AAPA American Association of Port Authorities

# 2013 Cruise Seminar

**San Francisco, California**
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# Design & Safety

## Mobile Elevating Gangways and Passenger Boarding Bridges

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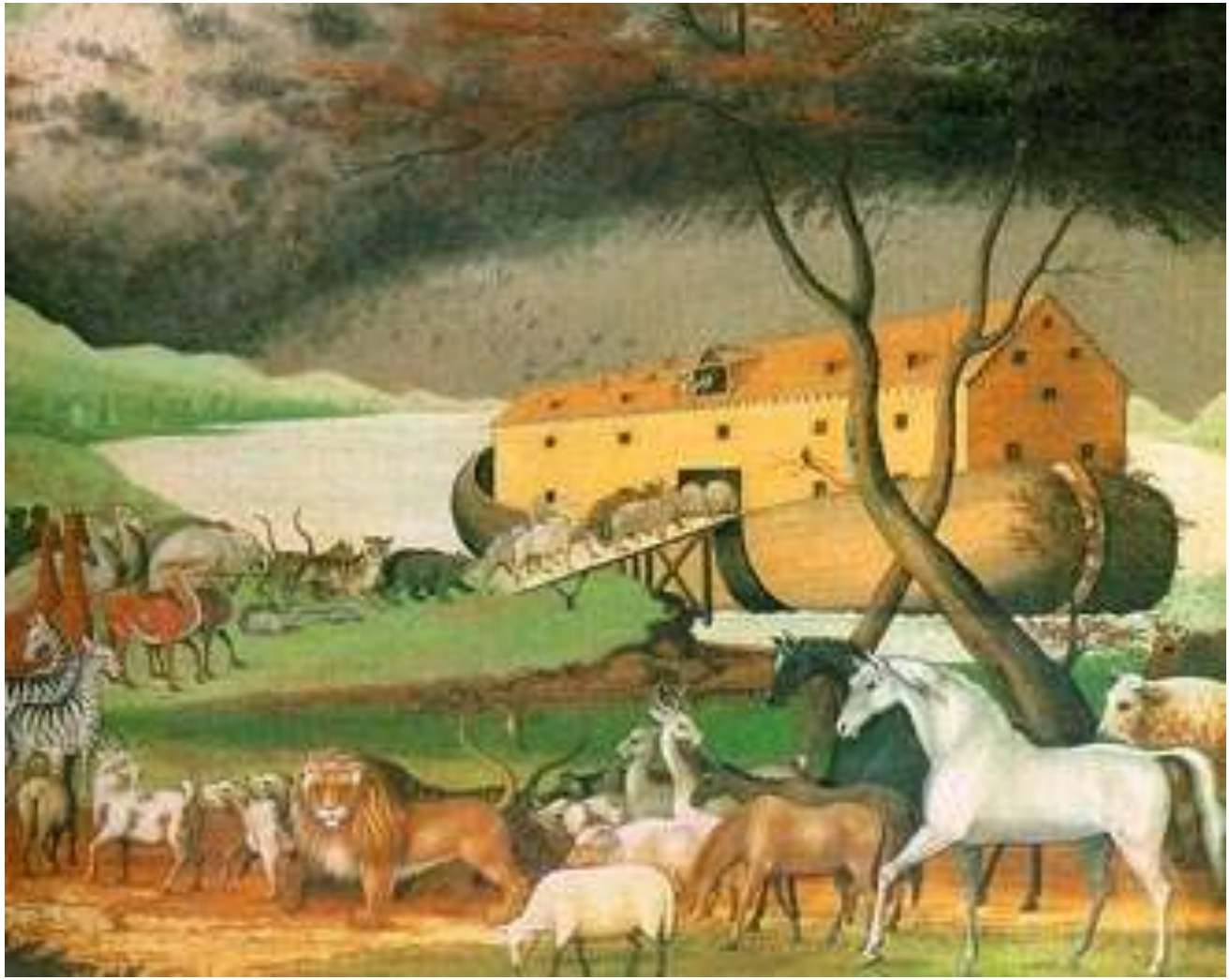
SAFETY

SAFETY

SAFETY

**= RELIABILITY**

# It used to be so easy…



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# Design with Safety in mind

PASSENGER SAFETY – BASIS FOR THE DESIGN

* Slip resistant flooring type Altro Safety
* Transition ramps to have distinct colours
* Sensors to stop telescopic movement when passenger in danger
* Ultrasonic sensors, inclinometers and absolute encoders for safe and stable operation. In all over 20 sensors are installed to assure reliability of operation
* Audio and visual alarms activated if preset operational parameters exceeded.

