



# Digital Technology to Transform AIMS

*MARTECH 2016 - 3rd International Conference on Maritime Technology and Engineering*

*July 06<sup>th</sup>, 2016 - Lisbon*

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A solution powered by



*Bureau Veritas Overview*



*Bureau Veritas AIM Tools*



*Bureau Veritas AIMS Description*

# What we do ?



Created en 1828

Testing,  
Inspection,  
Certification &  
Technical Assistance

Helping clients meet their growing  
challenges of quality, health & safety,  
environnemental protection and social  
responsability.

# An extensive geographic footprint



**66,500** employees



**1,400** offices and laboratories  
in **140** countries

Europe



**14 400**



**400**

Middle East,  
Eastern Europe



**6 000**



**143**

Americas



**20 100**



**330**

Africa,



**3 000**



**117**

Asia, Pacific



**23 000**



**410**

# A large portfolio of businesses

## 2015 Revenue: € 4.6 billion

8%



**Marine  
& Offshore**

17%



**Commodities**

14%



**Consumer  
Products**

6%



**Government  
Services &  
International  
Trade**

23%



**Industry**

13%



**In-Service  
Inspection &  
Verification**

11%



**Construction**

8%



**Certification**

**Oil & Gas**



# From conformity to performance

1

## Conform to regulation

Identify applicable regulation  
Assess conformity  
Report QHSE compliance

2

## Reduce risks

Control supply chain  
Perform risk analysis  
Reduce QHSE risk exposure

3

## Increase performance

Recognition through certification  
QHSE services outsourcing  
QHSE function optimisation

## Classification

Range of services performed on an offshore floating unit, including design review, construction surveys, attendance at sea, equipment inspections, until its delivery and during its in-service life based on BV rules

## Inspection

Shop, site and equipment inspections performed during construction phase as an independent body (third party), within statutory certifications or as a second party on behalf of the customer

## Verification

Independent review of design and operations to certify that the Safety Case done for an installation concluded on suitable safety measures (Initial Suitability check) and that the installation design and operations complies with the performance standards

## Asset Integrity Management (AIM)

Review of the management processes and techniques intended to maintain the integrity of the assets in order to optimise costs without compromising the safety, availability, reliability or the environment (eg: (RBI), Reliability Centred Maintenance (RCM), Reliability Availability Maintenance (RAM)).

**Offshore Floating Units & Equipment Classification**

**Offshore Units & Equipment Certification**

**Offshore Units Independent Verification**

**Consulting & Outsourcing**

**New Technology Assessment**

## Certification

Design review, onsite audits, witness of tests and inspections to certify that an equipment, a system or an installation complies with client specifications, agreed standards or regulatory/ statutory requirements

## Naval & Structural Analyses

Independent technical studies in the naval and structural domains (eg: stability, mooring, hydrodynamic & structure)

## Risk & Safety

Independent technical studies in HSE & Risk Management areas. (eg: Safety Case or studies, HAZOP, HAZID, Quantified Risk Assessments, Environmental impact assessments)

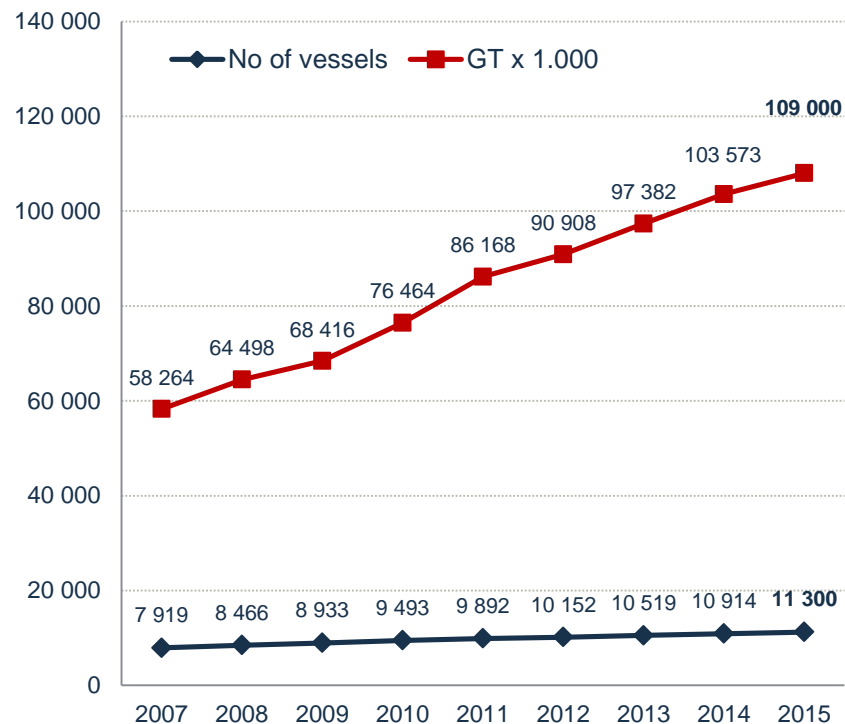
**3<sup>rd</sup> Party Services**

**2<sup>nd</sup> Party Services**

# BV classed fleet:

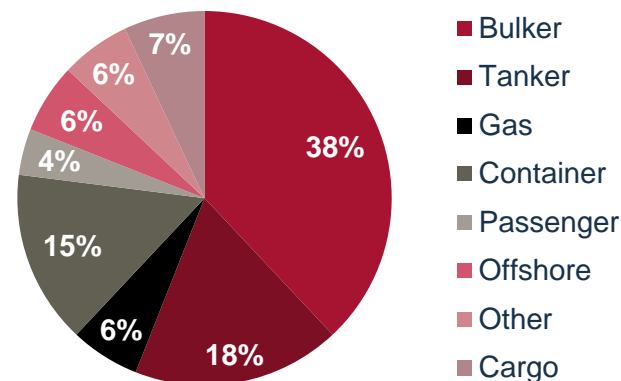
## 11,300 ships and 109m gt in 11-2015

### Evolution



- Average fleet age at 13.3 years
- Broad portfolio of vessels

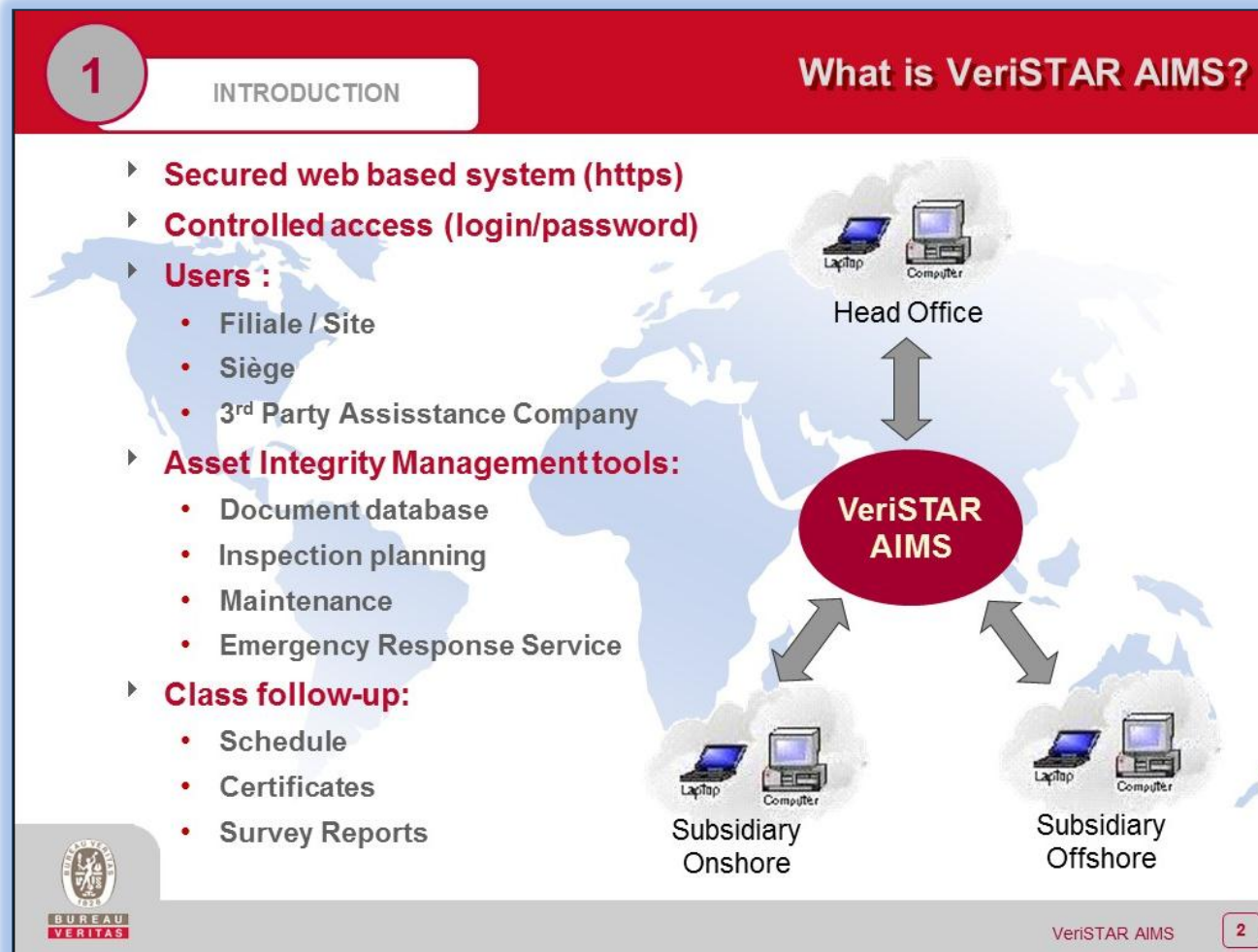
### Ship Type / GT





# After 10 years of support to FUIMS....

- ▶ In 2005 we developed VeriSTAR AIMS for TOTAL FUIMS to be implemented on subsidiaries with Floating Units



