



British
Geological Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

A banner at the top of the slide with a collage background. From left to right: a rocky landscape, a volcanic flow, a mountain valley, a close-up of a rock, a city skyline, and a rocky outcrop. The text 'Gateway to the Earth' is overlaid in white.

Gateway to the Earth

Remotely operated sea bed rockdrills and vibrocorers: new advances

Heather Stewart

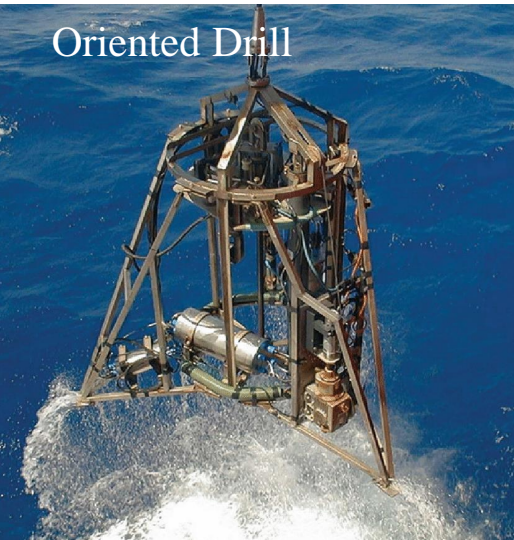
On behalf of the Marine Geology and Operations Team

Overview

- Background
- The BGS 55m rockdrill
- The BGS battery-operated vibrocorers
- Summary

