P&O Maritime Services

Marine Institute
Foras na Mara

3 Solutions Found for Irish Research Vessels

A CTD Davit design

A Vibration Damping Solution

Managing mooring chain on a small vessel

Bill Dwyer, P&O Maritime Services

Celtic Voyager & Celtic Explorer

Marine Institute , Ireland. 1991

RV Lough Beltra 1978 –1997

Marine Technology Ltd

1983 - 1997

Marine Technical & Development Services 1998

P&O Maritime Services, 2006

Celtic Voyager, 1997

Celtic Explorer, 2003

Provider of Specialist Maritime Services

HQ Melbourne, Australia

600 worldwide

P&O Maritime Services

P&O Maritime Services Ireland

Located in Galway
on the west coast of
Ireland

50 Employees
14 shore based
33 Ships crew

220 Million Acres of
Irish Ocean Territory

Celtic Voyager

31.4m long
8.5m beam
Draft 3.8m
340 Tonnes

15 Berths
15 Days endurance

EM1002 Multibeam
Sub Bottom Profiler
SBE 911 CTD Rosette
Hull mounted RDI ADCP
Automated Weather System
Fugro Starfix position
Ixsea GAPS

EA400 Single Beam
SBE 21 Thermosalinograph
Turner Model 10 Fluorometer
MDM400 Data logger
Seapath Motion reference System
Furuno Fishing Sonar
EchoPlus Ground Discriminator

Celtic Explorer

ICES 209
65m Long
15m Beam
2500 Tonnes
Diesel Electric
Drop Keel
DP System
31 Berths
45 days endurance

EM1002 Multibeam
Sub Bottom Profiler
SBE 911 CTD Rosette
Fugro Starfix position
Moving Vessel Profiler
IT Network

EA600 Single Beam
SBE 21 Thermosalinograph
Turner Model 10 Fluorometer
SP70 Fishing Sonar
Automated Weather System
Seapath Motion reference System

EK60 Scientific Sounder
Hull mounted ADC
MDM400 Data logger
Ixsea GAPS
Gravity Meter
Octans III

CTD Deployments

Problems on Celtic Voyager

- CTD Derrick
  - High pivot Point
  - Big Pendulum Effect
- Smashed Bottles
- Damaged Rosette frame
- Damaged Instrumentation