*Bureau Veritas Overview*



*Bureau Veritas AIM Tools*

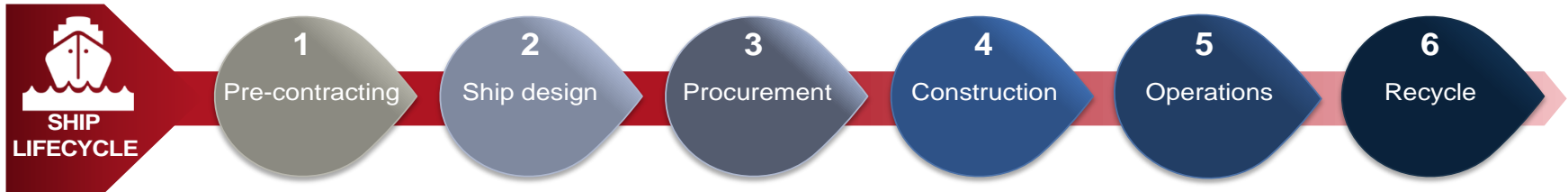


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## STEPPING INTO THE DIGITAL TRANSFORMATION... ...WITH THE NEXT GENERATION OF ASSET INTEGRITY MANAGEMENT SYSTEM

# The Digital Transformation will cover the lifecycle of the asset



## DIGITAL TWIN

An **easy accessible 3D model** of  
with **up-to-date data** covering design and operations



## CONNECTED ASSET

continuously feeds data into the model  
(e.g. hull condition, equipment, navigation)  
which can be used to optimize  
maintenance and performance



## CONNECTED SURVEYOR

feeds the 3D model with data and also  
uses the data already stored in the “twin”  
to improve productivity (design review, surveys)  
and customer satisfaction





**DASSAULT  
SYSTEMES**

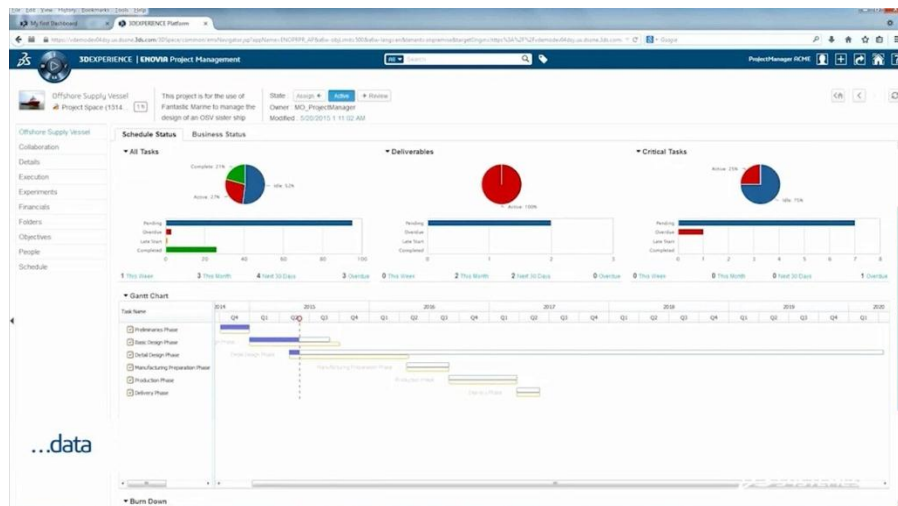
**POWERED BY DASSAULT  
SYSTEMES...**



**3DEXPERIENCE®**

Powered by Dassault Systèmes

**... BASED ON THE 3DEXPERIENCE®  
BUSINESS PLATFORM CONNECTING:  
...ASSETS  
...PEOPLE  
...DATA**







## Apply the Digital Transformation into the Asset Integrity Management:

Oil & Gas  
Offshore  
Units



**Create a Digital twin with intelligent data.**

**Connected to Operator IT systems and existing tools used in operations**

**Provide a cohesive interface with clear dash boarding**

**Integrating compliance activities (Class, Independent Verification, Certification...)**

*Bureau Veritas Overview*



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# FEATURES OF AIM SYSTEM

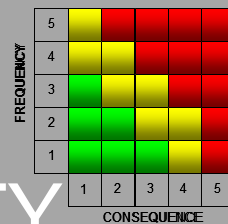
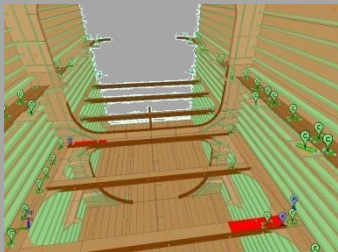
## COLLABORATION & MOBILITY



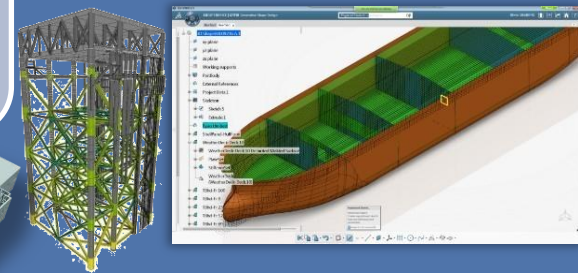
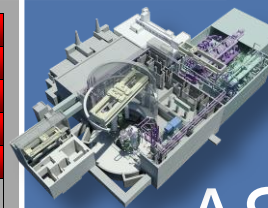
## INTEGRITY MONITORING



