INCASS
Inspection **Ca**pabilities for Enhanced **S**hip **S**afety

SEVENTH FRAMEWORK PROGRAMME

INCASS
Inspection **Ca**pabilities for Enhanced **S**hip **S**afety

Ship safety prediction and prognosis: the INCASS way

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INCASS scope

- ✓ INCASS: EU FP7 funded project (2013-2016)

INCASS project investigates and develops tools and methodologies on:

- ✓ ship inspection
- ✓ Predictive condition-based maintenance
- ✓ Enhanced ship surveys for structures and machinery
- ✓ promote maritime safety and protect the environment according to industry and EC requirements

http://www.incass.eu/

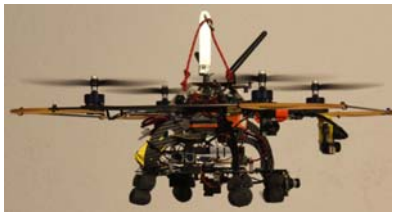
INCASS project partners

- 2 Universities (USG, UIB)
- 3 Classification Societies (RINA, BV, LR)
- 1 research institute (DFKI)
- 2 marine consultancy companies (SHIPCON and GLAFCOS)
- 1 marine consultant and software solutions company (AES)
- 2 shipping companies (owners/managers) (DANAOS, APA)
- 1 Marine Support Services company (TSI)

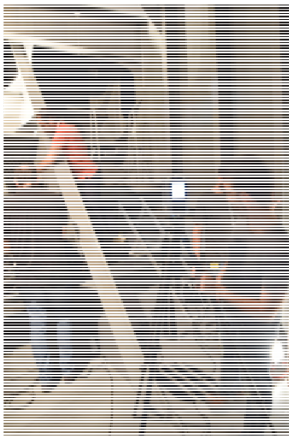
INCASS innovation

- ✓ Enhanced inspection of ship structures based on robotic platforms
- ✓ Advanced/Condition Based inspection tools and methodologies
- ✓ Develop Structural and Machinery Risk/Reliability Analysis (SRA and MRA)
- ✓ Reliability and Criticality based Maintenance based on Condition Based approaches
- ✓ Central Stochastic Database for ship structures and machinery
- ✓ Decision Support System (DSS) for structures and machinery

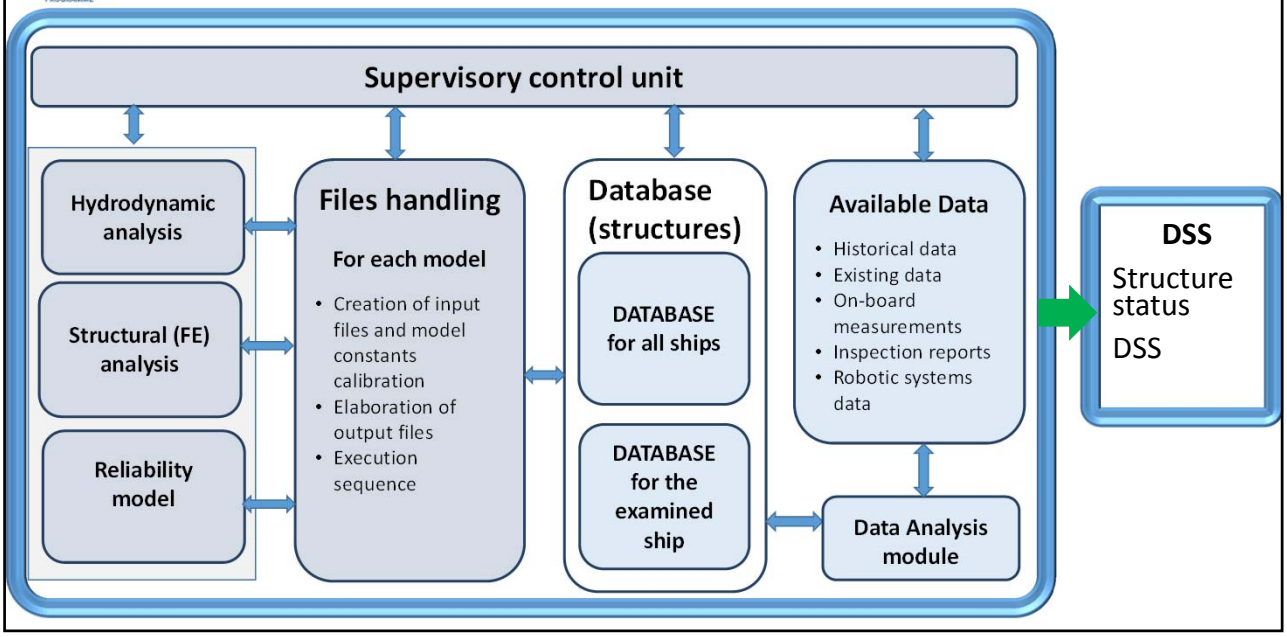
Structural Intelligent Monitoring Systems