Background – remotely operated rockdrills and vibrocorers

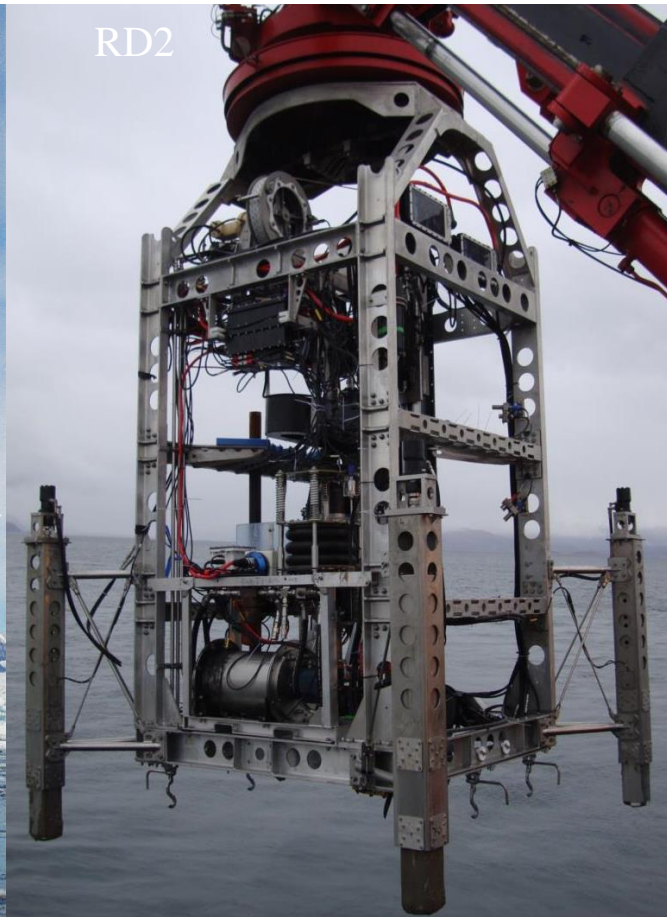
Oriented Drill



RD1/6m vibrocorer



RD2



3m Vibrocorer

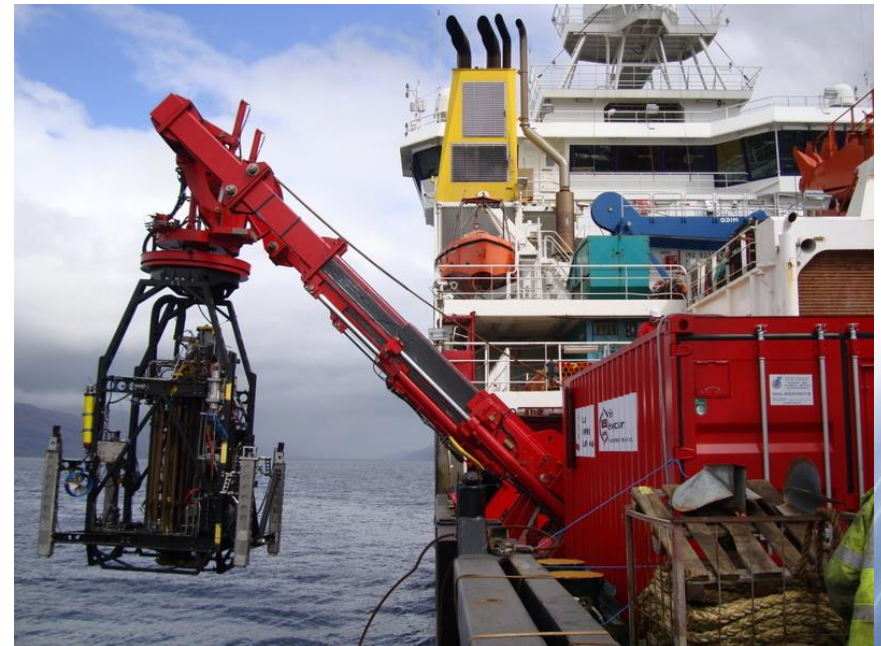
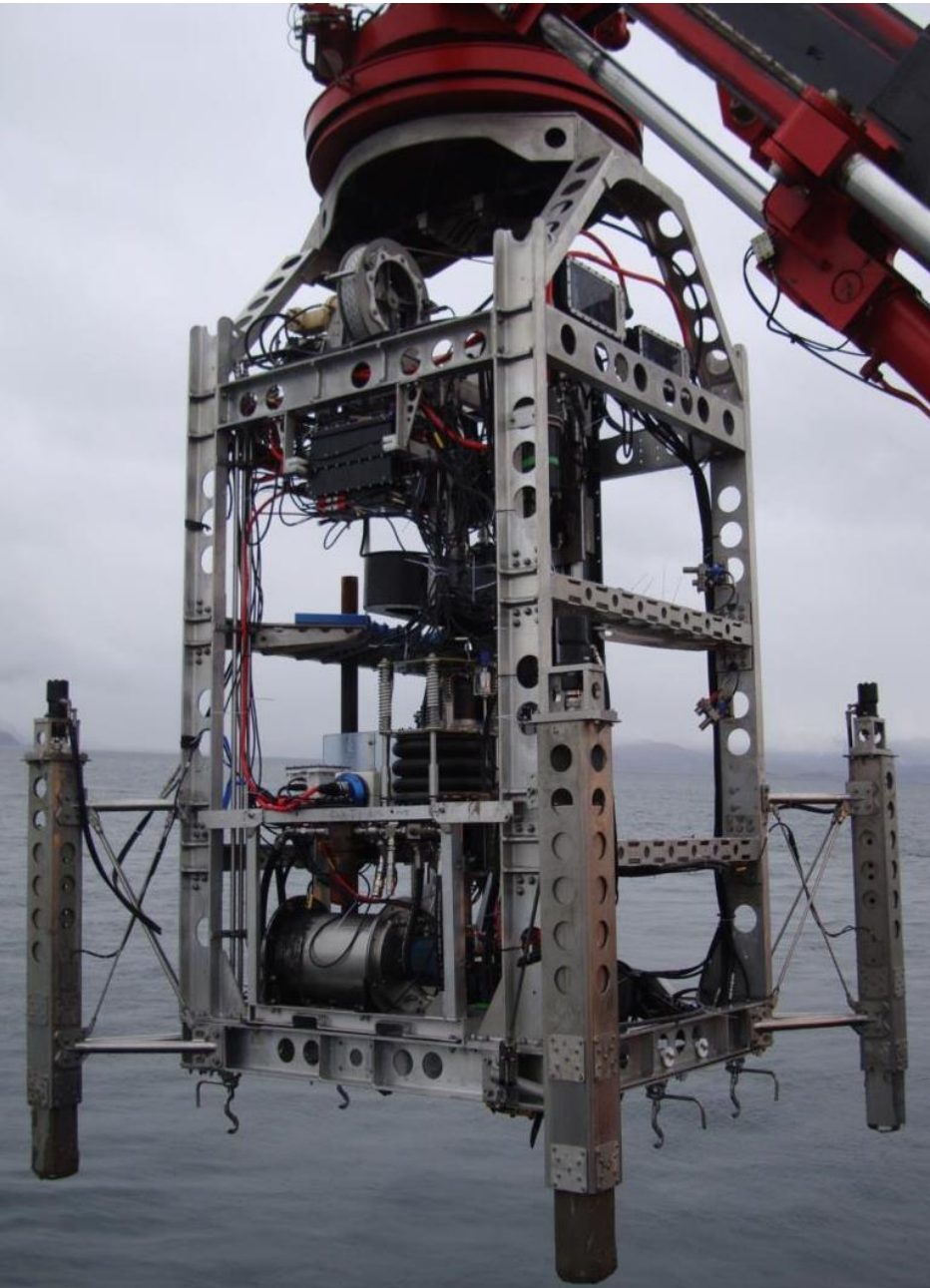


