

Automation of the ship condition assessment process



BUREAU
VERITAS



VeriSTAR HLC

Digital ship

Athens, 2006.10.20

The problem



Existing Thickness Measurement (TM) files are not convenient (Excel tables + sketches):

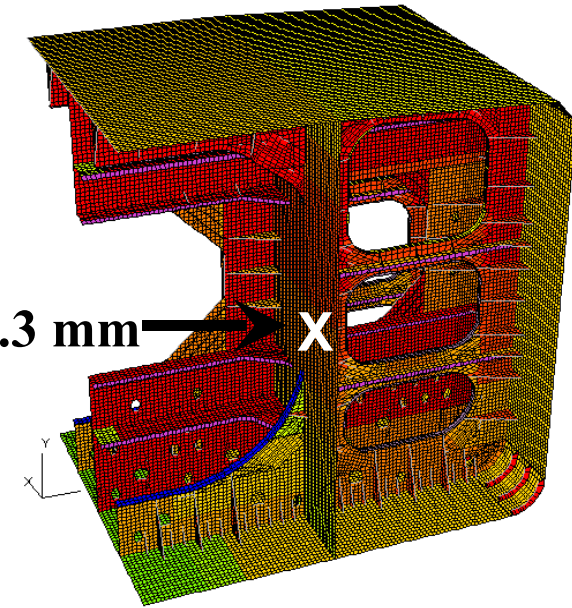
- easy to overlook a structural weakness,
- final report arrives after end of dry docking,
- no possibility of comparison between TM campaigns.



The solution

VeriSTAR Hull Life Cycle (HLC)

$T_h = 15.3 \text{ mm}$ → X



Enter TM into a standardized simplified 3D-model of the ship:

- Rule conformity can be checked by computers,
- Immediately available at any time during a TM campaign,
- Automatic degradation alarms,
- The 3D-model with the measurement campaigns can be passed to another classification society.



CAS Project

www.shiphullmonitoring.eu

- **electronic processing**
- **standard interface**
- **ship hull electronic model**

=> avoid surprises regarding ship degradation

- **EC funded**
- **Duration 3 years**
- **Started on 01 February 2005 (mid-project now)**
- **Budget 3 100 000 Euro**



