**DMaC**

**Dynamic Marine Component test facility**

### Control Centre

- Fully autonomous control and data logging
- Programmable test design
  - Force driven
  - Displacement driven
- NI Compact RIO / Labview
  - Data acquisition and control channels
    - 32 analogue inputs
    - 8 differential strain gauge inputs
    - 64 digital inputs
    - 32 Digital Outputs
    - 16 Analogue Outputs
  - Sampling frequency (combined) 250 kHz
  - Position control frequency 120 kHz
- Replicate any measured marine induced force and motion cycle
- Simulate marine component response to real sea state conditions in a controlled environment
- Internet enabled for real time viewing and control

### Test Bed

- Maximum specimen dimensions
  - Length 6 m
  - Diameter 800 mm
  - Weight (including tether) 1000 kg
- Wet or dry operation
- Full fresh water submersion operation
- Watchdog system with safety interlocks
- 6mm Polycarbonate safety shield
- Spare data acquisition inputs for specimen specific data recording applications
- Adjustable Z position

### Headstock: 3 Degrees of Freedom Gimbal

- X and Y bending
  - Displacement ±30°
  - Frequency 0.25 Hz
  - Off-axis load 10 kNm
- Torsion
  - Angle Infinite 360°
  - Torque 1500 Nm
  - Speed 10 rpm
- Maximum specimen properties
  - Diameter 800 mm
  - Base to pivot point 300 mm
  - Weight 500 kg

### Tailstock: Z Actuator

- Z actuator dimensions
  - Stroke 1 m
  - Rod diameter 70 mm
  - Bore diameter 160 mm
- Maximum Dynamic Force 30 Tonnes
- Maximum Static Force 45 Tonnes
- Equal area actuator
- 2 Stage Servo-hydraulic control valve 462 l/min
- Preload force 14 Tonnes
- Frequency at 1m stroke 0.1 Hz
- Frequency (at 0.1m stroke) 1 Hz
- Frequency (at 0.01m stroke) 10 Hz

### Hydraulic Power Supply

- Electrical Power Supply
  - Power 130 kW
  - Voltage 415 V
- Hydraulic Power Unit
  - 2 off 55kW induction motors
  - 2 off variable displacement pumps
  - Drive Circuit Pressure 140 Bar
  - Flow Rate 362 l/min
  - Pilot Circuit Pressure 210 Bar
- Hydraulic Accumulators for average flow
- Oil tank capacity 1700 litres
Dynamic Marine Component Test facility

Investigating reliability in harsh dynamic offshore environments