## AIMS

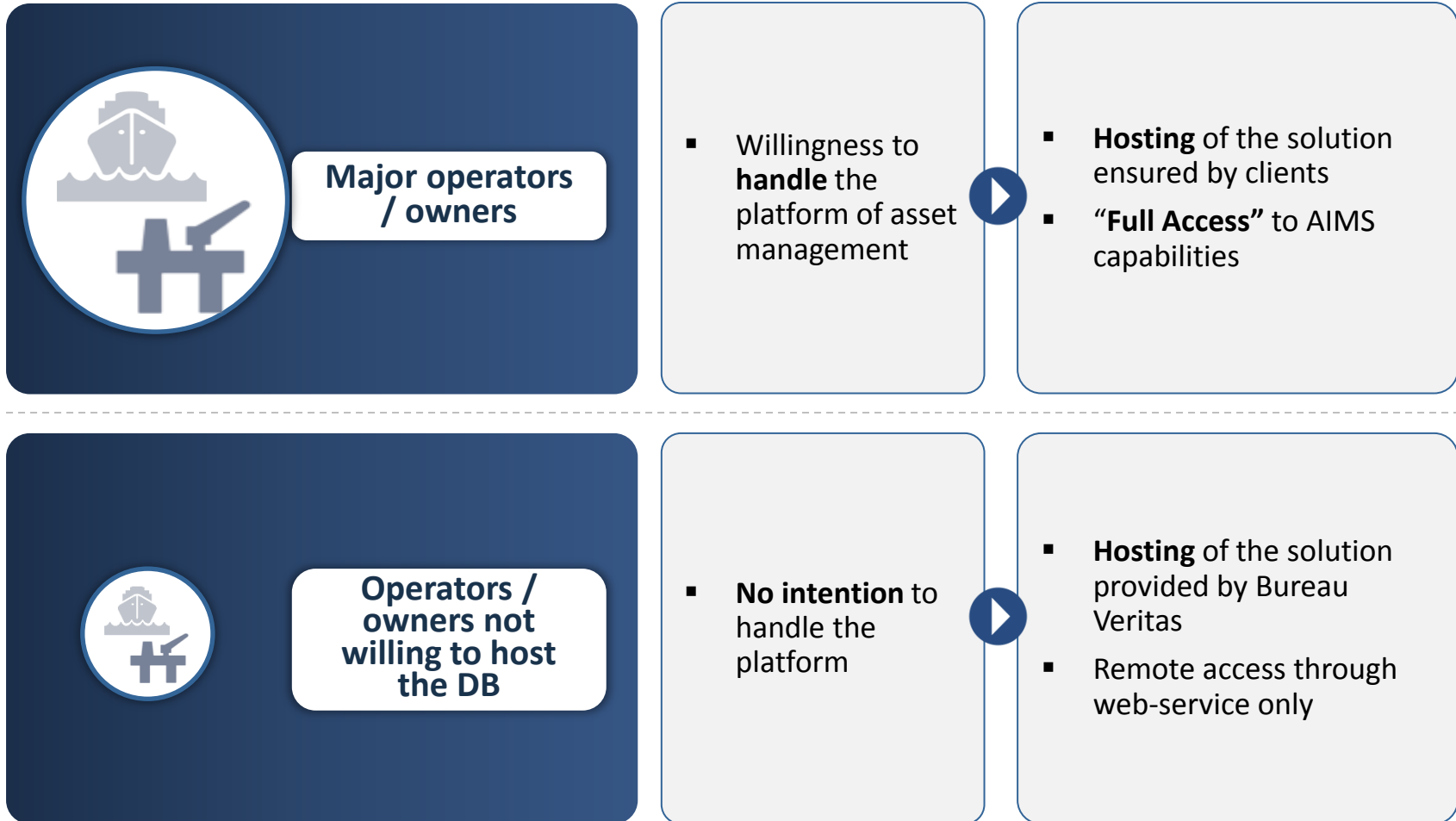


## INTEGRITY MANAGEMENT

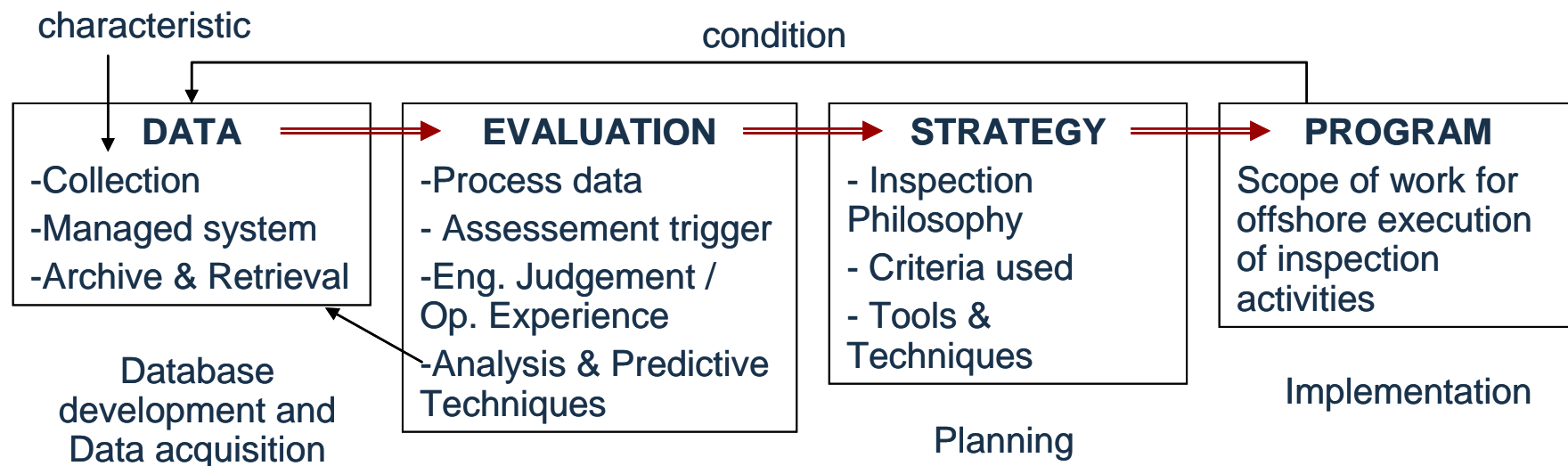


## ASSET DATA MANAGEMENT

# The AIMS must adapt to Client organization



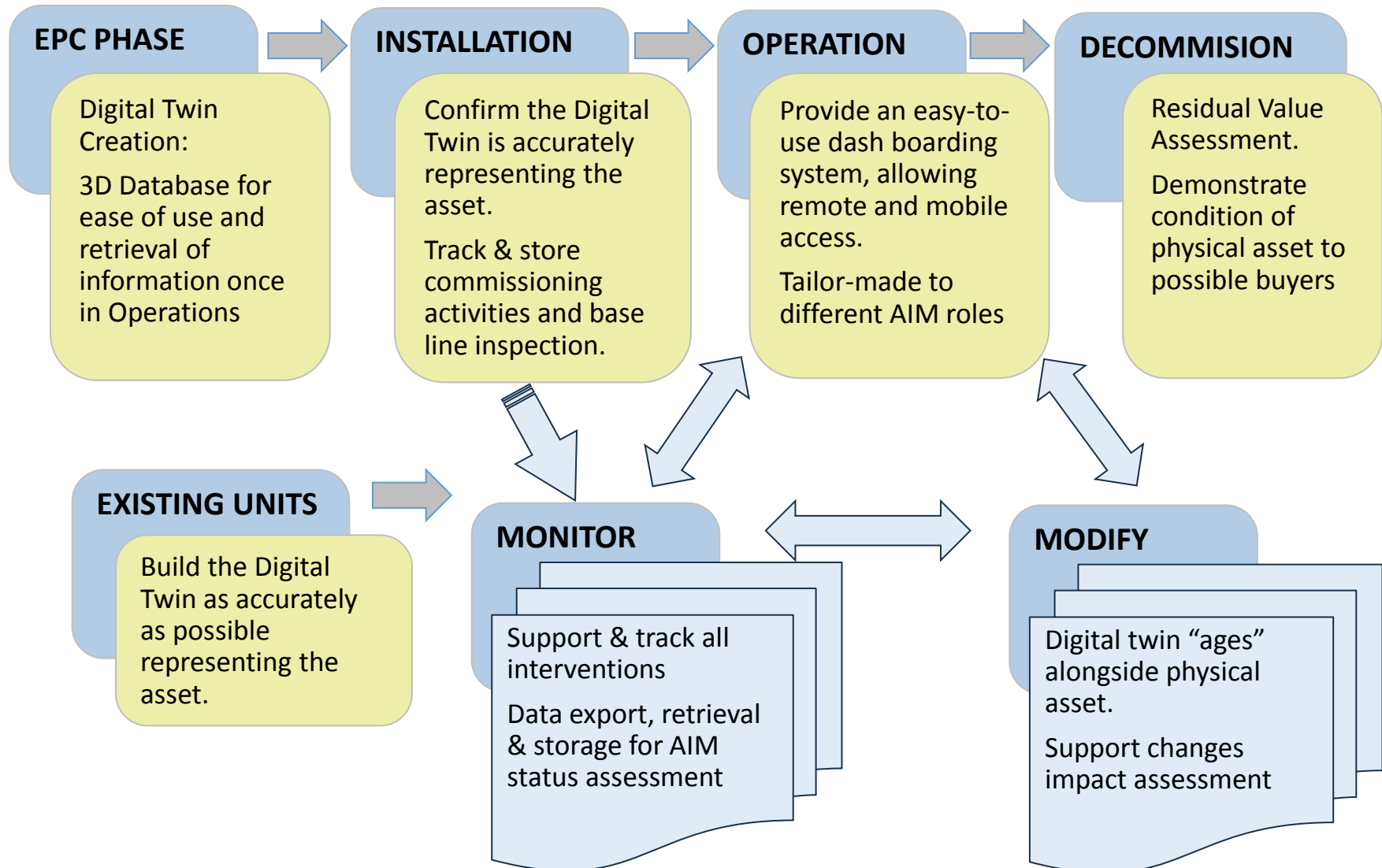
## HAVING THE SIM PROCESS AS THE BACKBONE



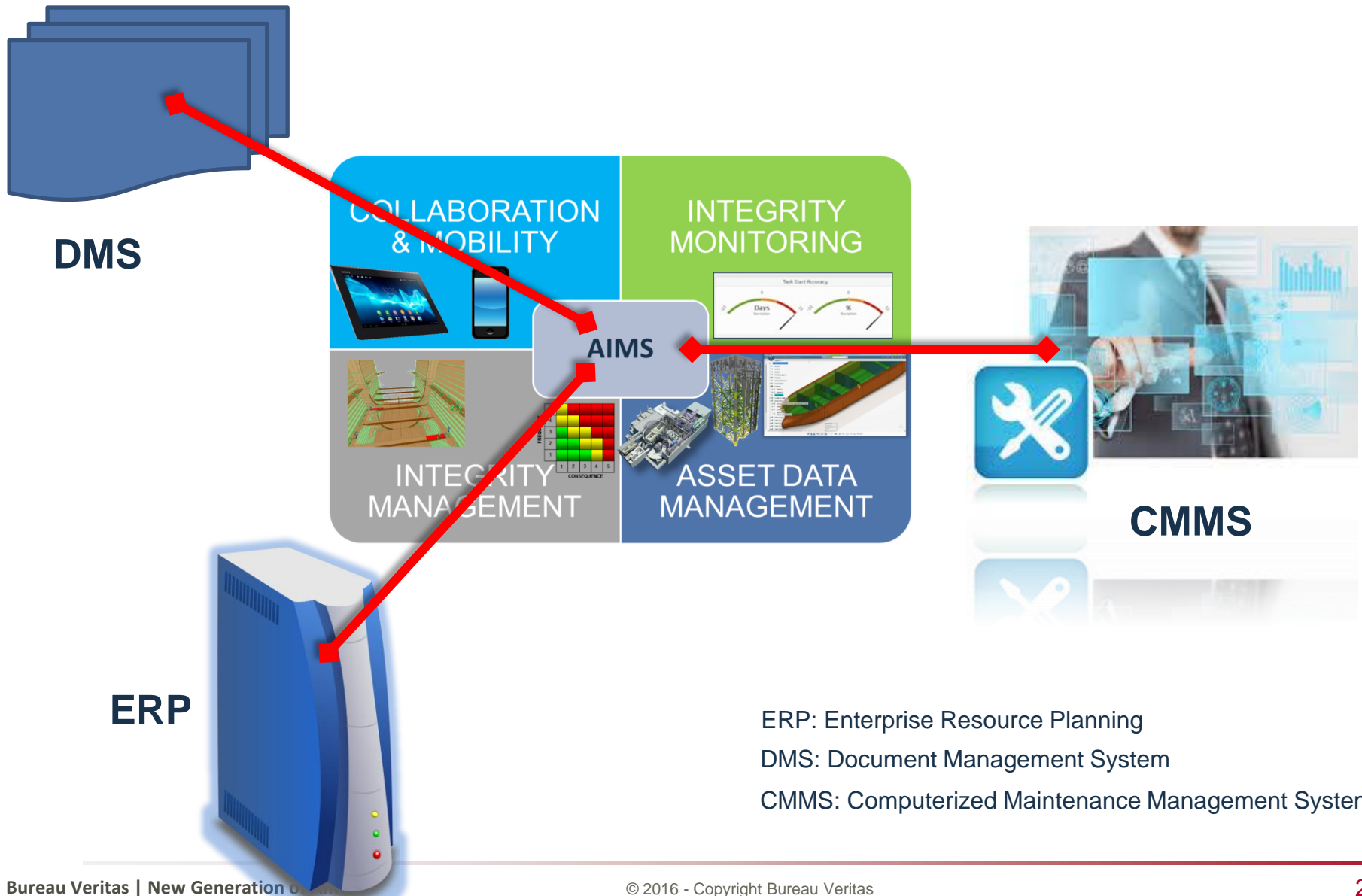
« **Structural integrity management (SIM) is a structured method recommended for assuring the condition of a structure and is a cyclic activity** » ISO 19902 : 2007