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# Regulations & Legislation

- ADA (Americans with Disabilities Act)
- NFPA 415/417 (National Fire Protection Agency)
- UL (Underwriters' Laboratory)
- SAE & ASME
- ASCE
- AISC
- EN 25817
- EN 287

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# Safety of Gangways

- Safety considerations are the basis of good design to assure total reliability

- How to achieve safety:

  - **Risk analysis** (assessment) of all components and parts (hazard identification)
  - **Risk classification** (risk rating assessment), risk control

# Considerations for Design

- Load calculations, live – wind
- Seismic considerations
- Hurricane/Storms (150 mph)
- Advanced Sensor Technology
- “Floating” transition ramps to Ship
- Redundancy of Systems

# Maintenance and Operation

- Maintenance shall be performed by trained and certified personnel according to plan assisted by on-line professional support.
- Operation by trained and certified personnel only
- Computerized automatic operation allowing Gangway to instantly follow Ship movements
- Electronic surveillance with automatic sms functions.
- Back-up drive system to ensure safe operation in the event of loss of the main system

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# Safety: Basis of Design to Assure Total Reliability

- Craftsmanship: Quality components and parts only
- Remote connection by 3G/GPRS for diagnostics, trouble shooting, software and program updates (service)
- Drive systems: hydraulic
- Ease of operation to avoid “short cuts”

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# Main Drive Systems

- The main drive system shall be **electro-hydraulic** to produce a linear movement with low complicity and load holding without the need for any rotating mechanisms, gear boxes, etc.

- The hydraulic lift cylinders shall be fed by several hydraulic pumps to guarantee highest redundancy.

- Hydraulic lift cylinders shall be designed in full compliance with Det Norske Veritas (DNV) marine standards.

# Gangway Design

- Design of Gangway to allow for totally unencumbered vehicle traffic and loading of stores and luggage

- Full access for vehicles and personnel:
  - Emergency
  - Fire trucks
  - Ambulances
  - Police
  - USCG/DHS/TSA

