



Chelsea Technologies Group

Commercialisation of the FerryBox Concept;
Finding new markets

Justin Dunning

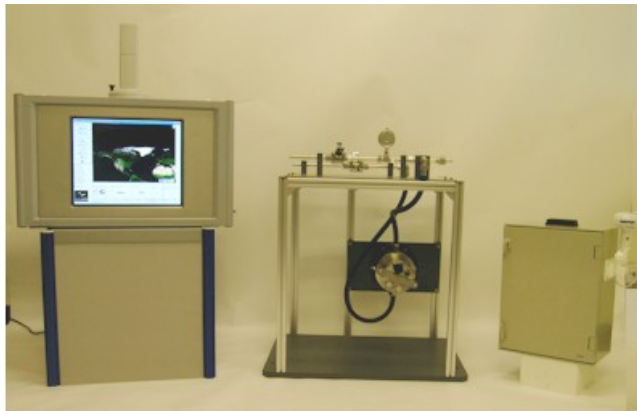
Sales Manager

4th FerryBox Workshop 2011 Helmholtz-Zentrum Geesthacht

Commercialisation of FerryBox

Introduction

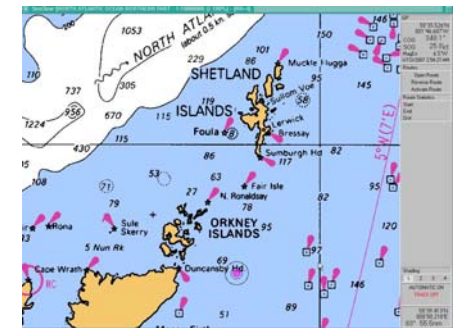
- Review of previous CTG FerryBox systems
- Environmental monitoring from Military Surface Ships
- Flow-through Plankton Sampler
- Ship exhaust gas scrubbing – sensor requirements
- WAVESENTRY
- Aqualine II FerryBox



Commercialisation of FerryBox

The CTG AquaLine FerryBox System

- AquaLine FerryBox
 - Sensor Package
 - MiniPack providing CTD-F + other sensors on request
 - Interface Unit with Passenger Display
 - GPS / GPRS unit
- Key Features
 - Robust autonomous Linux based software
 - Display switches between map of vessel position & data
 - Ship to shore data transmission when entering port



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Environmental monitoring from Military Surface Ships

- Background
 - Sonar 2081
 - CTG providing two outboard sensor packs - UK submarine fleet-fit
 - Sonar 2115
 - Incorporates both Sonar 2081 plus Deck End Equipment & Software
 - Fitted to Astute class submarines
- Requirement for surface ship based system
 - Enhance the MOD oceanographic data collection & knowledge
 - Produce oceanographic data suitable for scientific analysis by NOCS
 - Enable increased understanding of S2081 and S2115 data sets
 - Capability to host additional sensors
 - To improve the recognised environmental picture



Commercialisation of FerryBox

Environmental monitoring from Military Surface Ships

- Project Details
 - Commenced October 2010, completed March 2011
 - Single Manifold design with de-aerator and fluting
 - Fitted to Polar Bjorn – now called HMS PROTECTOR
 - Sails to Antarctic Autumn 2011
 - Data to be made available for analysis by NOCS
 - Additional sensors and further installations to be considered

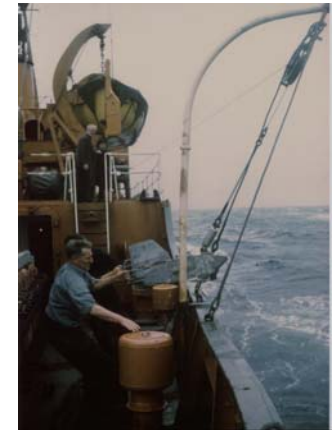


Commercialisation of FerryBox

Flow through Plankton Sampler for IMARES The Netherlands

- Project Details

- Project Contacts Dr Hauke Flores & Bram Couperus (Project Leader)
- To modify the CTG *in-situ* Plankton Sampler to a flow through device
- To provide a system suitable for operation on a Ferry
- Allow the Plankton Sampler Unit to be easily removed to fit gauze rolls
- Originally fitted to MS Vlieland operating between Harlingen & Vlieland
- System comprised of:
 - Plankton sampler
 - Watertight housing
 - Flow meter
 - Valves and Pressure Gauge