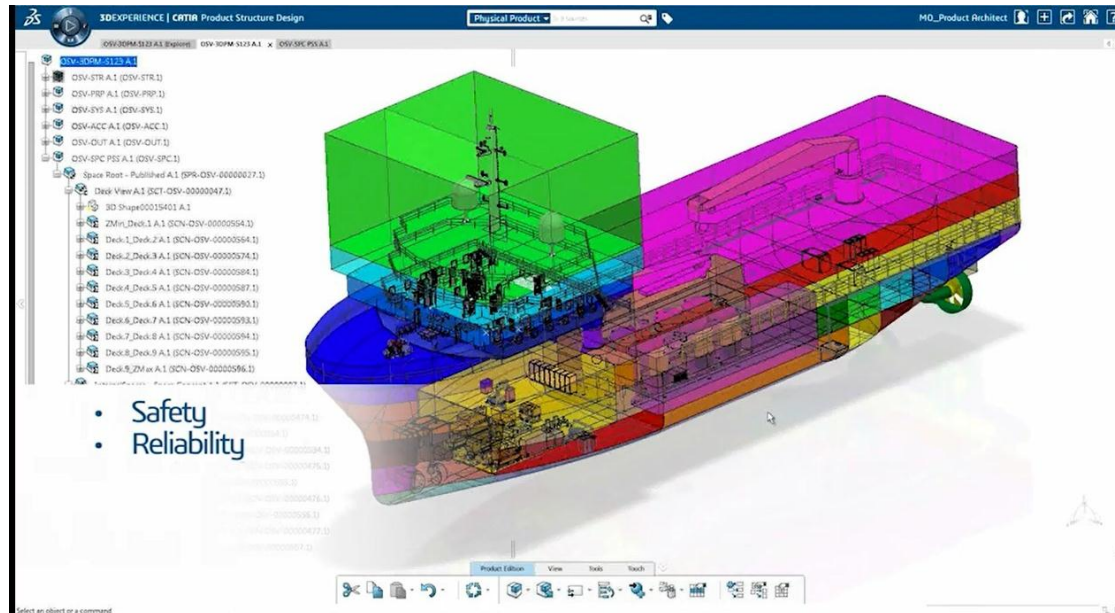


# When & How will the AIMS Platform help our Clients



# Connected to Existing IT Platforms

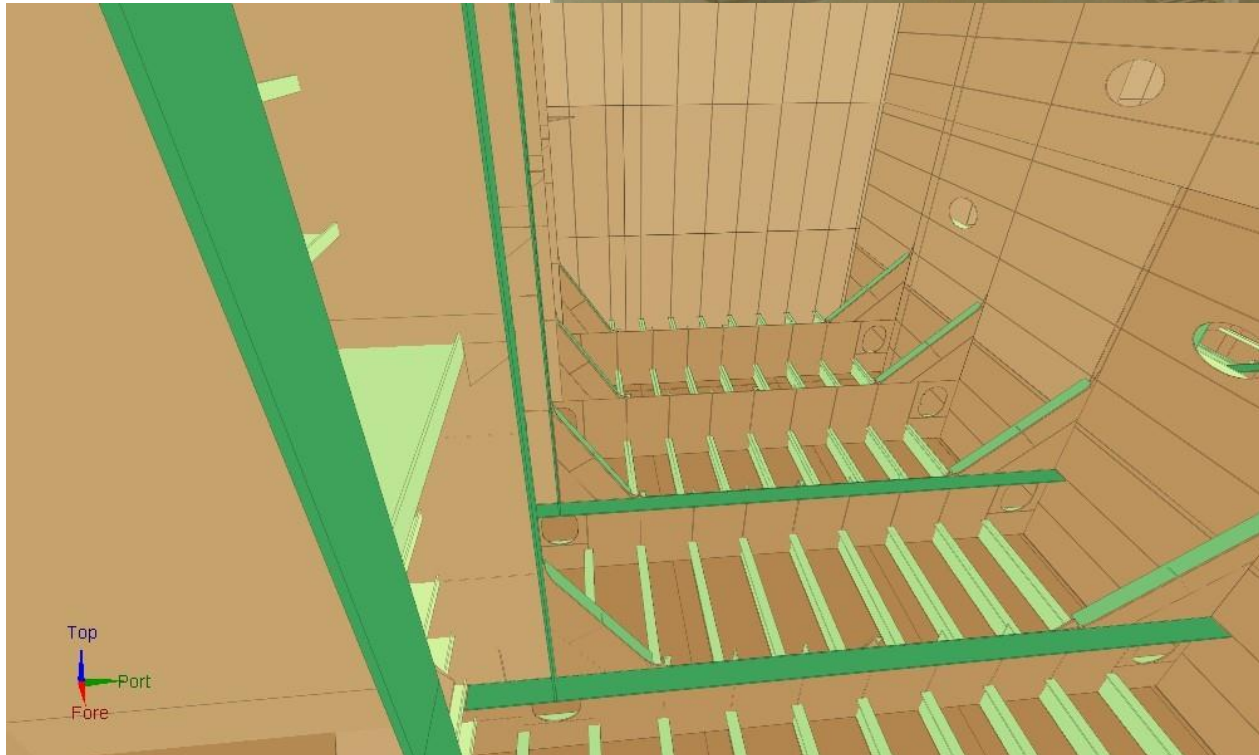
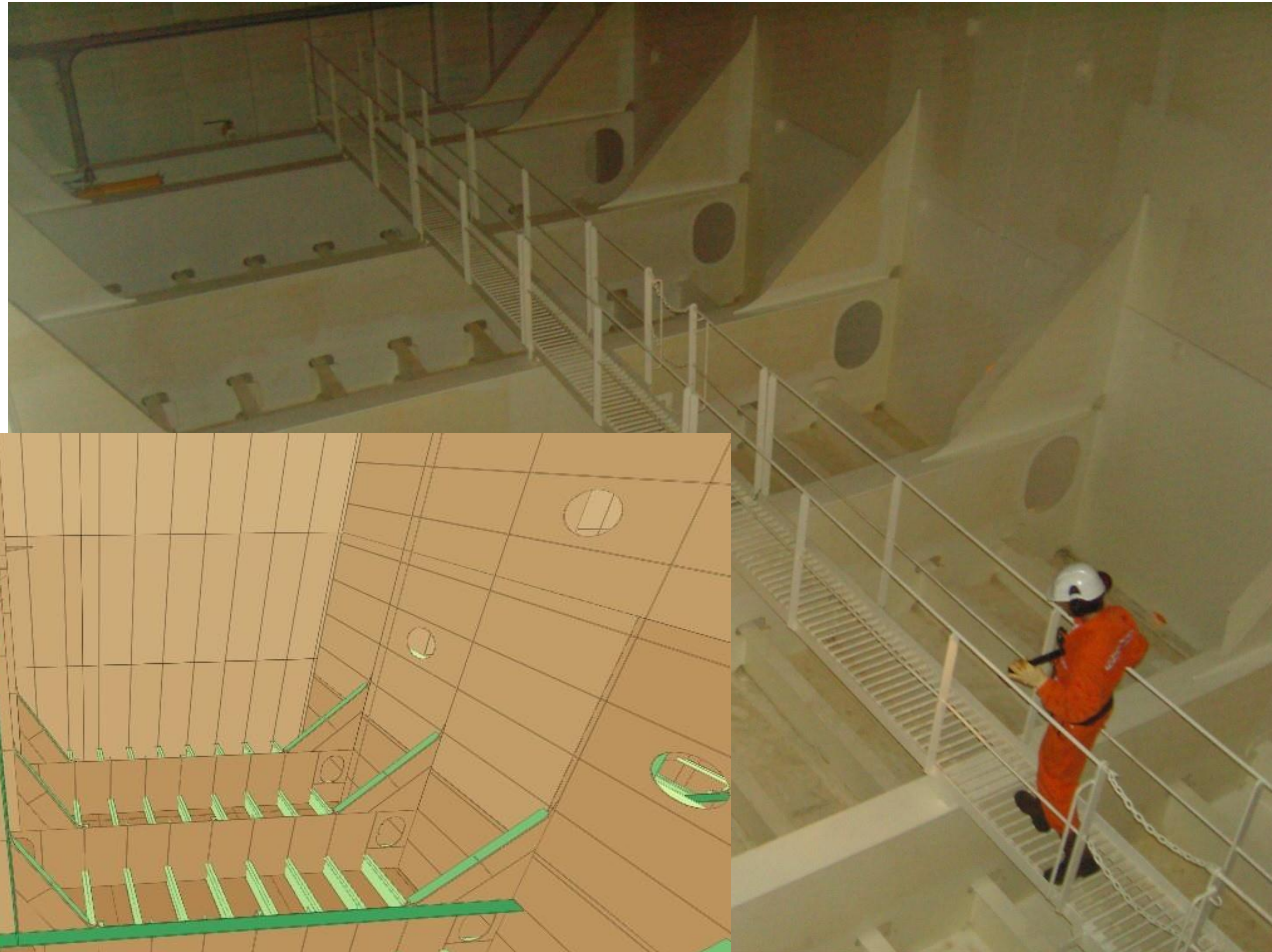