Problems addressed on Celtic Explorer

Celtic Explorer Davit Design

Reduce Pendulum Effect

Overhead telescopic Davit

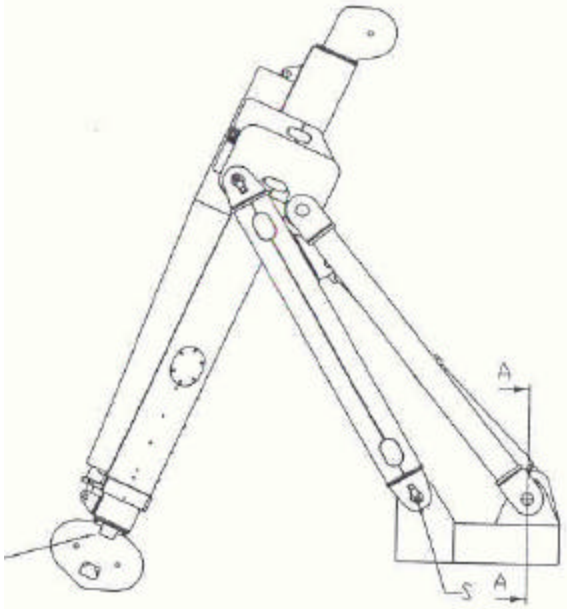
Requires a hanger -Expensive

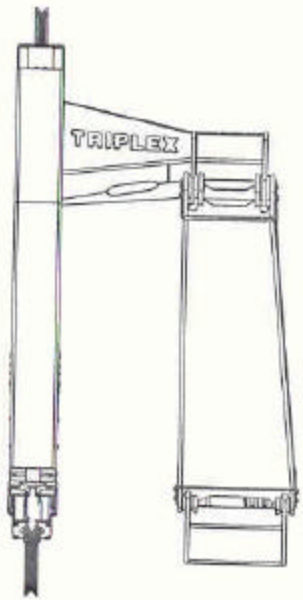
Simple Watts Linkage design chosen

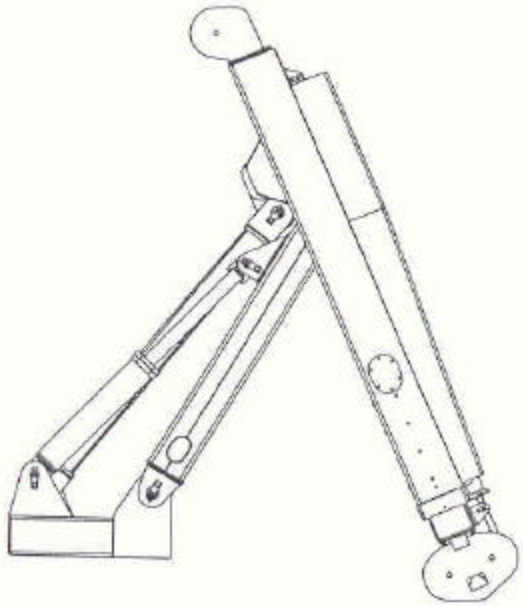
In house design in consultation with crane supplier

