

The MSC Flaminia

Thomas Höfer

MSC Flaminia, 85823 DWT, **6750 TEU**, 299 x 40 m

built by Daewoo in 2001

German flag; German ship owner; German ship management

Cargo manager / charterer: MSC Mediterranean Shipping Co.

On route July 2012: crew of 23 + 2 passengers + 2876 containers

Houston – Charleston – Antwerp - Bremerhaven



14 July 2012

Assumption according to the official German Investigation Report:
Exothermic reaction in 2 tanks with a stabilized chemical mixture,
resulting fire with 2 explosions injuring several members of the crew

Ca. 900 nm from Brest (France) / Falmouth (UK)

Photograph taken on 14 July 2012 from tanker DS Crown



17 - 21 July 2012

Crew and passengers off board;

Status of crew: 1 dead, 1 missing, 1 heavily injured, 4 injured

Arrival of 3 salvage tugs on 17, 19 and 21 July

Photograph taken on 17 July 2012 by Smit Salvage from Fairmount Expedition



18 – 24 July 2012

Fire fighting / cooling of ship and cargo from tugs

First boarding of rescue team on 20 July, fire fighting on board,
MSC Flaminia is taken in tow



25 – 27 July 2012

Fire fighting on board

Towing towards British Islands / France

Severe list (later up to 10°), draft increasing (later up to 19 m)



30 July - 5 August 2012

No fire fighting on board, stormy weather (in total for 13 days)

On **31 July**: Activation of MAR-ICE (Marine Intervention in Chemical Emergencies Network) including CEDRE



6 – 17 August 2012

Fire fighting on board, smouldering fire in open holds

Strategic discussions on salvage strategy intensified with competent authorities including UK, NL, France, Belgium, Germany

18 - 19 August 2012

Towing towards Land's End (UK)



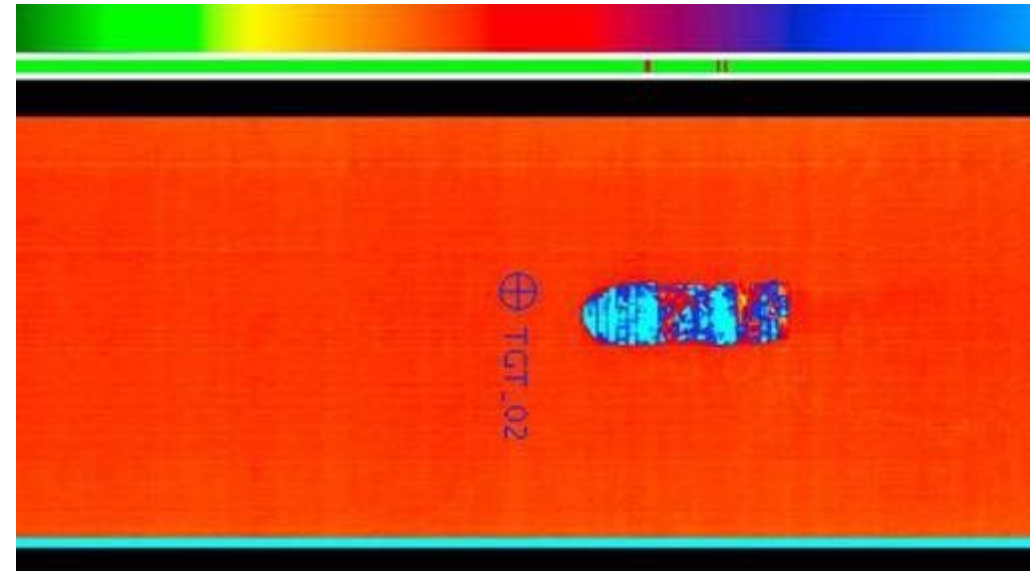
20 August 2012

Responsibility of Flag State declared (first offer from 15 August)

Central Command for Maritime Emergencies Germany (CCME):
Start of work for the MSC Flaminia incident



21 - 31 August 2012



Duties (at BfR)



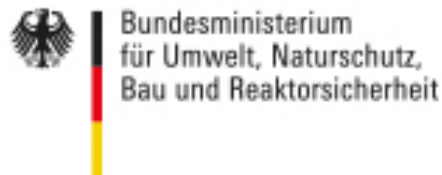
Press briefings via CCME

Answering requests on cargo for CCME

Open communication with environmental NGO's (9-13 hrs/5)

Consulting („help desk“) for CCME (24 hrs/7)

Lead management for consultation with experts of the *Independent Group of Environmental Experts* to optimise scientific information



Independent Group of
Scientists (UEG)

Duties (at BfR)



Bundesinstitut für Risikobewertung

Plausibility check of industry data (MSDS) and cargo manifest for dangerous goods' containers

Prepare „Civil Protection“ und „Occupational Safety“ guidance

Information on health protection in case of direct contact:

- health hazards
- first aid advice



**UK experience from
MSC Napoli incident 2007**



2876 Containers / 153 Dangerous Goods Containers

Stowage, fate and hazards of cargo transport units

HOLD 3

HOLD 4

HOLD 5

HOLD 6

HOLD 7



Overview on dangerous goods data

1. Compilation of available documents

- (1) Cargo Manifest
- (2) Dangerous Goods Declarations
- (3) information communicated by consignors

