

VESSELBASED ROV INTERVENTION; STRATEGY & CHALLENGES



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Espen Ingebretsen,
ROV Project Manager -
Vessel Operations



RISK MANAGEMENT & COST

Long term commitment allows the contractor to plan long term, thus giving a better foundation for dispersing risk, control cost, improve service and offer a correct price for the service in question; a win/win solution.

A common understanding of the risk and cost elements involved in a given project, will give a common understanding of 'the right price'.

Lowest bidder = best alternative?

The best way to reduce cost is to complete a job correctly, safe and fast the first time! In order to make that possible, the right conditions must be present!

Alternative pricing can be an encouragement to reach common goals. Incentive schemes and bonuses; Risk & Reward.

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RISK MANAGEMENT & COST

Areas of improvement

- ✓ Risk is never modeled as a quantitative value
- ✓ Financial models don't capture technical decisions or flexibility to change direction
- ✓ High discount rates for long-term uncertain pay-off or high risk programs result in negative NPV
- ✓ Inability to collaborate technical and financial models related to large campaigns

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RISK MANAGEMENT & COST

Long Term Commitment = Investment & positive growth

How does the LTC optimize the long-term strategy, risk management and return?

- ✓ **Cultivation of investment, continuous improvement & reduce risk**
- ✓ **Development of safe and cost-effective solutions**
- ✓ **Balanced risk-sharing and risk dispersed over time**

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**Vessel based ROV Intervention;
Short-term ad-hoc mobilizations or purpose built solutions?
.....contracting perspective!**

AD-HOC



PURPOSE BUILT

Advantages of a Purpose Built system

- Reduced mobilization time & cost
- Reduced weather limitations
- Less system failures, less downtime
- Enhanced availability
- Enhanced efficiency
- Dedicated ROV crew thus improving experience transfer



Millennium Plus o/b BOA DeepC

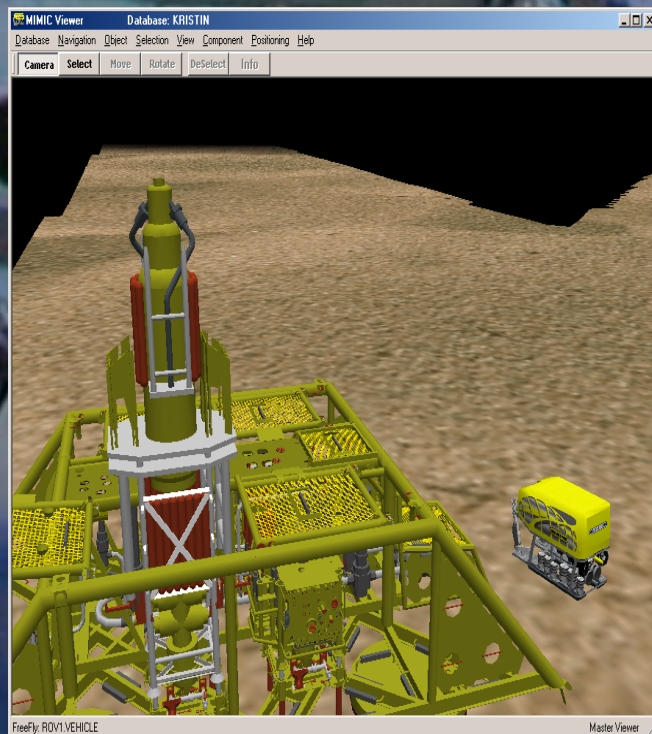
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MIMIC/VSIS = MULTI-LEVEL VIRTUAL SUPPORT

Engineering
Procedure development
Training
3D-NAV/Execution
Reporting

LIFE OF FIELD SUPPORT

- Access Verification
- Preparation of unplanned/adhoc operations
- Subsea Structure Optimisation
- Subsea Tooling Optimisation
- Operational workout of Virtual procedures
- Virtual Site Integration Test - SIT
- Virtual Shallow Water Test - SWT
- Procedure Animation
- Pilot/Operator training
- Reporting