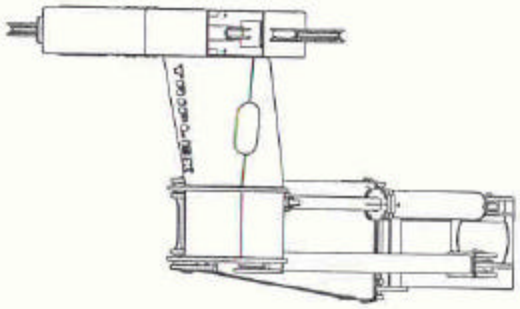
No Hangar -less space

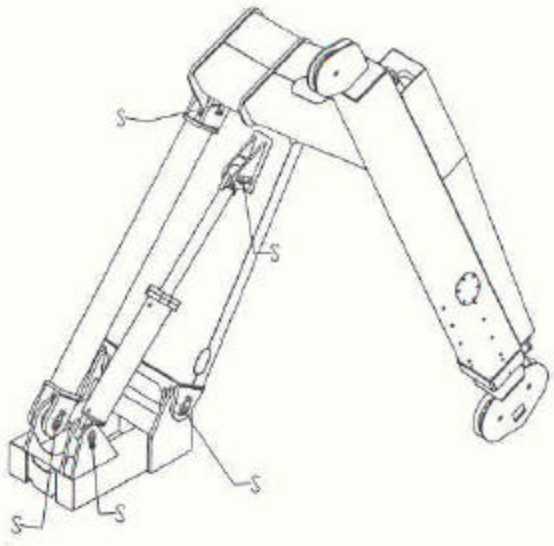
Less cost





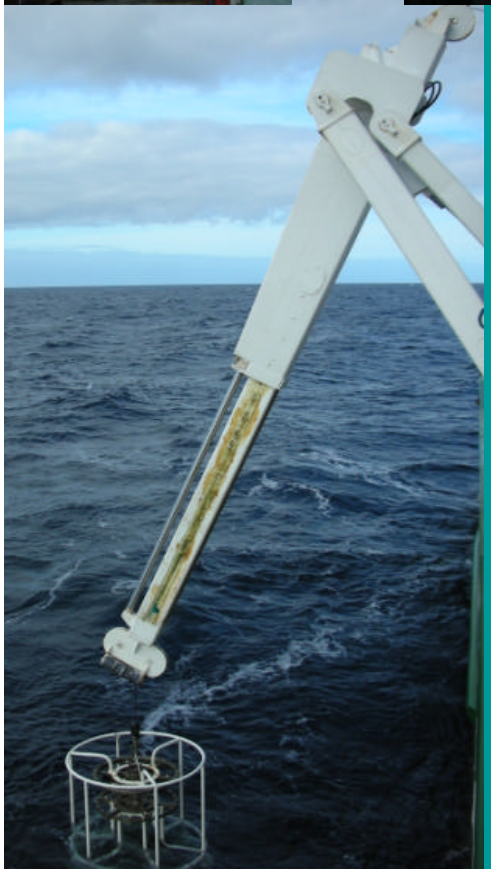






S - GREASE NIPPEL

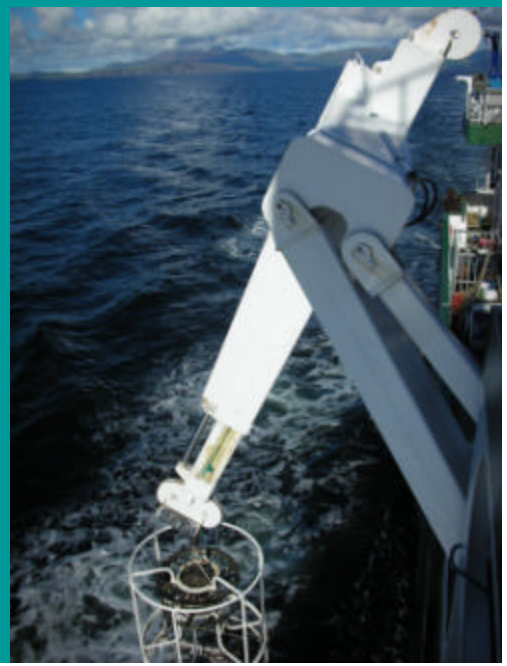
TRIPLEX CTD DAVIT MAIN ASSEMBLY LUBRICATE	Date DATE		
	Format A1		
SM TRIPLEX AS	Drawing no. 1950		



Minimum of movement required for deployment

Telescopic arm can reach down towards sea surface

Seabird 911 CTD
24 x 10ltr bottle Rosette



Celtic Explorer Davit Design

- Heave compensation system added
- Needed for deep water deployments
- Influence of heave on CTD data is reduced.
- Can deploy in much heavier seas.

