



NTSB National Transportation Safety Board

Office of Marine Safety

M/V Crown Princess

Engineering Factors

Engineering Factors



- Integrated navigation system
- Shallow water effects
- Video study - heel angle estimate
- Voyage data recorder

Integrated Navigation System



- Radar, electronic chart, autopilot
- Trackpilot modes
 - Heading
 - Course
 - Track

Trackpilot – Heading Control

Settings

- Rudder economy
- Rudder limit



Trackpilot – Heading Control

- Rudder economy – precise trackkeeping vs. rudder use

Rudder Economy	Steering	Weather
1	Precise	Calm
2....3	Precise to tolerant	Normal
4....6	Tolerant	Bad
Higher	Very tolerant	Very bad

Trackpilot – Heading Control

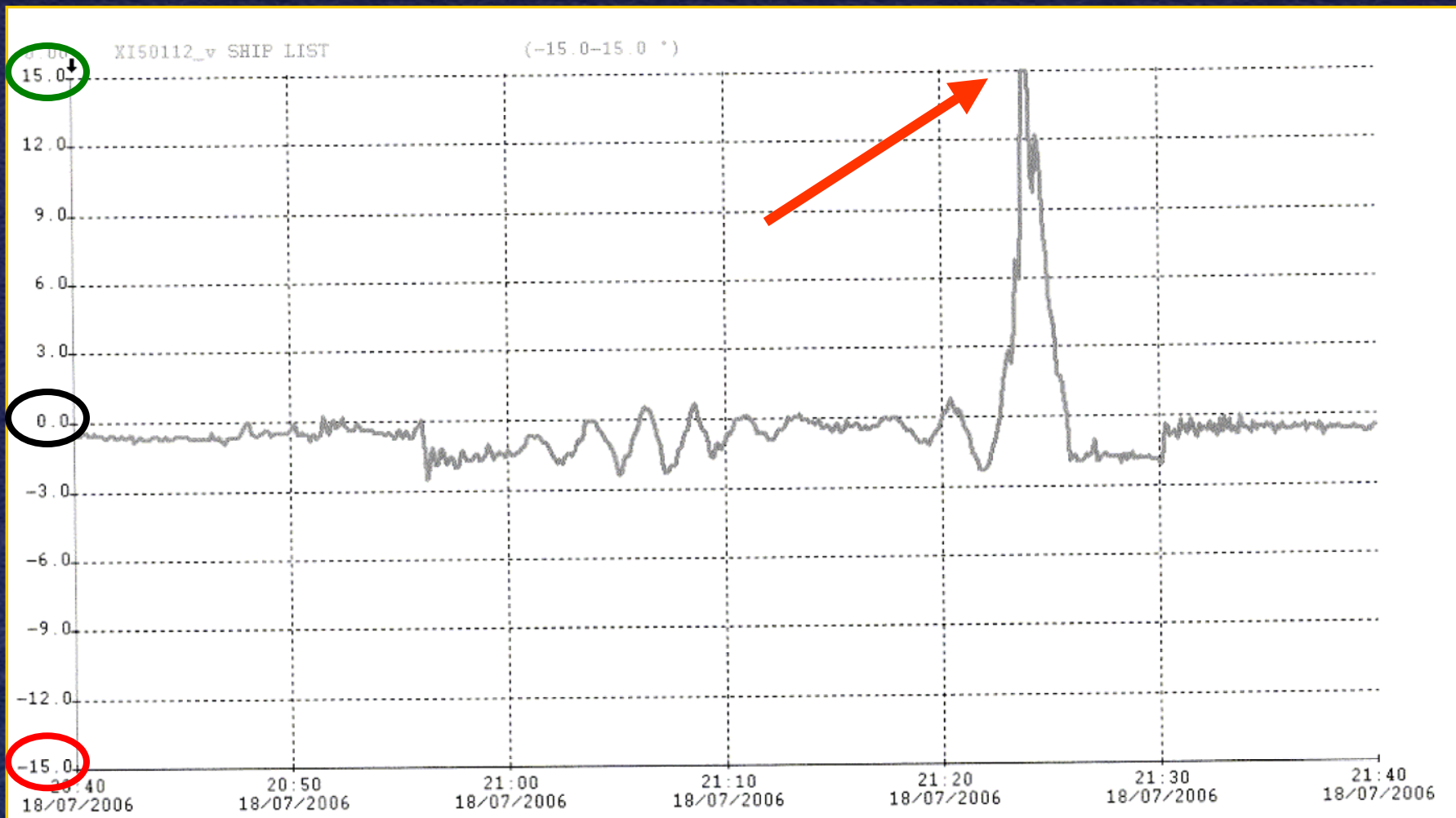
Rudder Limit

- Specifies maximum value for the rudder control system
- Alarm sounds when limit is reached
- Lower limit to be set for higher speed