55m Rockdrill (RD2)

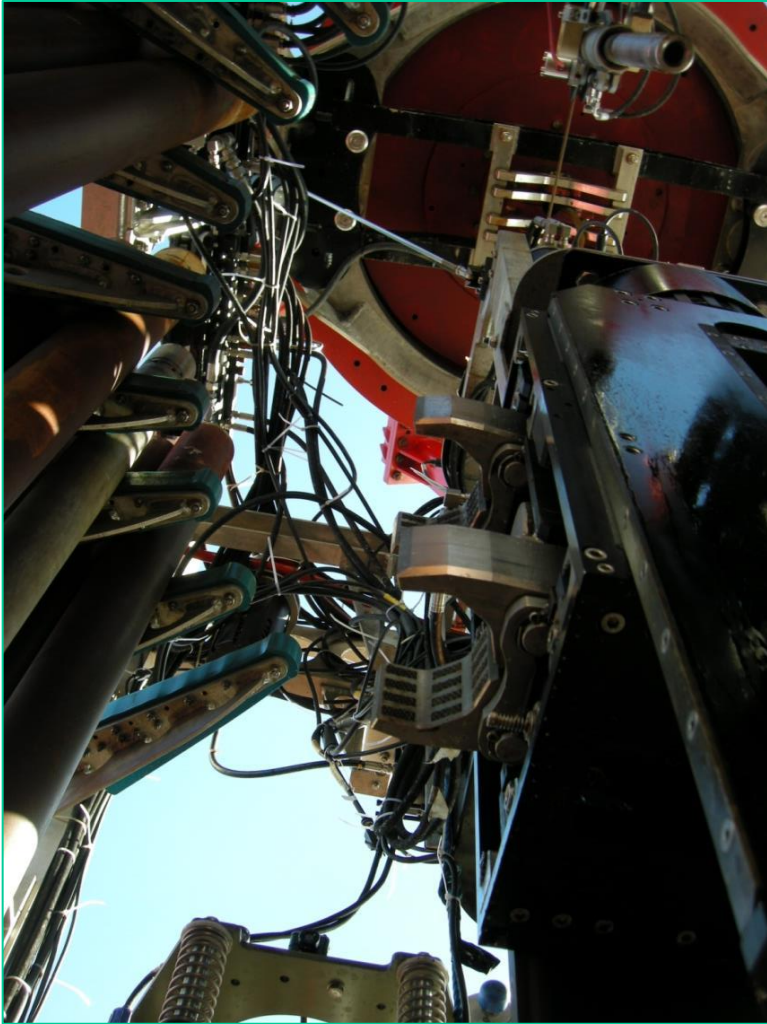


- Capable of coring up to 55m below sea bed
- 1.7m core lengths
- Can operate in water depths up to 4000m
- Additional sensors:
 - Gas flow meters
 - Down-hole logging tools
 - CTD

- Wire-line coring tools
- 4.8m high, 3m wide
- Comes in 7 containers including its own Launch and Recovery System (LARS)



A tool arm located in the centre of the drill moves the drill rods and core barrels from the tool racks to drill centre and back again.