Celtic Explorer Davit Design

Pendulum effect greatly reduced

No impacts on side of vessel

No damaged bottles or instrumentation

Have deployed to 4800m depth

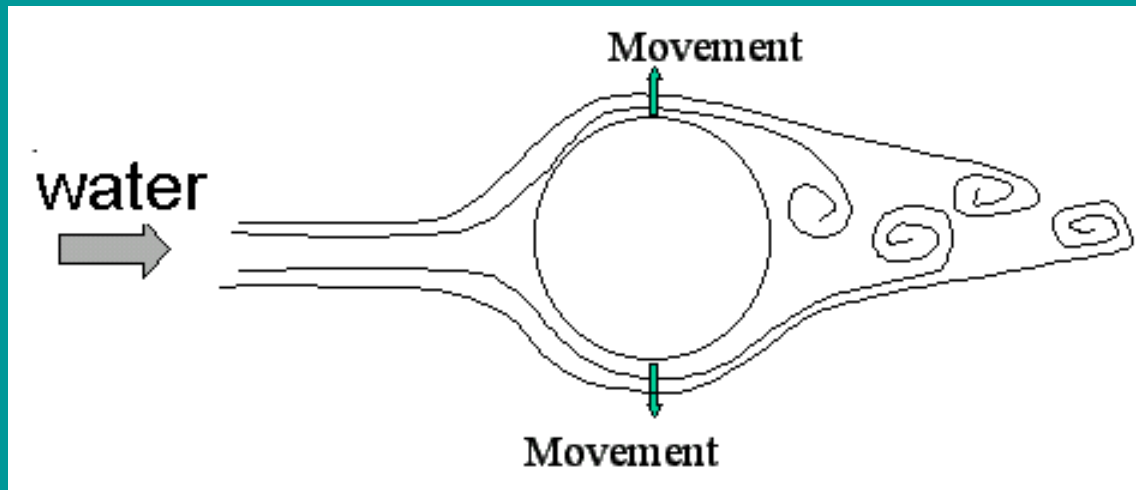
Deployed in 6m swells

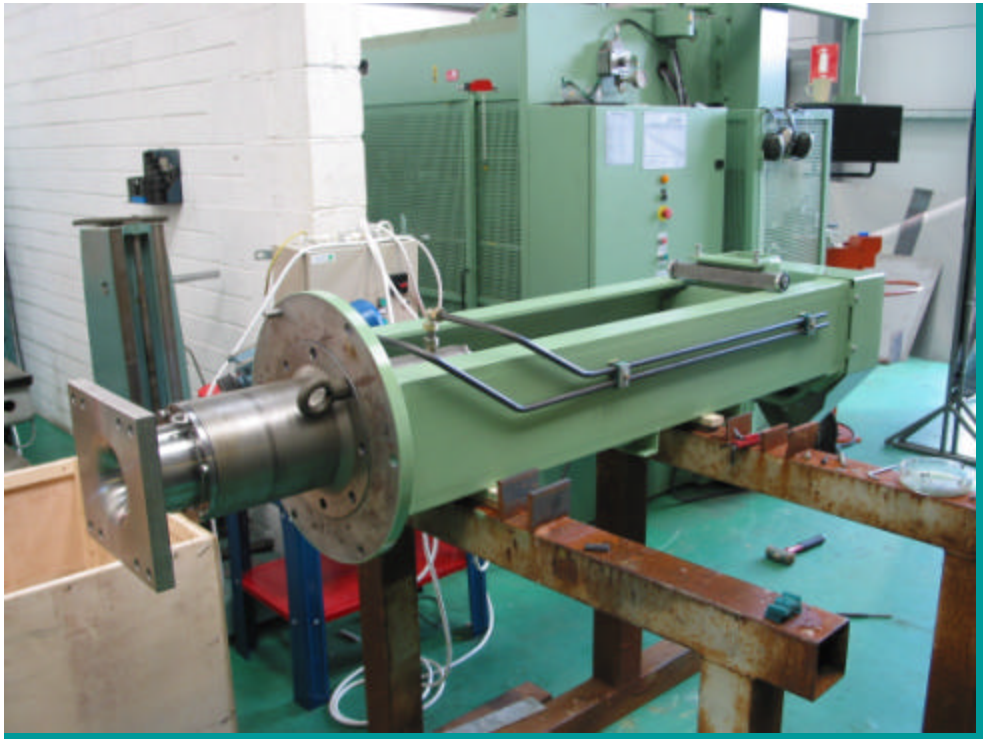
Heave influence removed from data

Working on Davit for Celtic Voyager

Vibration damping

- Vortex Shedding - well known phenomenon.
- Occurs in the wake of towed bodies, cables and suspended poles.
- As speed increases these Vortex induced vibrations increase.
- Potential issue with a retraction unit on Celtic Voyager





- Retraction unit pole
  - In-house design
  - Size contrained by space
  - Pole length 2500mm
  - Diameter 150mm
  - Stroke 1780mm
- Potential for vibration very high

•Helix form used to disrupt vortices

-Spiral Wrap

•Cheap option to use rope

•slackens when retracted

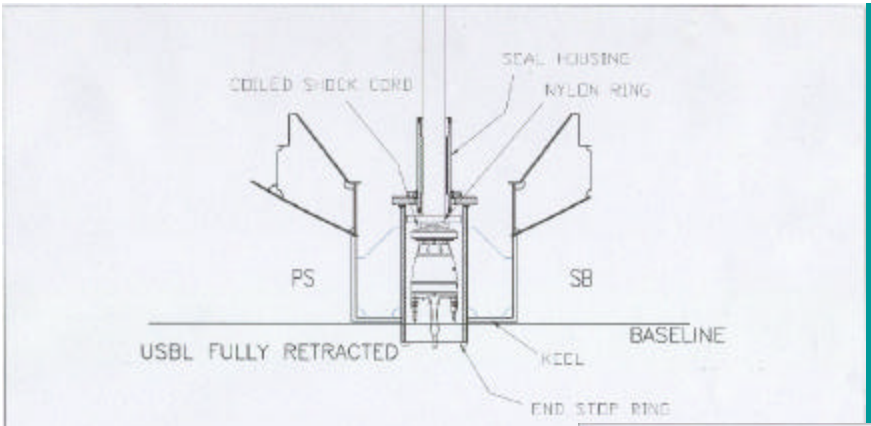
•Potential to foul

–Used bungee cord – works very well!