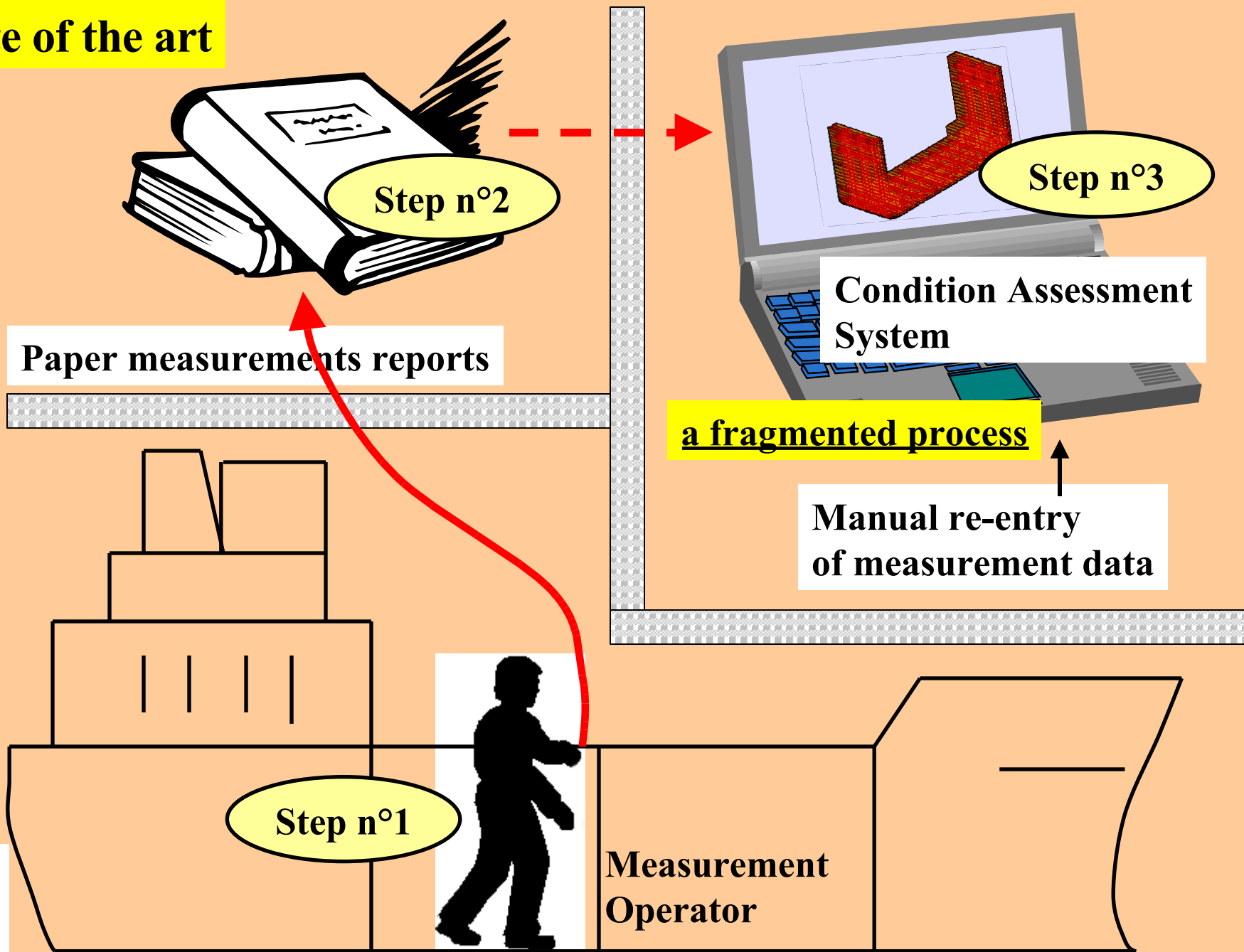
PARTNERS

Bureau Veritas	Classification Society	France
Germanischer Lloyd	Classification Society	Germany
Materiaal Metingen GROUP	Thickness Measurements company	Netherlands
SENER	Shipyard software vendor	Spain
Instituto Superior Técnico	University	Portugal
LISNAVE Estaleiros Navais	Repair shipyard	Portugal
Cybernetix	Robot maker/operator	France
INTERTANKO	Owners Association	-
TOTAL (TAM)	Charterer	France
RS	Classification Society	Russia