High Speed - Shallow Water Effects

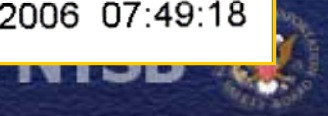
- Squat – sinkage and trim
- Decreased course stability
- Hand steering and autopilot affected
- Rudder economy setting

Video Study – Heel Angle Estimate

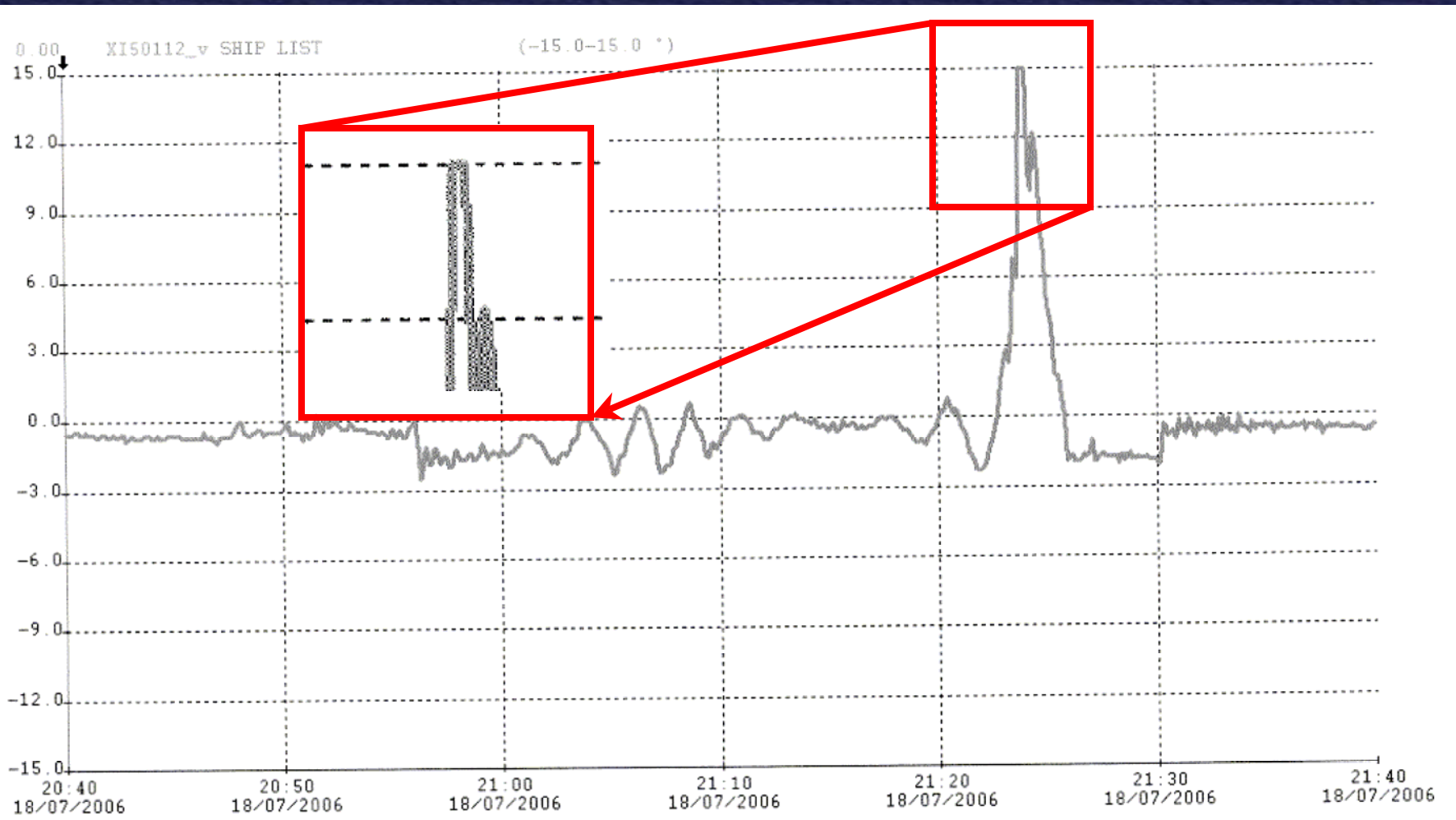


Curve Sheet: Graph - Operator choice of graphs
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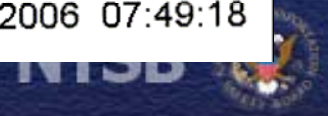
Video Study – Heel Angle Estimate