## COMBINING UNIQUE 3D MODEL WITH SMART DATA FOR:

- SAFETY
- RELIABILITY
- HIGH PERFORMANCE
- ENERGY EFFICIENCY
- SUSTAINABILITY

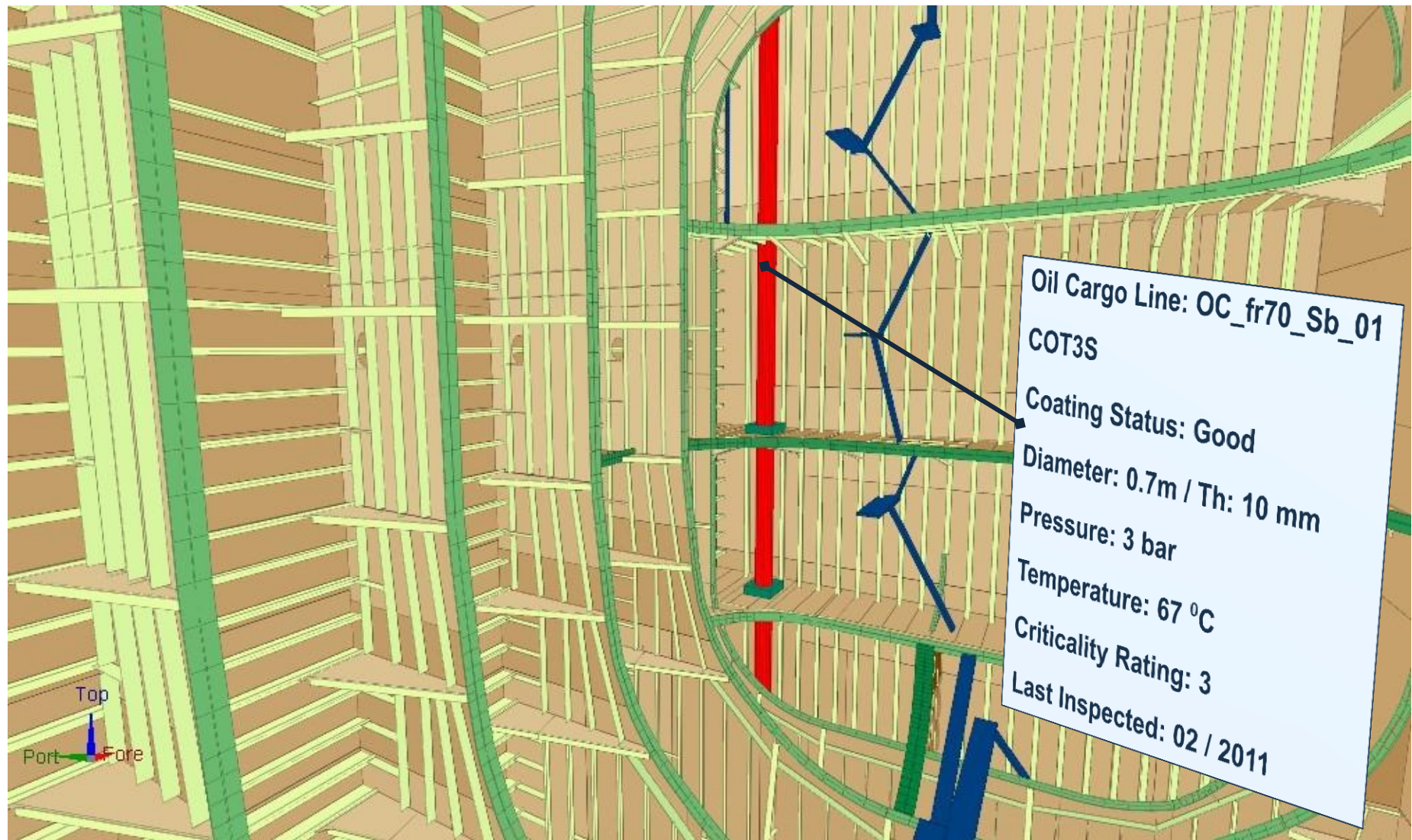
# A 3D Model that represents closely actual asset