Relevant partners for the thickness measurement process



State of the art



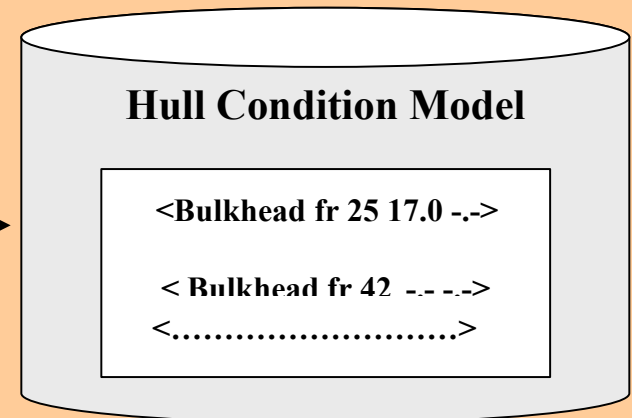
Towards an IACS standard

To replace the current UR Z10 thickness measurement Excel sheets

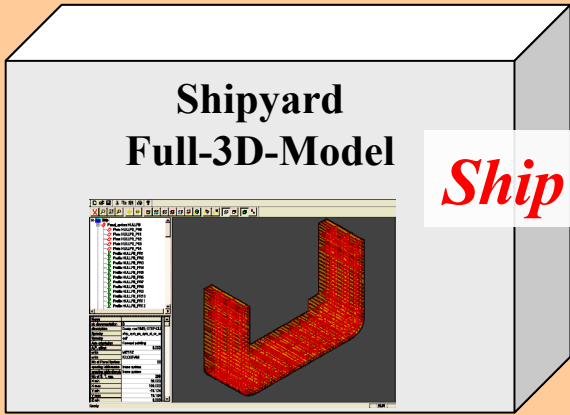
TM1-T Report on THICKNESS MEASUREMENT