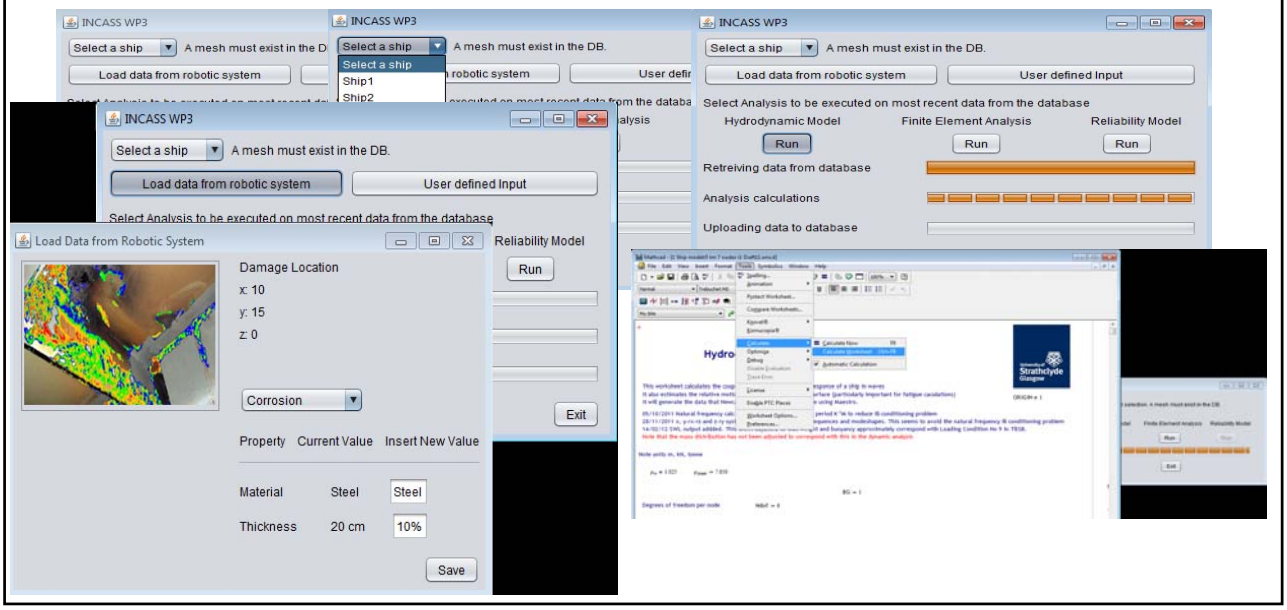
Structural Intelligent Monitoring Systems