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Flow through Plankton Sampler for IMARES The Netherlands

- Application
 - the APS was installed on the VLIELAND in 2009
 - the system ran technically without problems, but the sampling efficiency appeared low
 - in 2010, IMARES stopped sampling on the ferry and developed a mobile system for research vessels to investigate ways to improve the sampling efficiency, mainly funnel systems on the mouth opening
 - Trials have shown figures of zooplankton density that are in the order of magnitude expected in the Wadden Sea



Commercialisation of FerryBox



De MS VLIELAND



Route through Wadden Sea

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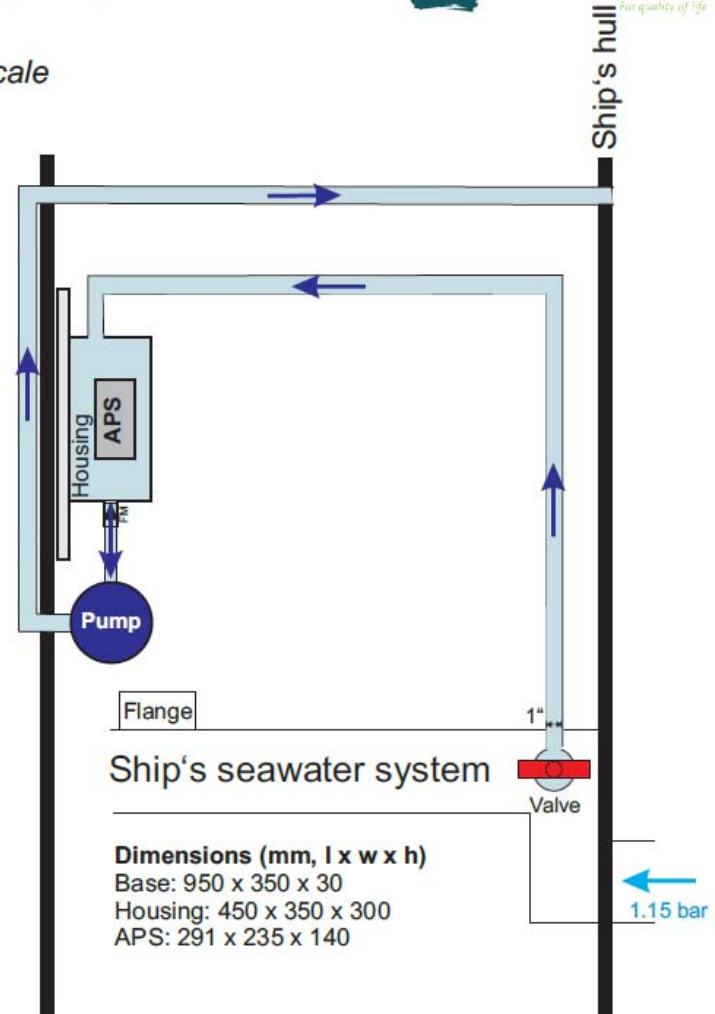
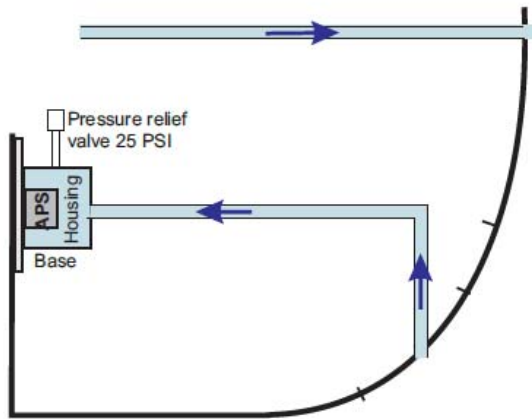


