

# HUMPHREE®

Vessel Motion Monitoring

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# Agenda

Vessel Motion Monitoring from Humphree  
Background.

VMM system Layout and Performance

VMM recordings

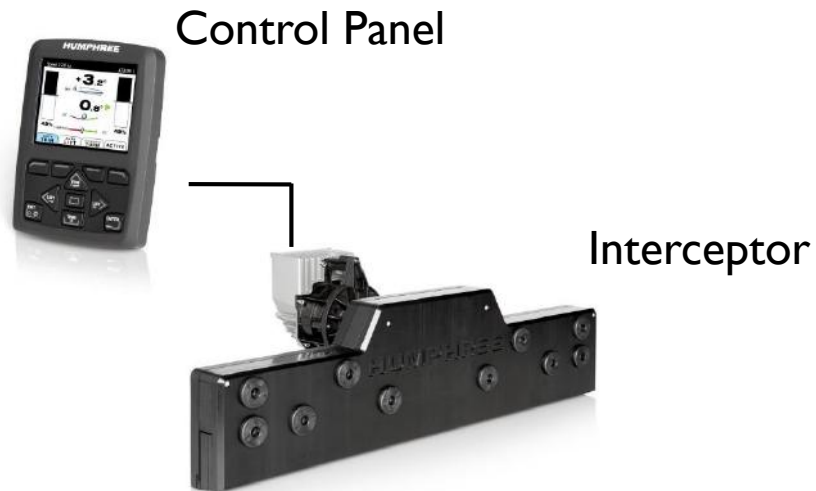
Post processing of “Big data”

Questions and Answers

# Humphree background

Humphree is known for being a world leader in Trim & Stabilisation system

Our experience with improving boat handling and stabilisation has given us unique experience of recording accelerations and running conditions on board different vessels

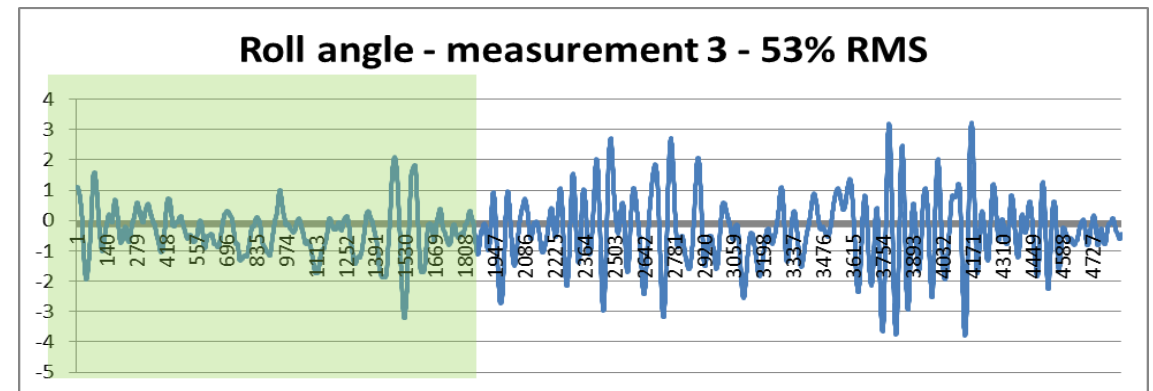
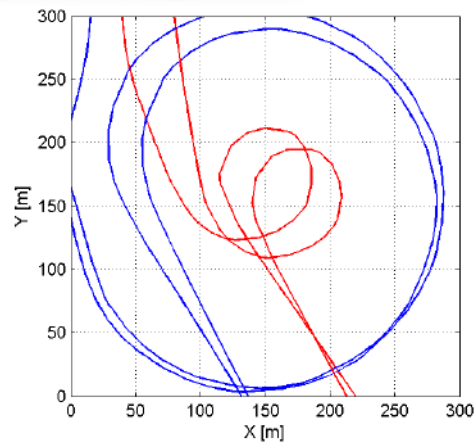
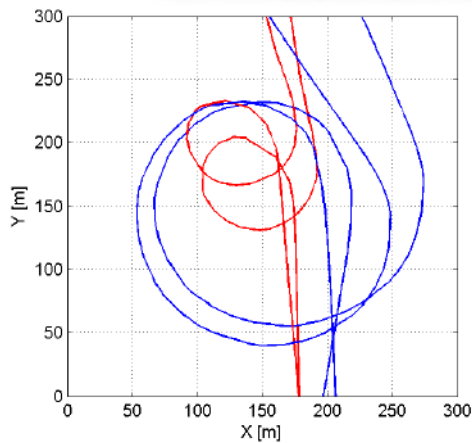


# Sea Trial Recording

## Maneuvering



## Active Stabilisation



# Performance Parameters

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Trim and Stabilisation systems improves boat handling to get a more comfortable ride

With or without such system the crew and vessel will be affected by the sea conditions