Bungee Cord works very well!

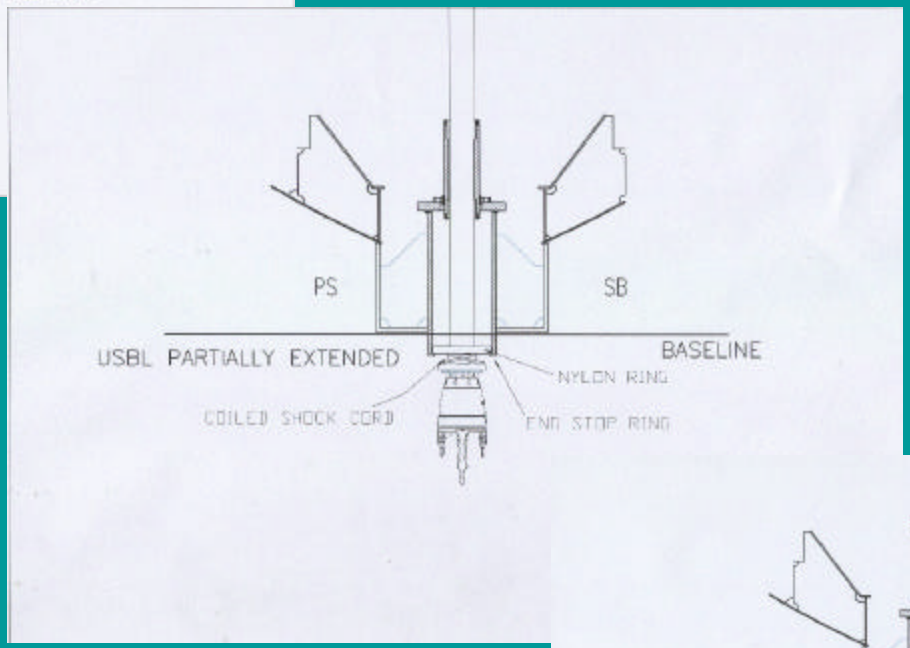
Sliding Ring on the pole allows much shorter cord lengths

