

MacArtney

MacArtney
UNDERWATER TECHNOLOGY

Launch and Recovery Systems ERVO Meeting Copenhagen, May 13 – 15th 2009



J20



J22

- 12 TSS 500 (120V)
- 11 TSS 400 (120V)
- 10 R01 Drogger
- 9 Laser 2
- 8 Sonodyne 7600
- 7

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World Wide Sales & Service Support



- **Group headquarters**

Esbjerg, Denmark

- **Subsidiaries**

7 locations in Europe & USA

- **Sales offices**

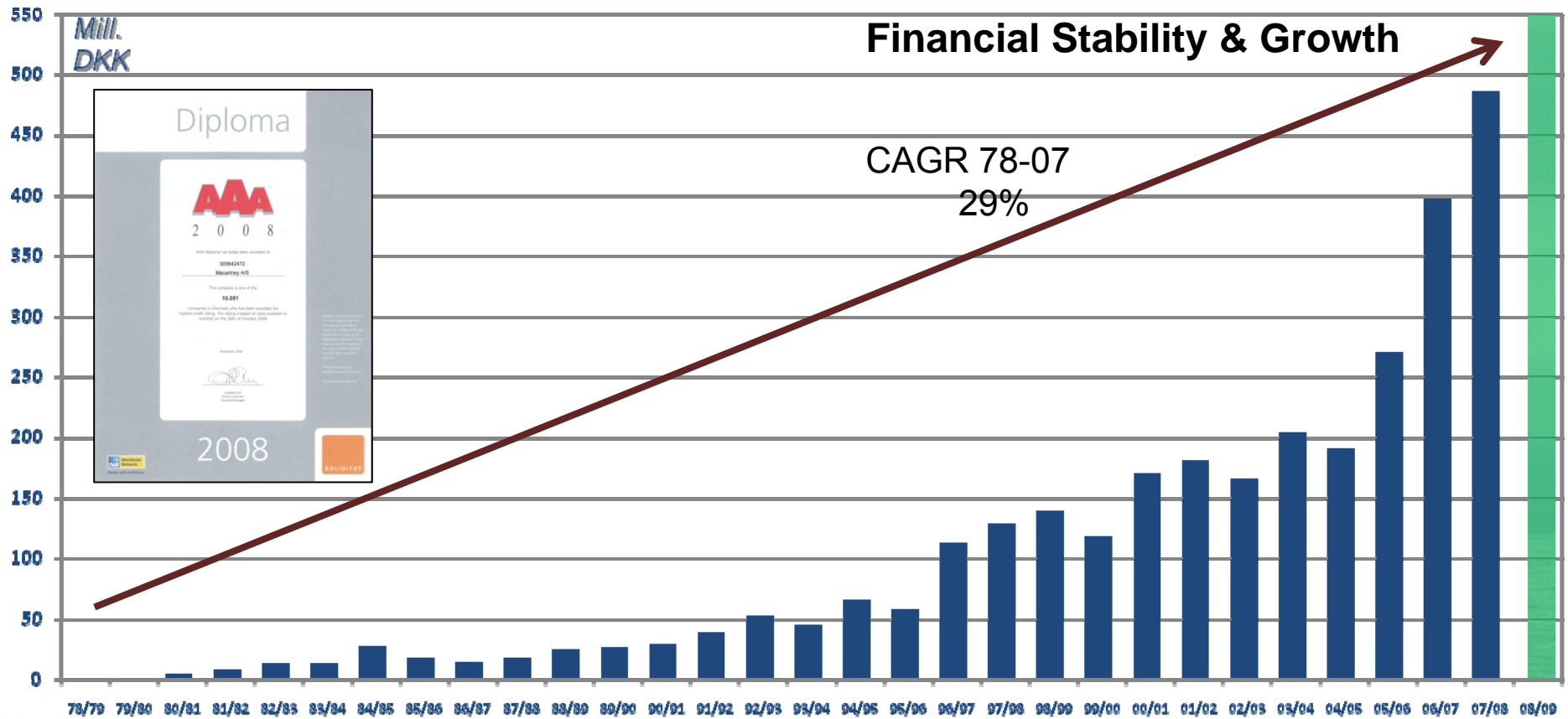
3 locations; UK, USA & Middle East

- **Sales Representatives**

20 locations around the world

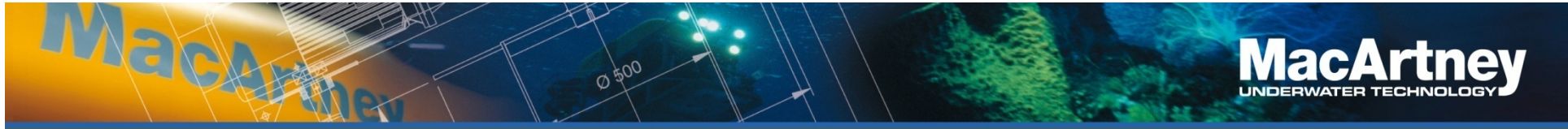
Founded 1978 by Martin & Winnie MacArtney

200+ Employees



Quality Assurance: ISO 9001:2000

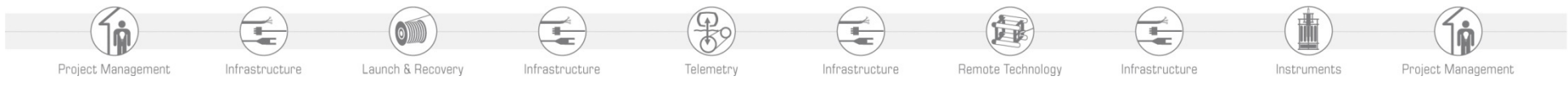




MacArtney Systems

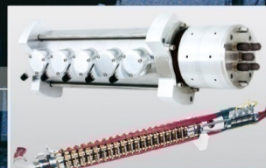
<p>Infrastructure:</p> <ul style="list-style-type: none"> Cables Connectors Fibre Optic Connectors Terminations 	<p>Telemetry</p> <ul style="list-style-type: none"> Multiplexers Electronics 	<p>Launch & Recovery</p> <ul style="list-style-type: none"> Winches Rotary Products
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<p>Remote Technology</p> <ul style="list-style-type: none"> FOCUS 2 TRIAXUS ROV MVP 	<p>Instruments</p> <ul style="list-style-type: none"> Acoustic Equipment Oceanographic Instruments TV/Photo & Light 	<p>System Integration</p>
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Launch & Recovery

- Winches
- A-frames & Cranes
- Rotary products



Cormac Series

Made from AISI 304 Stainless steel
(316 optional)

SWL from 2 – 12 kN
Cable lengths from 100 – 3500m

Applications:
Side Scan Sonar
CTD/SVP profiling
Lightweight Towed sensor platforms
Midwater ROV systems



Cormac 0



Cormac 6



MASH Oceanographic Series

Compact design, PLC controlled electric winch system.

- Electric driven level wind
- Built in cable length/speed counter
- Tension monitoring (optional)
- Constant tension (option)
- RS-232 communication
- PC SW for automatic profiling

SWL from 5 – 25 kN

Cable lengths from 500 – 6800m

Applications:

ROTV systems

Deep tow SSS & Subbottom profiling

Full Ocean depth CTD/SVP profiling

ROV systems



MASH 1000



MASH 2500



MASH 5000



Project Management



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Launch & Recovery



Infrastructure



Telemetry



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Remote Technology



Infrastructure



Instruments



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Special Systems

Electric Traction Winches
w & w/o Right Angle Level
wind.