Sea Sickness

**36%**

Sea Sickness Index

G-Force

**1,7**

Max impact

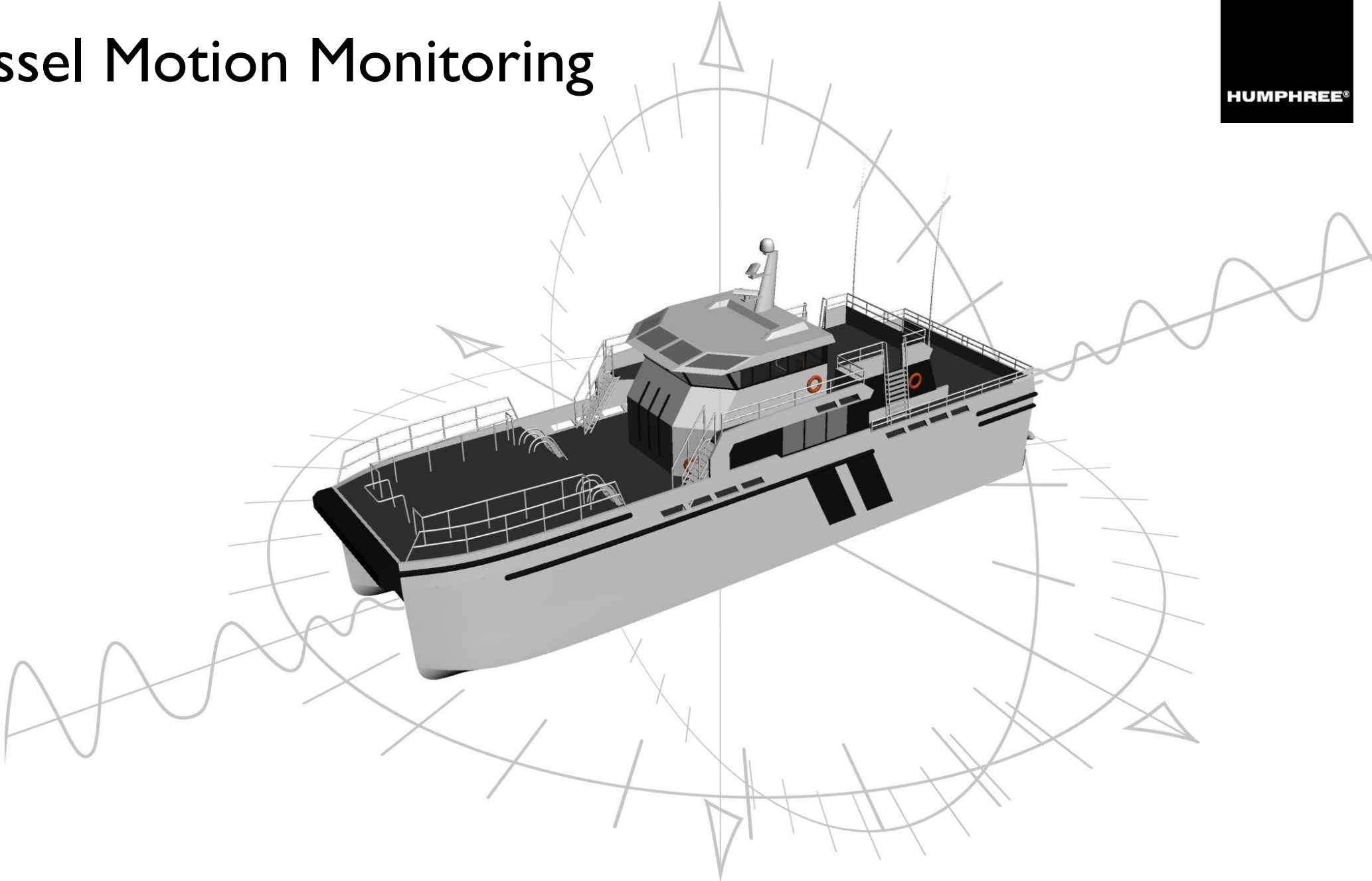
Impact counter

**7**

Red impacts

# Vessel Motion Monitoring

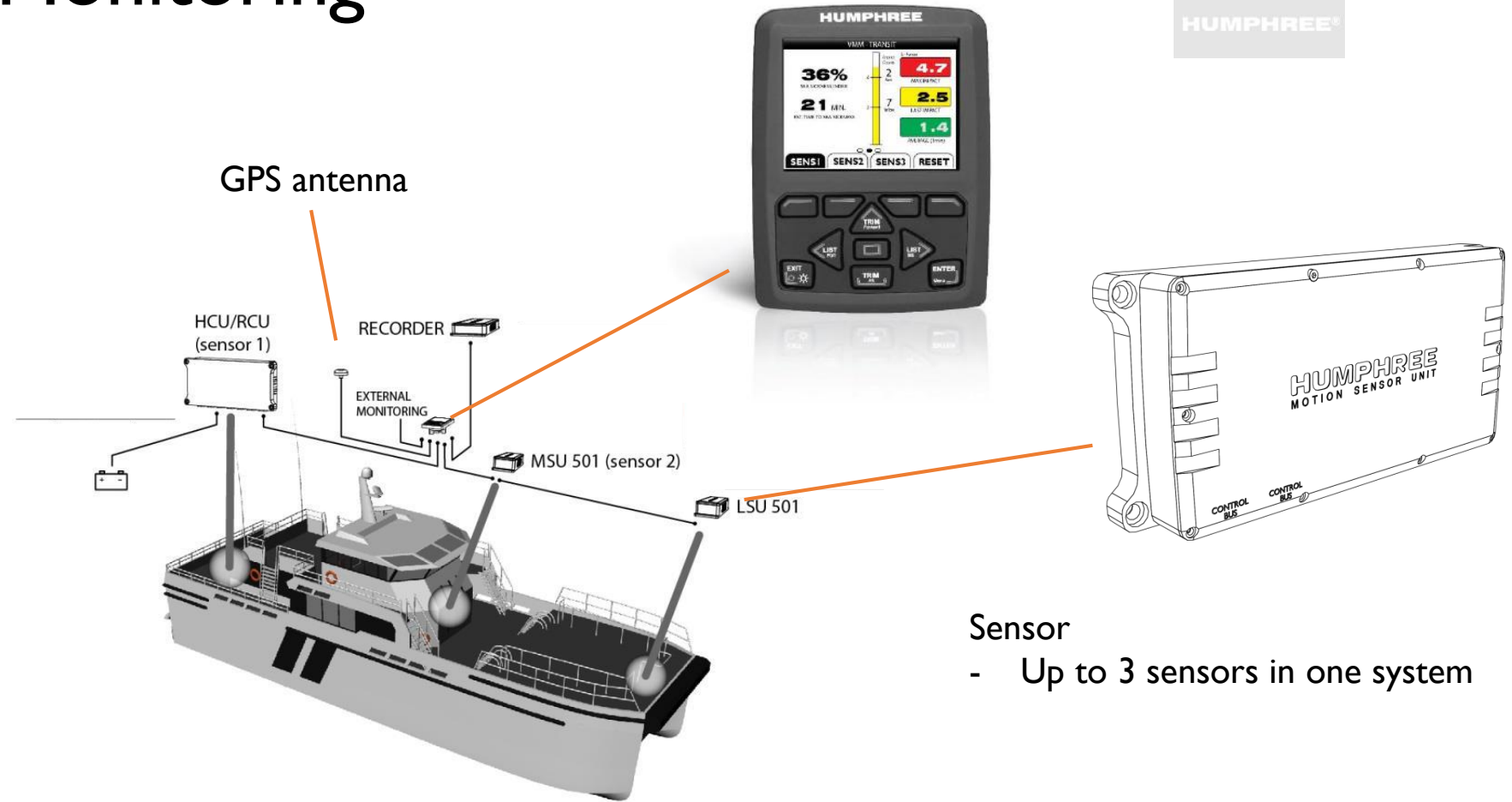
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# Vessel Motion Monitoring

Control panel at helm station

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# Vessel Motion Monitoring