Ship's name..... Class Identity

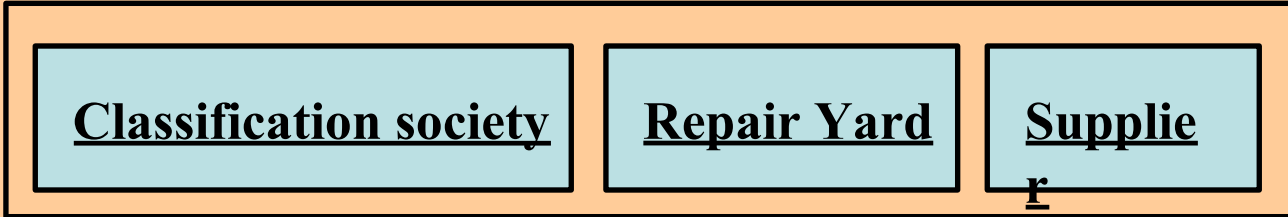
STRAKE POSITION	No. or Letter	Org. Thk. mm	Forward Reading			
			Gauged		Diminution P	
			P	S	mm	%
12th forward						
11th						
10th						
9th						



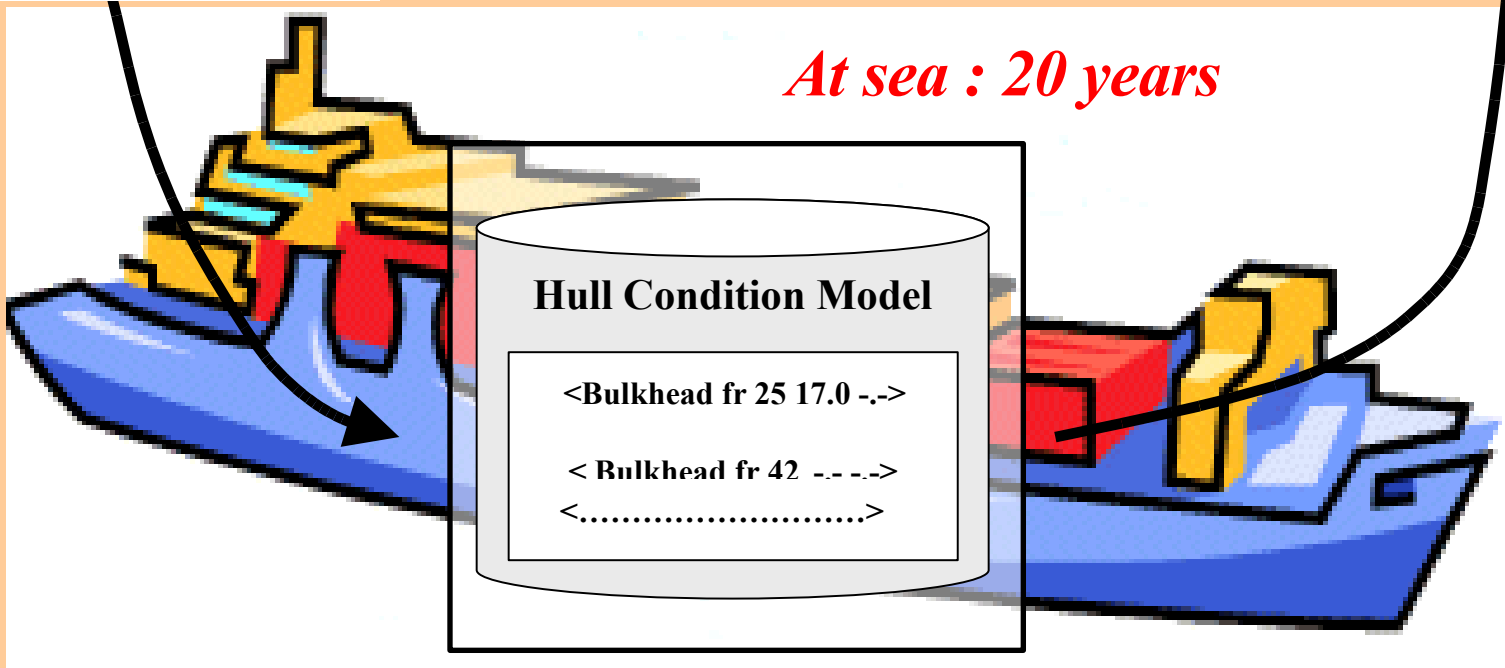
Life cycle support (scenario n°1)