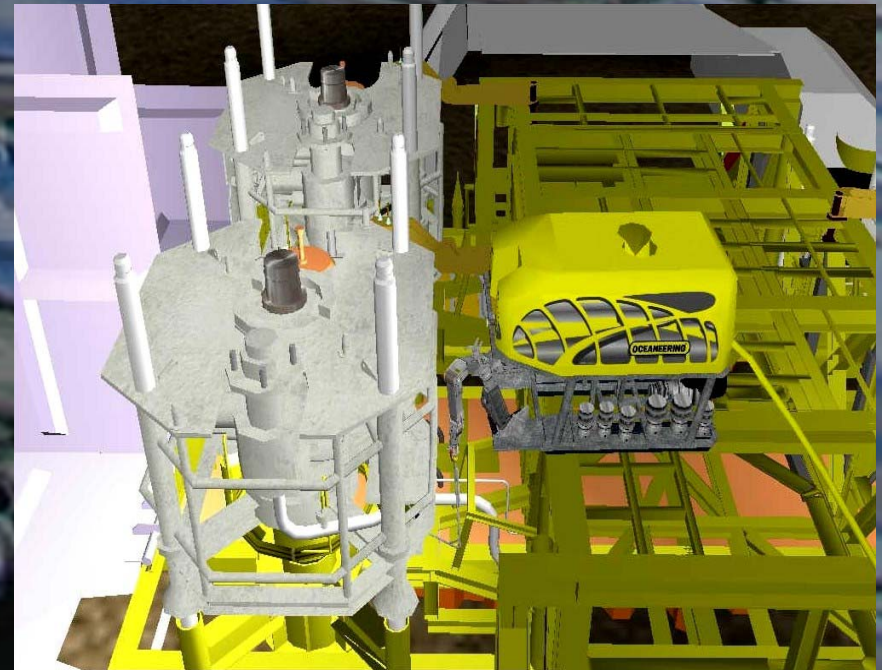
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TORDIS F4-AH Jacking Operation



Pre-Engineering Planning Workshop;

- planning of operation
- working out procedures
- training on operation
- tool optimisation



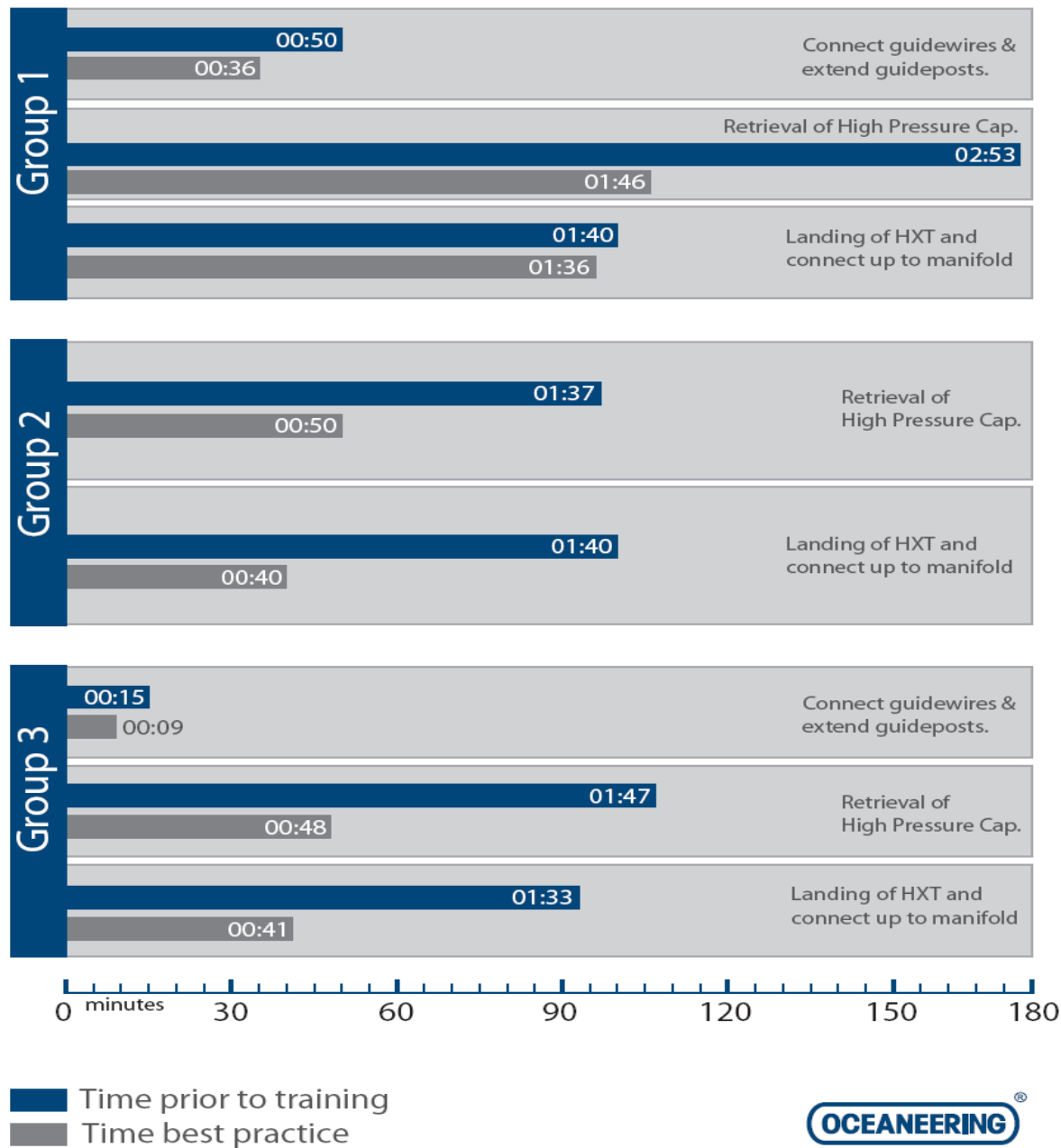
3D-Simulation; Release flowline mandrel
from VXT

