



# SMS Dynamic Hull Monitoring System

Digital Twin Marine Technology for Real-Time  
Vessel Condition Monitoring

**Safety  
Assurance**

**Optimal Return  
on Investment**

**Maximum Value from  
Embodied Carbon**

# Reducing Risk in Maritime and Offshore Operations

FPSOs operating without a dedicated hull monitoring system face significant operational and financial risks due to the lack of real-time structural integrity data. Consequences might include :



Undetected fatigue, corrosion and hull damage



Sudden shutdowns or catastrophic failure



Sources:

\*NACE International study

\*\* [https://www.safety4sea.com/wp-content/uploads/2015/01/GREEN4SEALog-Issue-04.pdf?utm\\_source=chatgpt.com](https://www.safety4sea.com/wp-content/uploads/2015/01/GREEN4SEALog-Issue-04.pdf?utm_source=chatgpt.com)

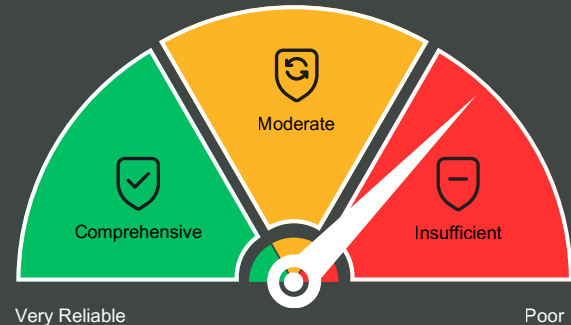
\*\*\* [https://www.offshore-mag.com/business-briefs/equipment-engineering/article/16759003/floating-production-inspection-evaluation-methods-help-fpsos-fsos-avoid-drydocking?utm\\_source=chatgpt.com](https://www.offshore-mag.com/business-briefs/equipment-engineering/article/16759003/floating-production-inspection-evaluation-methods-help-fpsos-fsos-avoid-drydocking?utm_source=chatgpt.com)

# Limitations of Manual Inspections

Manual, periodic hull checks are slow, error-prone, and miss early warning signs. They fall short of today's demands for continuous structural insight and regulatory rigor.

This outdated approach forces operators to rely solely on conservative integrity models, leading to:

- Excessive, costly maintenance
- Unnecessary early decommissioning
- Increases lifecycle costs
- Compromised long-term safety, regulatory compliance, and asset longevity



For example, inspecting one cargo tank can cost around £1 million every five years. With several tanks on board, the total quickly increases. By using Dynamic Risk-Based Inspection (DRBI), you can focus efforts where they matter most and reduce overall inspection costs.