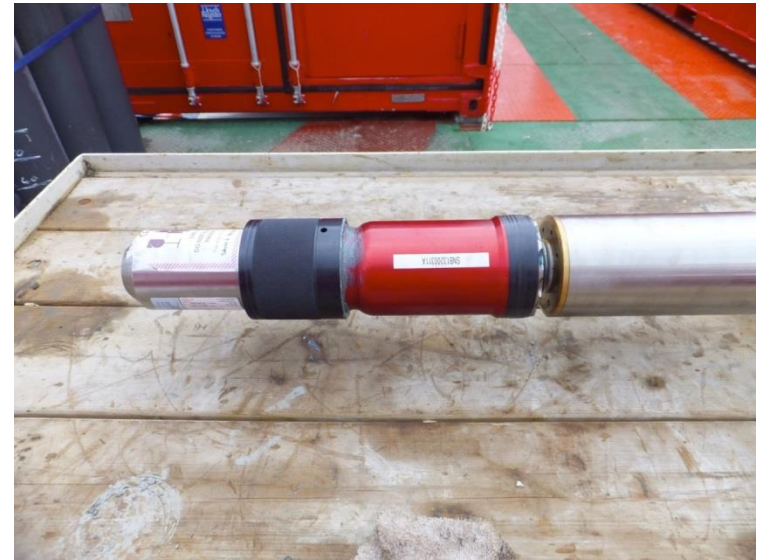


A view of the back deck

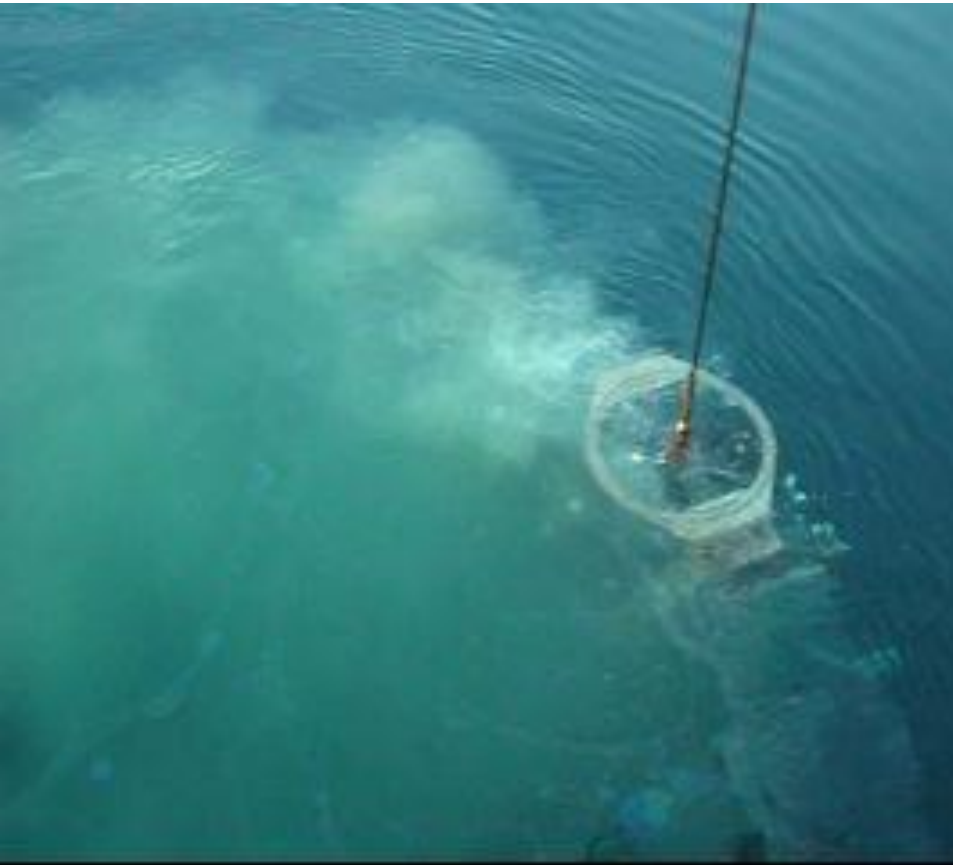


Gas flow meters

- BGS developed concept to assess volume of gas hydrates.
 - Battery data logger
 - Patent pending