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Statoil Kristin Field

ROV TRAINING COURSE

"best practice"



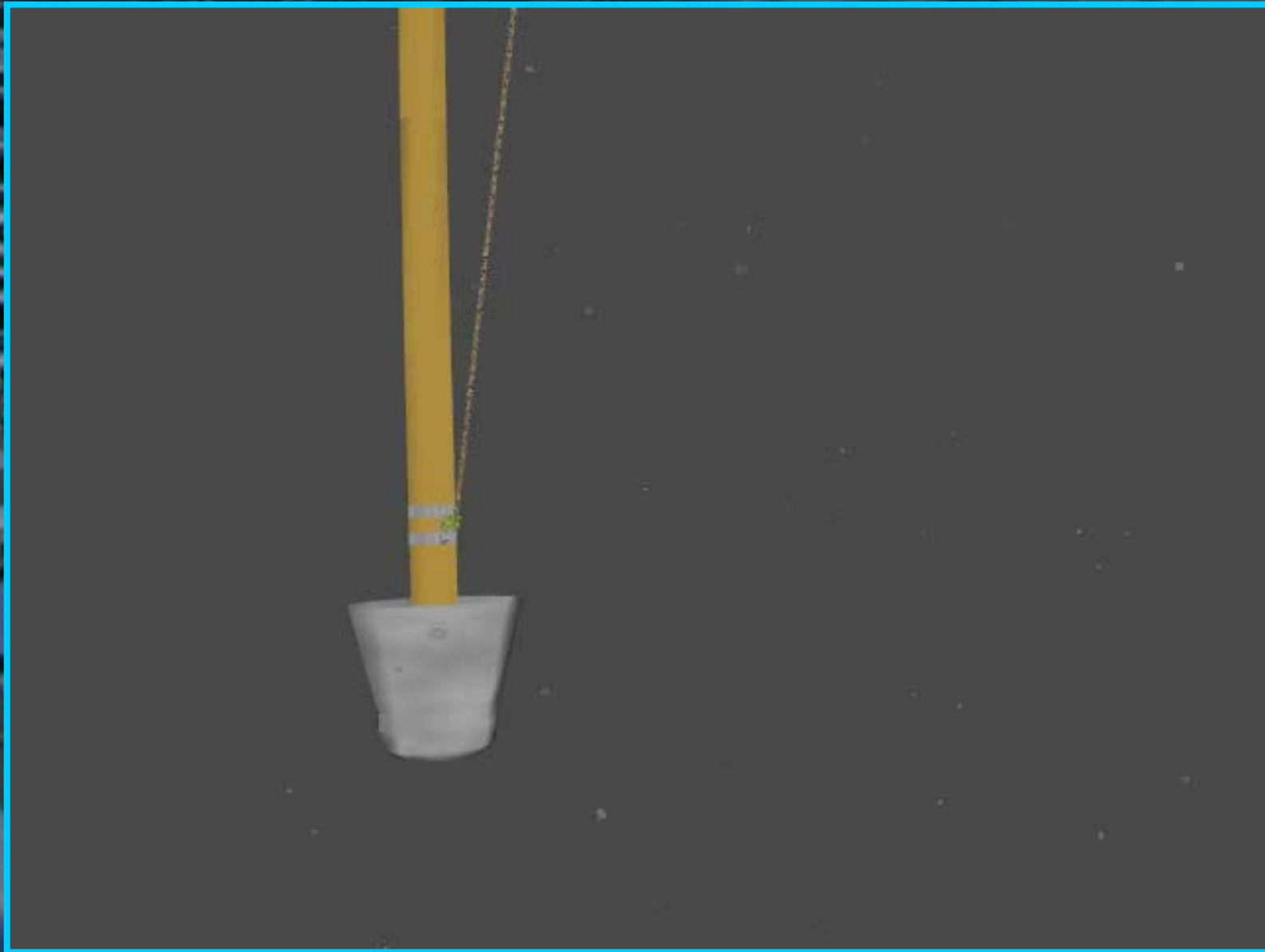
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Time saved= 1:25hrs