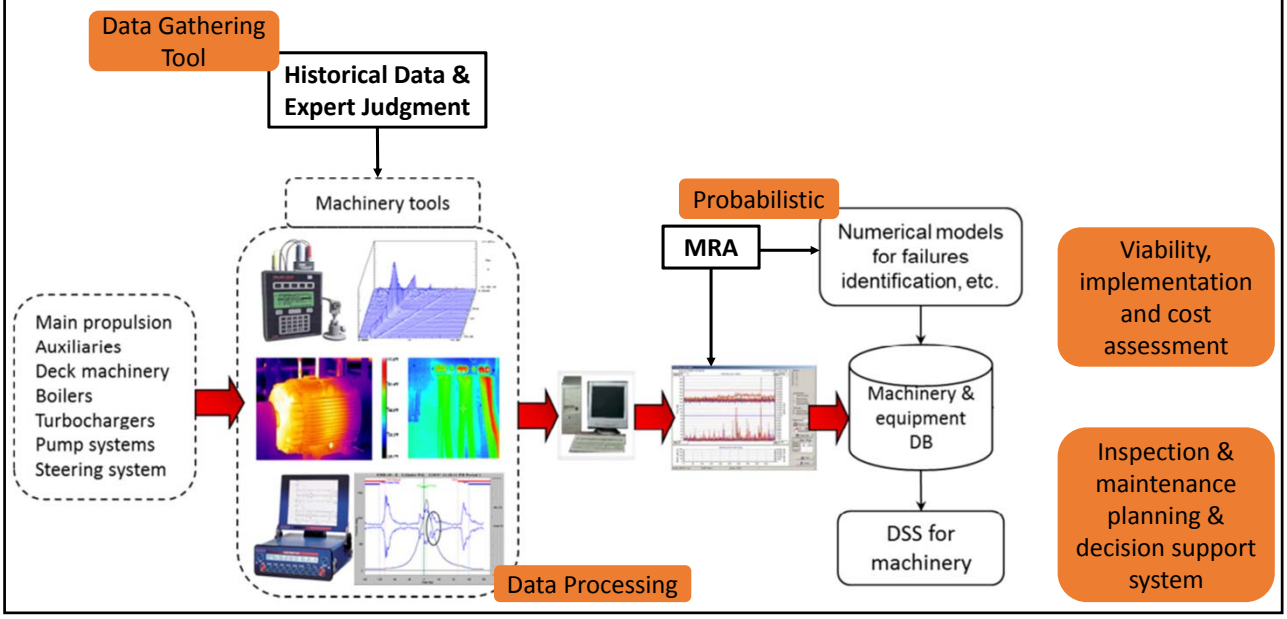
Structural Modelling and Analysis



Structural Evaluation Tool



Machinery Modelling & Analysis tool



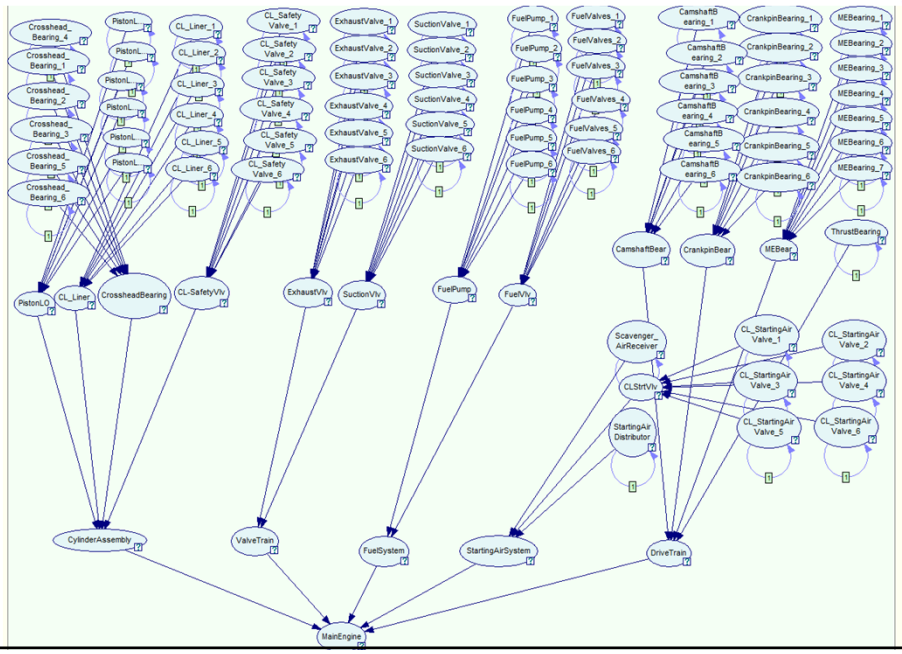
Selected Ship Machinery and Equipment

1. Main Engine (M/E)
2. Turbocharger (T/C)
3. Critically Selected Pumps
   - ✓ Ballast
   - ✓ Cargo (Tanker ship)
   - ✓ Cooling Water (CW)
   - ✓ Fire-fighting
   - ✓ Fuel Oil (FO)

