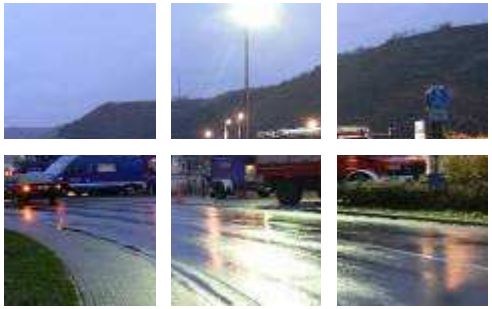
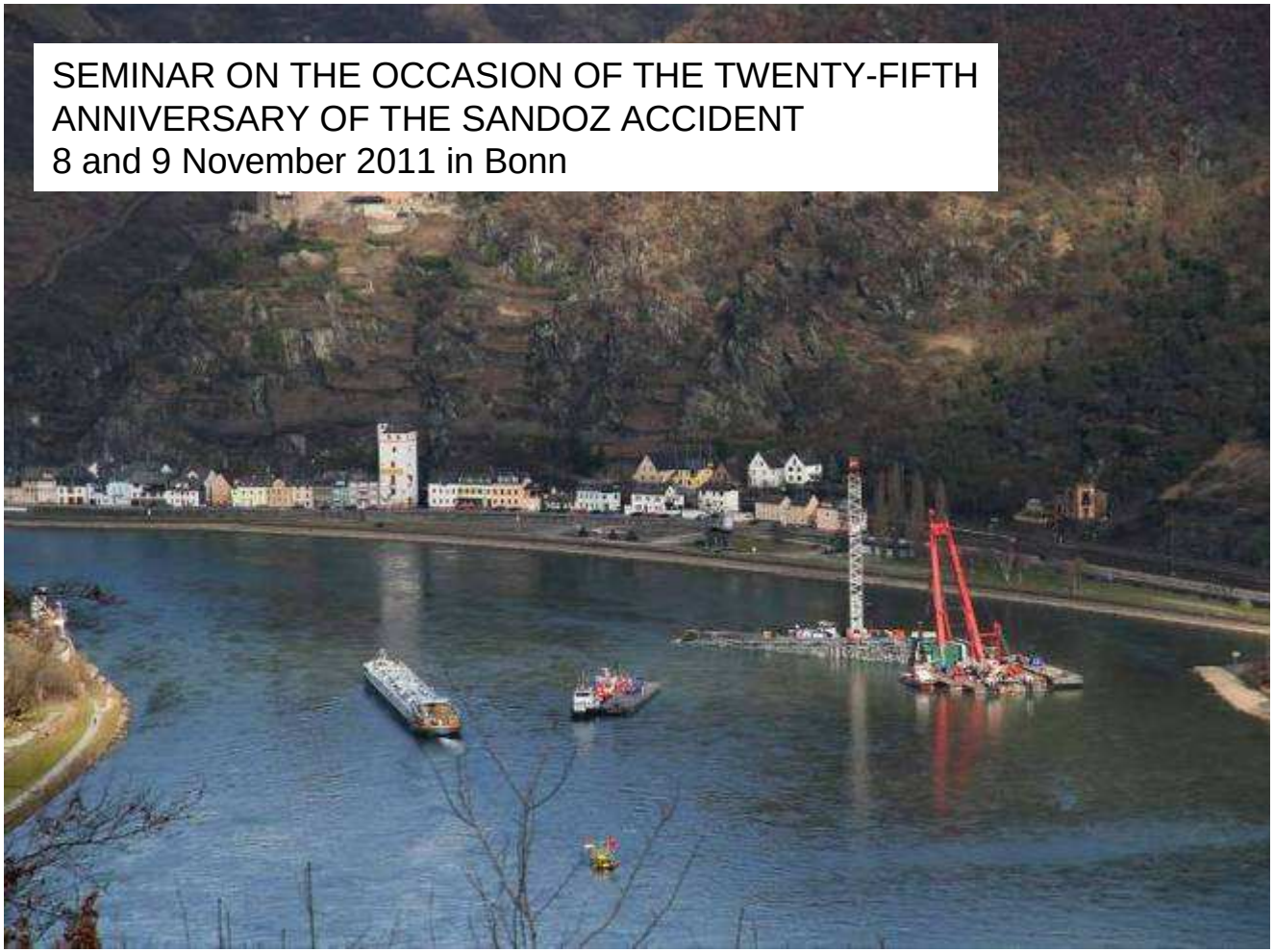
Wir machen Schifffahrt möglich.