Group # 2
Time saved= 1:47hrs

Group # 3
Time saved= 1:58hrs

TOTAL TIME SAVED =
5:10hrs

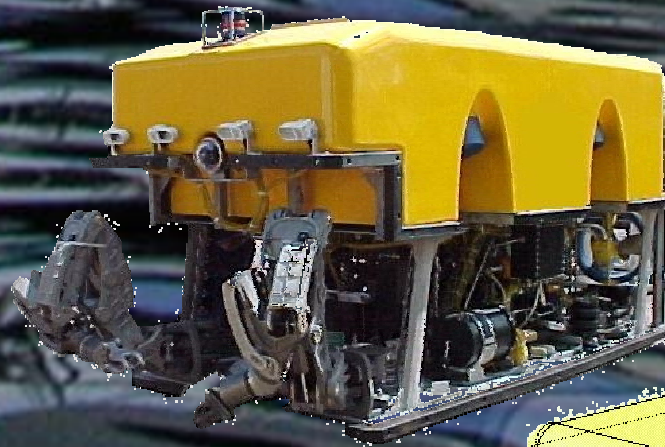
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Example from Statoil's 'SNØHVIT Field'
Installation of Cuttings Transport System

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MILLENNIUM Plus® 150SHP WROV AS INTEGRATED o/b BOA DEEPC



**Greater than 3500kg
through-Frame Lift!**

**Hydraulic power
200lpm @ 3000psi**

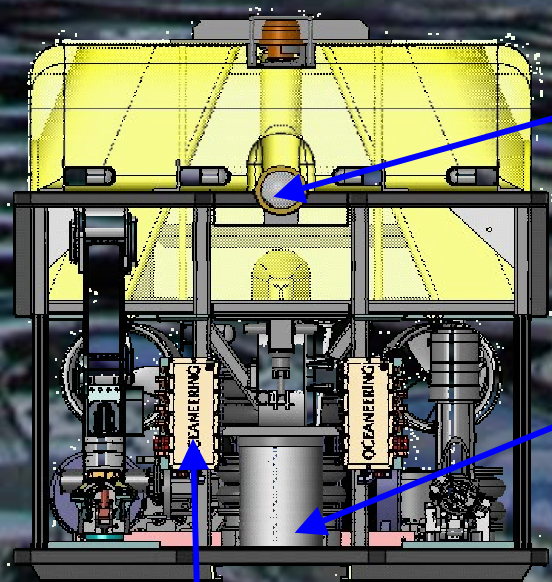
**20 Amps of
Power to run
Survey or
Tooling**

