TKI initiatives

Maritiem Innovatie Event: Filling the Gaps

The Arctic four leaf clover
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- LNG TP: LNG Tank Placement
- ARES: Arctic Shipping Resilience
- AIRFLUX: Human Moonpool Operation
- CONSTRUCTIVE: Offshore structures
Problem: Bunker tank placing = show stopper for LNG implementation
  o Regulations => needed space is not (commercial) applicable

Opportunity: Constructive measurements + inherent bunker tank crash worthiness
  o => Prescriptive regulations overruled by first principles!

Results: Bunker tank placement scenario due to goal based design

An opportunity as a safe fuel for cleaner shipping ie Arctic regions (zero oil spill!!)

More info:
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Short Sea, Dredgers, Fishing, Yachts, Offshore Vessels. Ship owners, Ship Engineering, Builders, Class, Government
JIP ARES: Arctic REsilience of Ships

Bring the robustness of asset and operation to the next level

Ship resilience

- Safety supporting equipment, automation & sensors
- Robust structure
- Adequate regulations
- Human control & operation
- Decision support (sensor systems)
- Stability

Proposed Scope:
- Risk assessment on the operation (scenarios, tools and criteria)
- Human Control (incl. training & education)
- Stability tools (flooding etc.)
- Robust & resilient structures (before & after an incident)
- Decision support (sensor systems)

More info:
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Draft plan available
Problem: Closed moonpool (harsh environments) result in operational limitations for humans (dizziness / nausea)

Goal: Avoid health and safety risks and reduction of work efficiency => stay fit for purpose

JIP AIRFLUX
Air pressure Fluctuations in Enclosed Moonpools

Proposed scope:
- Examination of nausea related to complaints
- Determine acceptable limits (literature)
- Simulate Moonpool environments & validate the limitations
- Define parameters for attractive & healthy job environment
- Mitigation measures on habituation (retention)

JIP with Partners
Offshore Operators, Oil majors, Special Equipment Engineering, Class, Government

More info:
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Initiative partner: Alexei Berezitski, Huisman
CONSTRUCTIVE Offshore structures & materials

Open for participation:
MONITOR (JIP) FELOSFI (JIP) cost reduction / maintenance EUROS (STW)

• Mooring Chain Corrosion (residual strength & fatigue lifetime)
• Fatigue of steel under Arctic conditions
• Crack Arrest for Arctic conditions
• Dynamic Ice-loads

Materials Research program TTI Materials:
Fracture of steel: (AFSUM -2/-3) (S355/S690)
• Small scale weld material toughness testing
• Small scale cast material toughness testing
• CoFrac: fracture toughness in constraint condition
• CTOD vs Wide plate

Fatigue of Steel
• Fatigue of steel under Arctic conditions
• Corrfat I: Corrosion fatigue Initiation
• Corrfat II: Corrosion fatigue propagation

Composites
• Reliability of (damaged) composite structures
• Reliability of generic GFRP panels in offshore and infrastructural applications
• Reliability of joints for GFRP panels in offshore and infrastructural applications
CONSTRUCTIVE Offshore structures & materials

Good ideas
Need your reflection
Schedule a meeting!

Predictable behaviour
(new applications & extreme conditions)!

- Brittle Fracture of steel
- Damage mechanics
- Fatigue of steel
- Composites

CONSTRUCTIVE
Power of Collaboration, in People and Facilities

ENERGY
Wind op Material Research Program

HTSM
Material Research Program

Research topics:
- Fracture of steel (S355/S690)
- Fatigue of steel (corrosion fatigue)
- Composites (reliability / joints and GFRP panels)

Applied research related to:
WATER
(Offshore, Arctic & deep sea)

ENERGY: Offshore Wind & tidal
(cost reduction and predictable behaviour)

HTSM
(materials under extreme conditions)

INDUSTRY
Research topics:
- Fracture of steel (S355/S690)
- Fatigue of steel (corrosion fatigue)
- Composites (reliability / joints and GFRP panels)

Applied research related to:
WATER
(Offshore, Arctic & deep sea)

ENERGY: Offshore Wind & tidal
(cost reduction and predictable behaviour)

HTSM
(materials under extreme conditions)

Joint initiative program on Offshore Structures (TKI JIP’s & STW)
by Industry, TNO & TUD, supported by MKC

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