WSV.de
Wasser- und Schifffahrtsverwaltung des Bundes

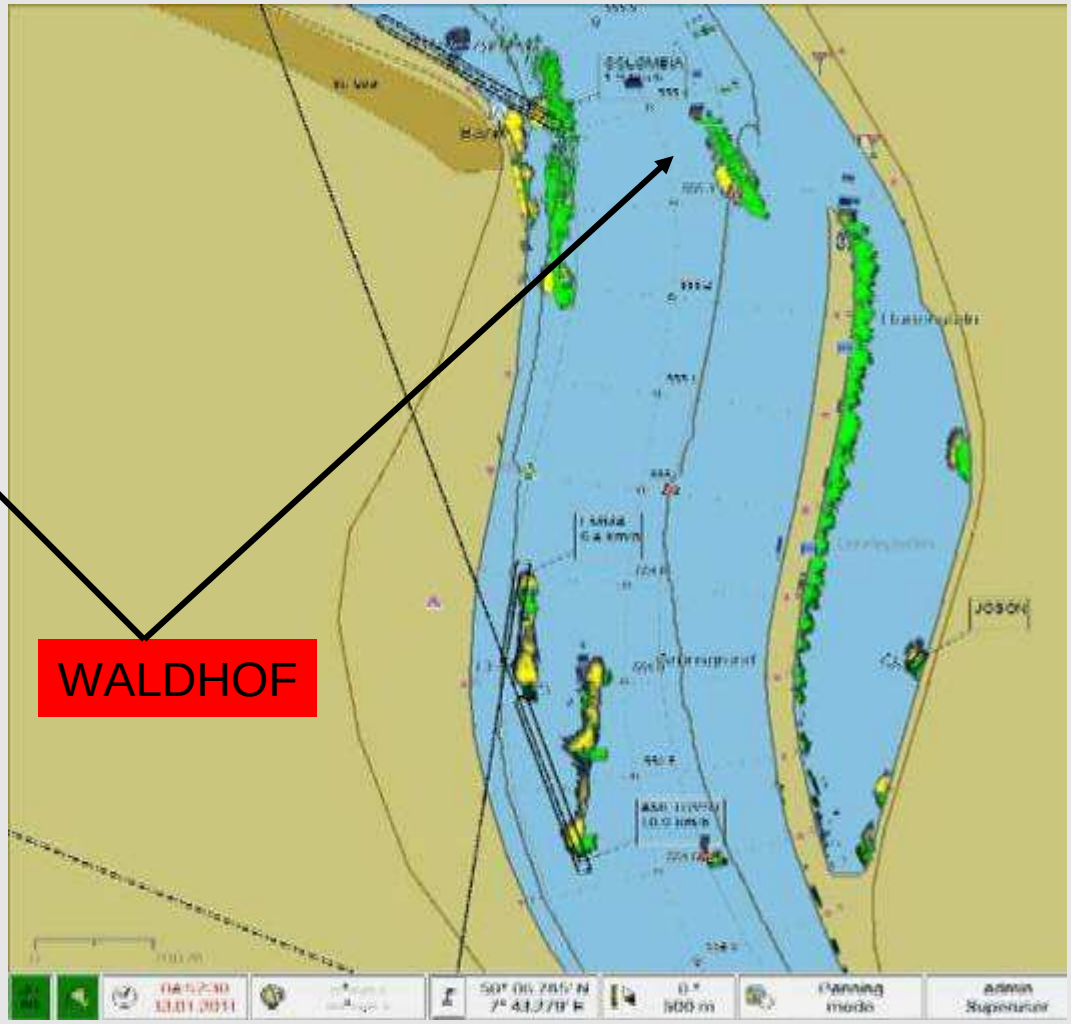
case study of the tanker accident near Loreley Rock in January 2011





SEMINAR ON THE OCCASION OF THE TWENTY-FIFTH ANNIVERSARY OF THE SANDOZ ACCIDENT
8 and 9 November 2011 in Bonn

radar map of accident-location
rhine-km 555,3



data of TMS „Waldhof“
What we knew in the early beginning

tanker: 110 m long, 10,50 m wide, double hull, type C

crew: 4 persons on the ship, 2 rescued, 2 missed

charge: 2400 to high concentrated sulfuric acid (96%)

construction:

7 several tanks for acid
7 several ballast-tanks

(Bild von 1993 als 85 m-Schiff)

WSV.de

Phase 1: First Settings

- ✓**searching for the missing crew** members
- ✓„**build up“ of infrastructure** at the accident site (ships, technical equipment, meeting rooms, communication technology, etc)
- ✓provisionally **securing of the ship** against increasing flood with towing ships, wires and pontons
- ✓to **get known** with involved persons and authorities

WSV.de

two open questions in the beginning

LEAKAGE in the ballast and product-tanks?

open connection between the tanks?