Ship building : 1 year



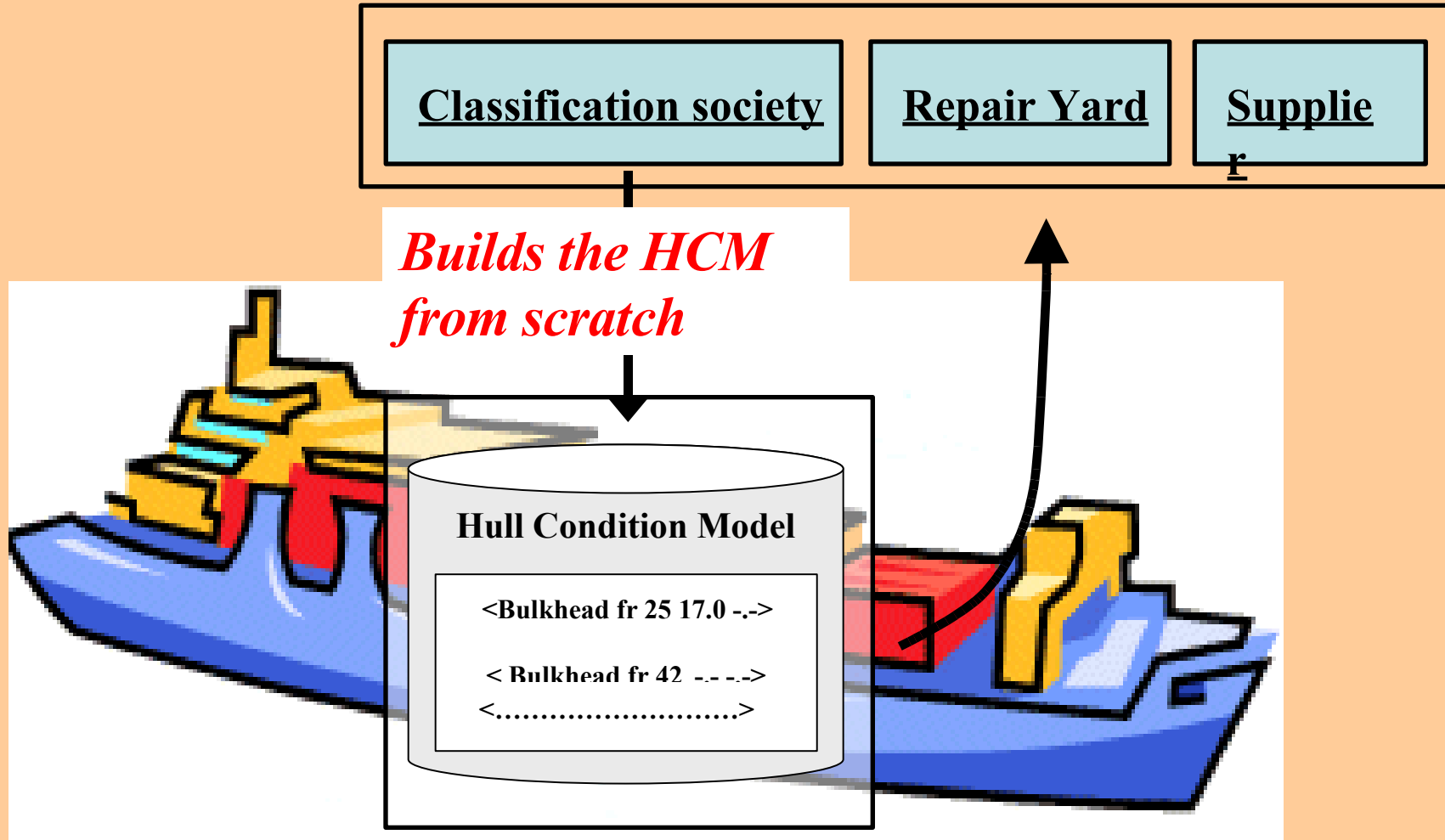
Databases are delivered with the vessel



Standard electronic documentation follows the vessel



Life cycle support (scenario n°2)

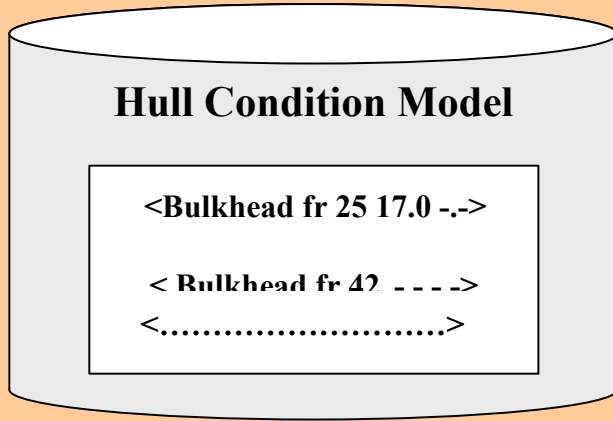


Associating structural elements and measurements into an XML file

< Bulkhead fr 25 17.0 -.- >

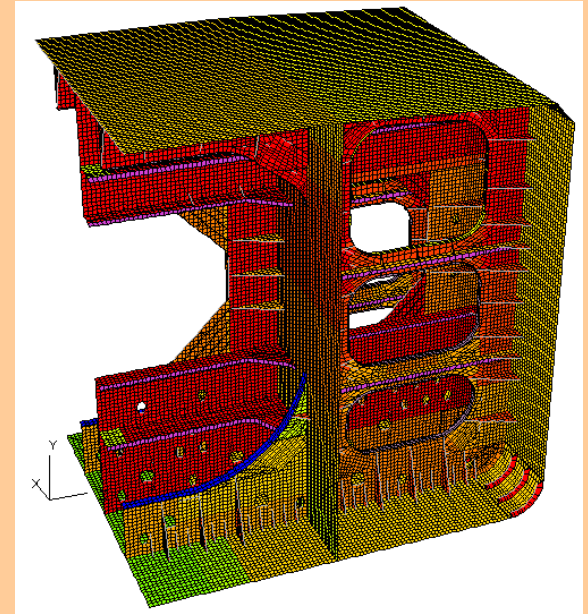
Structural element

17.0 = original thickness
(for structural element)



ISO STEP "Light"

