ACTIVE HEAVE COMPENSATION

Joshua Eaton

UNOLS East Coast Winch Pool

Purpose

Why

- Reduce Package Movement
  - ROV Docking
  - Steady Sampling
- Remove Slack Conditions
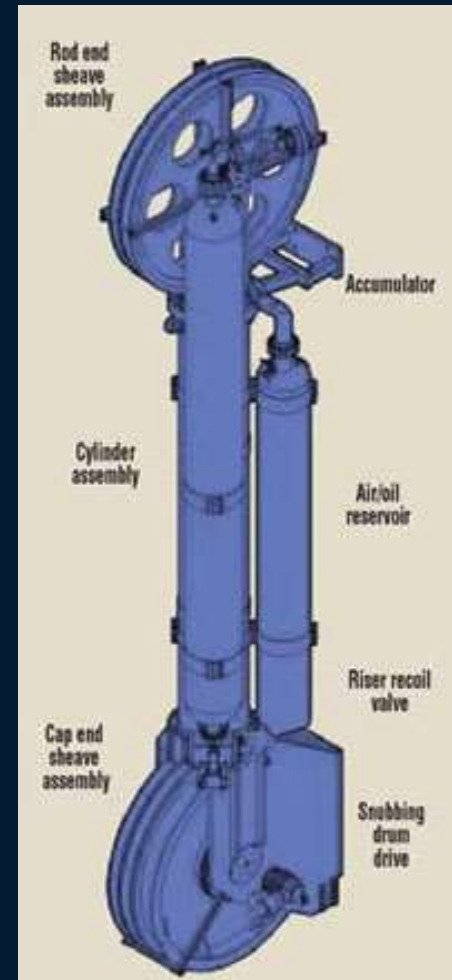- Alleviate Snap Loading
- Lessens Package Kiting

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Methods of Compensation

Slack Tensioner

- Limited Range
  - +- 3.5 meters
- Multiple Sheaves
- Complicated Maintenance
- Complex Set Up
- Difficult Running

Rod end sheave assembly

Accumulator

Cylinder assembly

Air/oil reservoir

Riser recoil valve

Cap end sheave assembly

Snubbing drum drive

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Example

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Bobbing Crane

- Limited Motion
  - +-1.25 meters
- Fixed Installation
- Complicates Wire Path

No Example

☐ ☹

Active Heave Compensation

- Electric and Hydraulic
- Expensive MRU
- High Accuracy
- Ship Survey

Example: Industry

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Example: In ECWP Shop

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Example: JASON AHC Off

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Example: JASON AHC On

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Typical Factors

Expected	Actual
☐ Perfect Survey	☐ Approximate Survey
☐ Centimeter Accuracy	☐ Half Meter Accuracy
☐ 60 M/Min	☐ 100 M/Min