a **DEEP HOLE** is formed under the ship

the ship moves into the hole

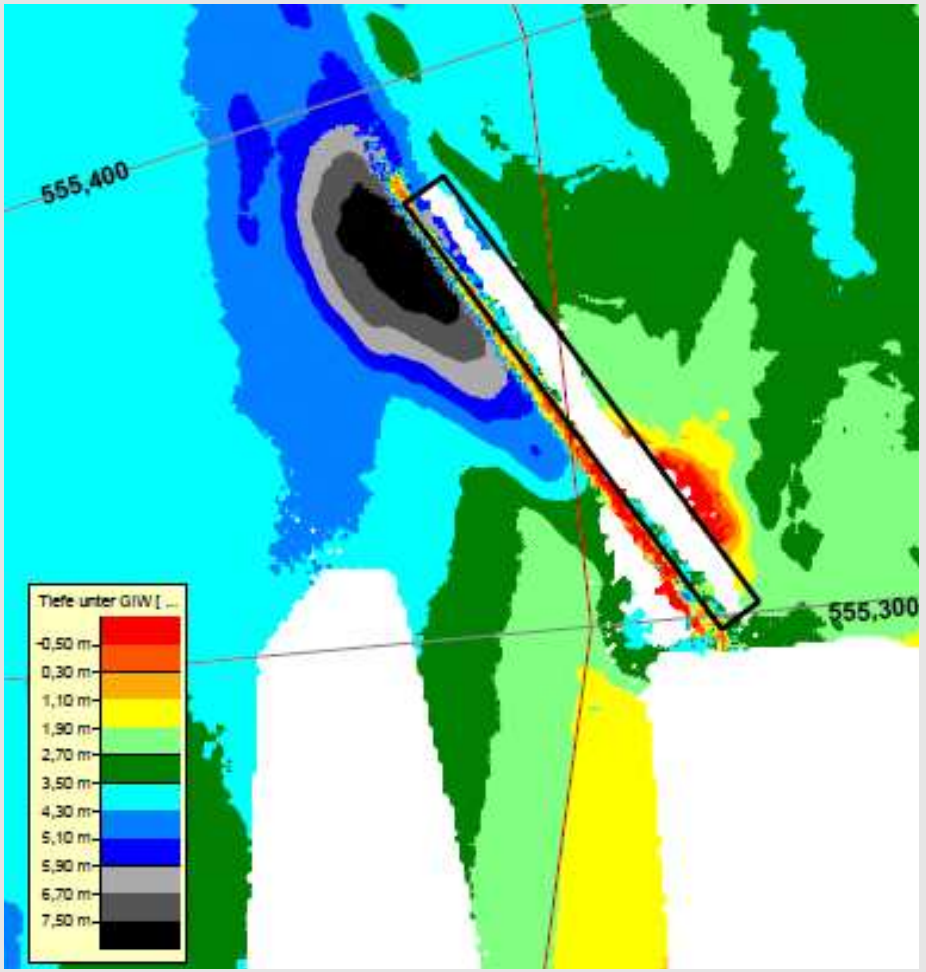
acid going out, water coming in or both?

stability? working on the ship?

What kind of risk does this create for **ship**, **salvage crew**, **people, living areas** and **environment?**

WSV.de

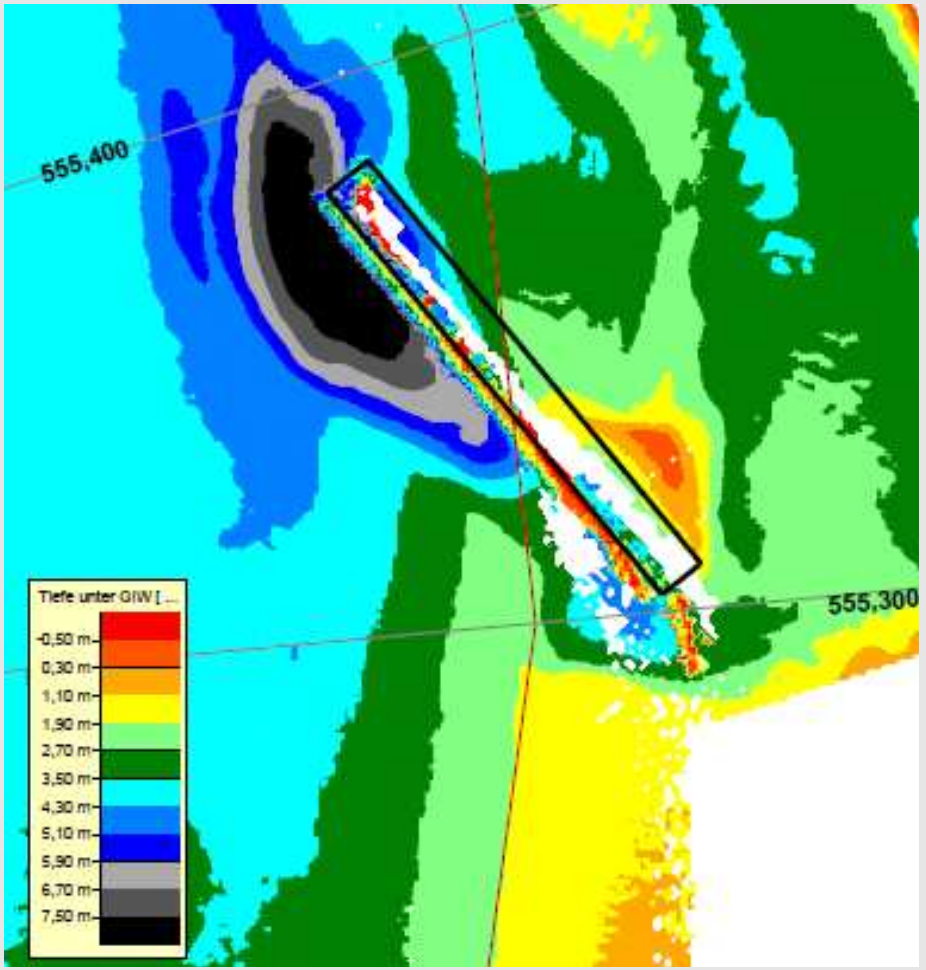
the hole under the ship …. (day 3)