Gas flow meters



BGS Vibrocorers

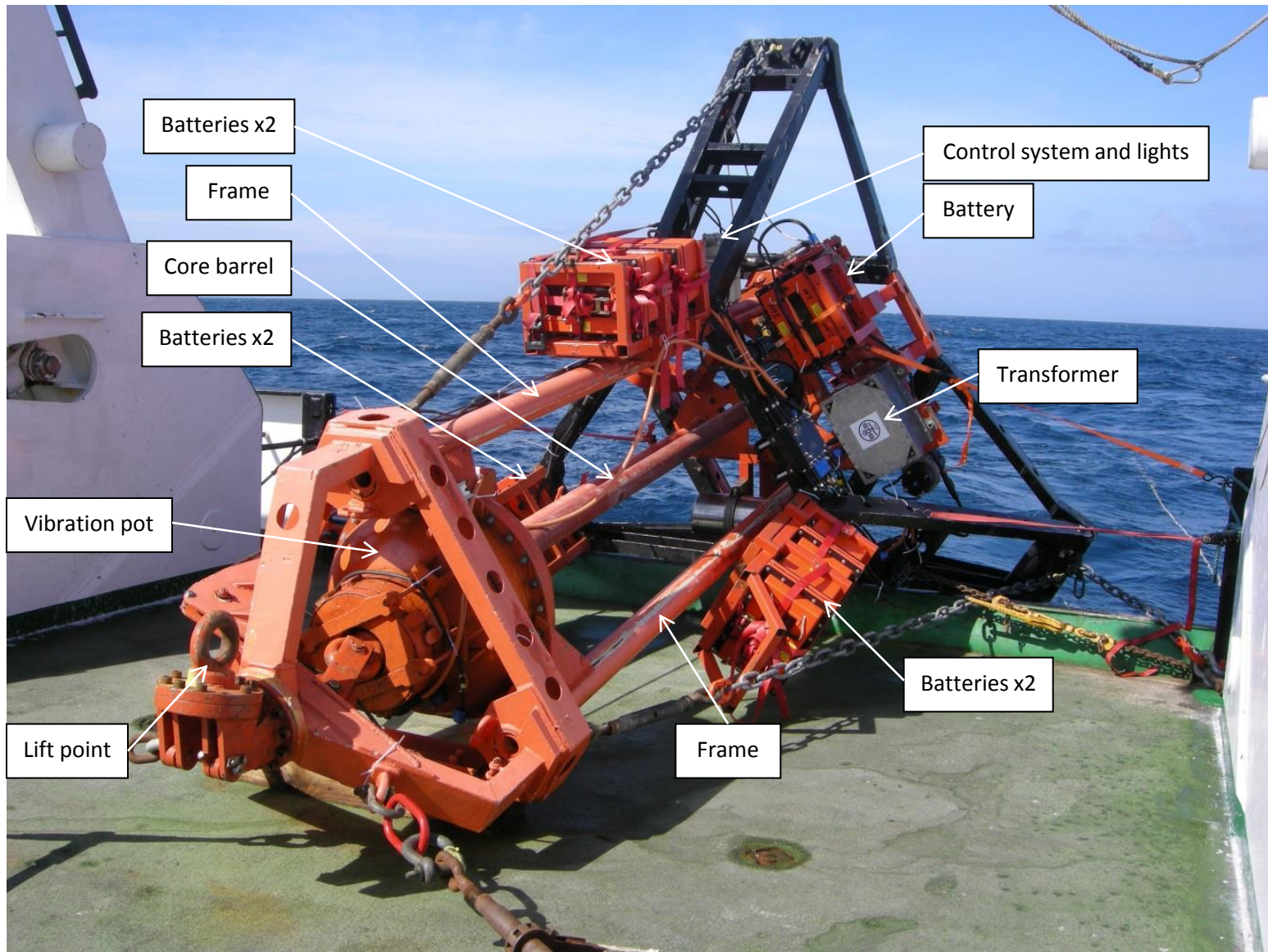




- Umbilical deployed Vibrocorer
 - Operates to 2000m WD
- Scientific requirement 6000m WD
- Solution: autonomous, battery powered system