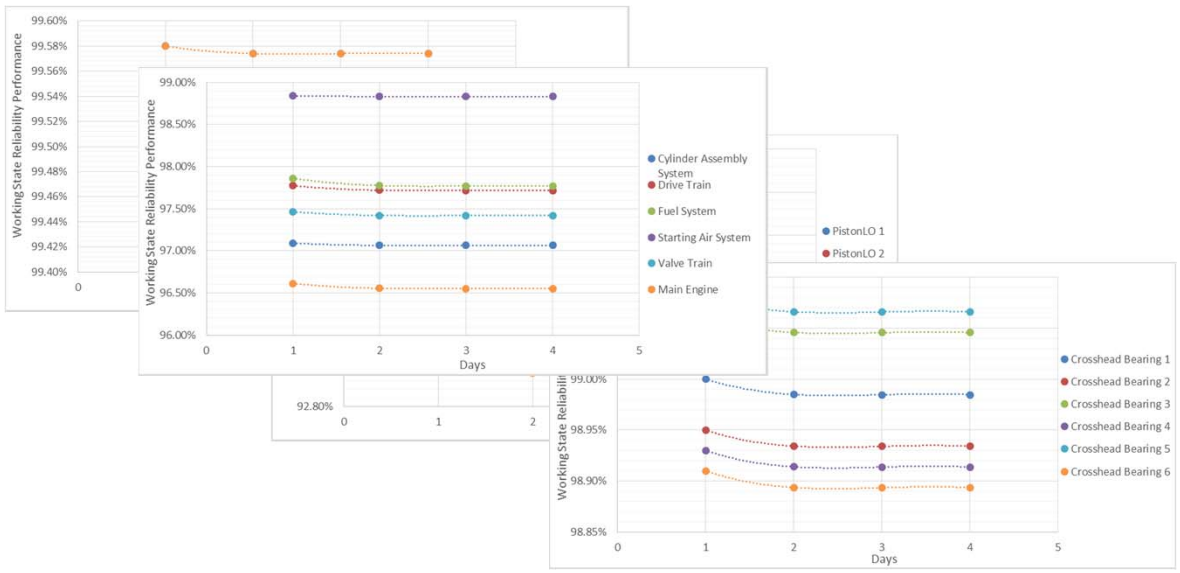




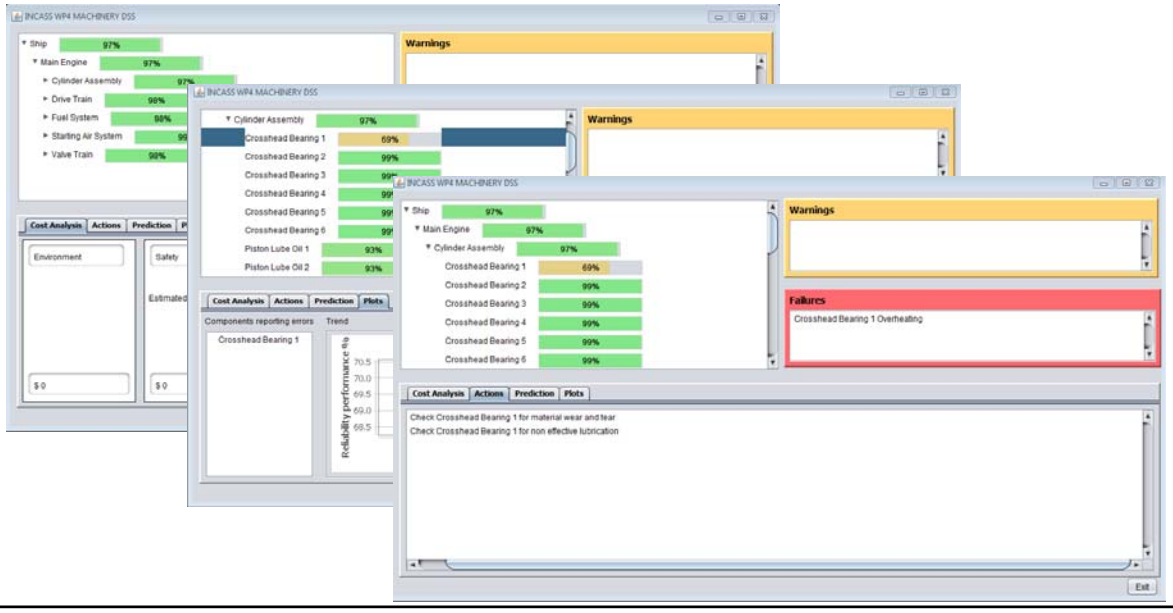
MRA Case Study – Main Engine



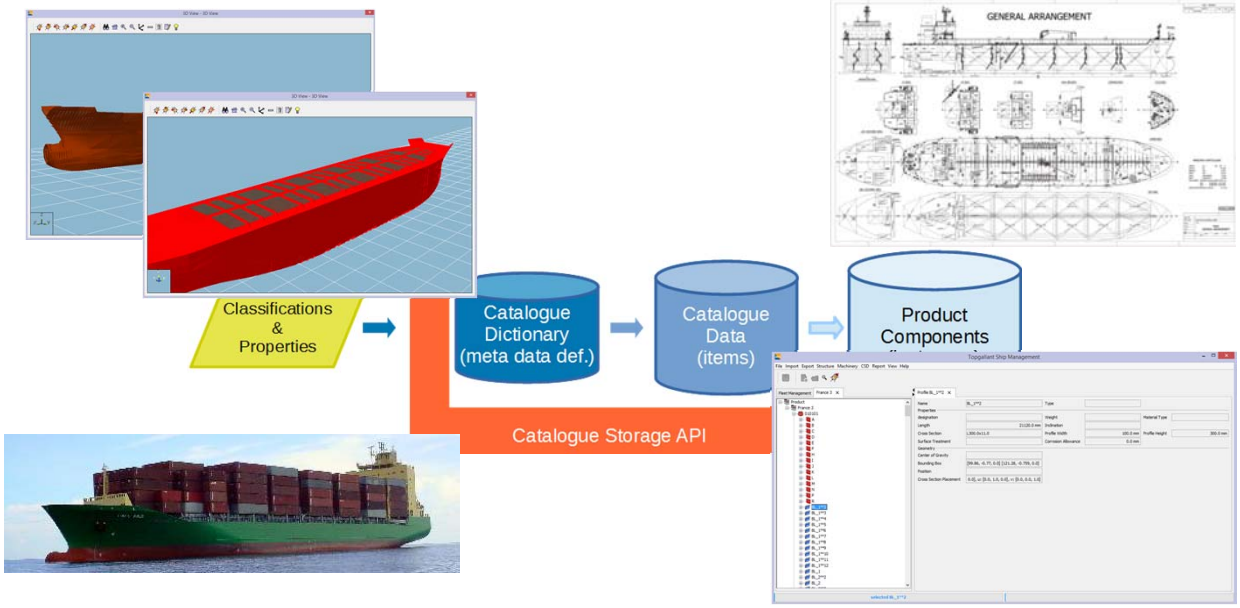