WSV.de

the hole under the ship (day 5)

… is getting bigger



WSV.de

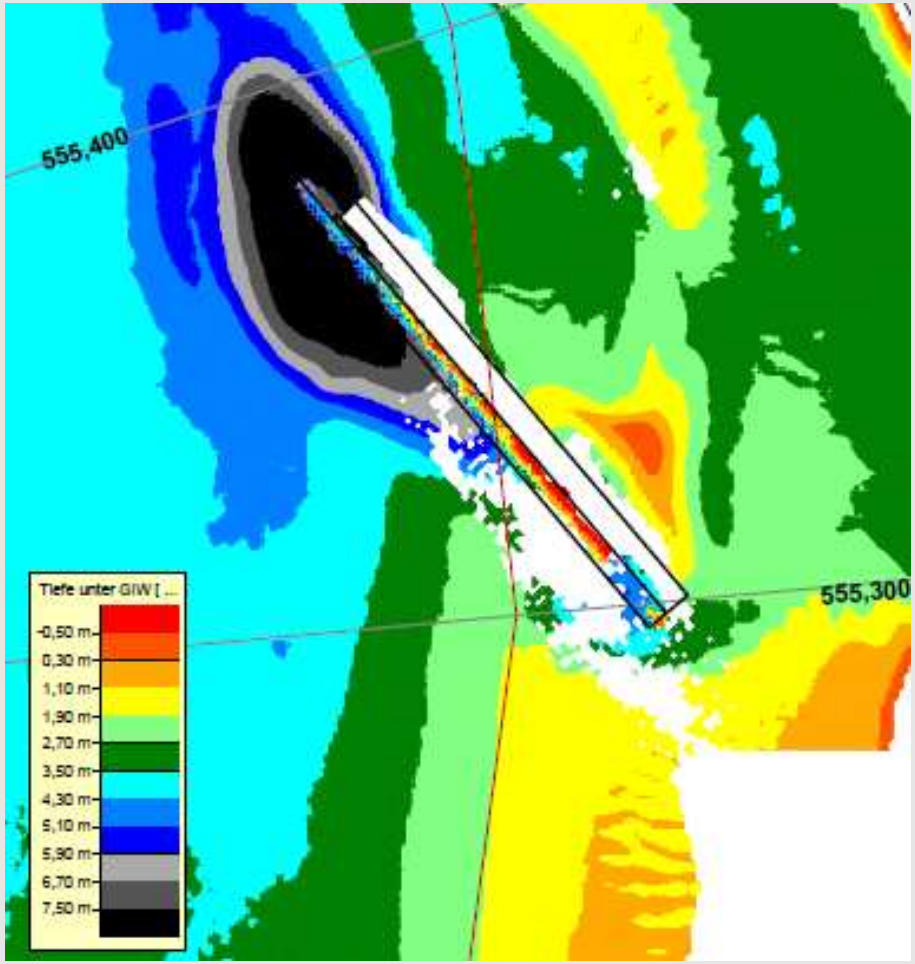
the hole under the ship…(day 9)

… and bigger.