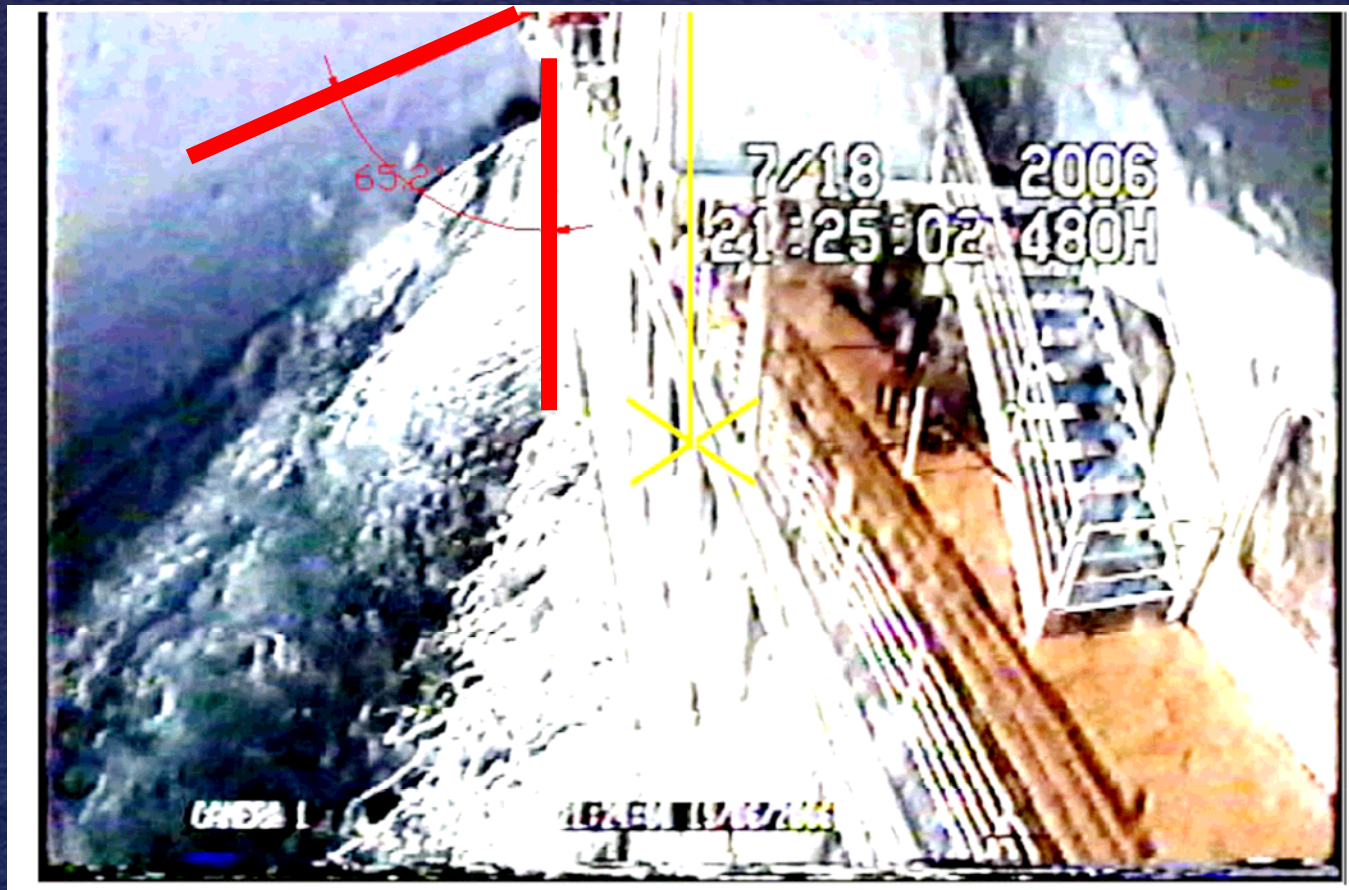
Curve Sheet: Graph - Operator choice of graphs

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Video Study – Heel Angle Estimate



Voyage Data Recorder

- Heel angle not recorded
- No requirement to record
- Valuable information in certain accidents



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