Current VHLC model

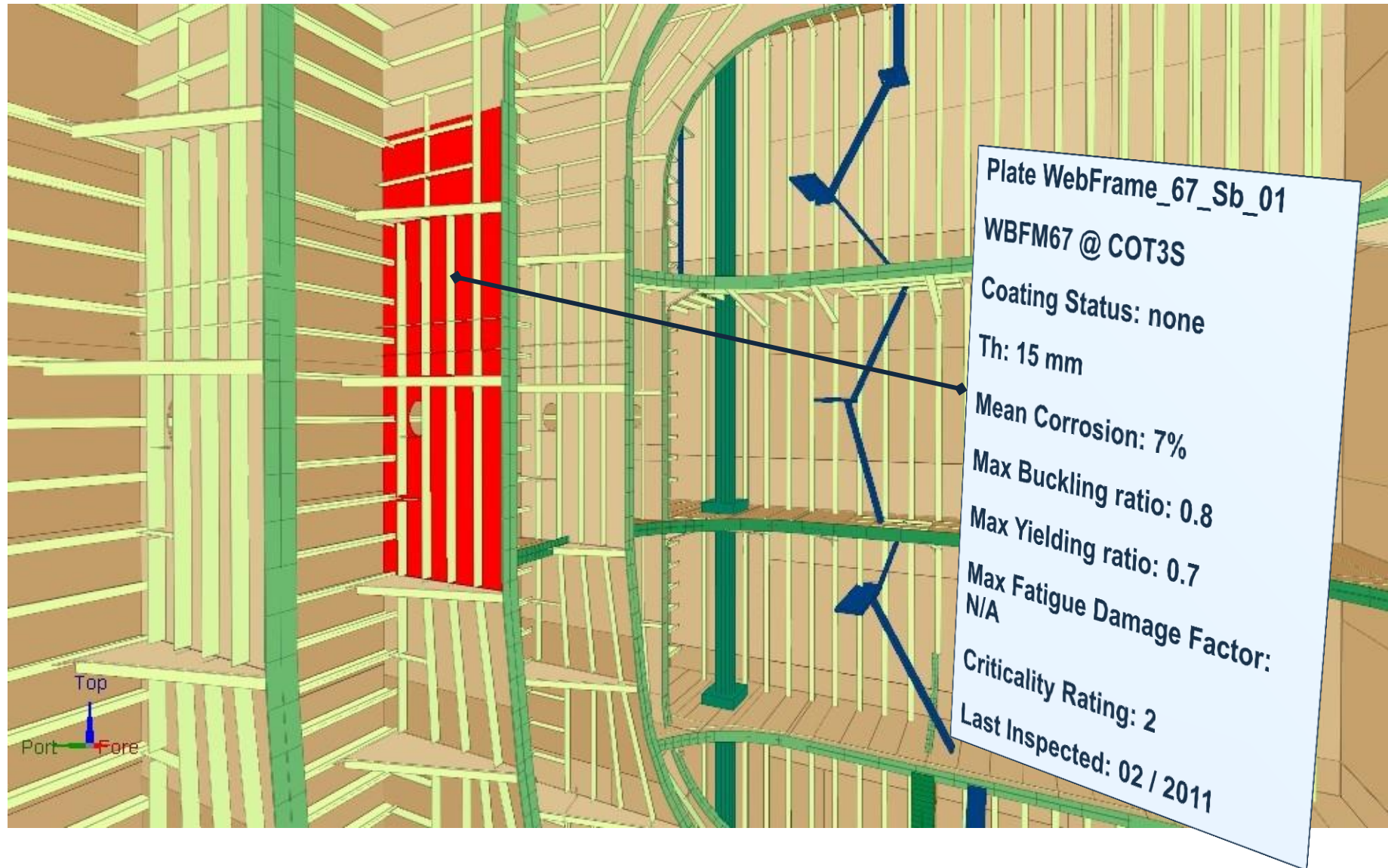


# With Smart-Data attached to individual items

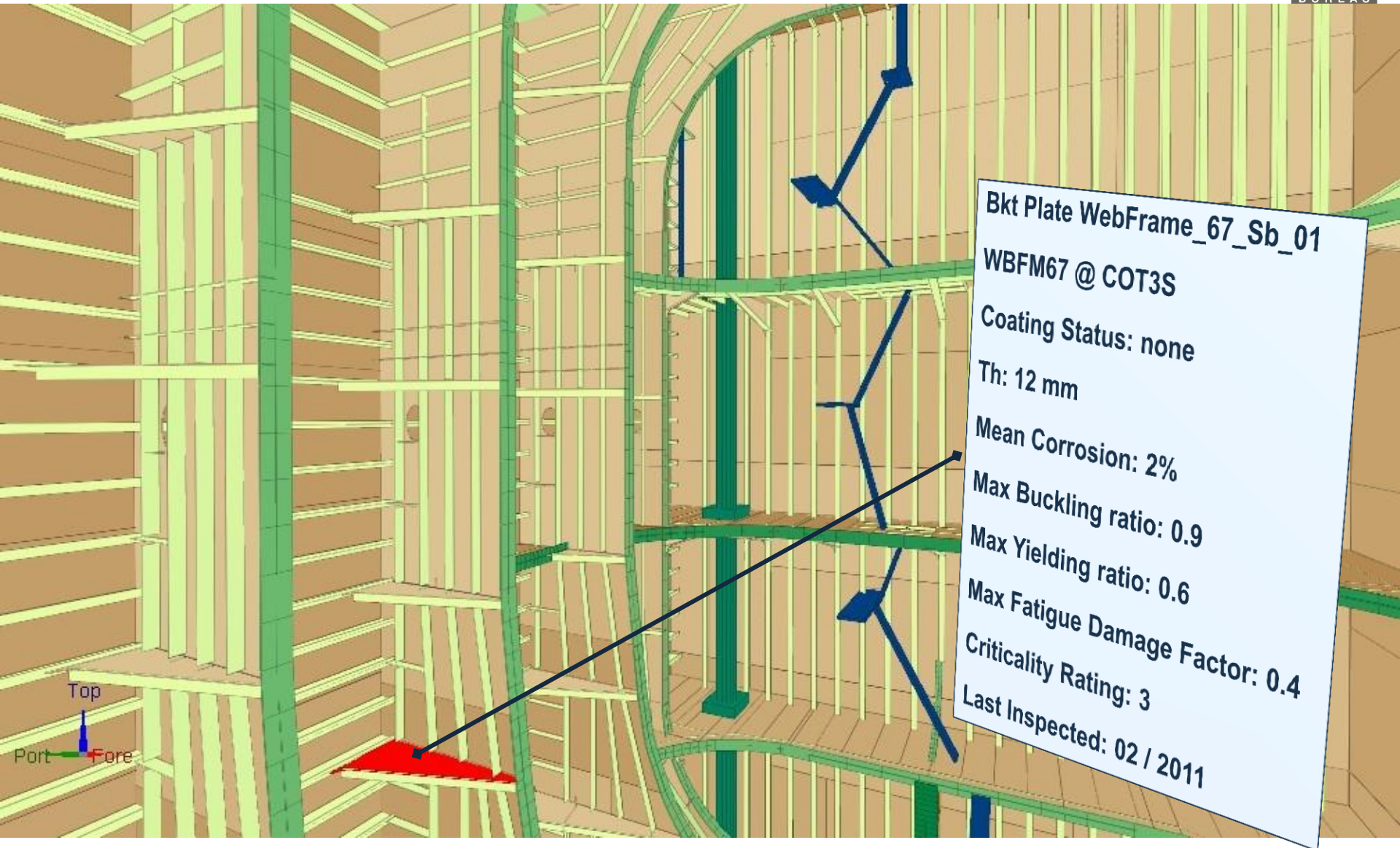




# With Smart-Data attached to individual items



# With Smart-Data attached to individual items

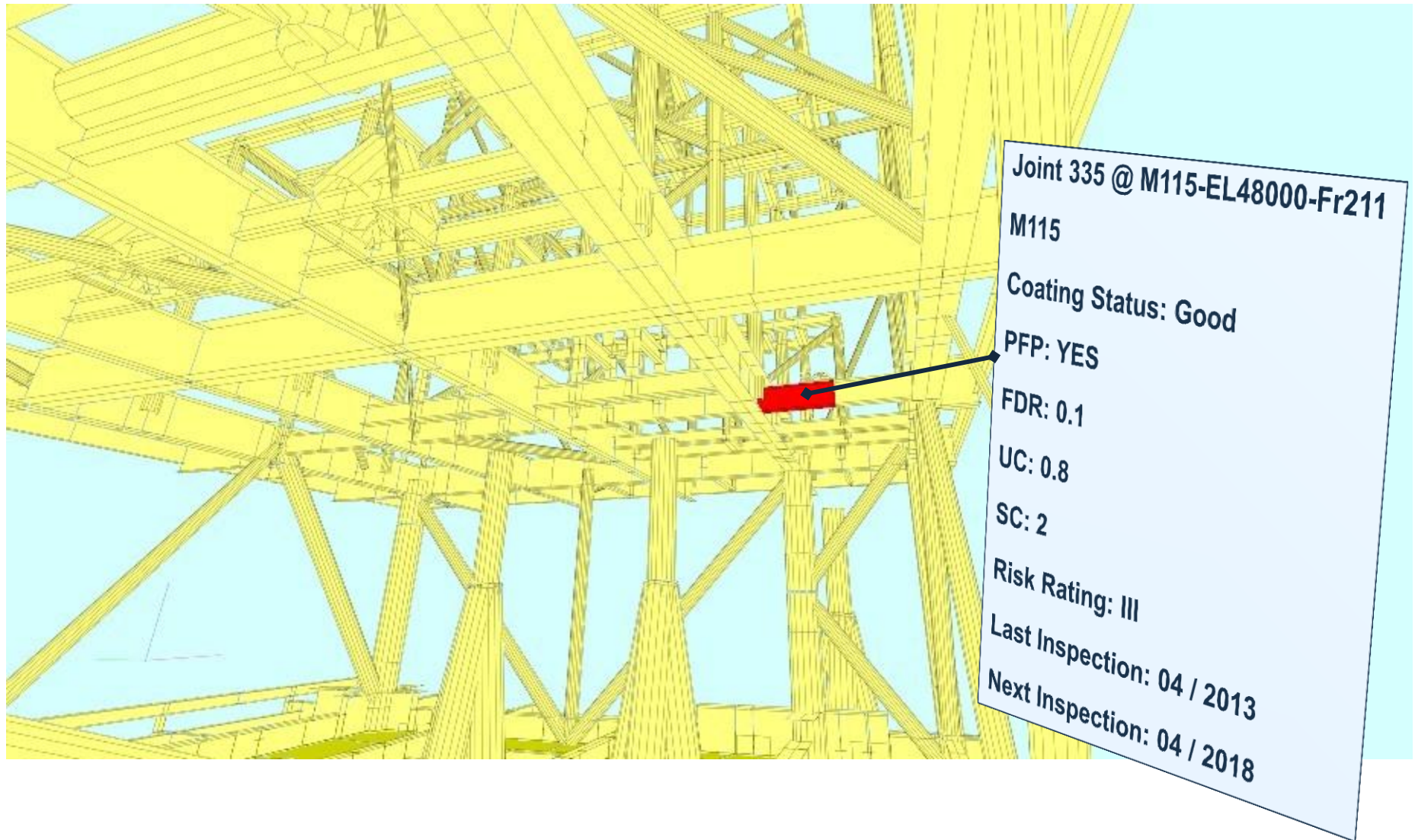




# With Smart-Data attached to Groups of Items



# Irrespective of type of item





# Smart-Data attached to Zones / Compartments

**CCOT3**

Coating Status: Poor

Mean Corrosion: 5%

