte Ablage der notwendigen IHM-Informationen (Schadstoffart und -menge, Verortung) für:
 - Systeme
 - Komponenten
 - Verbrauchsmittel (Farben, Fußbodenbelägen usw.)
- Datenkontrollmechanismen (Vollständigkeit, Plausibilität)
- Automatische Erstellung einer IHM

- **Lösung:**

- Integration der IHM-Daten in das Lifecycle-Modell des Schiffes
- Implementierung einer Business Logik zur automatischen Erstellung einer IHM
- Umsetzung als Web Applikation

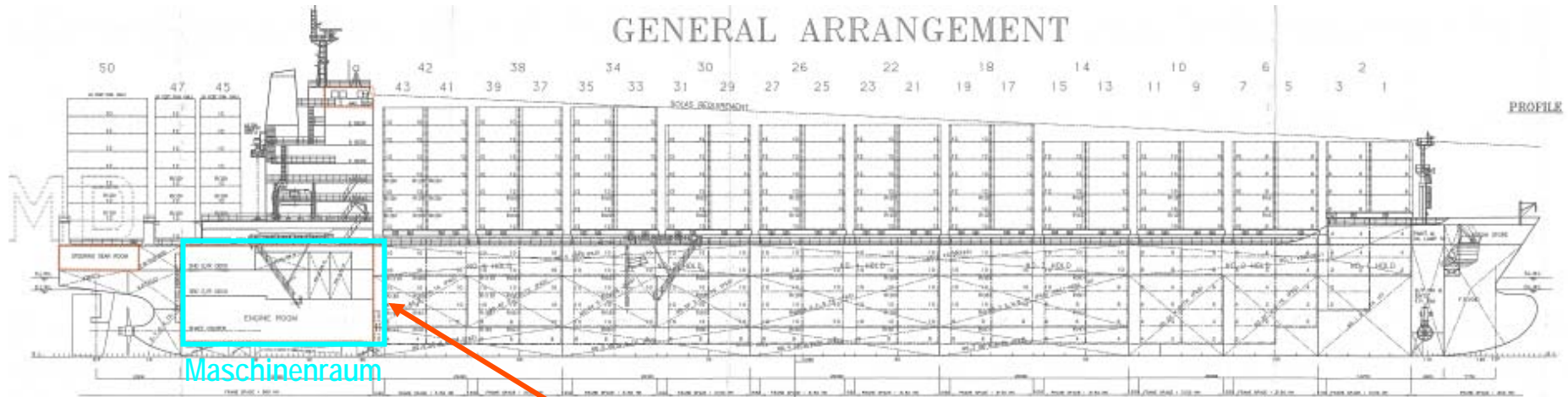


HMMS: System Architektur



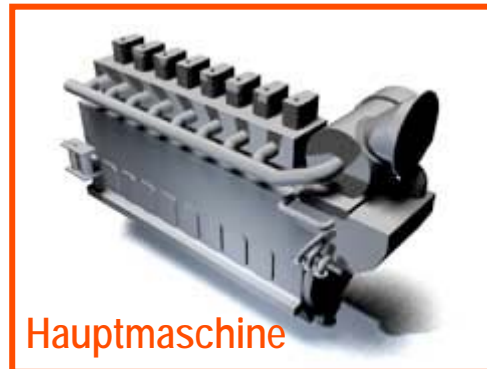
— TIS Komponenten für HMMS (MarLife)