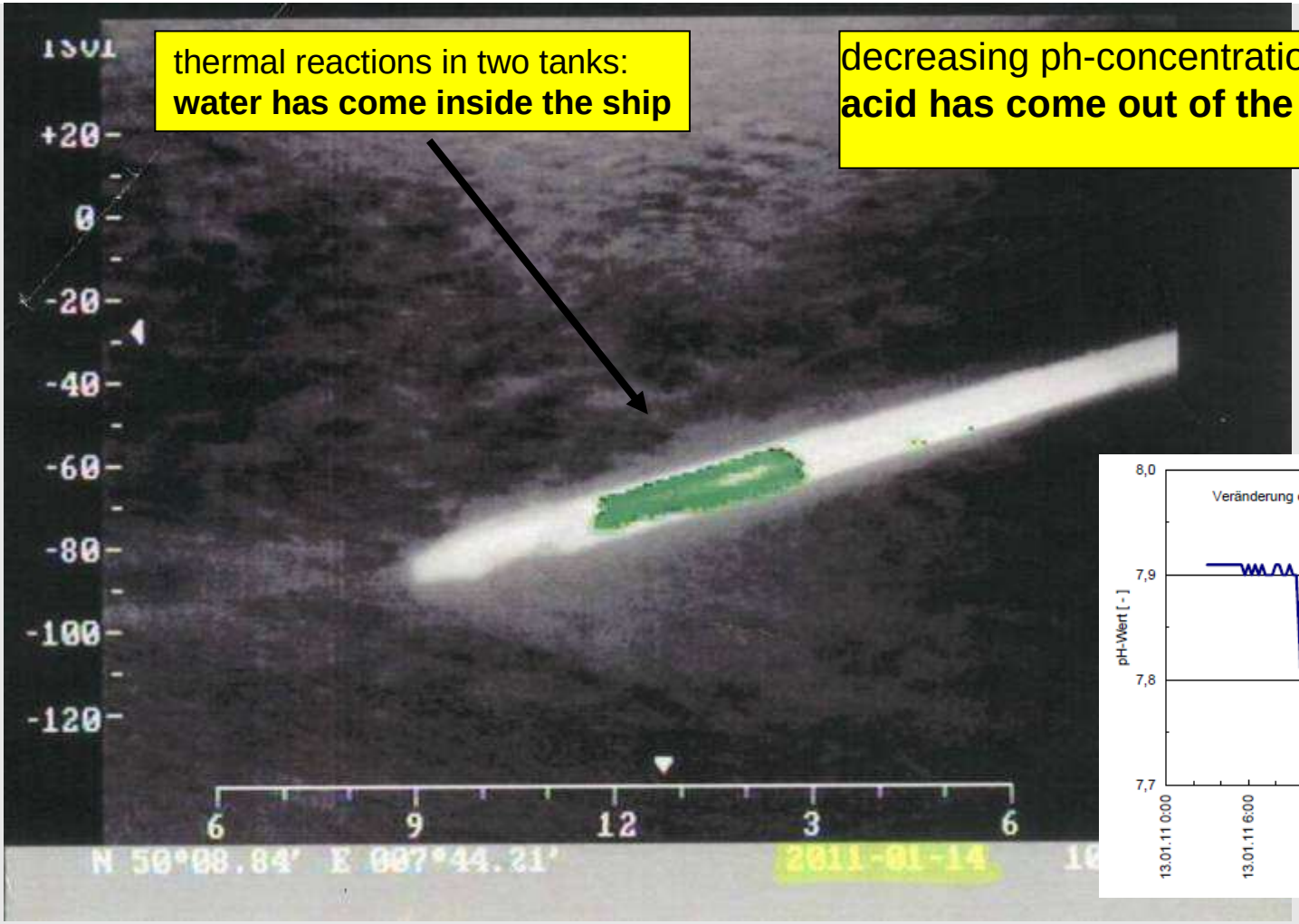
- a barge with gravles is brought to the site, to fill the hole, if neccessary

- swimming cranes have arrived and stabilize the ship

- passage of 91 ships



day 2: the leakage problem
thermal images, ph-concentration



WSV.de

the process of sulfuric acid / gas inside the tanks

concentrated sulfuric acid
+
water

↓

- heavily increasing temperature
- lower concentration of acid

↓

corrosion of the steel tanks → stability of the ship is questionable

↓

creating of hydrogen gas →
- danger of explosion
- danger of sudden contamination of the river

we need to know: **what is inside the 7 tanks?**

WSV.de

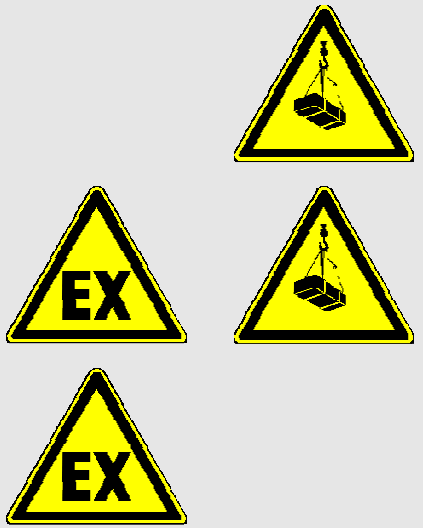
first salvage concept

- **Identification of gas** in the tanks:
  - drilling holes 8 mm
  - hydrogen gas in all 7 tanks
  - that means – drilling in a „bomb“
- **inertisation**, change hydrogen gas with nitrogen gas
  - drilling holes with 80 mm
- **homogenisation** of the liquid to a known concentration
- **pumping** the acid liquid into a **tank-barge.**
  - drilling holes with 800 mm
- no pumping into the river