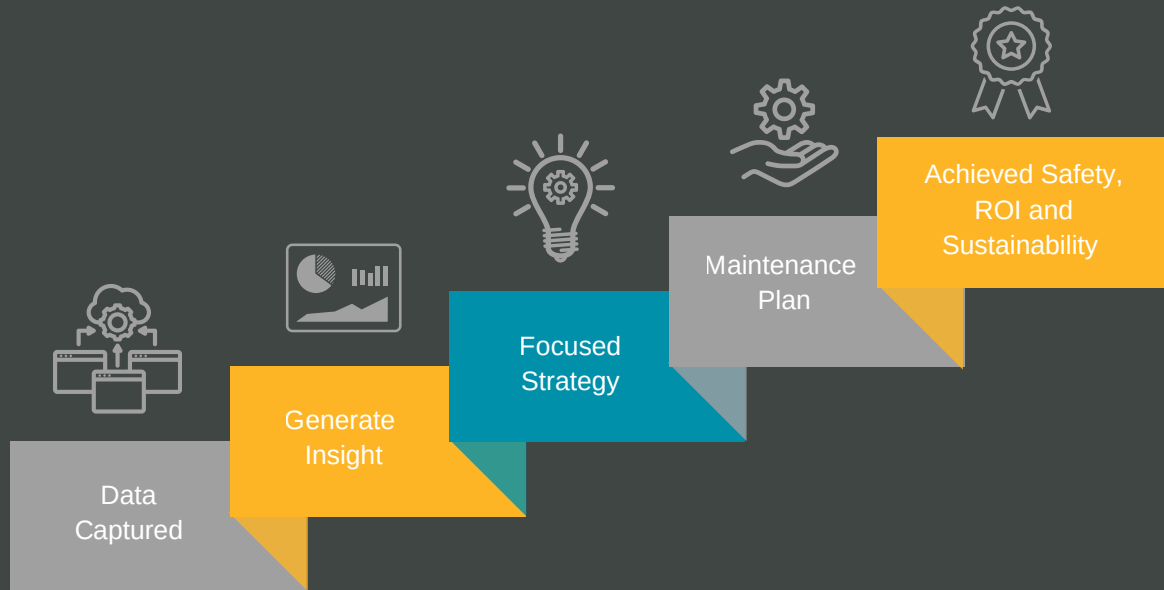
# Conventional vs. Real-Time Monitoring

## Key Aspect & Their Output

ASPECT	CONVENTIONAL MONITORING	REAL - TIME MONITORING
Frequency	Periodic, manual	Continuous, automated
Accuracy	Prone to human error	High precision data-driven
Damage Detection	Often detects damage late	Catches early signs in real-time
Decision-Making	Based on assumptions	Based on live integrity data
Maintenance Planning	Over-engineered, costly	Predictive and optimised
Operational Downtime	Higher risk due to undetected issues	Reduced through proactive action
Compliance Readiness	Harder to meet evolving standards	Built to support modern regulatory requirements
Asset Lifecycle	Shortened due to conservative models	Extended through informed decisions

# Real-Time Monitoring of Hull Integrity

SMS's innovative technology delivers real-time data capture and analysis, enabling vessel operators to make best value decisions about maintenance and repair. These insights allow operators to make informed decisions about resource allocation across their fleet, delivering a range of value-adding benefits.



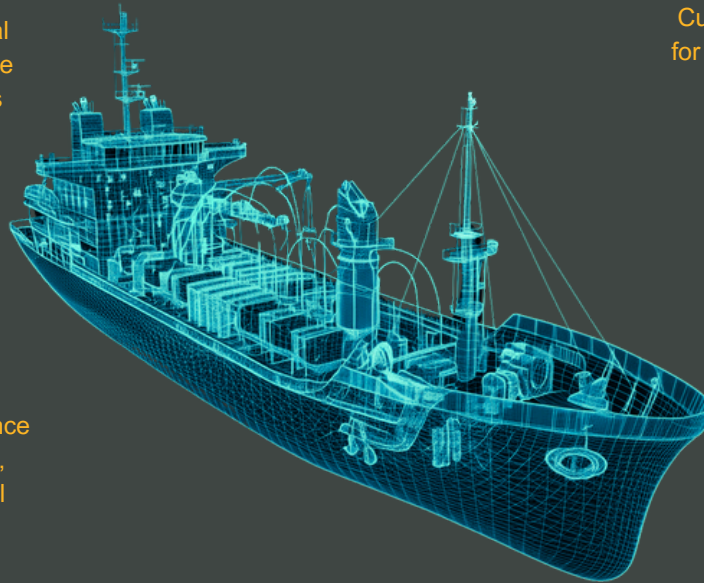
# Real-Time Insights , Instant Clarity

SMS' integrated system features an array of strategically positioned sensors across your vessel, connected to a recording and advanced analytical platform - a "Digital Twin." The system meets classification society monitoring standards, including DNV, GL, ABS (Smart HMS 1-3 +R), and ClassNK.

Continuous structural monitoring of offshore and maritime assets



Predictive maintenance insights for fatigue, corrosion, and wall thickness



Customized sensing plans for unique vessel types and operational zones



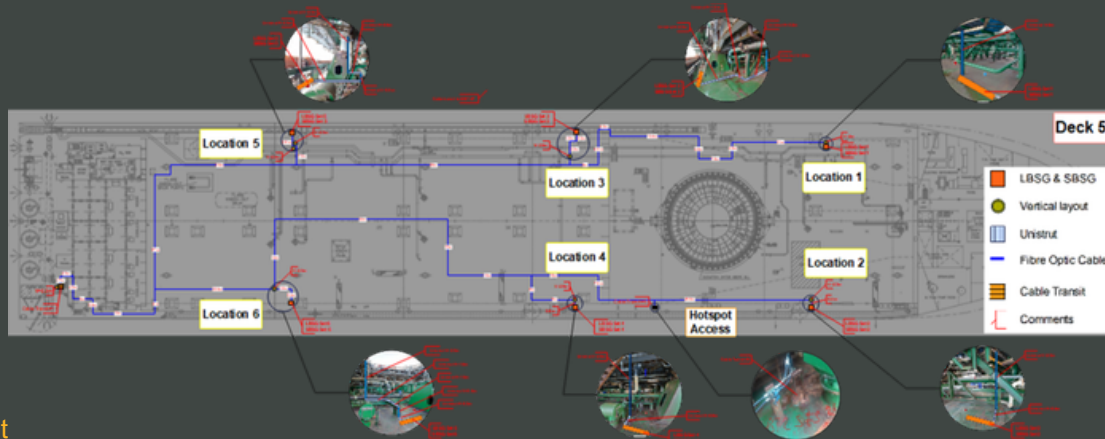
Dockless risk assessments that minimise downtime and extend asset life