REDERIJ DOEKSEN

Concept drawing APS system on MS VLIELAND



Not drawn at exact scale



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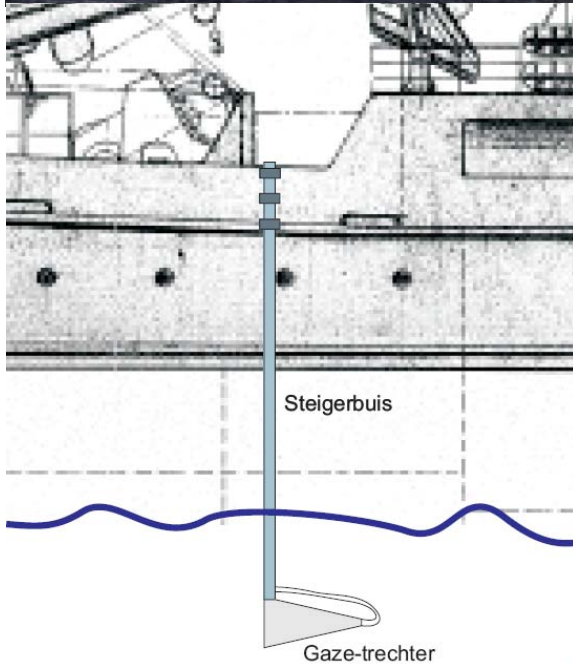
R.V. *Tridens*

North Sea, Nov.
2010

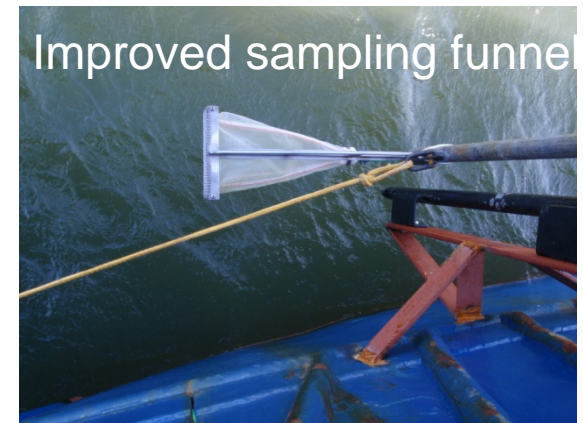


F.V. *Jacoriwi*,

Wadden Sea, May 2011



Sampling at up to
13 knots shipspeed

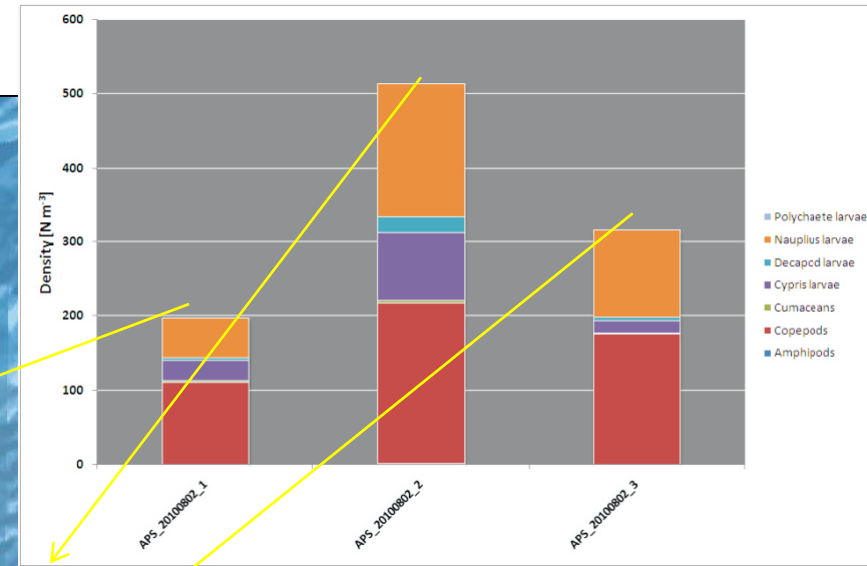
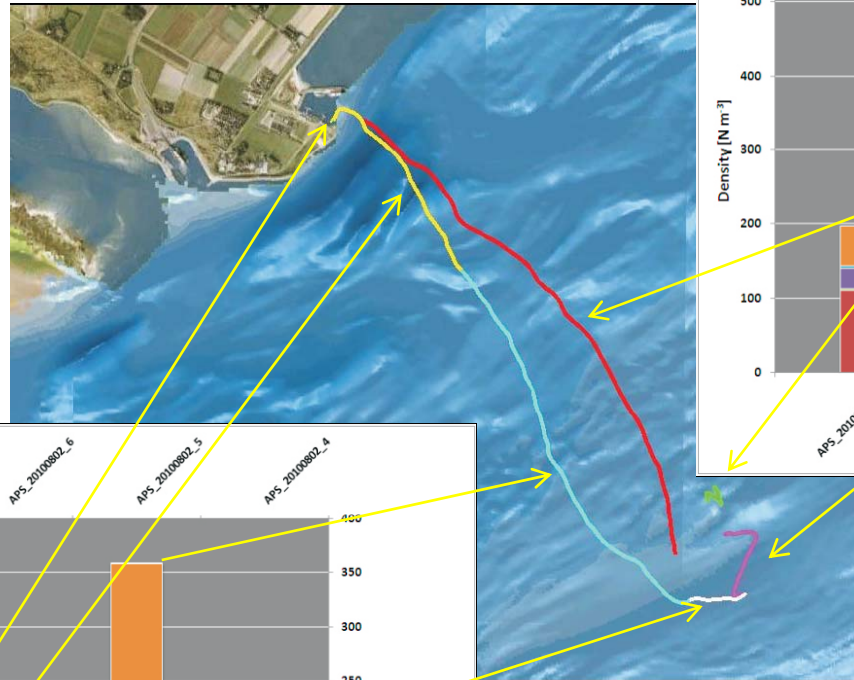