# S A F E T Y

**S** = *Strict compliance with codes and regulations*

**A** = *Advanced IT solutions and software programs*

**F** = *Functionality, first class components*

**E** = *Education of operators/maintenance*

**T** = *Technology with talent*

**Y** = Yield of investment

**SAFETY = RELIABILITY AND CONFIDENCE**

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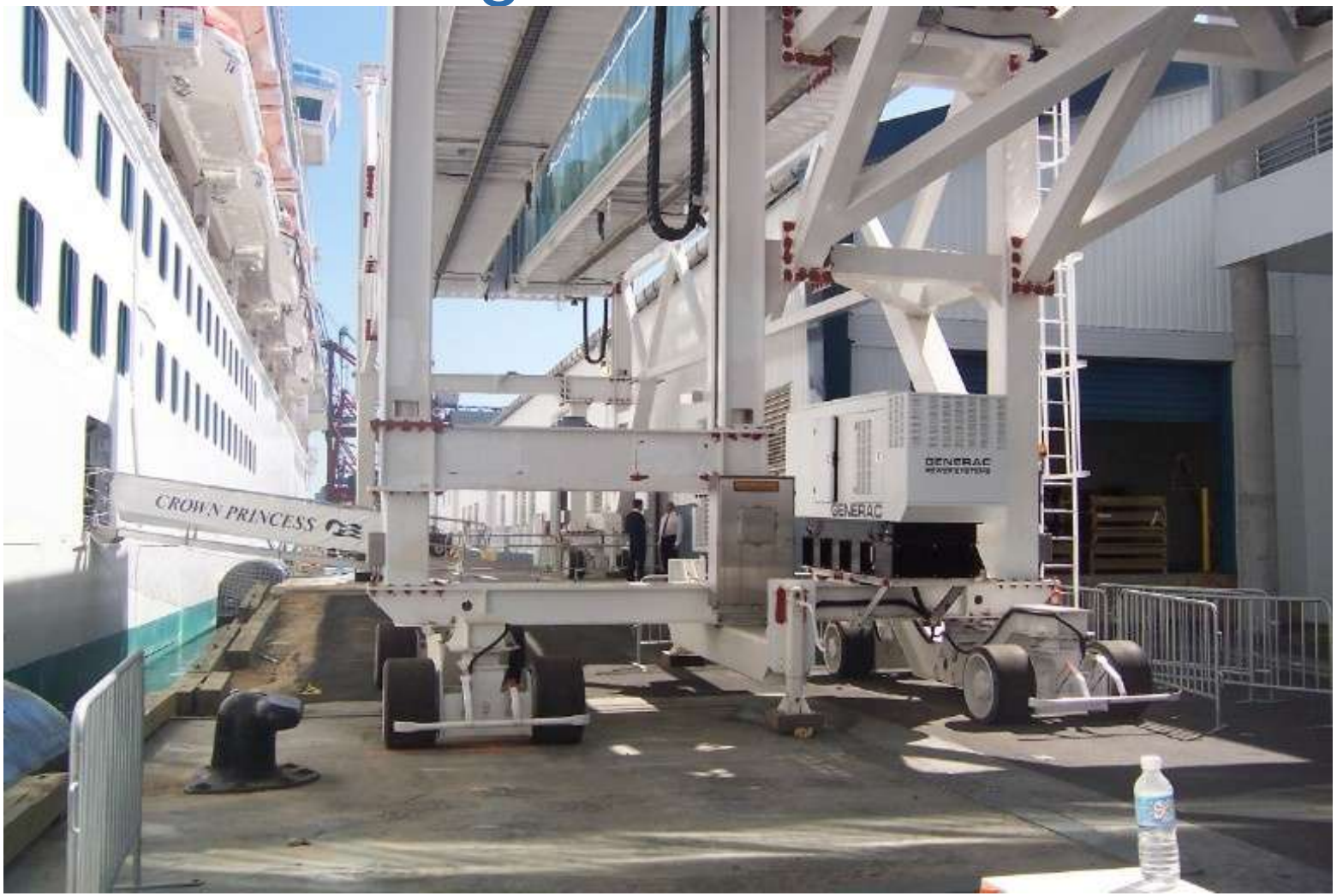
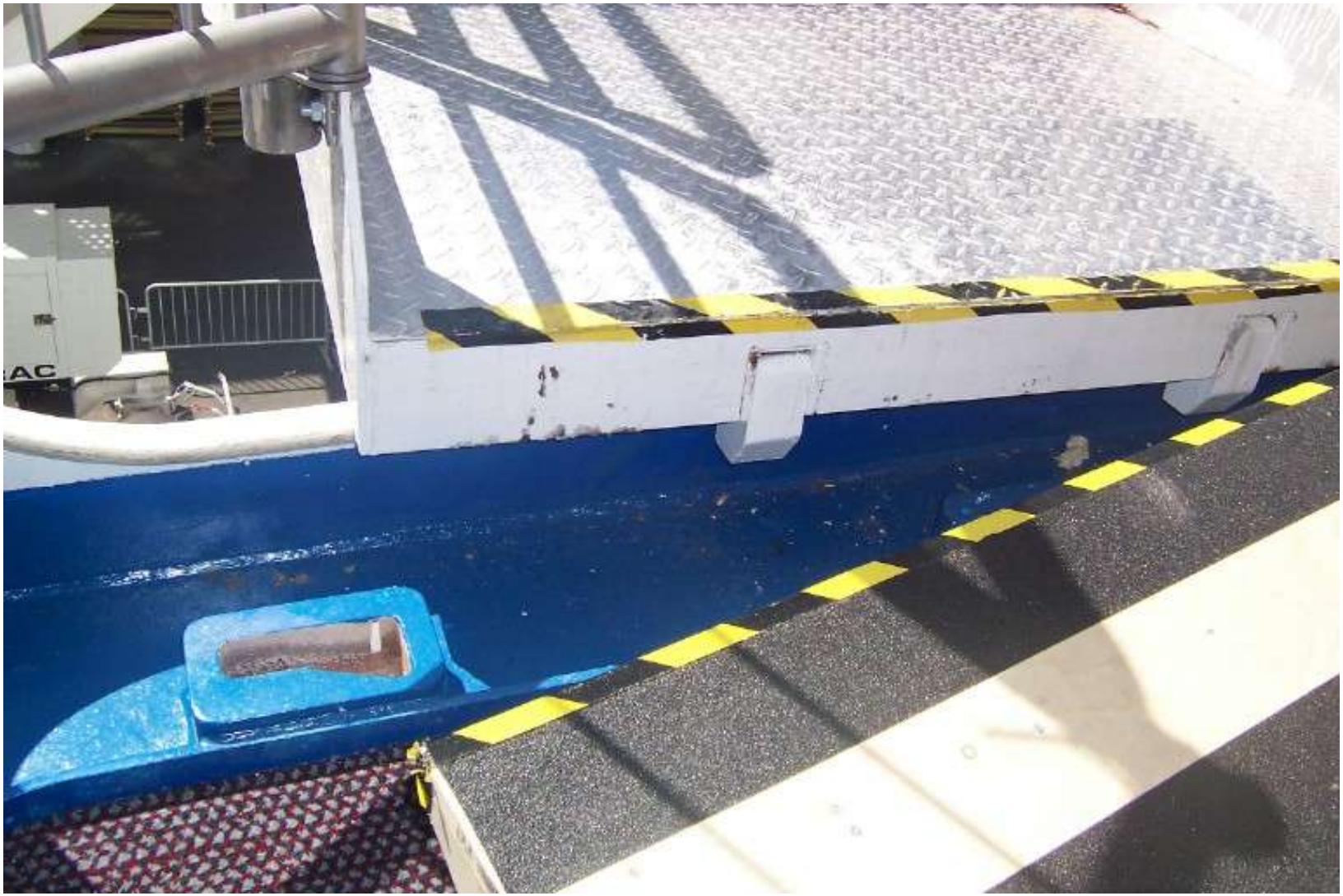
# Flawed Gangway Design Blocking the Wharf Deck