MRA Results with raw/recorded data



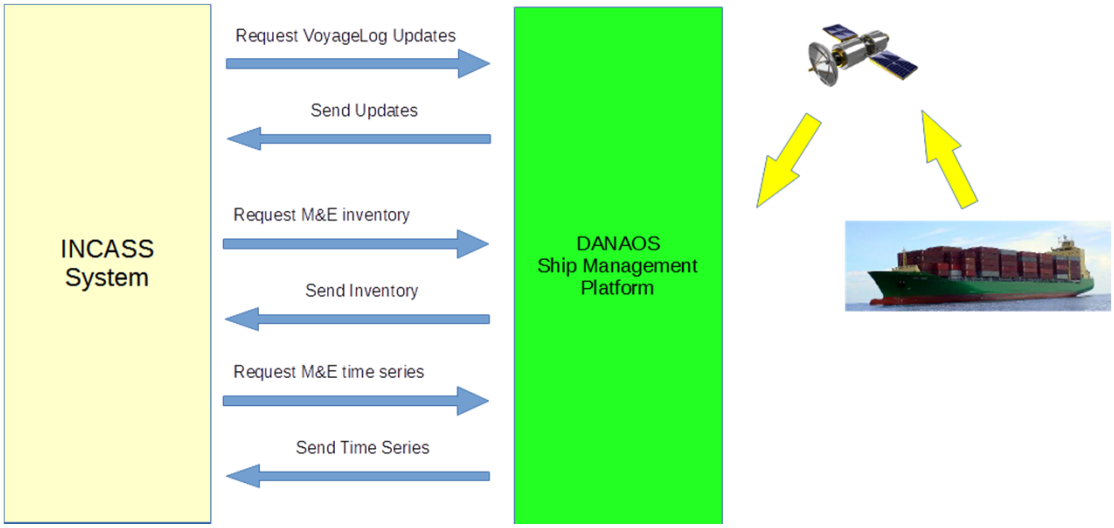
MRA DSS Graphical User Interface (GUI)