Considerations

☐ Elevated velocities from the winch drum through the sheave train

☐ Package velocity approximately 0 M/S

☐ Low tension variation

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The MRU

Expensive Piece of Kit

- ☐ $30K
- ☐ Calibration
- ☐ Placement
- ☐ Other Uses
- ☐ Out Put

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The Survey

Ship CG

MRU Placement

Overboarding Point

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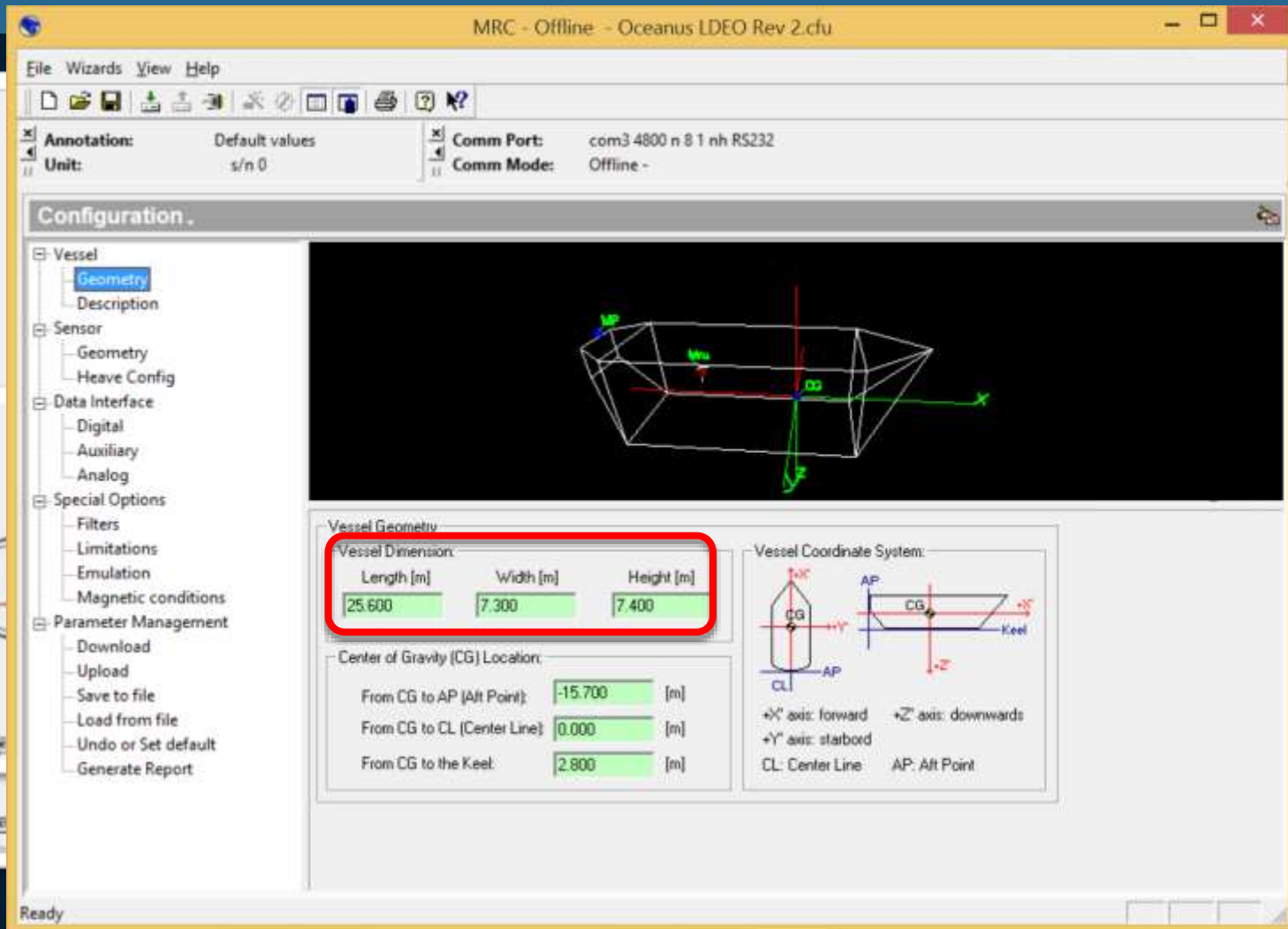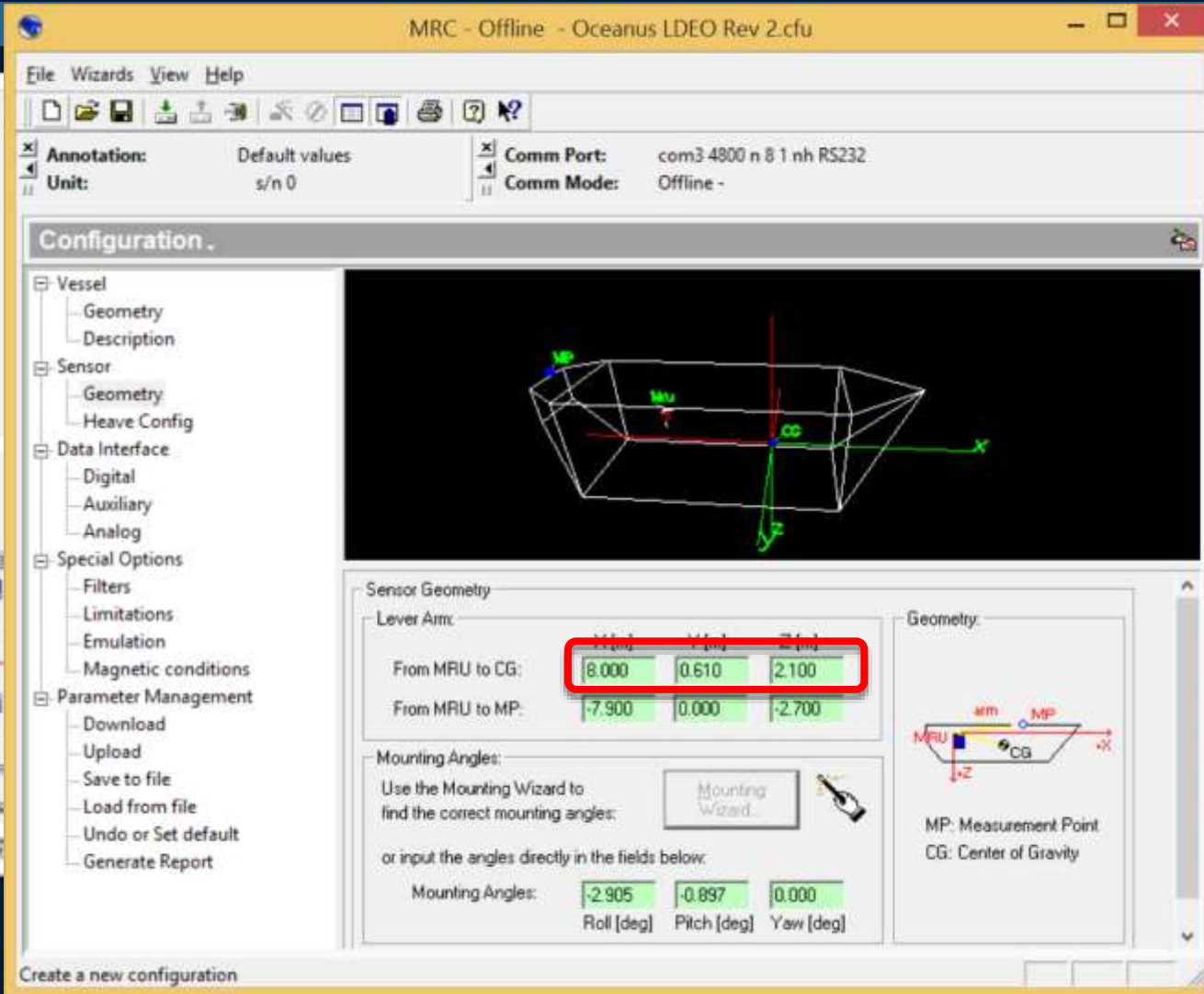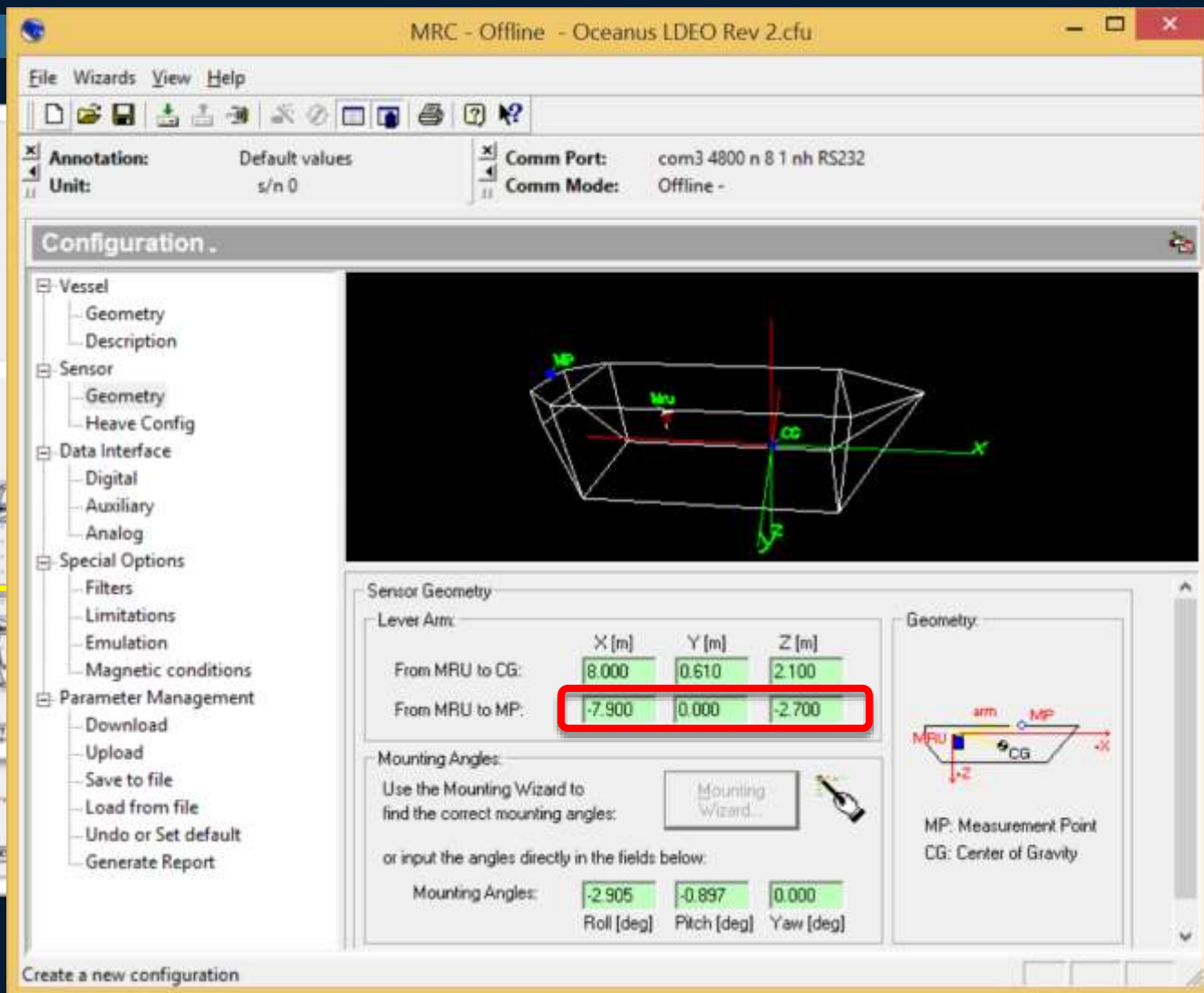
Method

- Simple Survey
- Calculation of Movement Around CG
- Lever Arms

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Innovations

MRU Distribution

- Centralize the MRU
- Single "perfect" survey
- Allow for multiple overboarding points
- MRU stays on ship
- Allows for use with portable systems
- Possible lag

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New MRUs

- Kongsberg Series 5
- Multiple Overboarding Points

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New Concept

- Heave Sensor
- Small
- No Survey
- Place on any Sheave

Questions