- Suitable for fiber armoured
cables
- (For Ultra clean CTD Systems)



Other examples is winches for
Low temperature operation:
 $\pm 20 - 30^{\circ}\text{C}$

(Requires special welding procedures and materials)



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Launch & Recovery



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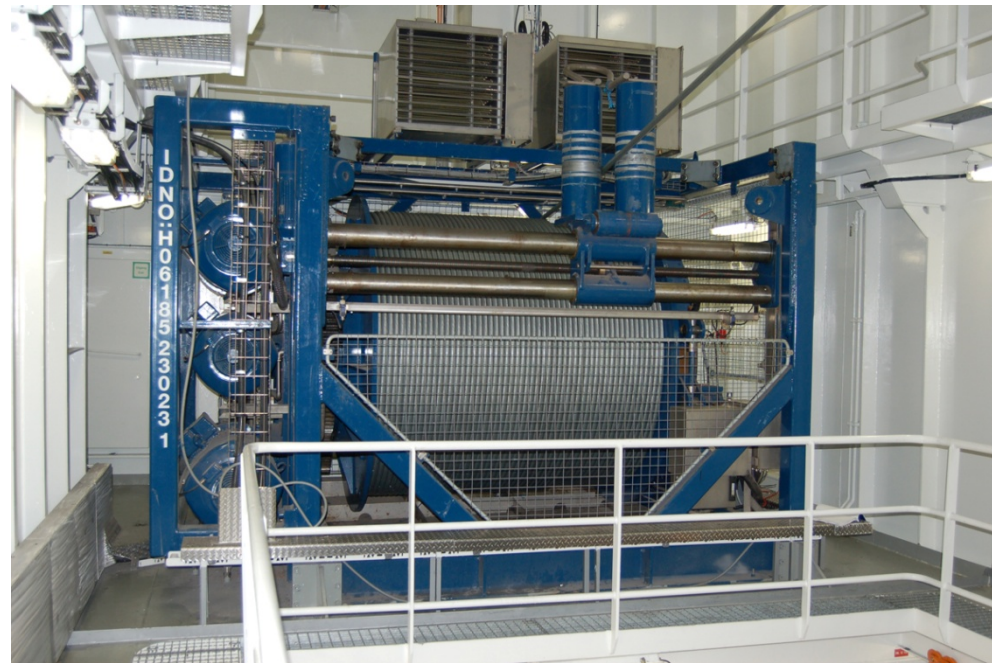
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MASH ROV Umbilical Winch Series

- Compact design
- PLC controlled electric winch system.
- Electric driven level wind
- Built in cable length/speed counter
- Tension monitoring
- RS-232 communication
- Designed to integrate with MacArtney LARS and AHC systems