Database Development and Implementation



Database and Ship-Shore Communication



INCASS Tools - Case Studies

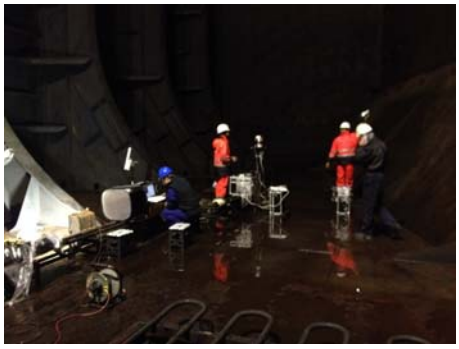
Air Compressors

Turbocharger

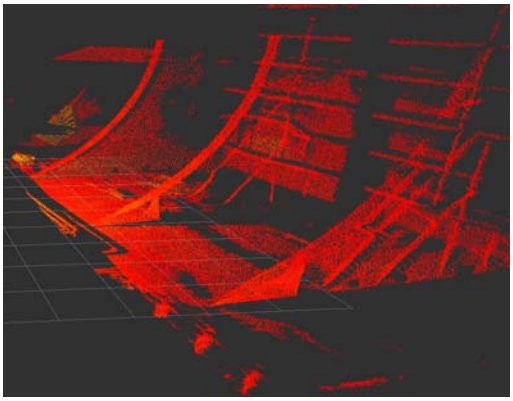
Ballast Pump

Main Engine

Robotic Platforms-Onboard Field Tests



Robotic Platforms-Onboard Field Tests



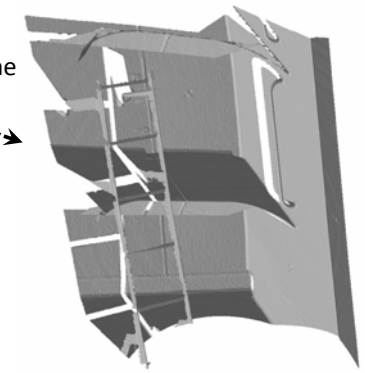
Intelligent Monitoring Systems

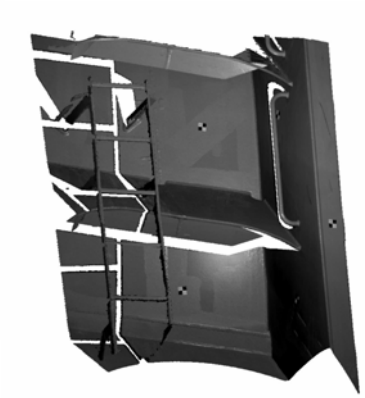
[viral: VIrtual ReALism for inspection of ship structures]

Intelligent Monitoring Systems [field test]

from the raw images like the one below

reconstruction of the terrain in 3D is intended





INCASS spreading the word…

- ✓ public workshops at LR hqrts – industry and regulators (ship operators, IMO, EMSA, UK MCA, etc)
- ✓ POSIDONIA maritime conference and exhibition 2014 & 2016
- ✓ promo material, newsletter, linkedin and active webpage
- ✓ international conferences (SOME, IMAM, WMTC, SCC, TRA, ROBOT, IROS, IEEE) and scientific journals
- ✓ Greek Engineers Society, RINA (Royal Institution of Naval Architects), SNAME (Society of Naval Architects and Marine Engineers), ImaREST, DANAOS Users group et al

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Thank you for your attention!

Questions?