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## Sensor data

- Acceleration (x,y,z) Hz?
- Angles (x,y,z)
- Angle rate (x,y,z)
- GPS data (GPS antenna)

## Derived data

- Landing force
- Heave
- MSI
- Trim (RMS)
- List (RMS)

## External data

- NMEA input (wind, Engine RPM...)



# Vessel Motion Monitoring

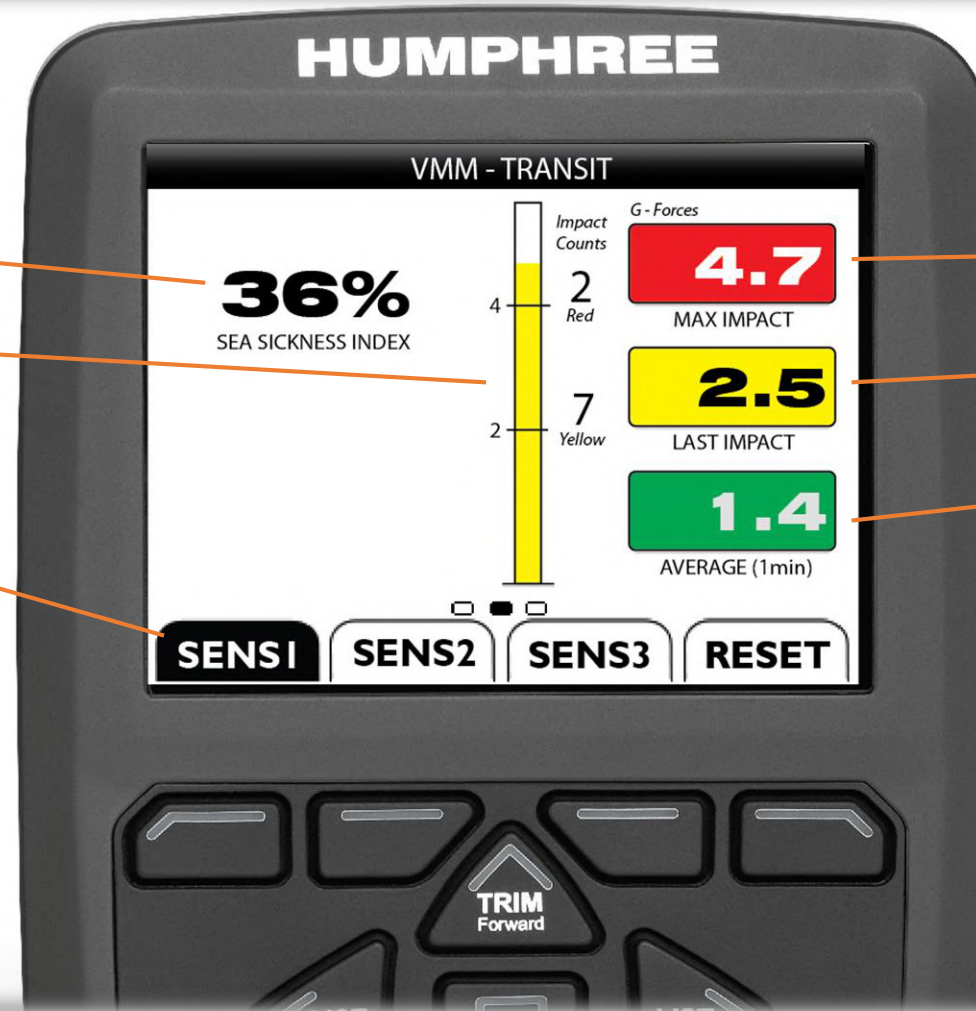
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Displays main values in the Control panel