2. Identification of hazards of goods loaded inside containers

Safety Data Sheets compiled by chemical industry fire brigades (BASF SE & Dow Chemical) via TUIS (Transport-Accident-Information and Technical-Support-System is „national ICE“)

3. Connecting information from salvage master

to individual containers with above mentioned information

- about 72 destroyed or lost
- about 24 damaged or effected by fire
- about 55 in principle intact

Objectives for the risk assessment approach

1. Identification of those **hazards which are specific** to the MSC Flaminia incident
„specific hazards“ are those not common to all vessels under distress (e.g. fuel oil)
2. Hazard evaluation with the **emphasis on precautionary measures** during emergency operations
either on board, on sea, on beach or during site cleaning
3. No **comprehensive risk assessment** (hazard x probability)
the stability of the vessel was of highest importance and the probability of total loss was not calculable

Fire fighting water

Independent Group of
Scientists (UEG)

Suspicion:

Strong contamination by chemicals from leaking dangerous goods cargo

Evaluation:

Because of the large volume (first estimate: 20,000 tonnes) even „slight“ contamination could create hazards to the marine environment

Chemical analysis and biological testing:

after evaluation of the situation by UEG scientists ecotoxicological testing was recommended (supported by scientific literature)



Ecotoxicity tests

(performed at Federal Institute of Hydrology, BfG)

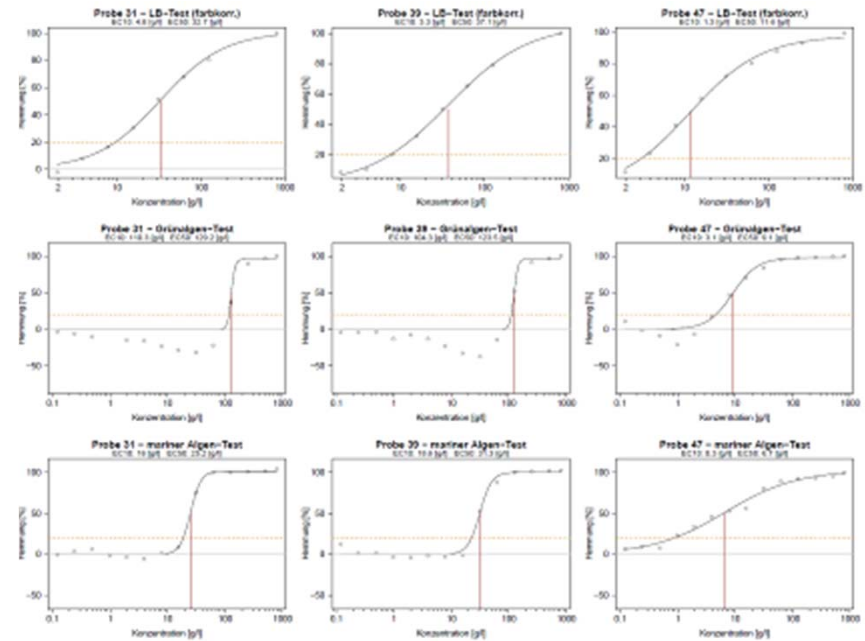


1. Luminescent **bacteria** test with *(Alii)vibrio fischeri*
2. Growth inhibition test with the **green algae** *Desmodesmus subspicatus*
3. Growth inhibition test with the **marine algae** *Phaeodactylum tricorutum*
4. Acute immobilisation test with **Daphnia magna**
5. Artemia test with *Artemia franciscana*
6. Yeast Estrogen Screen (YES) with *S. cerevisiae* (endocrine)
7. Yeast Androgen Screen (YAS) with *S. cerevisiae* (endocrine)
8. Ames fluctuation test with *Salmonella typhimurium* (mutagen.)

Fire fighting water



Independent Group of
Scientists (UEG)



Results:

- (1) Acute aquatic toxicity EC_{50} ranging ≥ 6700 mg/L; marine algae as most sensitive organism**
- (2) Potential risk for the marine ecosystem: when diluting by factor 2000 no direct adverse effects assumed; slight endocrine activity and mutagenic potential**
- (3) Fire fighting hazard class „alarming“ to „critical“: no direct discharge into sewage systems / environment**

Conclusions / challenges / perspectives from an environment / health risk assessment standpoint

1 „Small volume“ (%) of dangerous goods / time for assessment:

Evaluation of hazard information in a shorter time period ?

2 Only 3000 containers (7000 TEU) involved (medium sized vessel):

Risk assessment for large container vessels (>14000 TEU) ?

3 The Dangerous Goods classification is limited to specific criteria:

Non-classified containers are creating a risk to the environment ?

Conclusions / challenges / perspectives from an environment / health risk assessment standpoint

- 4 Material safety data for chemical mixtures / articles on board:
Information for specific product composition from consignors ?
- 5 Toxic effects from fire fighting water on the environment:
Testing and for risk assessment guidance (European acceptance) ?
- 6 Container vessels in emergency at European coasts:
European co-operation for common risk assessment / data exchange ?

First report in French:

Feu à bord du MSC Flaminia gestion par les autorités allemandes

Bulletin d'information du CEDRE n° 30 - juin 2013 (4 - 9)



Official German report has just been published
(www.bsu-bund.de)

**Federal Bureau of Maritime Casualty Investigation (BSU):
Investigation Report 255/12
Fire and explosion on board the MSC Flaminia on 14 July
2012 in the Atlantic and the ensuing events**



Thank you for your attention !

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