HMMS: Beispieldaten



Maschinenraum

steht im



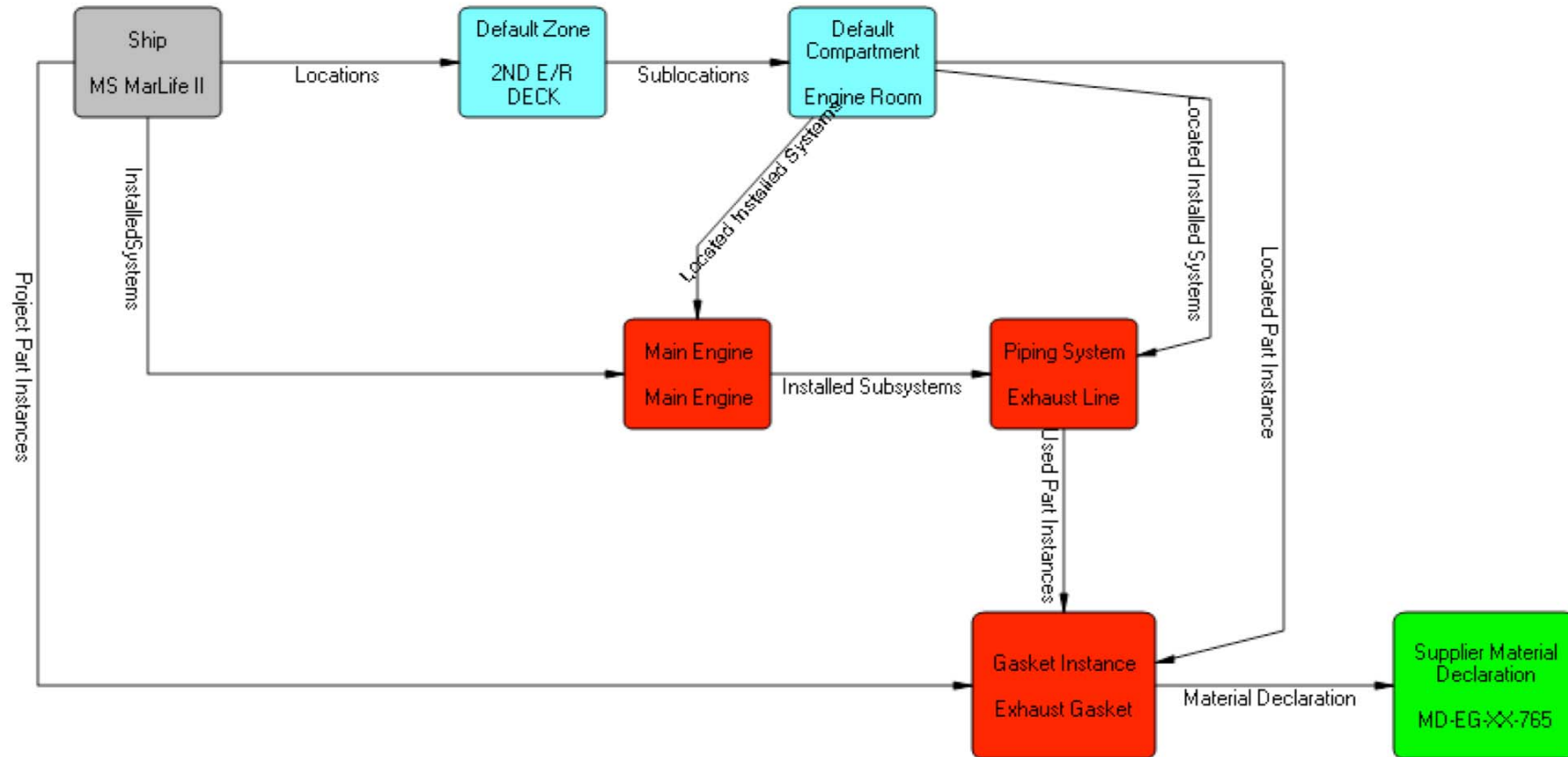
Hauptmaschine

enthält
Schadstoffe

Material Declaration					
-Date of Declaration-					
-MD ID Number-					
-MD Title-					
-Supplier (Respondent) Information-					
-Product Information-					
-Material Information-					

Materialdeklaration

HMMS: Beispieldaten



HMMS – Beispiel: Hauptmaschine

The screenshot displays the HMMS software interface for Germanischer Lloyd. The left sidebar shows a project tree with 'MS MarLife II' selected, leading to 'Main Engine'. The main window shows the configuration for the 'Main Engine' (Diesel Motor M.A.N 7K50MC-C). Below this, a table lists installed subsystems.

Parameter Sets	Subsystems	Calculation	Additionally used	Material Declarations	Used Installed Parts	Manufacturer	Where used in
Name	Type	Valid from	Changed on	Description			
Cylinder Station 1	Default Installed System	17/09/2008 15:19:20	18/09/2008 08:28:41 [uleb]	Cylinder Station 1			
Cylinder Station 2	Default Installed System	17/09/2008 15:19:52	18/09/2008 08:28:41 [uleb]	Cylinder Station 2			
Cylinder Station 3	Default Installed System	17/09/2008 15:20:18	18/09/2008 08:28:41 [uleb]	Cylinder Station 3			
Cylinder Station 4	Default Installed System	17/09/2008 15:20:35	18/09/2008 08:28:41 [uleb]	Cylinder Station 4			
Cylinder Station 5	Default Installed System	01/01/0001 01:00:00	18/09/2008 08:28:41 [uleb]	Cylinder Station 5			
Cylinder Station 6	Default Installed System	17/09/2008 15:27:48	18/09/2008 08:28:41 [uleb]	Cylinder Station 6			
Cylinder Station 7	Default Installed System	17/09/2008 15:28:06	15/10/2008 12:03:24 [uleb]	Cylinder Station 7			
Exhaust Line	Piping System	11/11/2008 08:50:13	11/11/2008 07:50:39 [uleb]	Exhaust Line			

Version: 1.0.3224 (29/10/2008)

HMMS-Beispiel: Dichtung in der Abgasleitung

The screenshot shows the Germanischer Lloyd HMMS software interface. The top navigation bar includes 'Start', 'Projects', 'Part Descriptions', 'Materials', 'Certificates', 'Material Declarations', and 'Administration'. The main window is divided into a left-hand tree view and a right-hand detail view.