SWL up to 150kN
Cable lengths up to 4500m

Applications:
Work class ROV systems
Trenchers



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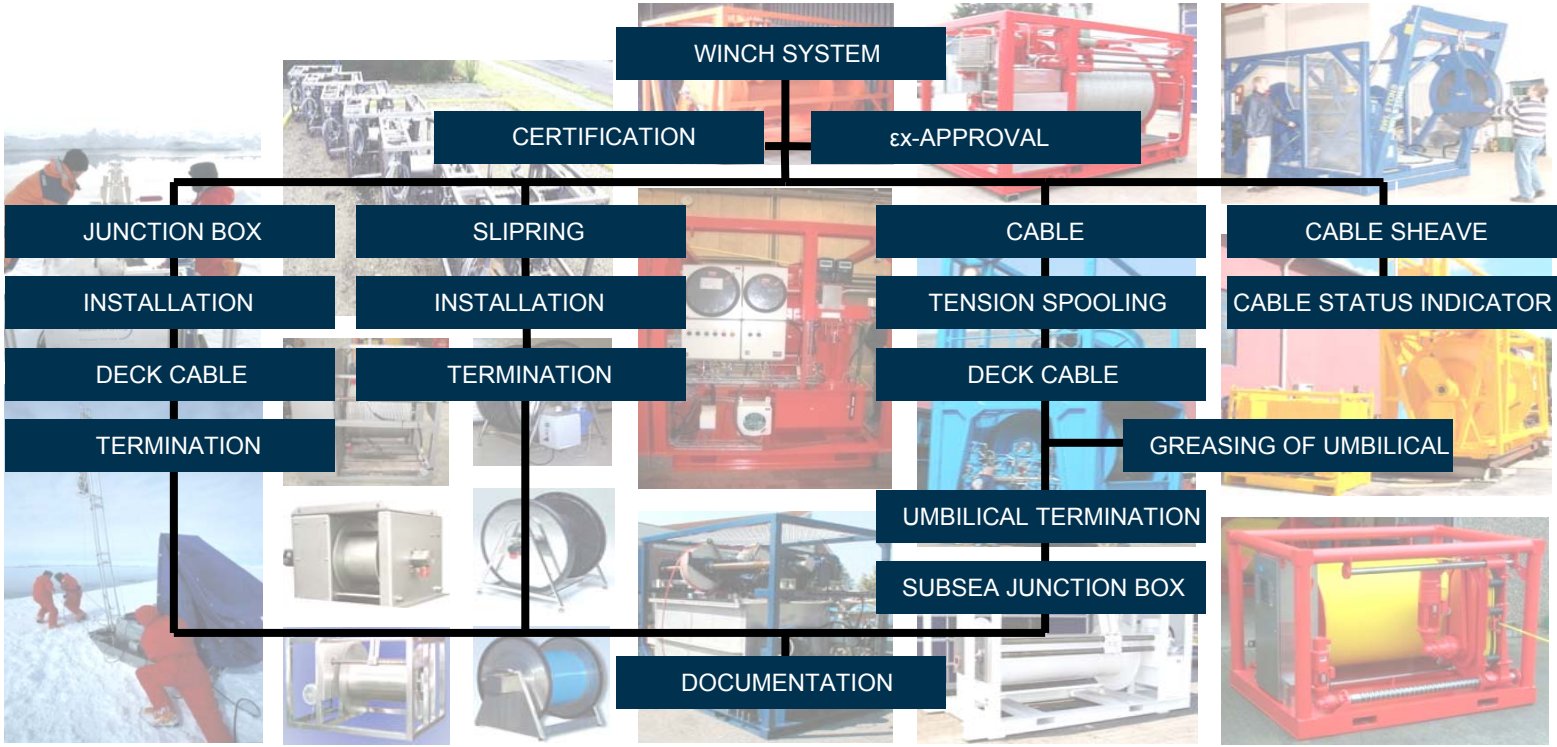
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Winch Certification:

- Lloyds
- ABS
- Germ Lloyds
- EN 13852-1 and EN 13852-2 Offshore Cranes and Barge/Floating
- 2.7.1 Lift Certification for Offshore Lift
- IMO Lift Certification for Offshore Lift – over 25 tonnes
- ILO 152 Lift Certification for Onshore lift
- CE marking
- ATEX and Exx certification
- NORSOK

• DnV Certification of Lifting Appliances 1994



DET NORSKE VERITAS

CERTIFICATE OF CONFORMITY

FOR WINCH SYSTEM

COC No.: ENEOK-200610137
 Cnt No.: 146.23.2/181065

COC No.: ENEOK-200610137
 Cnt No.: 146.23.2/181065

Br.cylinder-23023-15 rev.0 Brakecylinder
 Bandbrake-22305-16 rev.0 Bandbrake

Welding:
 Welding was carried out by certified welders in accordance with approved welding procedures.

Non destructive testing (NDT):
 NDT was carried out according to table G3 in section 2 for primary members, Rules for Lifting Appliances.

Tests:
 The following tests were witnessed:
 - Brake holding load on first layer (Static brake test) : 52,7 Tonnes
 - Dynamic emergency stop test : 19,5 Tonnes

Result of the survey:
 The workmanship, tests and documentation were as far as it could be controlled found in order and in accordance with "Rules for Certification of Lifting Appliances", 1994.

Please note:

- "Loose gear" (shackles, hook, rings etc.) is not covered in this approval. It has to comply with recognized standard or code and be delivered with manufacturer's certificate.
- Fastening to deck structure and support in the deck structure is not covered in this approval. To be approved in each single case of installation if DNV certificate CG2 is wanted.
- The size of the dynamic factor is not approved. The operator must secure that the dynamic factor will not be exceeded.
- The transportation aspects are not covered by this Certificate of Conformity. Please refer to DNV Statement of Conformity No. ENEOK-200610136.

