Active/Passive Precision Heave Compensation
Real Time Digital Controller

PRECISION
CONTROL TECHNOLOGIES

Solution Overview

- Winch and cylinder dynamics
- Gas Dynamics
- FE cable and drill string modeling
- Stress wave modeling
- Modeling of inertial instrumentation and heave estimation algorithms
- System gain and phase margins determined prior to detailed design

Total compensation of the Heave Vector Position, velocity and acceleration Compensation

Lowering and Soft landing

Vessel Mounted and Aided Heave ® Motion Reference Units
- 25mm payload precision (1200m, 2m heave,16s period)
- Lower/land rates 20mm/s to 100mm/s

Simplified hydraulic arrangement
Auto transition to tension control
- Ideal for Real time control applications
- No phase change in output data
- High accuracy heave rate and heave

Heave Compensation Types
Winch Compensators
Cylinder Compensators
Stored energy Regen
Combined Active Passive Compensators

Inertial Instrumentation
Vessel mounted MRU (Medium precision ~100mm accuracy)
Aided Heave® (Heave error < 5mm, High precision payload control ~25mm accuracy)

System Modeling
Mathematical Modeling of Heave Compensation System including
- Hydraulics modeling

Technical Specification

PC104 Based Real Time Processor
2 x RS232/485 Serial Ports 4800 to 115200kBaud
Ethernet Modbus TCP
32 Digital I/O
16 x 16 bit ADC
8 x 12 bit DAC

12 Relays
Modbus Interface to PLCs
DIN Rail Mounted
Operating Temperature: -10C to 45C
EMC Certified to IEC 60533
Environmentally tested to Lloyds Register
Environmental Spec 1

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