Plate based

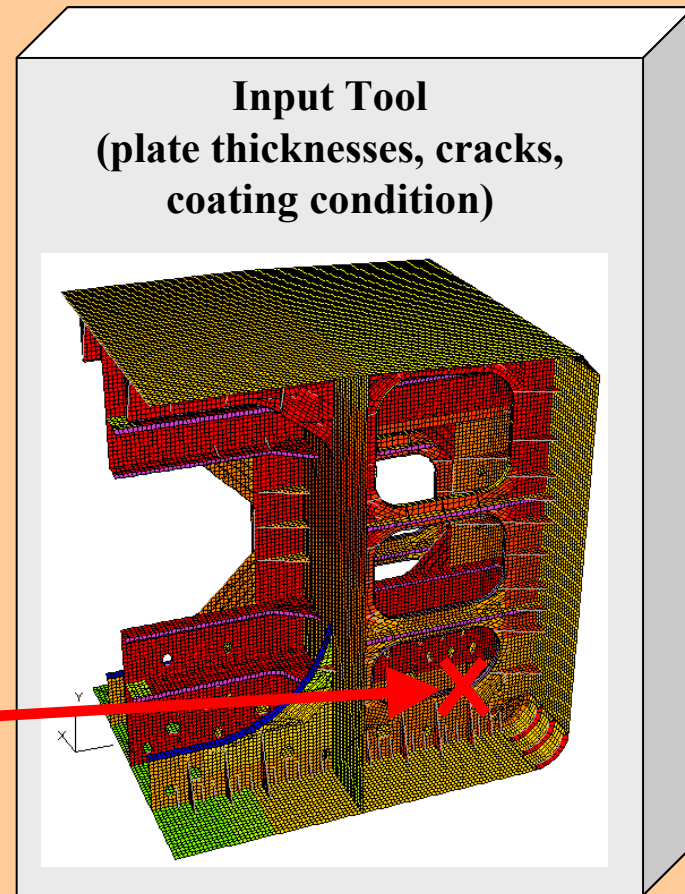
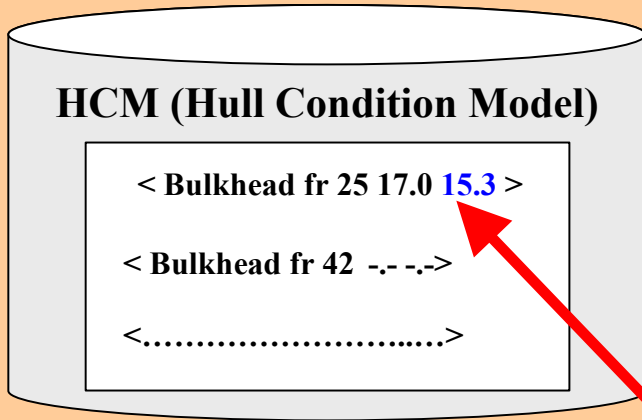


Hull Condition Model



Input tool

The electronic model is always present behind the graphical interface



Click !

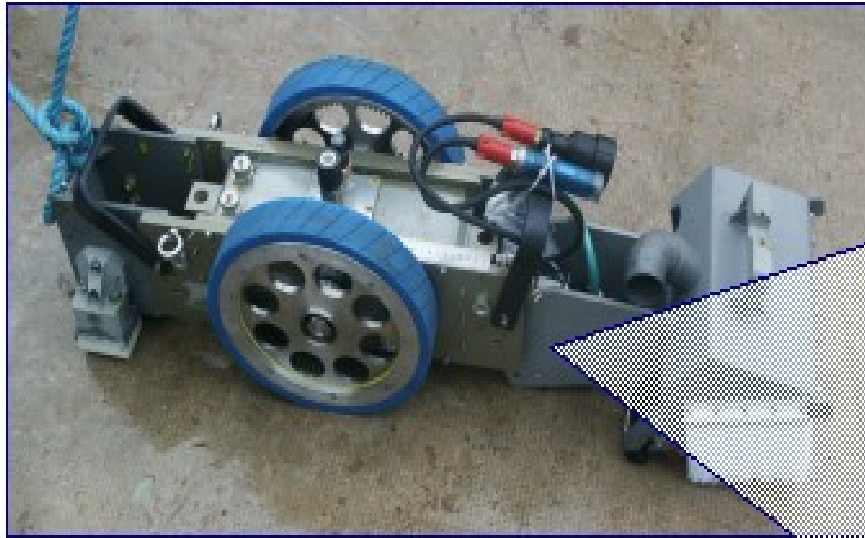
15.3

Measurement on board



Measurement robots

This principle is particularly adapted to the use of robotic vehicles equipped with ultrasonic sensors (for thickness measurements).