No other aspects are covered by this report.

Signed for Det Norske Veritas AS
Name: *Jan Erik Gaagshøj*
 Jan Erik Gaagshøj

Date: 2006-10-31
Place: Esbjerg, Denmark

This is to certify that the undersigned surveyors during production and finally on 30th October 2006 attended the premises of Svendsborg Hydraulik A/S with the purpose of carrying out surveys and witnessing the Factory Acceptance Test (FAT) of the above mentioned winch system

BAISIS FOR APPROVAL

The winch is checked with respect to strength and material qualities according to DNV's "Rules for Certification of Lifting Appliances", 1994, rule-application according to section 1, cap. B 102 b, "Offshore Cranes". This COC is based on DNV Design Assessment for Type Approval No. S-4699, (step 2).

Safe Working Load: 128 kN (Top-layer)

Cable capacity: 3400 m, Ø34,4 mm
 Design dynamic factor $\gamma_0 = 2.0$
 Design temperature T_4 : -20° C.

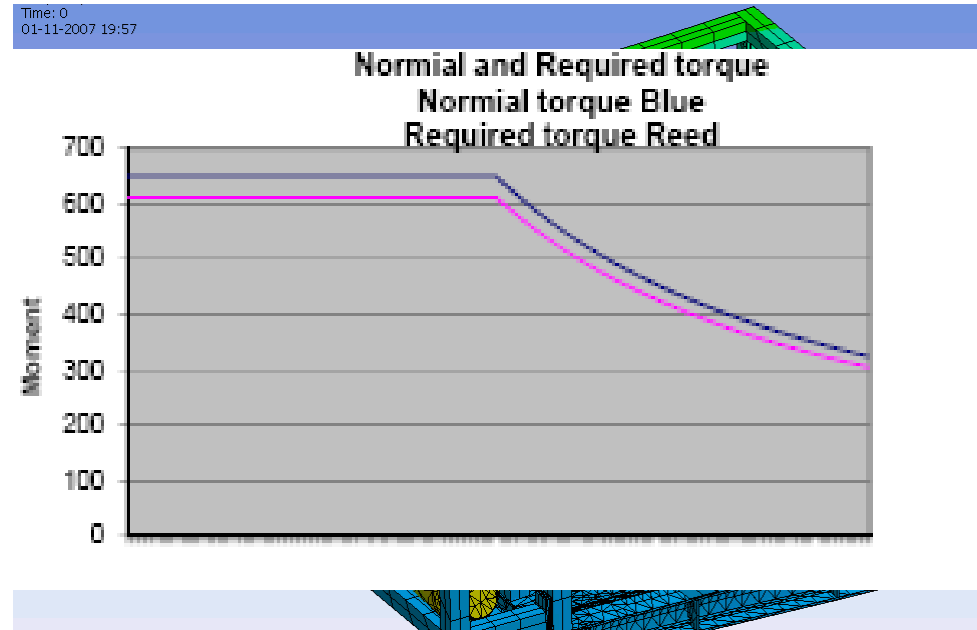
Approved:

MASH2500-34,4-130-1	rev.0	MASH2500-34,4-130	(For information)
Frame-23023-2	rev.0	Frame	
Drum-21023-3	rev.0	Drum	
A-Treble-23023-4	rev.0	A-Treble	
Levelwind-23023-6	rev.5	Level wind-2	
Wheels-22305-7	rev.0	Toothed wheel M14-Z84 + M14-Z17	
Bearingh. A-In-23023-13	rev.0	Bearing house	
Bearinghouse 190-23023-14	rev.0	Bearinghousing 190	



Design

- All winches are designed/calculated according to DnV Certification of Lifting Appliance and F.M.E. 1.001 Section I Heavy Lifting Appliance 1998 3rd Edition, Booklet 1, 2, 3, 4 and 9.
- ANSYS calculation
- AHC formulae is MacArtney propriety and is developed in cooperation with Aalborg University



Project _____
 Customer _____
 Date _____

Design input for calculating the hydrodynamic loads.
 Vessel movement, location of crane tip and stiffness of crane/umbilical system.