Improved sampling funnel

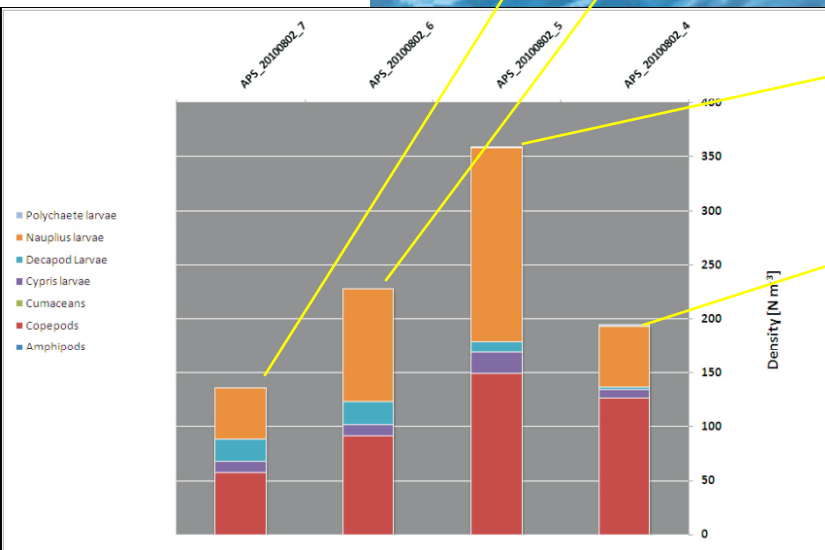
Improving sampling efficiency

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Improving sampling efficiency



Zooplankton density
(ind. m⁻³)



Wadden Sea transect (Texel)



Hamworthy Krystallon Exhaust Gas Cleaning

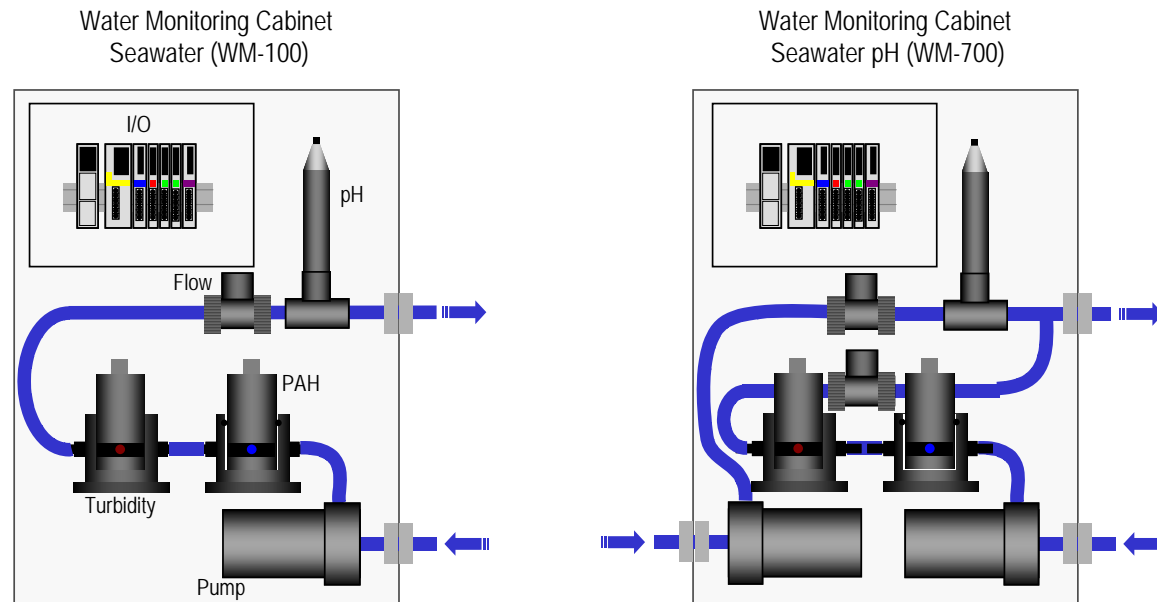
- Drivers
 - IMO regulations on emissions, operators required to use cleaner fuels and / or abatement technology
 - Lower operating costs if switching fuels can be avoided – adopt scrubbing systems
- Technology
 - Seawater scrubber can remove 99% of SO_x and 85% of particulates
 - Wash Water treatment system removes both particulate and hydrocarbon waste products.
 - Monitoring of Gases NO_x, SO_x and CO₂
 - Wash Water discharge is monitored for hydrocarbons, turbidity and pH