# Dangerous Gangway Design
# Transition Ramp attached to Ship



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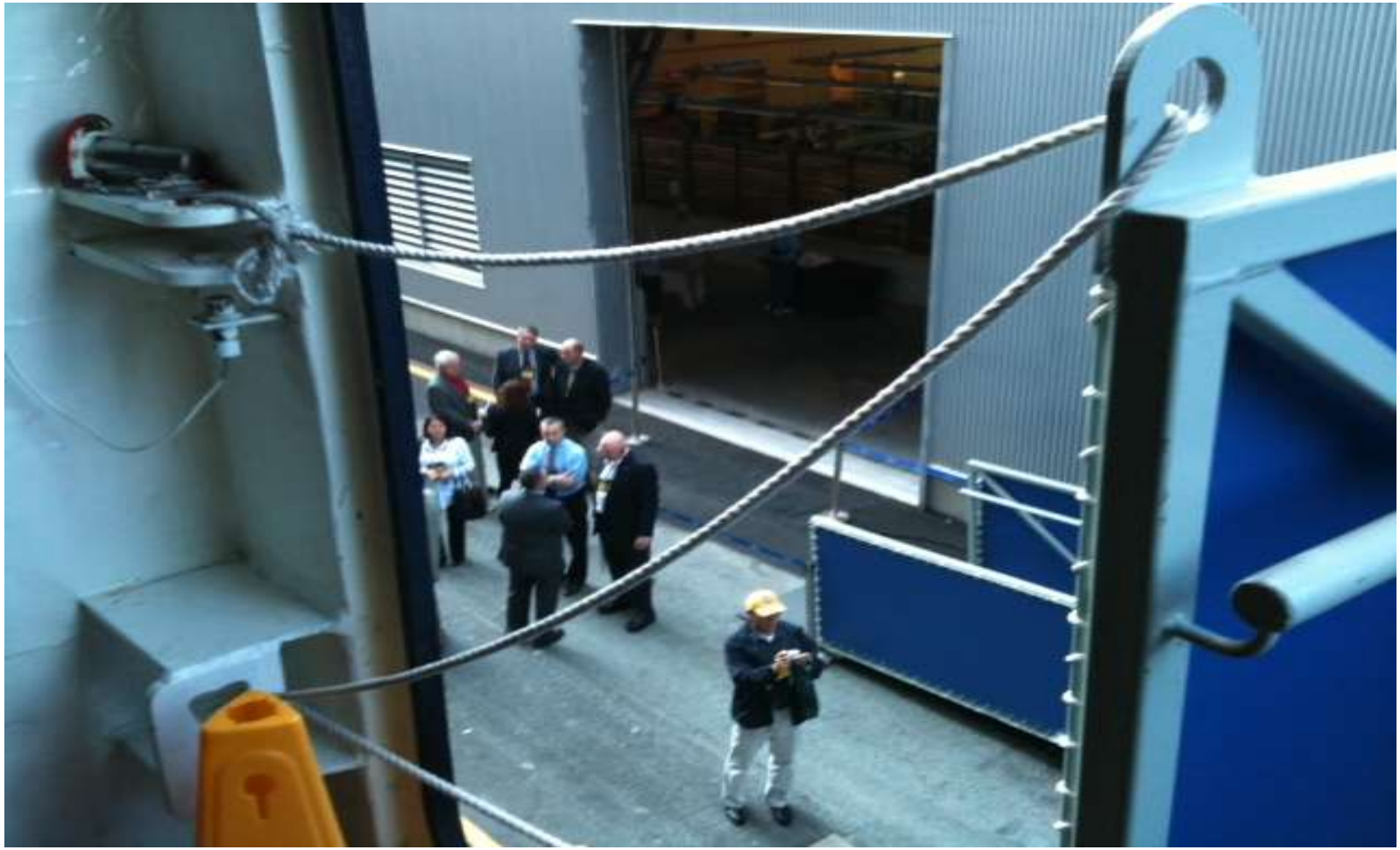
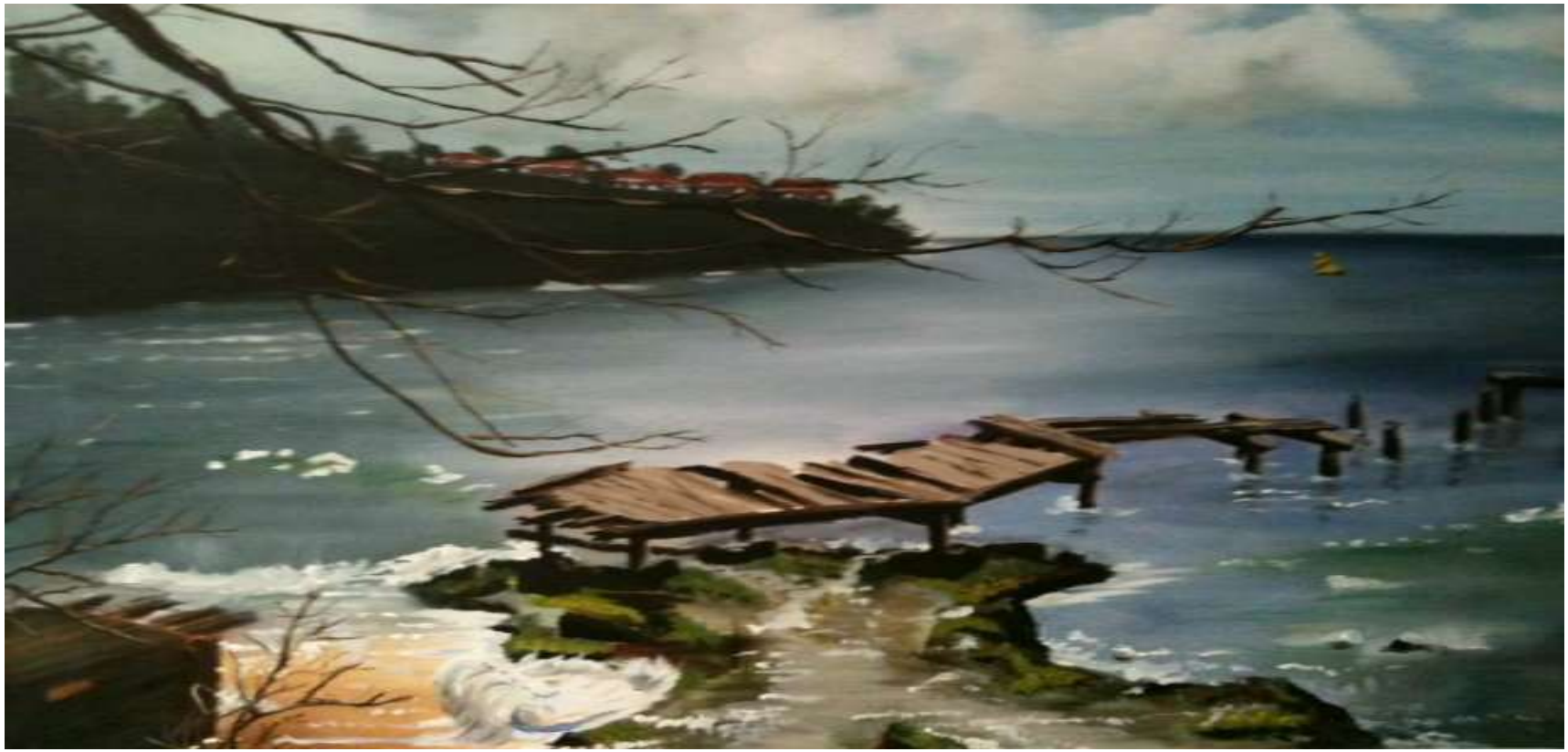
# Unsafe, YES !



# Danger, ramp attached to Ship !

# Risk asessment made ?



# Questions?

Thank you for your attention!