Wave height	Meter
Period	Second
Characteristic heave movement of the vessel	Meter
Characteristic roll movement of the vessel	°
Characteristic pitch movement of the vessel	°
Horizontal distance from centerline to crane tip	Meter
Horizontal distance from middle line to crane tip	Meter
Vessels natural period heave	Second
Vessels natural period roll	Second
Vessels natural period pitch	Second
Stiffness of the crane/umbilical system	kN/m

Wave height	Meter
Period	Second
Characteristic heave movement of the vessel	Meter
Characteristic roll movement of the vessel	°
Characteristic pitch movement of the vessel	°
Horizontal distance from centerline to crane tip	Meter
Horizontal distance from middle line to crane tip	Meter
Vessels natural period heave	Second
Vessels natural period roll	Second
Vessels natural period pitch	Second
Stiffness of the crane/umbilical system	kN/m

AHC design check list:

- Definition of acceleration & speed of the crane tip
- Definition of the depth and load of the "package" (weight of umbilical, TMS, toolskid etc.)
- These are the basic design parameters for the winch.

AHC Winches



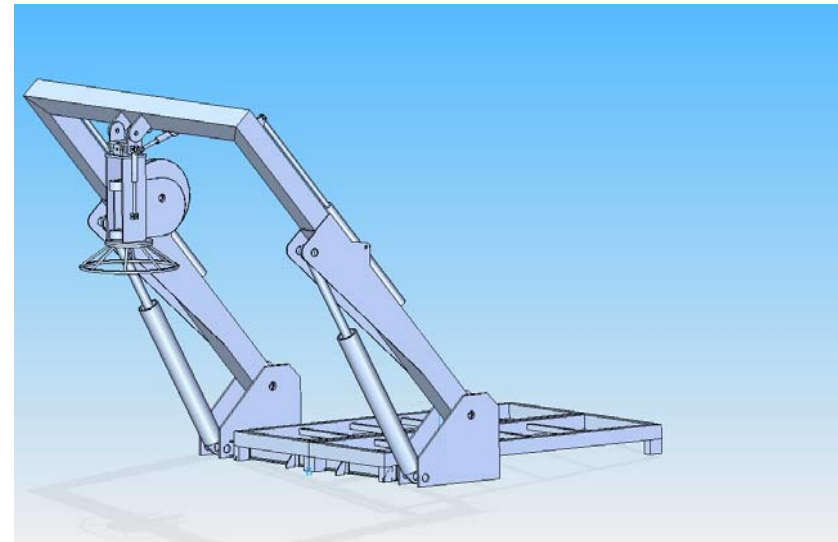
AHC Deactivated



AHC Activated

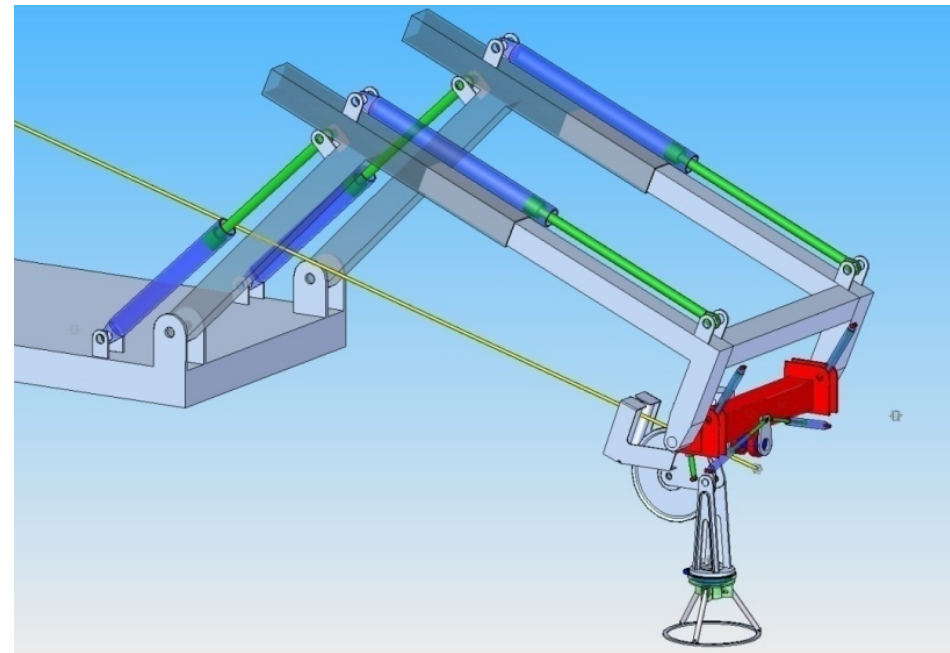
A-Frames

- Standard A-Frame systems SWL 15 tons γ -factor of 3
- Luffing 15 ton hydraulic (15 x 1,25 = 18,75 ton)
- Max Outreach: 5500 mm to centre line of cable