BGS battery-operated vibrocorers





Batteries x2

Frame

Core barrel

Batteries x2

Vibration pot

Lift point

Control system and lights

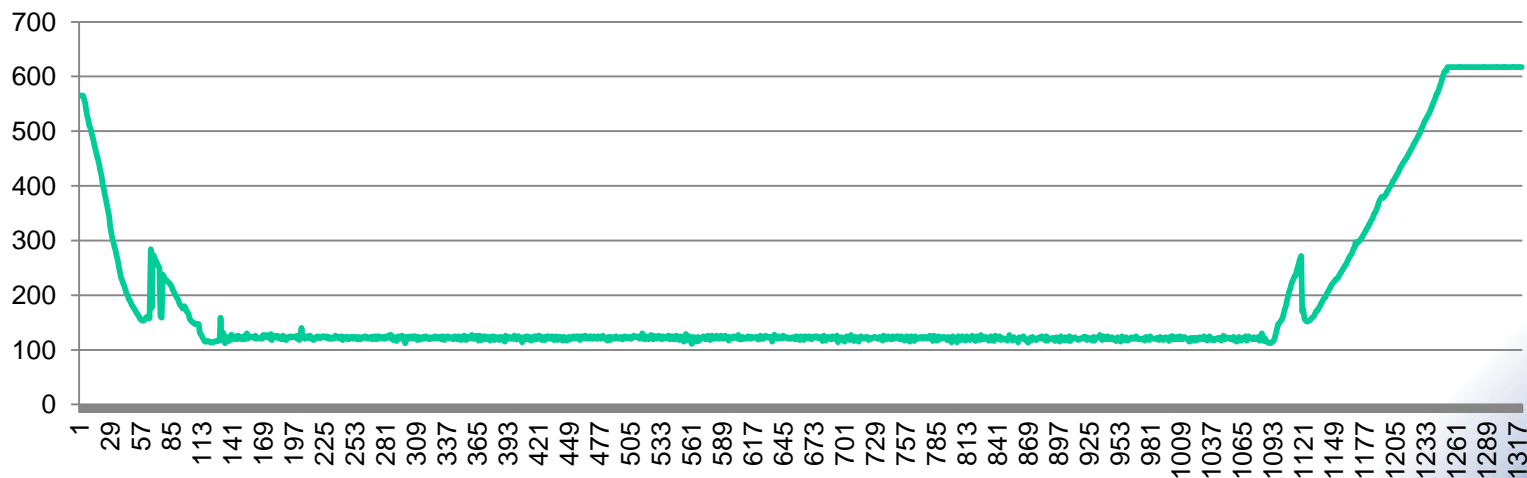
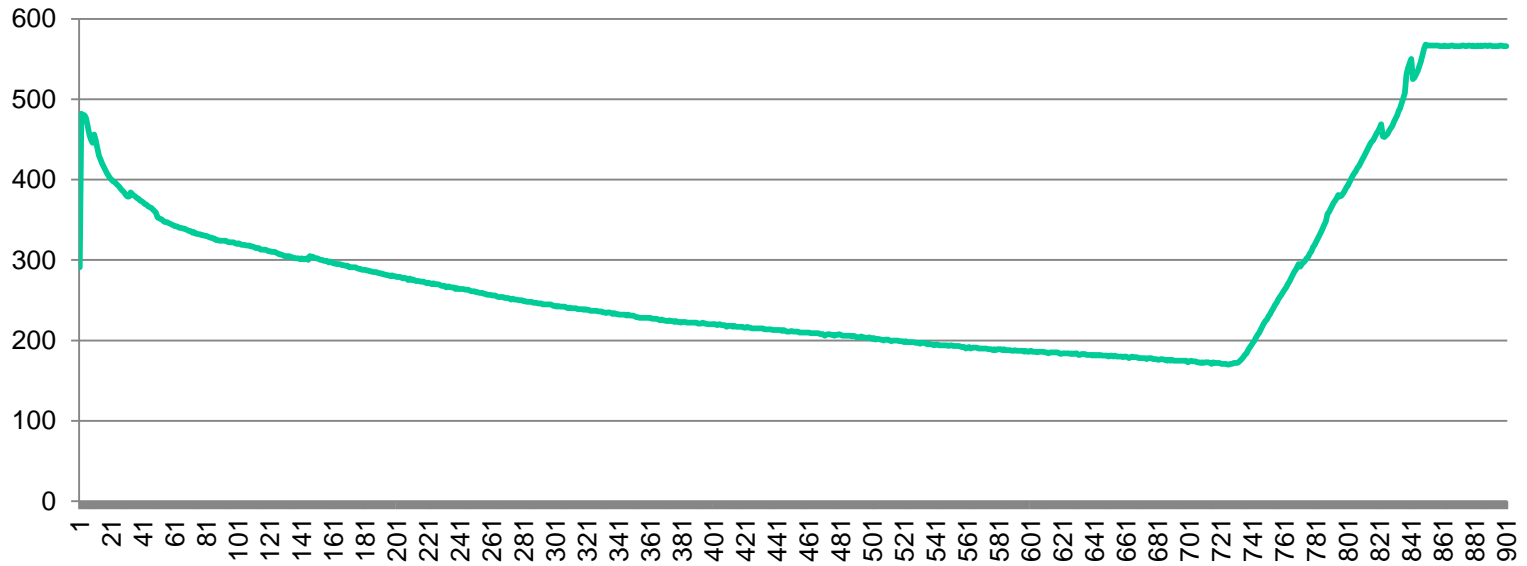
Battery

