VPR and Why One Inch Deck Bolts are Futile Joshua Eaton NBP12-01 Slightly Quesy Seminar Series

# **VPR** Components

- Science
  Instrumentation
- Engineering Instrumentation
- Winch and Wire





- Average Vertical Velocity 1 m/s
- Average Horizontal Velocity 5 m/s
- Real Time Data Collection

# **Science Instrumentation**

#### 1 Megapixel Camera

- 1 cm x 1 cm x 10 cm Image Volume
- 0.01 mm per pixel
- 30 Hz
- 17 cm
- CTD
- Fluorometer
- Turbidity
- PAR



## Science Data

- Science Data Over Fiber
- Image Extraction
  - ROI Based on
    Features
- Real Time Plotting



# **Additional Science Data**

#### • FRRF

- Oxygen
  - SBE 43
  - AADI Optode
  - Real Time Collection

# **Engineering Instrumentation**

- Paro Scientific Depth Sensor
- Altimeter
- 3 Servos
- DMU
- PC104 With a Real Time Kernal

## **VPR** Servos

- Pressure Balanced Housings
- Magnetic Encoder
- Limit Switches
- Harmonic Drive
  - Zero Backlash
  - High Gear Reduction
  - High Torque

# **Real Time Kernal**

- Operates in near real time
- Able to handle important tasks fast
- Mailboxes
- Operates independently of the topside

### Winch and Wire

- Fiber Optic 0.322 Cable
- Fairing Reduces Cd from about 1 to about .3
- Sheave Designed to right the fairing
- Chief Scientist Level Wind

### **Deck Bolts**

- Grade 8 bolts
- One inch bolt
  - Tensile = 125000 lbs
  - Shear = 60000 lbs
- 5/16 inch bolt
  - Tensile = 12000 lbs
  - Shear = 6000 lbs
- Deck Eye Pull Out Strength = 2000 lbs