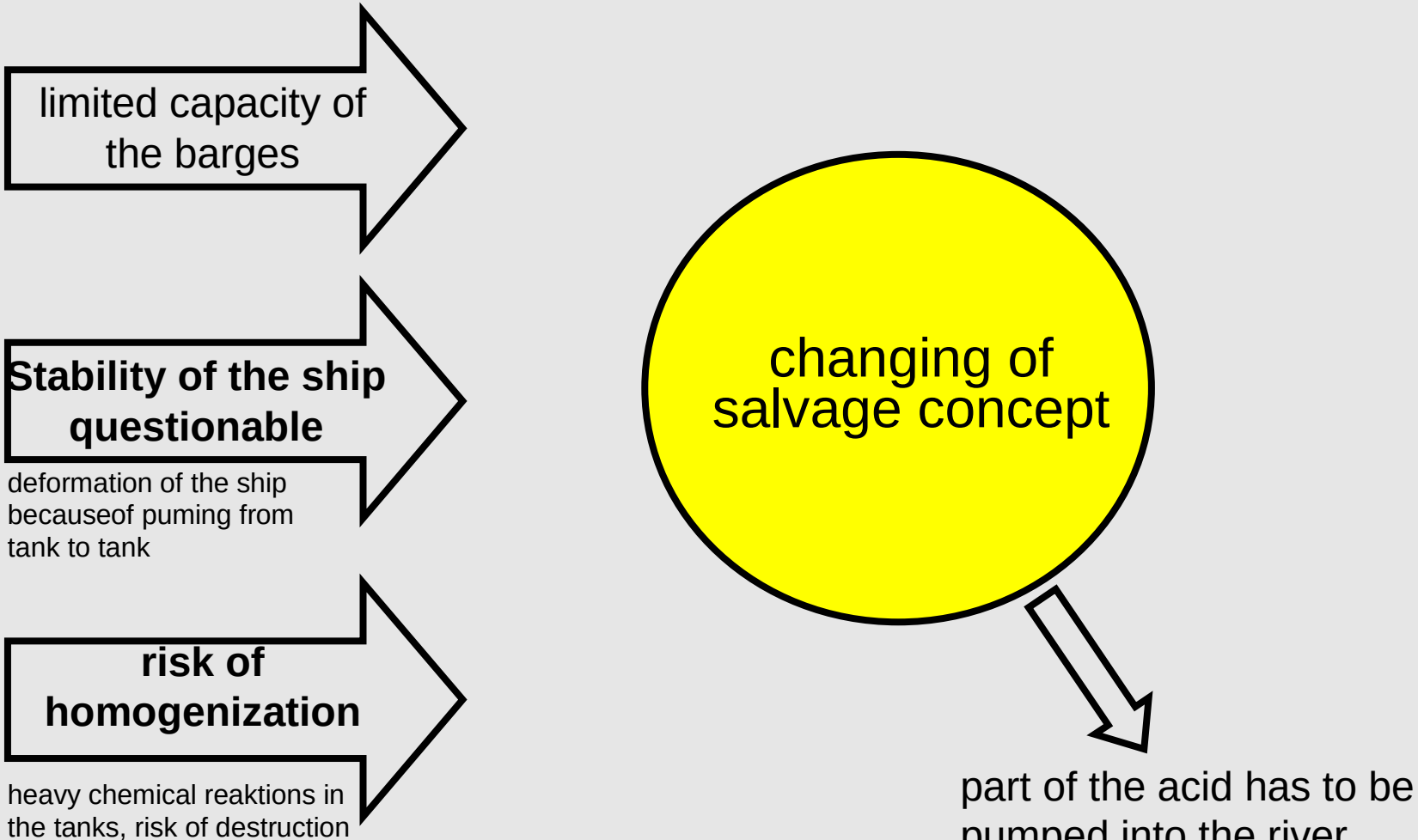
WSV.de

phases of the salvage process

Phase 1 **7 days**	**provisionally securing of the ship**
Phase 2 **5 days**	**stabilization**
Phase 3 **7 days**	**- drilling holes in the tanks** **- inertisation with nitrogen**
Phase 4 **11 days**	**- geting probes,** **- homogenisation,** **- pumping**
Phase 5 2 days	**lifting of the ship**