**MS1000 High-
Resolution sonar**

**6 each - 500
Watt Light
Circuits**

OCEANEERING®

MILLENNIUM Plus® 150SHP WROV AS INTEGRATED o/b BOA DEEPC

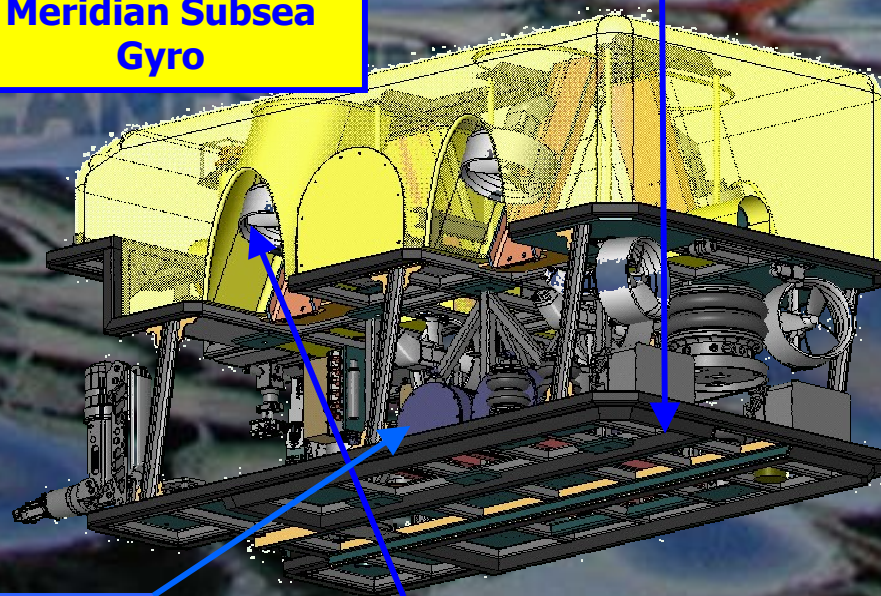


**Domed Pan &
Rotate Camera**

**2 each Spare 100lpm
Directional
Proportional Flow
Control Valves**

**Survey Grade TSS
Meridian Subsea
Gyro**

**11 each Spare
60-lpm
Solenoid
Valves**



**Focal 903HD Multiplexer w/
8 Video Channels
16 Data Channels
configured 24vdc/115vac**

**Improved vertical thruster
configuration & quick change
thruster mounting system**

'MAXXIMUM©'

Length: 3.1 meters

Width: 1.85 meters

Height: 2.1 meters

Depth Rating: 3050 meters (*standard*)

Payload: 750 kg

Hyd. Power: 220Shaft HP

Flow: 320lpm @ 3200psi

Propulsion:

4 x Cornered Vector (SA300)

4 x Vertical (SA300)

Thrust:

Fore/Aft/Lateral >1100 kg

Vertical Lift > 1350 kg

Front end lift >700 kg

Data/PWR:

16 regular data channels

10 x 5/12/24/115vdc @>5A

LAN Survey interface for

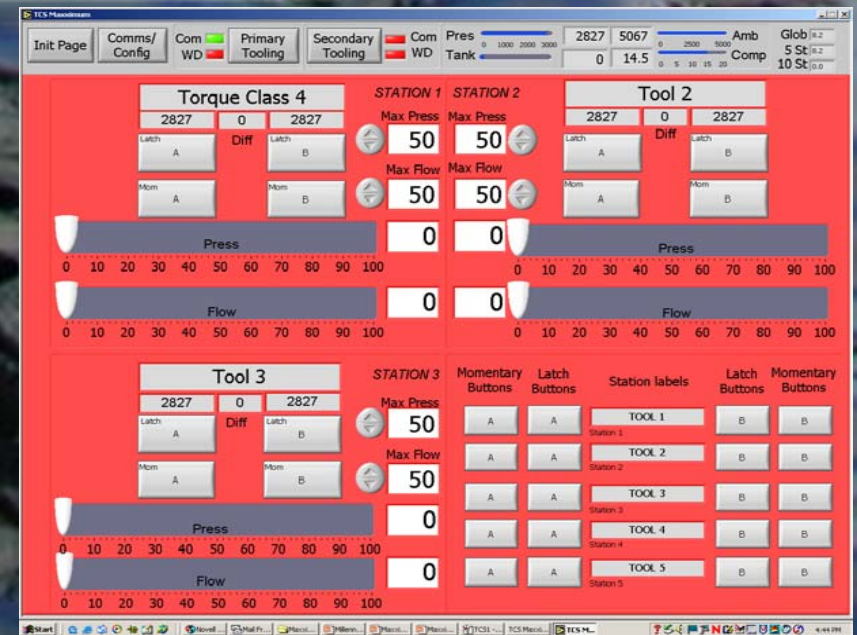
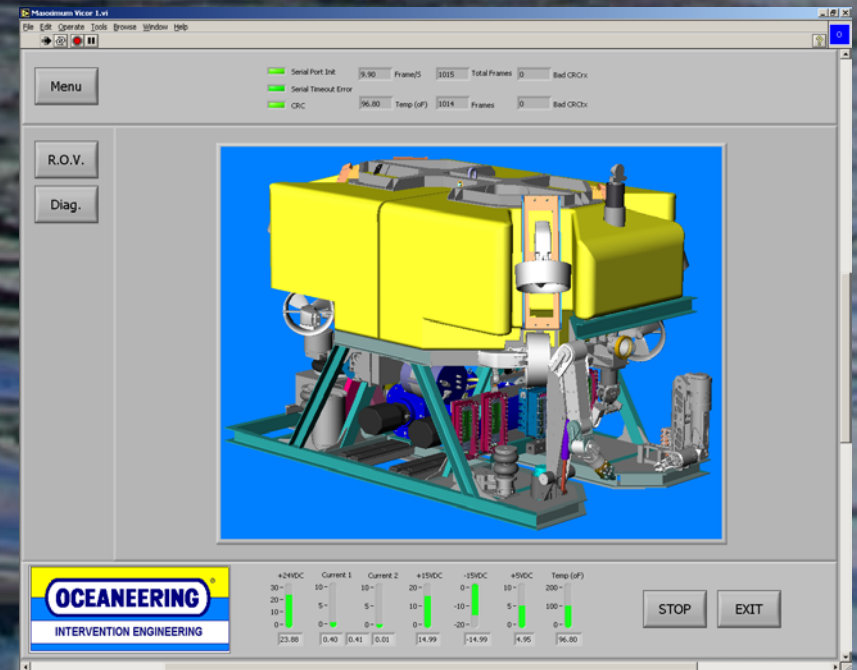
10 x 100Mbit sensor ports.