Tree View (Left): Shows a hierarchical structure of installed parts. The 'Exhaust Gasket' (EG-XC-765) is highlighted under the 'Main Engine Exhaust Manifold'.

Detail View (Right): Displays the 'Gasket Instance' details for 'Exhaust Gasket'. The instance ID is 159-852KK4, installed in 2006. The description is 'between Exhaust Manifold and Exhaust Pipe'. The manufacturer is 'M. A. N.'. The last changed date is 13/11/2008 12:34:49 [uleb].

Actions Panel (Far Right): Lists various actions such as 'Edit...', 'Add Parameter Set...', 'Reference new Part Description...', 'Add Test Certificate...', 'Add Additionally used...', 'Add Attachment...', 'Add External Document Reference...', 'Create Data Set...', 'Create Functional Unit...', 'Create Material Declaration...', 'Remove/Delete...', and 'Export...'.

Parameter Sets Table:

Parameter Sets	Part Description	Additionally used	Test Certificates	Material Declarations	Where used in	Attachments
Name	Changed on		Description	Edit link		
M/D-EG-XC-765	11/11/2008 09:03:10 [uleb]					

Historic Material Declarations Table:

Name	Changed on	Description	Edit link
No Items found			

Version: 1.0.3224 (29/10/2008)

HMMS – Beispiel: Materialdeklaration für die Dichtung

Material Declarations > MD-EG-XX-765

Supplier Material Declaration MD-EG-XX-765

ID	24924
Type	Supplier Material Declaration
Description	
Last changed	11/11/2008 10:03:10 [uleb]
<i>Material Declaration</i>	
Date of declaration	11/11/2008 10:00:00
Status of hazardous material	Positive
<i>Supplier Material Declaration</i>	
Identification number	
SoC identification number	
SoC revision number	
Manufacturer	M. A. N.
Person in charge	
Product name	
Mass	0.5 kg
Mass per unit area	kg/m ²
Mass per unit length	kg/m
Mass per unit volume	kg/m ³
Product code	EG-XX-765

Actions

- Edit...
- Add Referenced SoC...
- Add Attachment...
- Add External Document Reference...
- Remove/Delete...

Material Definitions	Referenced SoCs	Where used list	
Substance Group	Mass of substance [kg]	Parts of use	Exceeded threshold level
Asbestos	0.4	insulation	True

Erstelltes Schadstoffkataster (Inventory of Hazardous Materials)

1.1 Paints, Coating Systems and other Processed Materials containing materials listed in Table A and Table B of Appendix 1 of the Guidelines

No.	Application of Coating	Name of Coating	Location	Manufacturer	MD-ID No.	Substance Group	Appx.Quantity		Parts of use	Remarks
							Mass	Unit		
1	Anti-corrosiv Paint	Exagard 400	MAIN DECK	Coatings Maritime	A08.0013	Lead and Lead Compounds	72	kg		Dark grey colour
2	Anti-corrosiv Paint	Exagard 700	MAIN DECK	Coatings Maritime	A08.0014	Lead and Lead Compounds	58	kg		Coat, Yellow colour

1.2 Equipment and Machinery containing materials listed in Table A and Table B of Appendix 1 of the Guidelines

No.	Name of Equipment and Machinery	Location	Manufacturer	MD-ID No.	Substance Group	Appx.Quantity		Parts of use	Remarks
						Mass	Unit		
1	Exhaust Gasket	Engine Room	M.A.N.	MD-EG-XX-786	Asbestos	0.4	kg	insulation	
2	5th Deck FWD Compressor	E DECK	MarLife Company	MD-Comp-00786	Asbestos	1	kg	cardboard	Insulation

1.3 Systems containing materials listed in Table A and Table B of Appendix 1 of the Guidelines

No.	Name of System	Location	Manufacturer	MD-ID No.	Substance Group	Appx.Quantity		Parts of use	Remarks
						Mass	Unit		
1	Ceiling	NAV DECK		A08.0012	Asbestos	5.5	kg	Foams	Insulation
					Asbestos	13	kg	Mineral Wool	
2	Exhaust Line	Engine Room		MD5-00087	Asbestos	8	kg	insulation	Insulation for Exhaust Piping