Works well up to 10 knots

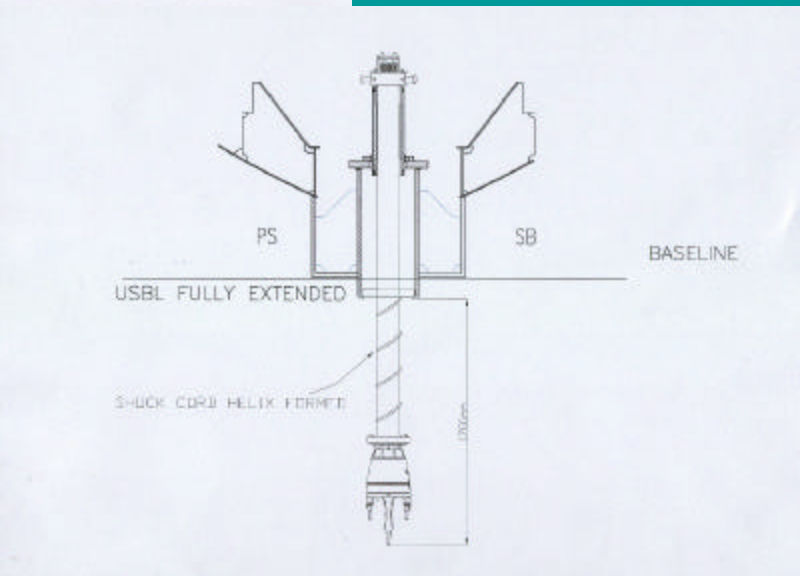


Cord attached to a nylon Ring that slides on the pole

Shorter length of bungee cord needed

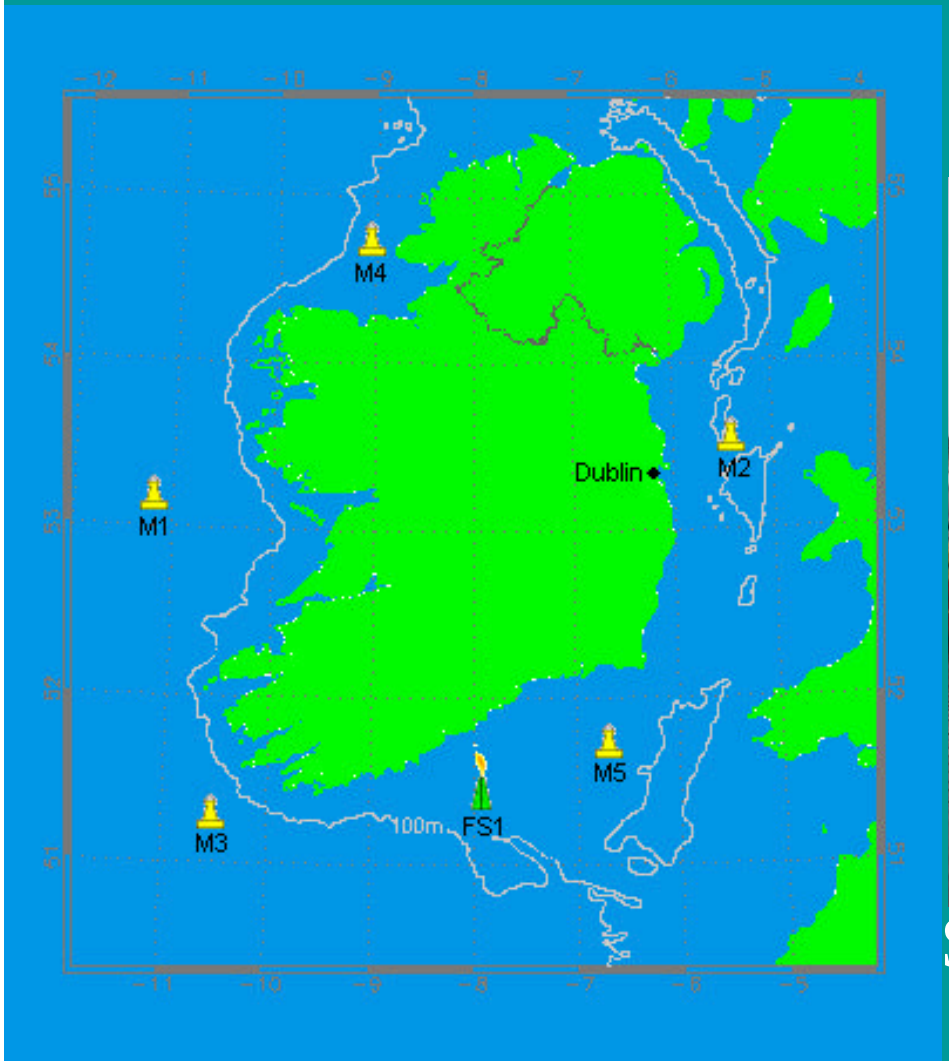


Cord easily replace by a diver



Irish DataBuoy Network

Shallow water deployments 90m-190m



Small Vessel deployment

Small vessel more cost effective

Buoy Moorings

Limited deck space for chain and wire

Buoy towed to station

Work space reduced

Higher risk of injury

Net Drum makes the job much easier!


Same method used on larger vessel

K Series Buoy Deployment

4500m mooring

Wire spooled one drum . Chain spooled on another

Deployed from Celtic Explorer

Woods Hole designed Mooring

Mooring Recovery

Cable ties snap off once rope is pulled

Easy reach to mooring rope

Hook to grab mooring rope