Sea sickness index

Live feedback

Switch between sensors on board



Max impact

Last impact

Average impact

# Vessel Motion Monitoring

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## Recorder

- Possible data export to Excel, csv-format
- Detailed recording for 14 days
- Or 2 year event log of recording for warranty



# Vessel Motion Monitoring



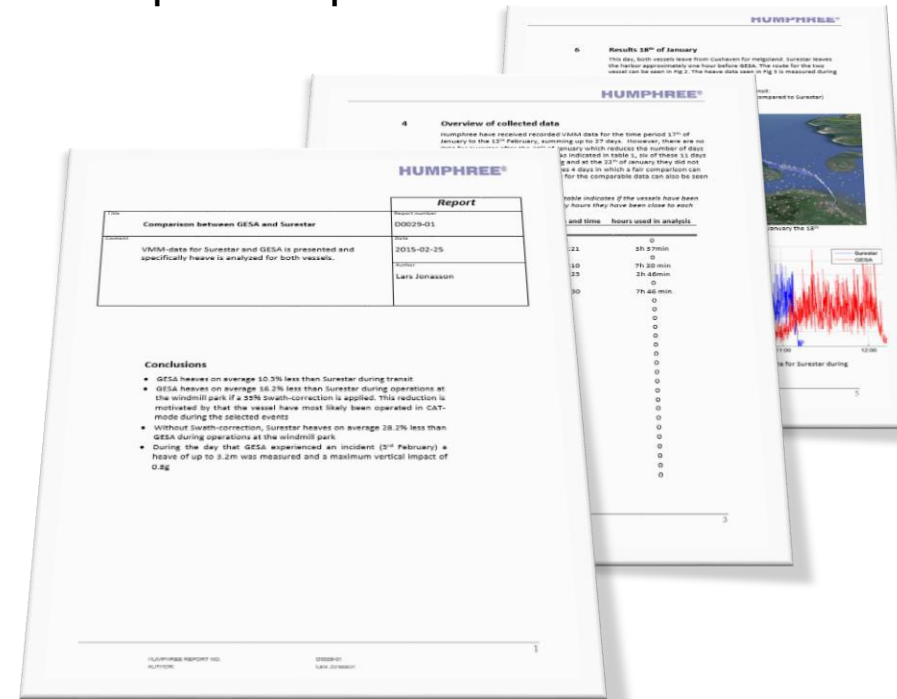
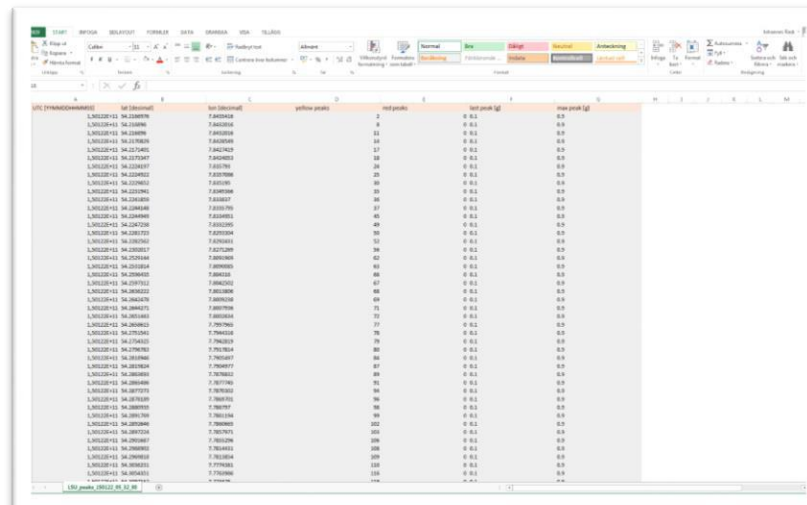
## Recorder

- Software for simplified analysis
- Export data to Excel for post analyse of data
- Humphree supports with written reports of vessel operation