The 220SHP 'MAXXIMUM©' Construction ROV

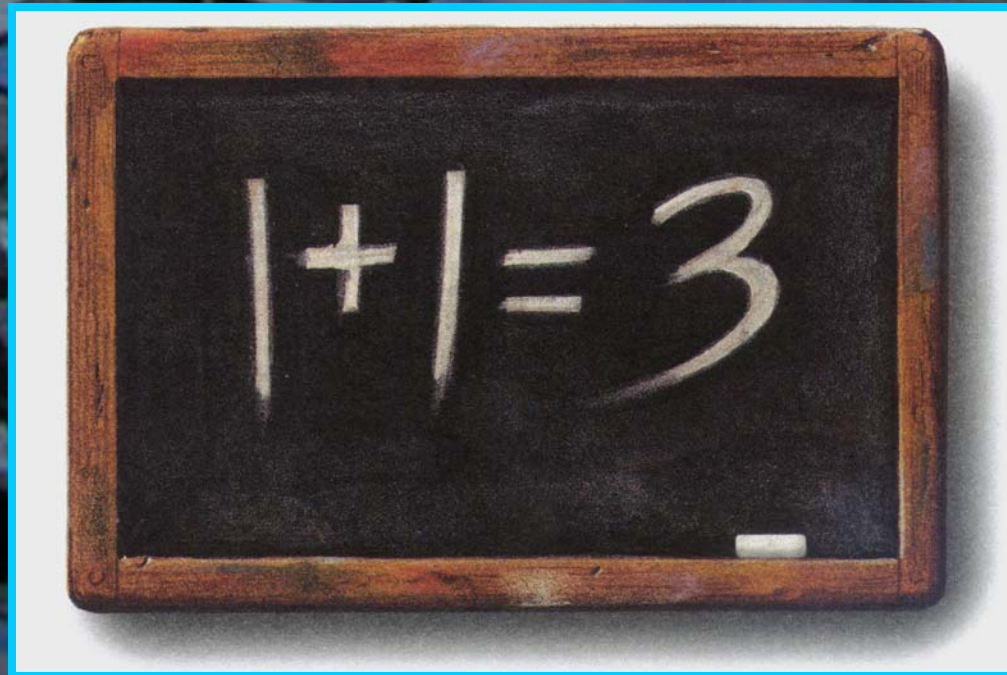
New Interactive Flight Control Console;

- Complete diagnostics control
- Online 'trouble-shooting'
- Integrated tooling control system
- On-the-fly datalogging/reporting
- Full survey sensor control



CONCLUSION;

LONG-TERM COMMITMENT = PURPOSE BUILT => RISK MANAGEMENT



WINTER SEASON WORK ANYONE?

.....a very busy summer season is right around the corner ☺



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