Transformer

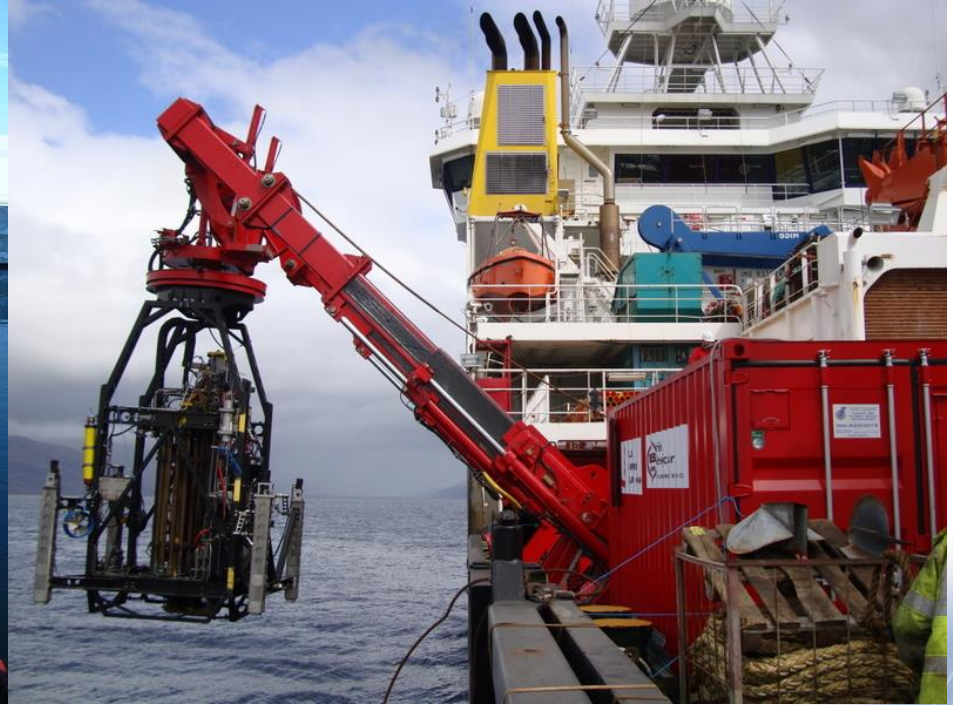
Batteries x2

Frame

Example of vibrocorer penetration graphs downloaded from the automated system.



High-latitude Operations



- Flexible options to operate on vessels able to work in ice prone areas.
- Battery system can be used on vessels with limited deck space.

Summary

- The BGS have a number of remotely operated vibrocorers and rockdrills available to the scientific community.
- The recently developed RD2 system:
 - Core up to 55m below sea floor.
 - Up to 4000m water depth.
 - Gas flow meter technology specifically developed for gas hydrate research.
- Autonomous, battery-operated vibrocoring system:
 - Compatible with 3m and 6m systems.
 - Up to 6000m water depth.
 - No extra power and lift umbilical so can fit onto vessels with limited vessel space.

Thank you

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