Max Buckling ratio: 0.9

Max Yielding ratio: 0.8

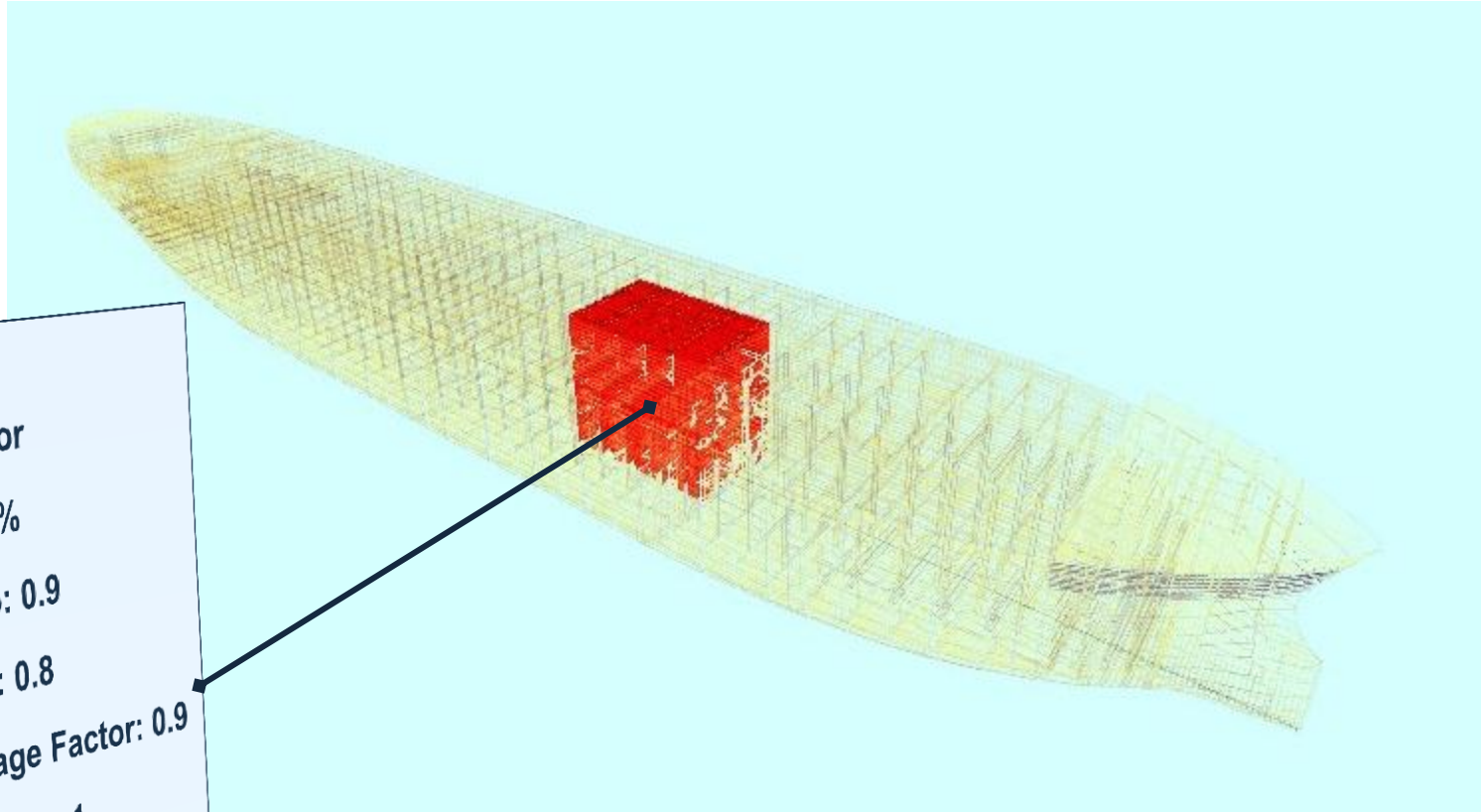
Max Fatigue Damage Factor: 0.9

Max Criticality Rating: 1

Last Inspected: 02 / 2012

Risk Rating: IV

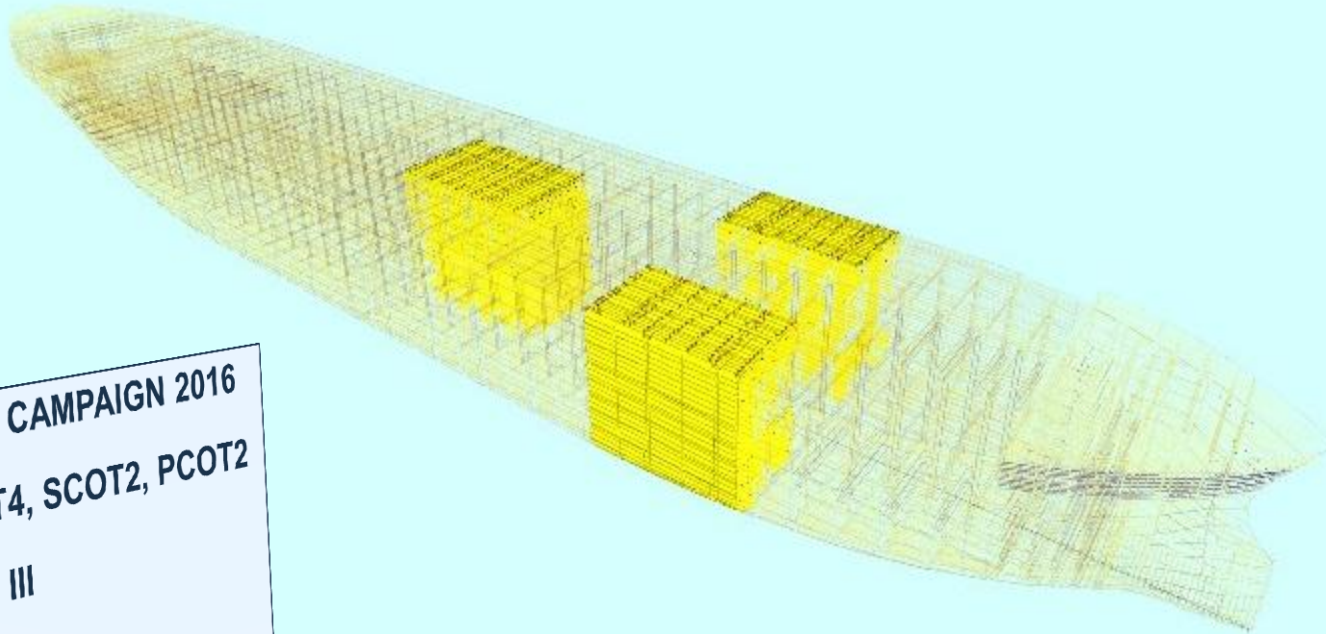
Next Inspection: 02 / 2015



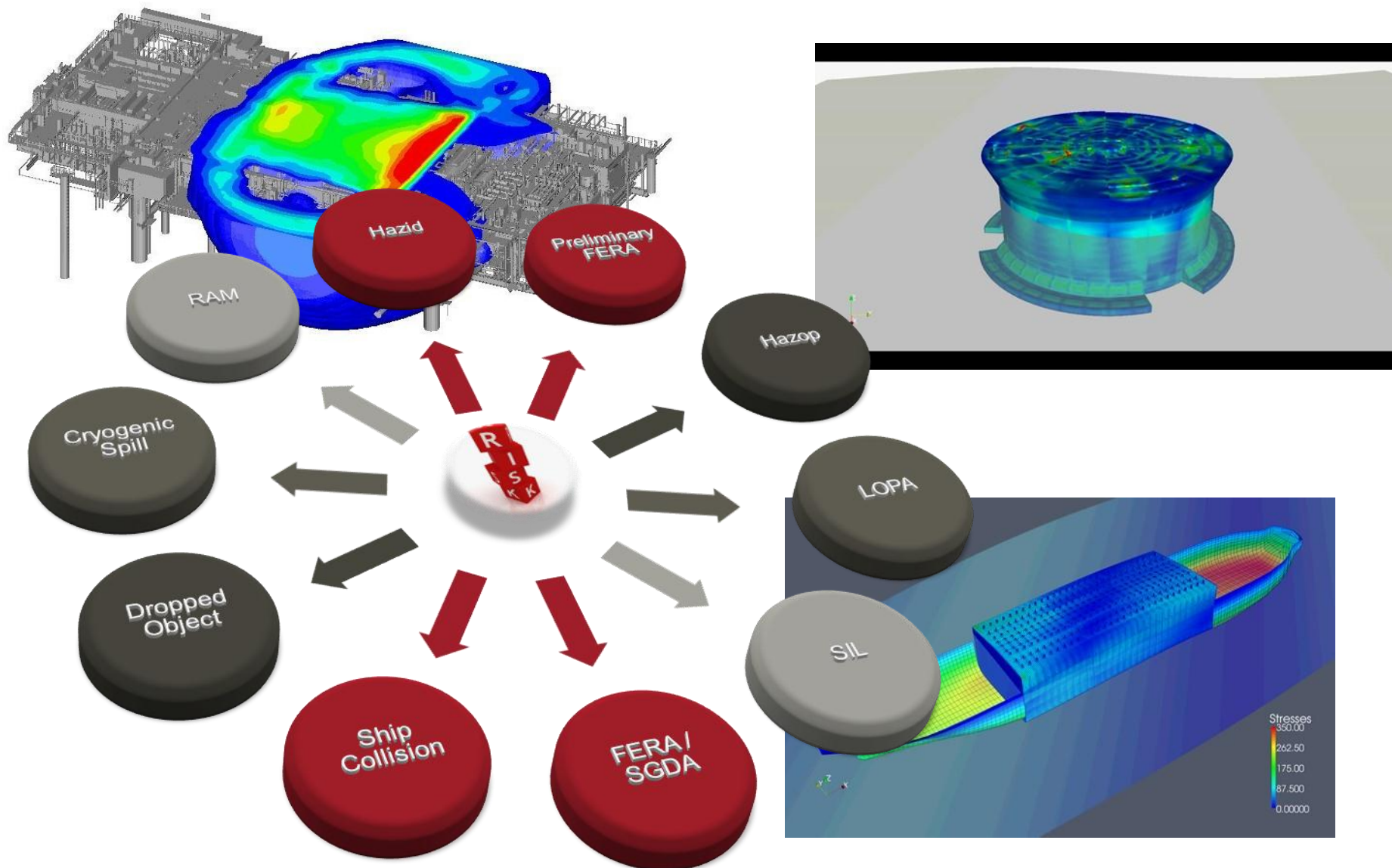


# Visualization of Areas Covered in Inspection Scope

**INSPECTION CAMPAIGN 2016**  
**Tanks: CCOT4, SCOT2, PCOT2**  
**Risk Rating: III**  
**Scope: CVI, UTM's**  
**Program: RBI-Class**