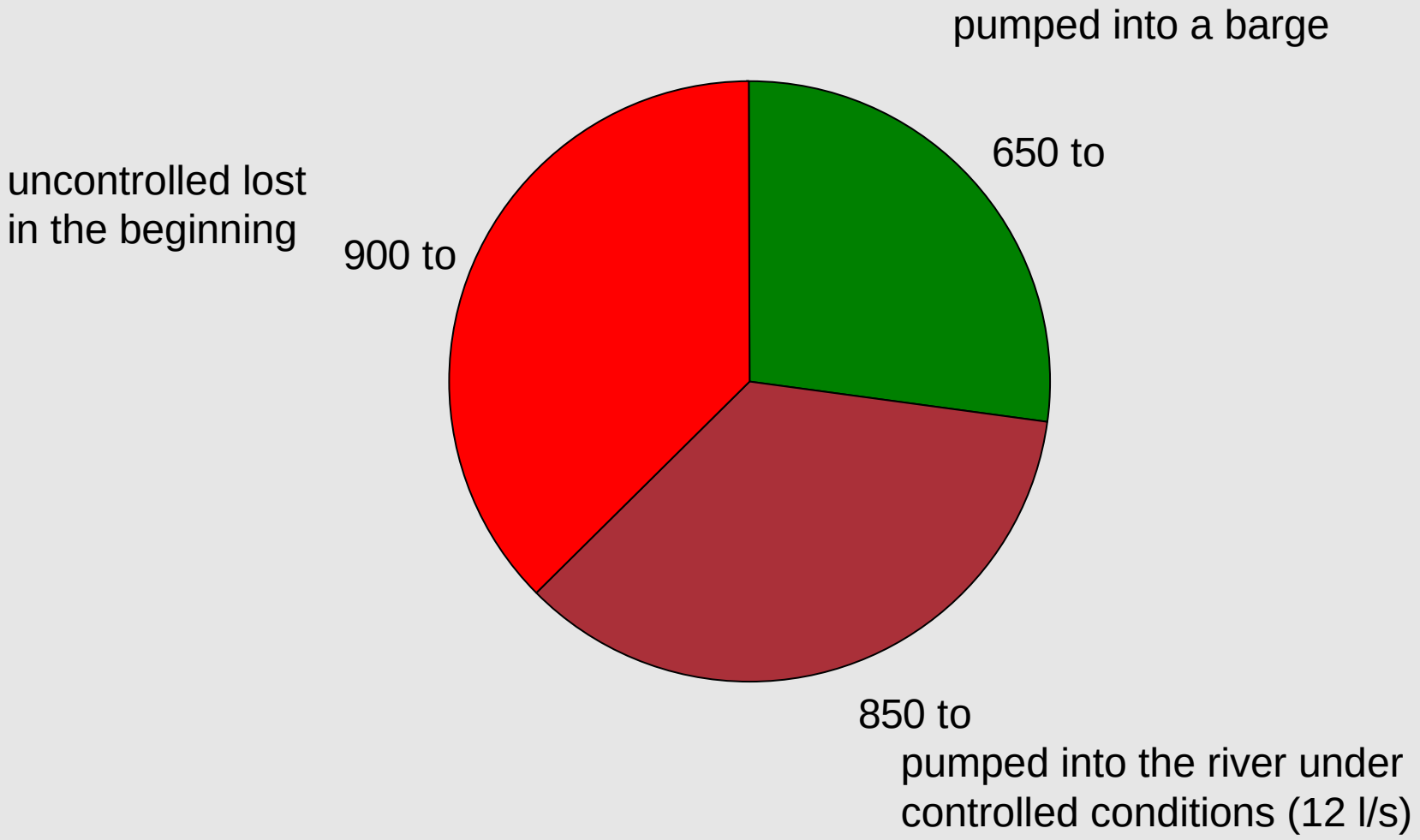


day 23: changing of salvage concept after pumping out the first tanks



WSV.de

What happened with the acid?



WSV.de

phase 5: pumping and lifting / turning the ship

lifting …

WSV.de

Phase 5: lifting the ship

turning …

WSV.de

Phase 5: Bergen

… swimming

WSV.de

major topics during the salvage (33 days)

- **difficult technical tasks**, chemical and environmental problems

- **information of the public**, shippers and shipping industrie

- **working with press**, professional press, television, broadcast

- **managing** the high number of **involved authorities and firms**

- well ordered **start of shipping** (650 ships waiting)

- **organisation of communikation**

WSV.de

analysis: factors of success

- **experience** in handling and managing accidents with ships
  at the staff of the water and shipping office Bingen
  (about 120 accidents a year)
- decission makers **continously on the scene**
- **no confrontation between authorities** about money, material and staff
- **extensive and open communication and information of the public**
  - 50 press-informations
  - twice a day speaker for television, broadcast and press)
  - forum for discussion on the homepage
- **one press center, speaking with one voice**
  (water police, fire department, state cancellery and district office)
- defined and **clear responcibility „water“ and „land“**

analysis:
what to learn and what to look at in the future

WSV.de

- better **knowledge of responcibility and possibilities** of involved authorities and firms