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Hamworthy Krystallon Exhaust Gas Cleaning

- CTG Sensors - UViLux Hydrocarbon fluorimeter & CTG Turbidity (ISO 7027:1999)
- Third party sensors – Hach pH and Bürkert flow sensor



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Hamworthy Krystallon Exhaust Gas Cleaning



Commercialisation of FerryBox

WAVESENTRY



WaveSentry

- UK Technology Strategy Board co-funded 18 month programme
- Information and forecasting tool for managing the risks of marine operations in adverse sea states
- Integration of diverse data sources from ship-borne sensors to novel satellite remote measurements
- Addresses the current inadequacies with regard to temporal and spatial resolution from atmospheric / ocean models
- Project Partners include:
 - HR Wallingford (Lead Partner)
 - EMU Ltd
 - Surrey Satellite Technology Ltd
 - National Oceanographic Centre, Southampton
 - Chelsea Technologies Group Ltd
 - Marine South East Ltd (Project Manager)



Commercialisation of FerryBox

WAVESENTRY Work Programme

- Pilot Specification
- Data Harvesting and Harmonisation
- Satellite Data Harvesting, Processing and Validation
- Commercialisation Plan
- Pilot Application and Evaluation



Commercialisation of FerryBox

CTG Activities

- Adaptation of existing AquaLine FerryBox system
- Provision of motion sensors to log ship motion and position (from GPS)
- Use of MEMS 3-axis gyro & 3-axis accelerometer
- Roll, Pitch, Yaw, Surge, Sway, Heave, Velocity recorded
- Data to be post-processed to infer sea state along the voyage



WaveSentry

CTG Project Input

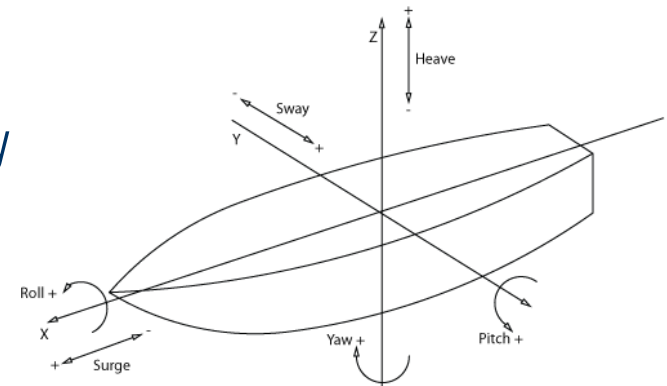
a platform for value-added data processing 'on board', with the specialist software coming from a collaborating company

CTG Aim

to offer as an additional dataset

for AquaLine FerryBox users

to engage host vessel organisations



Commercialisation of FerryBox

AquaLine II FerryBox

- Adopt recent developments within Hamworthy Krystallon project (reducing costs)
- Adopt, as standard, automatic cleaning routines for all systems
- Revert to single manifolds for each sensor to provide complete flexibility
- Provision of system pump
- Divorce passenger screen from interface unit for improved flexibility
- Offer as option data of ships motion through transect





Chelsea Technologies Group

www.chelsea.co.uk

4th FerryBox Workshop 2011 1st & 2nd September 2011 Helmholtz-Zentrum Geesthacht