# IMPORT/EXPORT FROM CALCULATION TOOLS



# Adapted to each AIM system user

## Country Managers

Status report through mobile website



## OIM

Status report through mobile website and PC Dashboard



## QHSE/Compliance Manager

Status report through mobile website and PC Dashboard



Actions transmitted to Calendar application



## Integrity Management team by discipline

Access through PC Console

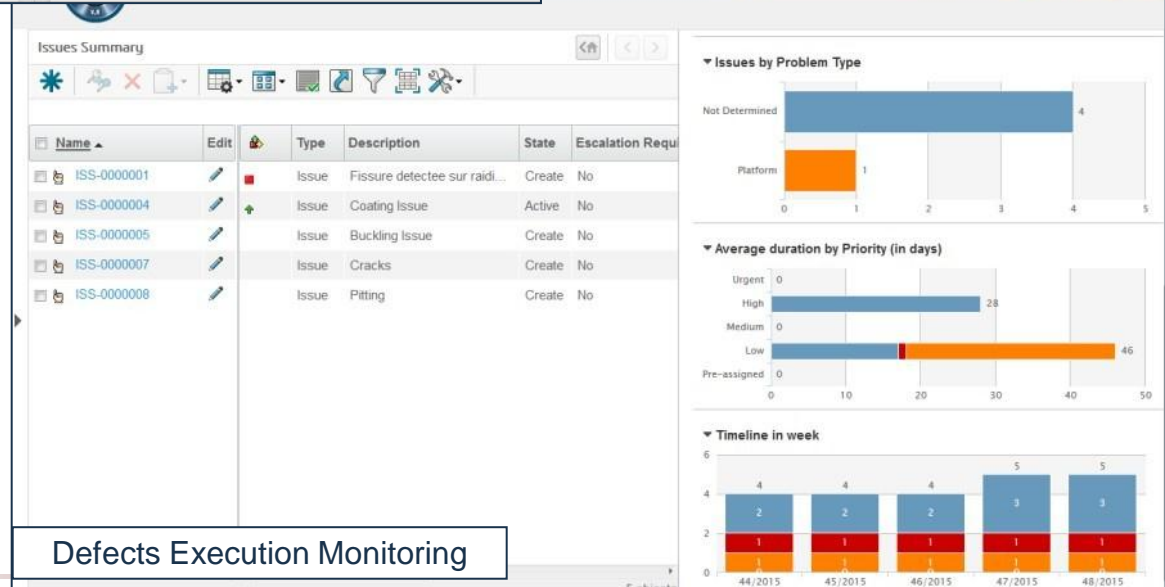


Actions transmitted to Calendar application



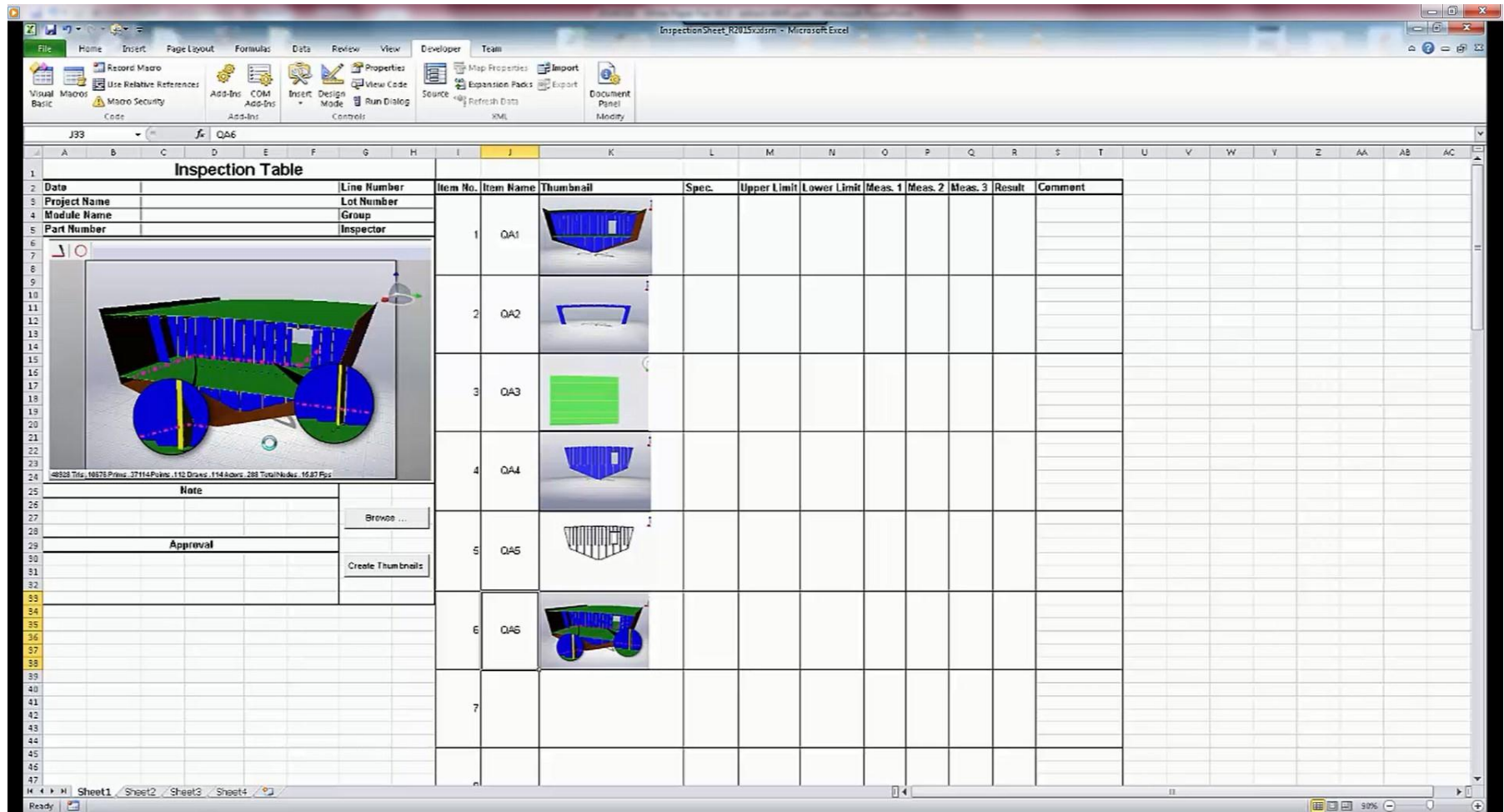
# Dedicated Dash-boarding

## ► User and Role based dash boards





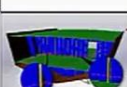



# DISCONNECTED MODE

- Easy-to-use templates for inspection team with embedded 3D model.



The screenshot displays a Microsoft Excel spreadsheet titled "InspectionSheet\_R2015xdsrsm - Microsoft Excel". The spreadsheet is designed as an inspection table template. The 'Note' column (column D) contains a 3D model of a mechanical part, which is a blue and green structure with a yellow vertical rod. The 'Item No.' column (column I) lists items 1 through 7. The 'Item Name' column (column J) lists items QA1 through QA6. The 'Thumbnail' column (column K) shows small images of the 3D model for each item. The 'Spec.' column (column L) is empty. The 'Upper Limit' column (column M) is empty. The 'Lower Limit' column (column N) is empty. The 'Meas. 1' column (column O) is empty. The 'Meas. 2' column (column P) is empty. The 'Meas. 3' column (column Q) is empty. The 'Result' column (column R) is empty. The 'Comment' column (column S) is empty. The 'Date' column (column A) is empty. The 'Project Name' column (column B) is empty. The 'Module Name' column (column C) is empty. The 'Part Number' column (column D) is empty. The 'Line Number' column (column E) is empty. The 'Lot Number' column (column F) is empty. The 'Group' column (column G) is empty. The 'Inspector' column (column H) is empty. The 'Note' column (column D) contains a 3D model of a mechanical part, which is a blue and green structure with a yellow vertical rod. The 'Approval' column (column D) contains a 'Brower ...' button and a 'Create Thumbnails' button. The 'Note' column (column D) contains a 3D model of a mechanical part, which is a blue and green structure with a yellow vertical rod. The 'Note' column (column D) contains a 3D model of a mechanical part, which is a blue and green structure with a yellow vertical rod.

Date	Project Name	Module Name	Part Number	Line Number	Lot Number	Group	Inspector	Item No.	Item Name	Thumbnail	Spec.	Upper Limit	Lower Limit	Meas. 1	Meas. 2	Meas. 3	Result	Comment
								1	QA1									
								2	QA2									
								3	QA3									
								4	QA4									
								5	QA5									
								6	QA6									
								7										



# All Assets can be covered





***Move Forward with Confidence***