- Outreach retracted: 3300 mm to centre line of cable
- Distance between boom legs: 5000 mm
- Parking area for ROV
 - Length: 6000 mm
 - Width: 4200 mm
- Subsea stress terminations... and more



A-Frame – New Development

- High tech A-frame System
- SWL 15 ton γ -factor of 3
- Long outreach (6,5m – 2,5m below deck)
- Flexible docking head
- Certified according to DnV Note 2.22



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Telemetry



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Instruments



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Crane systems

- Crane based LARS system – used on the Galathea expedition – Danish Navy
- Long out reach
- 20” Container skid
- Full certification of the winch system according to DnV’s “Rules for certification of Lifting Appliances 1995”



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Training

Training courses at 2 different levels are recommended as part of the scope of supply:

1. Operator course - 1 day
2. Supervisor course - 3 days

Training is conducted by our winch engineers



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Instruments

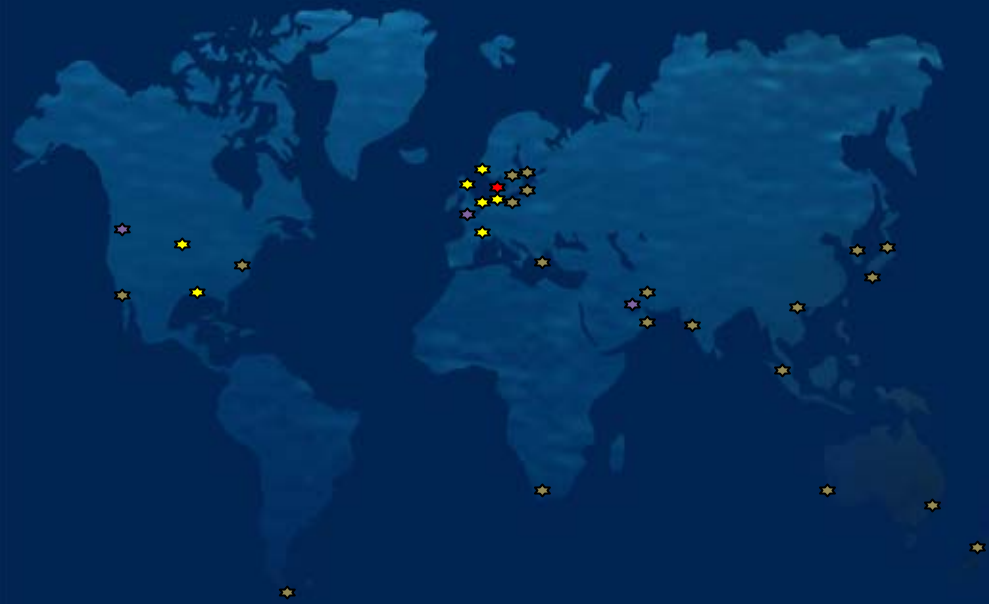


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Ø 500

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Thank You
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Hans-Jørgen Hansen
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