Magnetic Hull Crawler

Ultrasonic Measurement System

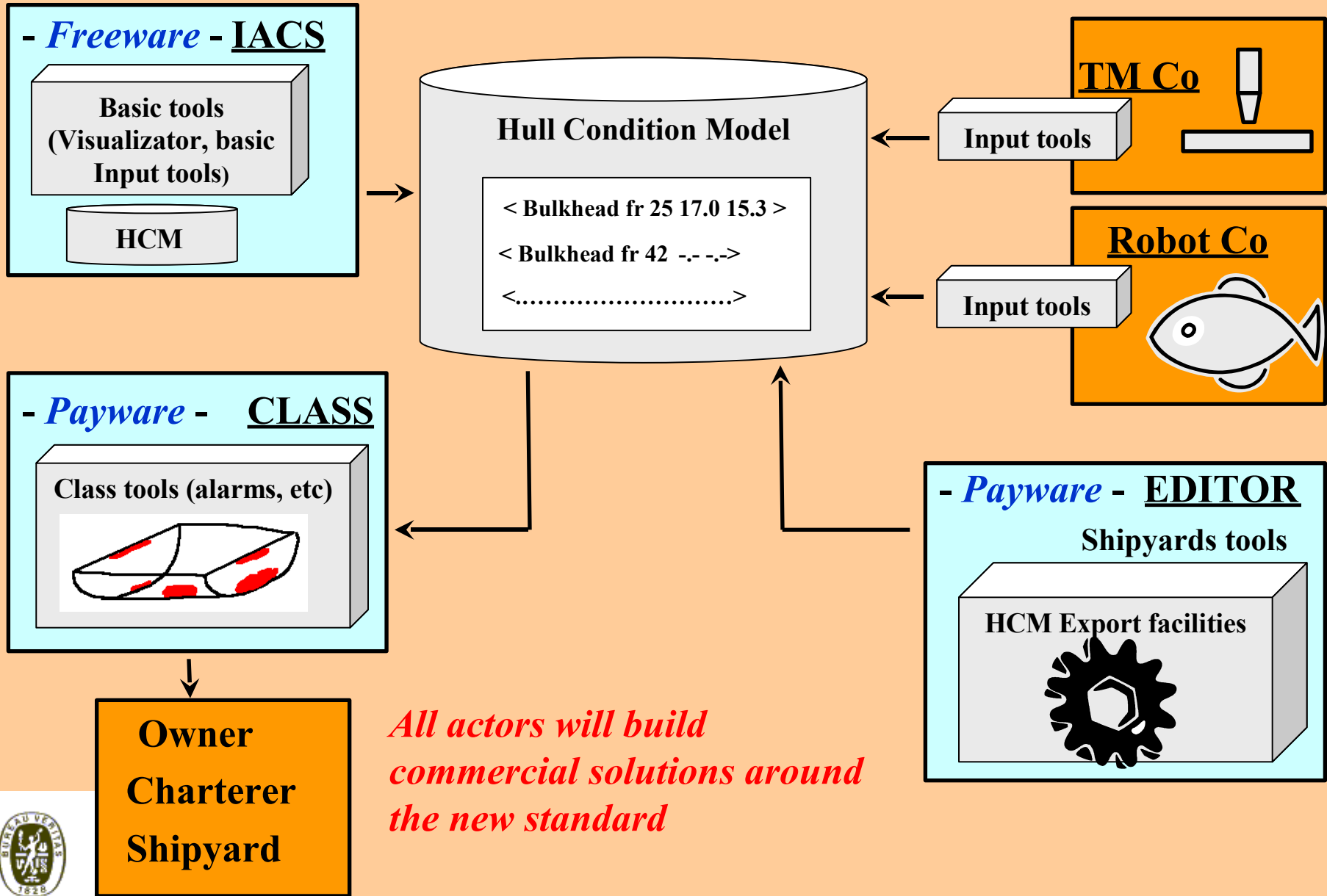


Measurement robots

In the project, a crawler climbs along metallic surfaces (ship's hull) using permanent magnets.