## Humphree Report

## Export data to Excel (with included software)

## Recorder

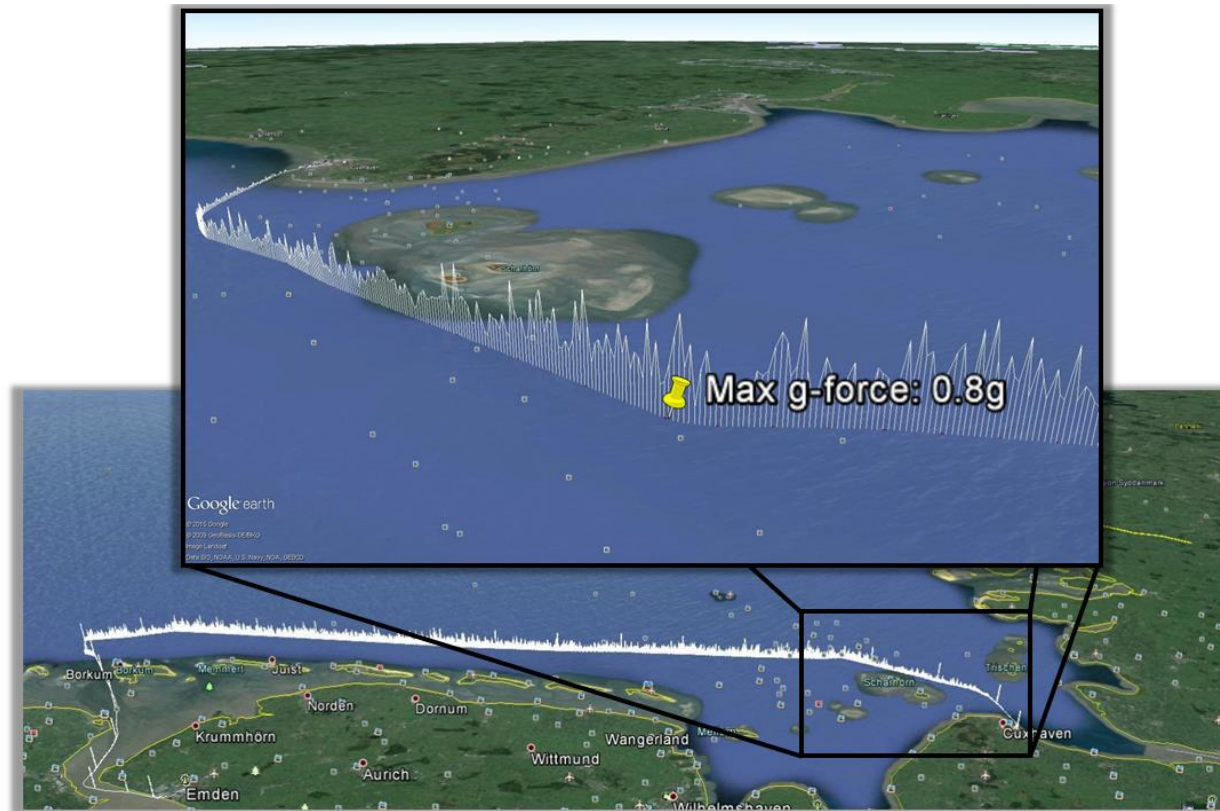


# Vessel Motion Monitoring