- **accident investigation and analysis** (this accident and in general)
  - why did it happen?
  - what else could happen?
- **risk analysis** of ship transport and potential danger of goods
- **analysis of impacts** on environment and economy

- better **IT-technology for communication** „in the outback“

- better **technical equipment for first securing** of the ship

- more **emergency alert drills** (to get familiar with such situations)

WSV.de

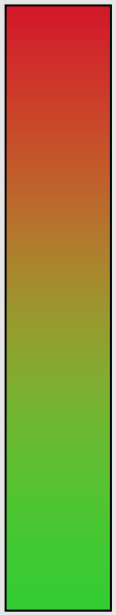
risk of shipping

conclusion:

heavy accident with great impact on shipping and economy

heavy impact on environment could be prevented

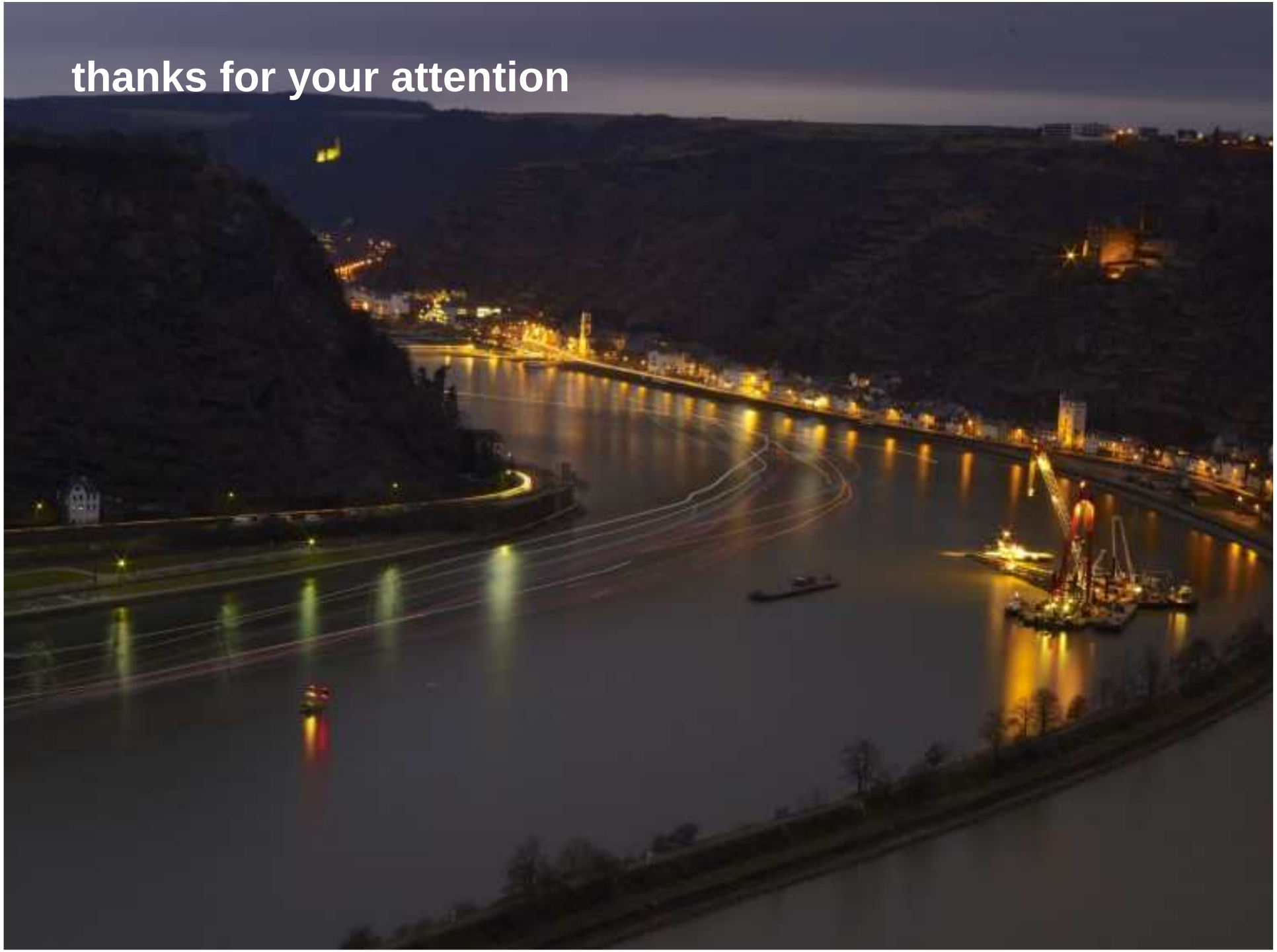
rating of WSA for the WALDHOF accident



but:

easily could have come worse

- cabin ship with passengers involved
- toxic product
- flammable or explosive product
- collision
- mobile danger areas because of flowing water


thanks for your attention