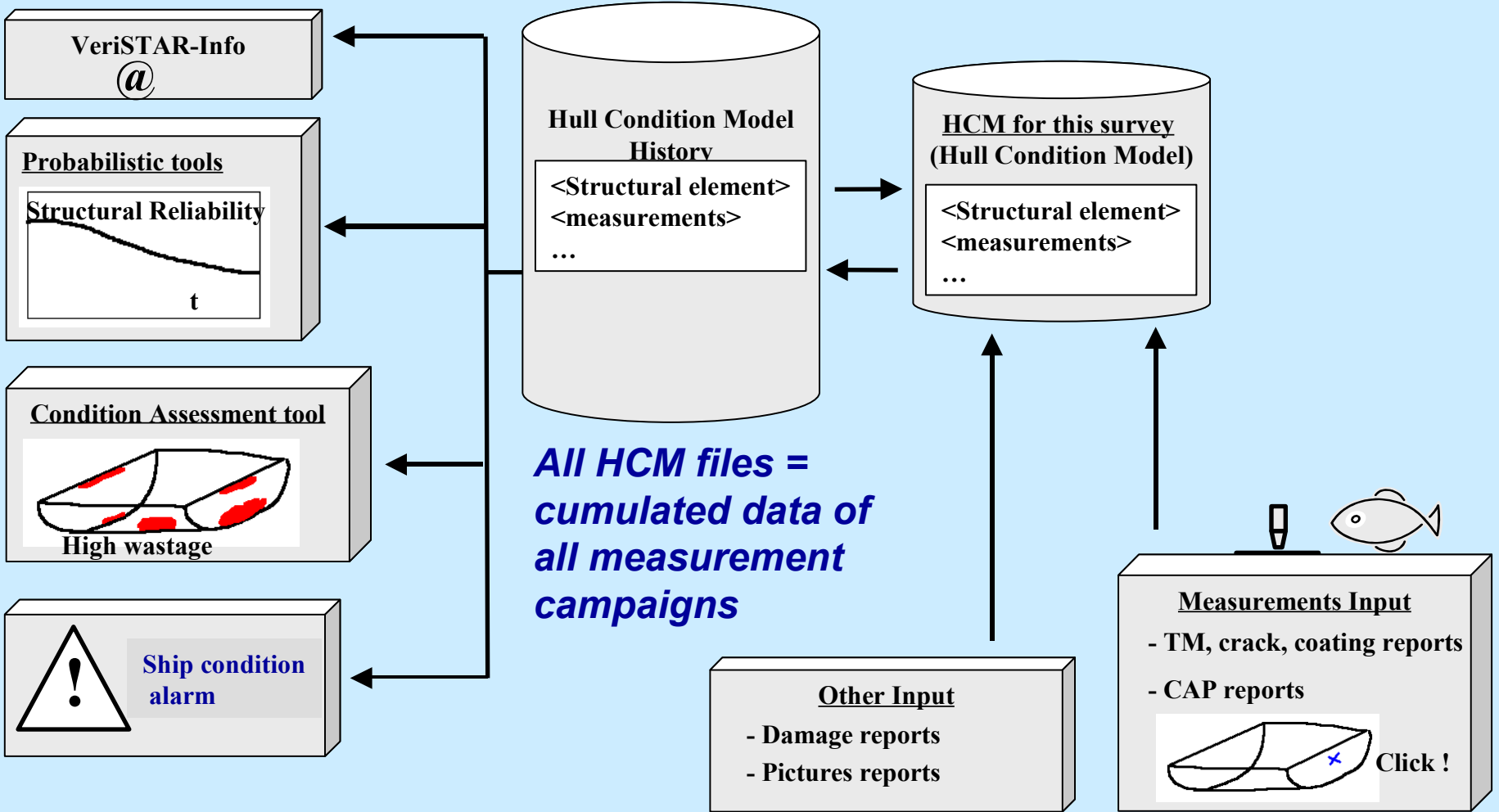


Expected business scenario



All actors will build commercial solutions around the new standard

VeriSTAR HLC map



VeriSTAR HLC : Owner's benefits

TM report in **real time**
... on time for **ordering repairs**

Reliability of TM analysis

On line access to TM, cracks, coating condition, pictures, etc
... with a **virtual navigation**

Global **condition assessment figures** : equivalent age, etc

Automatic alarms if quick degradation

Thank you for your attention