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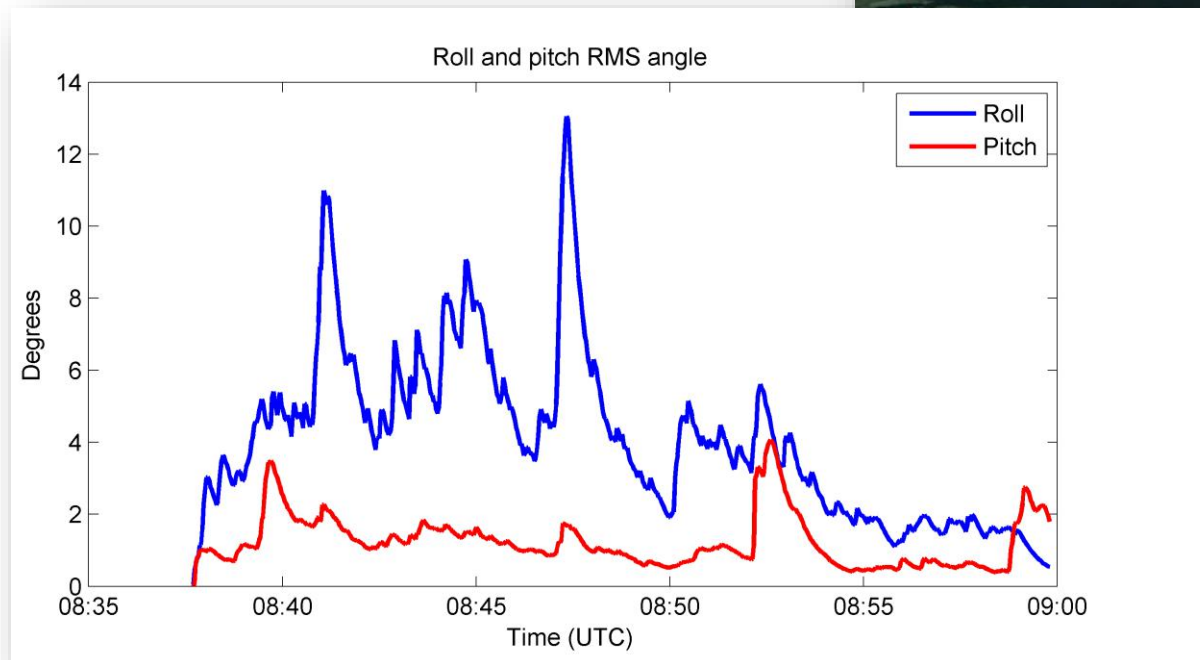
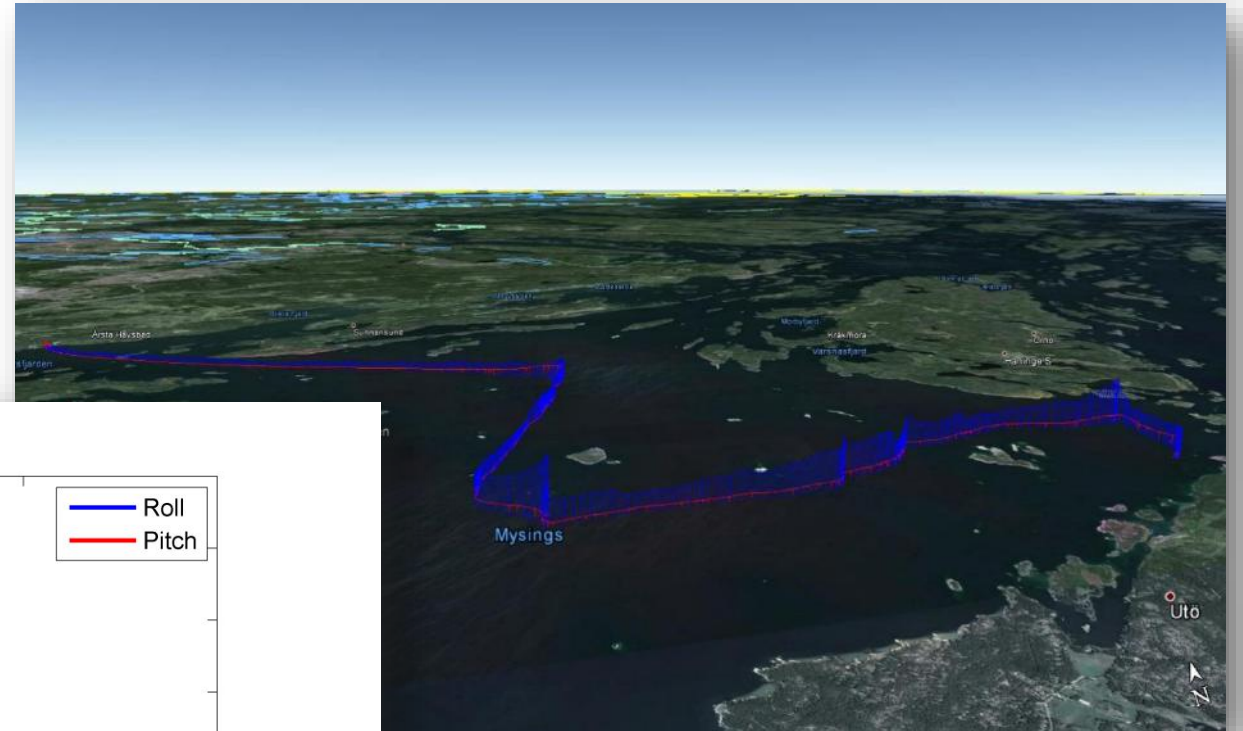
## Recorder