Optimize performance, reduce costs, and stay compliant all at once.

**Sense. Understand. Perform**

# Real-Time Insights , Instant Clarity



## Equipment

### 1. Strain Sensors:

- a) 6x Global Locations
  - 5x over 1m Short base fiber strain sensor
  - 1m Long base fiber strain sensor
  - 1m Displacement sensor

### b) 3x Local Location

- 5x Rosette strain sensor

### 3. Inertial Measurement Unit (IMU)

### 4. Wave Radar (Sea State Monitoring)

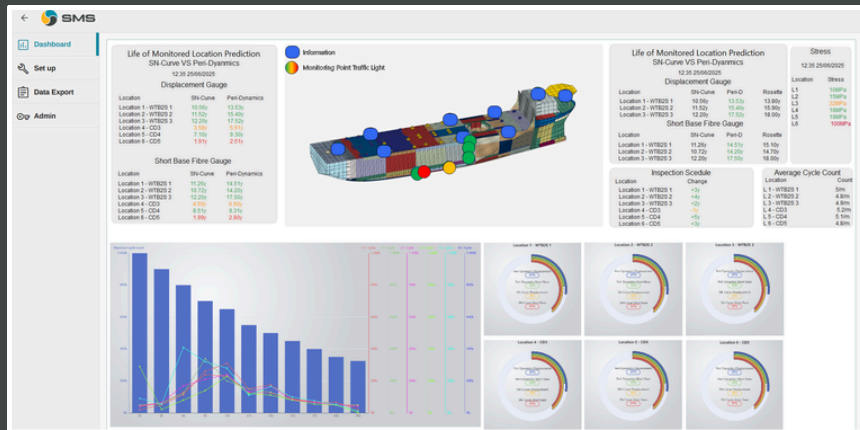
### 5. Corrosion / Wall thickness Monitors

### 6. Data Hub / Cloud based visualisation

*\*Over 100m data points / day*

# Validated, Customisable, and Globally Scalable

Initial validation and testing were carried out with support from the University of Strathclyde through their Naval Architecture, Ocean and Marine Engineering department, to ensure proven performance under real-world maritime conditions.



# Use Cases



## Structural Integrity Management

1. Fatigue monitoring
2. Corrosion detection
3. Crack initiation and propagation



## Safety and Risk Mitigation

1. Storm and extreme weather response
2. Collision or impact detection



## Maintenance Optimisation

1. Asset Life Extension
2. Dynamic Risk Based Inspection (DRBI)
3. Condition-Based Maintenance (CBM)
4. Inspection prioritisation
5. Dry-dock deferment



## Regulatory Compliance

1. Class society support
2. Asset life extension documentation
3. Incident investigation



## Cost Reduction & Asset Value

1. Avoid unplanned shutdowns
2. Maximise asset life
3. Support insurance claims



## Analytics Integration

1. Enable machine learning
2. Predictive analysis

# Key Benefits

Maximise safety, extend asset life, and reduce operational costs with real-time structural integrity insights.

## Avoid Unplanned Downtime

Detect structural issues early to prevent failures that could halt production and cost £1–2 million/day



## Optimise Inspection and Maintenance

Reduce reliance on conservative survey schedules by targeting high-risk areas, potentially saving millions per dry-docking cycle



## Extend Asset Life

Support regulatory compliance and asset life extension programs with verifiable structural data, increasing long-term asset value



## Improve Safety and Compliance

Meet Class Society requirements and maintain real-time documentation for audits, incident investigations, and insurance claims





## Let's Keep in Touch

# Contact

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