- Export data to Google Earth
- Post analyse of operation



# Vessel Motion Monitoring

Analyze Pitch and Roll motions during transit



# Vessel Motion Monitoring

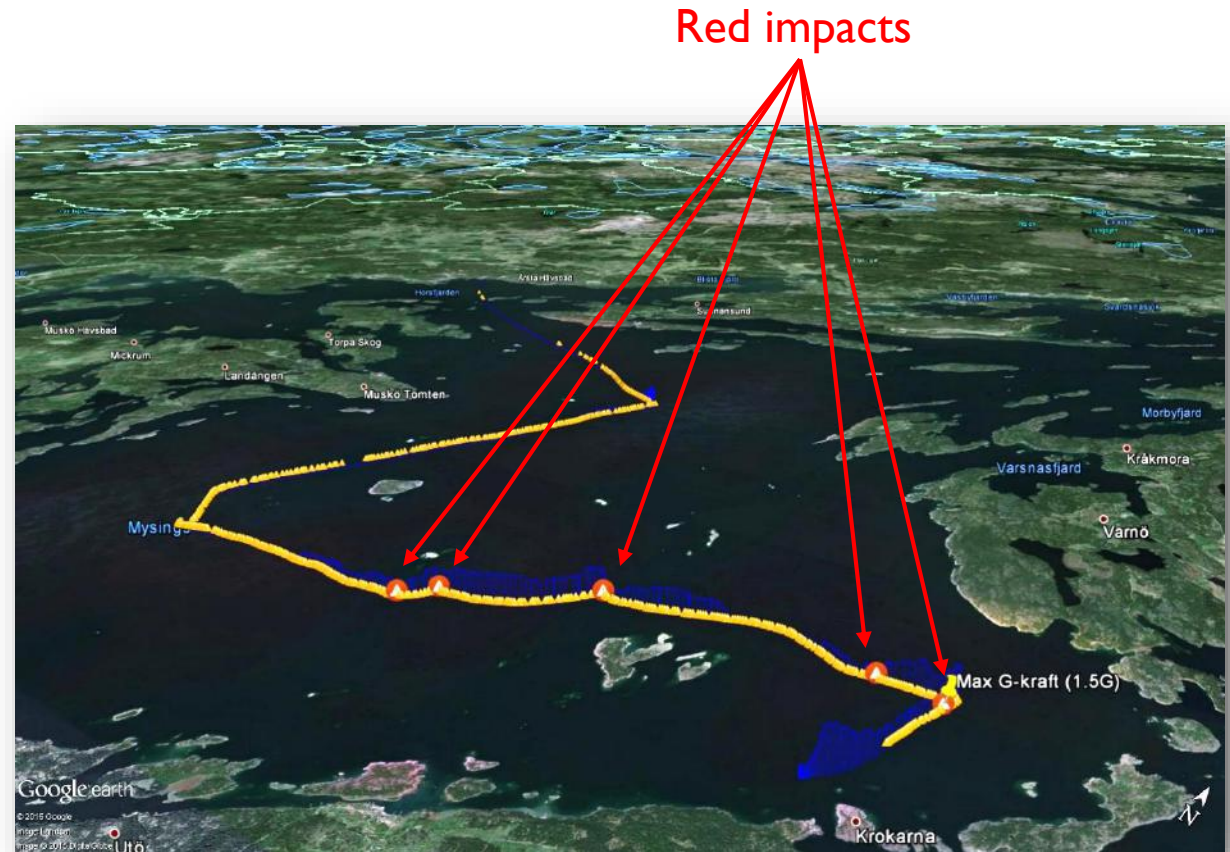
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Recorded data exported to Google Earth

We can from recorded data see that the crew has been exposed to 5 “Red impacts”

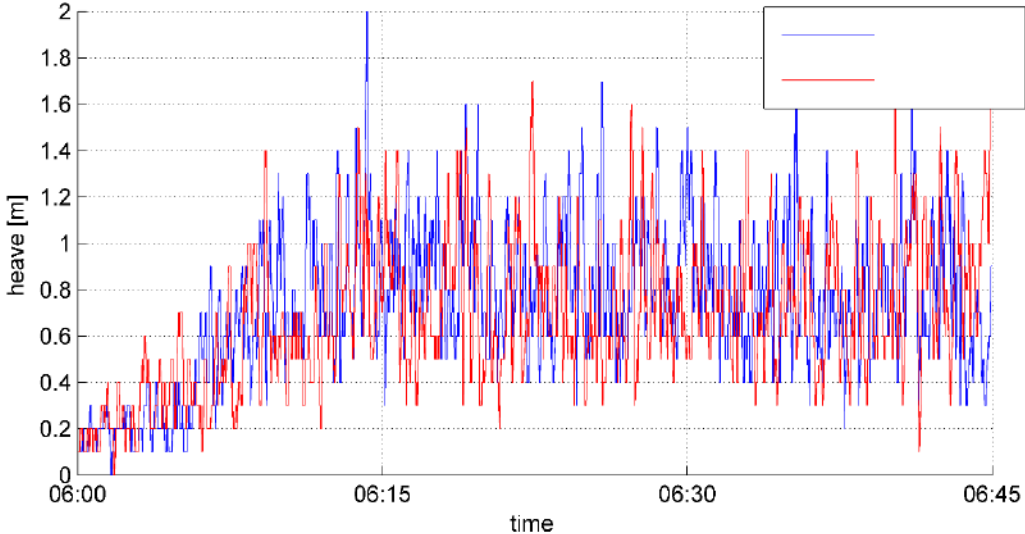
Max impact (G-force) was 1,5 G

The level for a “Red impact” can be set in the system



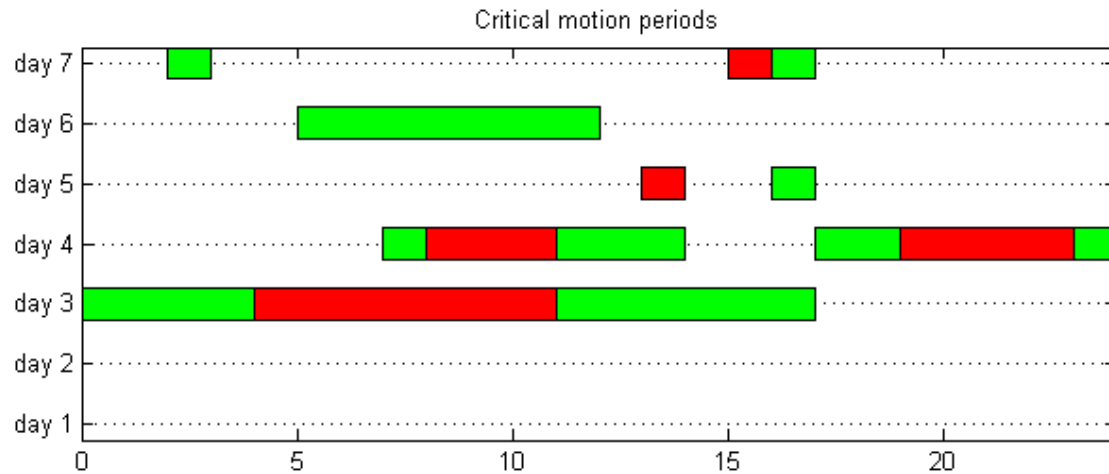
# Vessel Motion Monitoring

Comparing vessel motions for different vessels



# Post Processing Recorded Data to identify the critical motion period.

Daily reports to monitor your operation , crew or vessel.



Day	v. acc. [%]	h. acc. [%]	Roll [%]	Pitch [%]	Heave [%]
1	-	-	-	-	-
2	-	-	-	-	-
3	22.2	18.4	11.2	16.3	33.5
4	10.2	10.4	13.2	15.3	16.5
5	0.2	0.4	1.2	1.3	1.5
6	1.3	1.2	0.4	0.3	1.2
7	7.2	9.4	11.2	12.3	15.5



Day by day report for critical motion Periods

Map over Critical Motion Periods



# Post Processing Recorded Data to identify the critical motion events.

Daily reports to monitor your operation , crew or vessel.

## Landing forces

Number of yellow landing forces: 4  
Number of red landing forces: 1  
Maximum landing force: 633.2 kN

**Table 3:** Yellow landing forces

Day	Time	Long	Lat	Force [kN]	Heave [m]	Wave height [m]
03	05:30:22	-2.3242	65.3232	264.3	1.2	2.0
04	10:20:14	-2.1231	65.1112	350.0	0.5	0.8
06	10:01:02	-2.3242	65.3232	277.4	0.3	0.5
07	15:14:22	-2.3242	65.3232	533.3	1.5	2.0

**Table 4:** Red landing forces

Day	Time	Long	Lat	Force [kN]	Heave [m]	Wave height [m]
07	02:30:12	-2.3242	65.3232	633.2	0.7	1.2



Map over Critical Motion Events

# Vessel Motion Monitoring

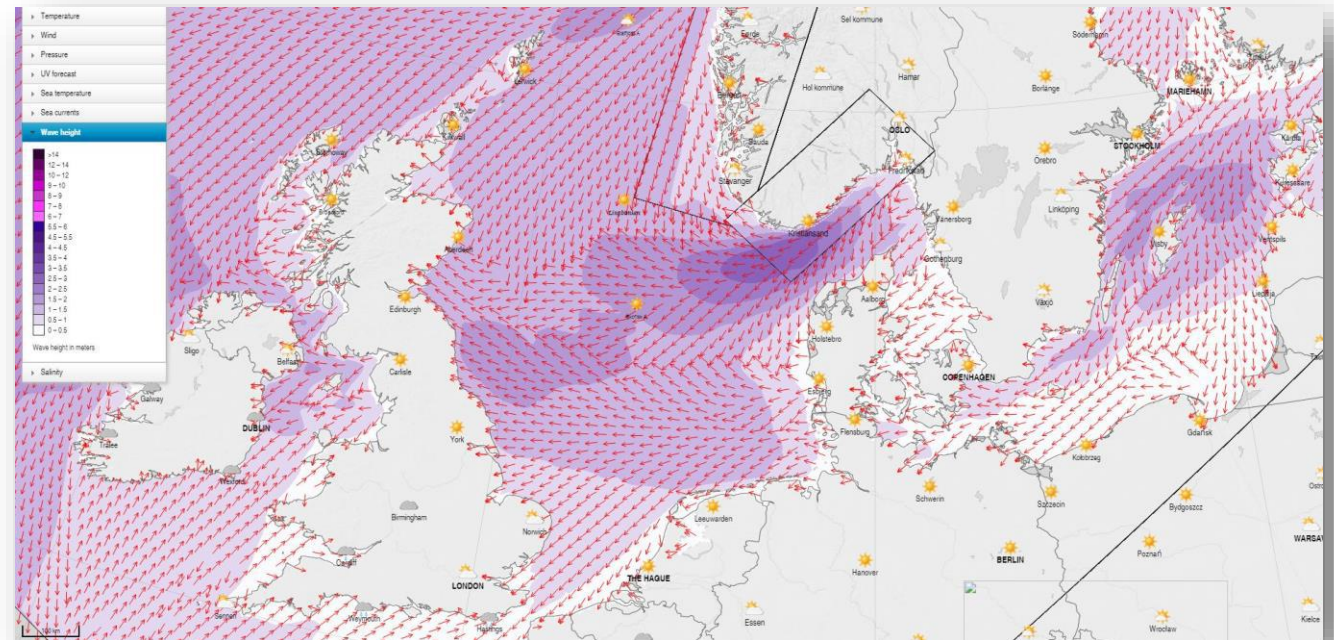
Overlay recorded data with weather information to understand how certain weather conditions affects the environment on board

Weather information from

- Weather buoy
- Weather maps



Weather buoy



Map over wave height

## QnA

What motions and data is important to record in  
High Speed Operations?

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Questions?

