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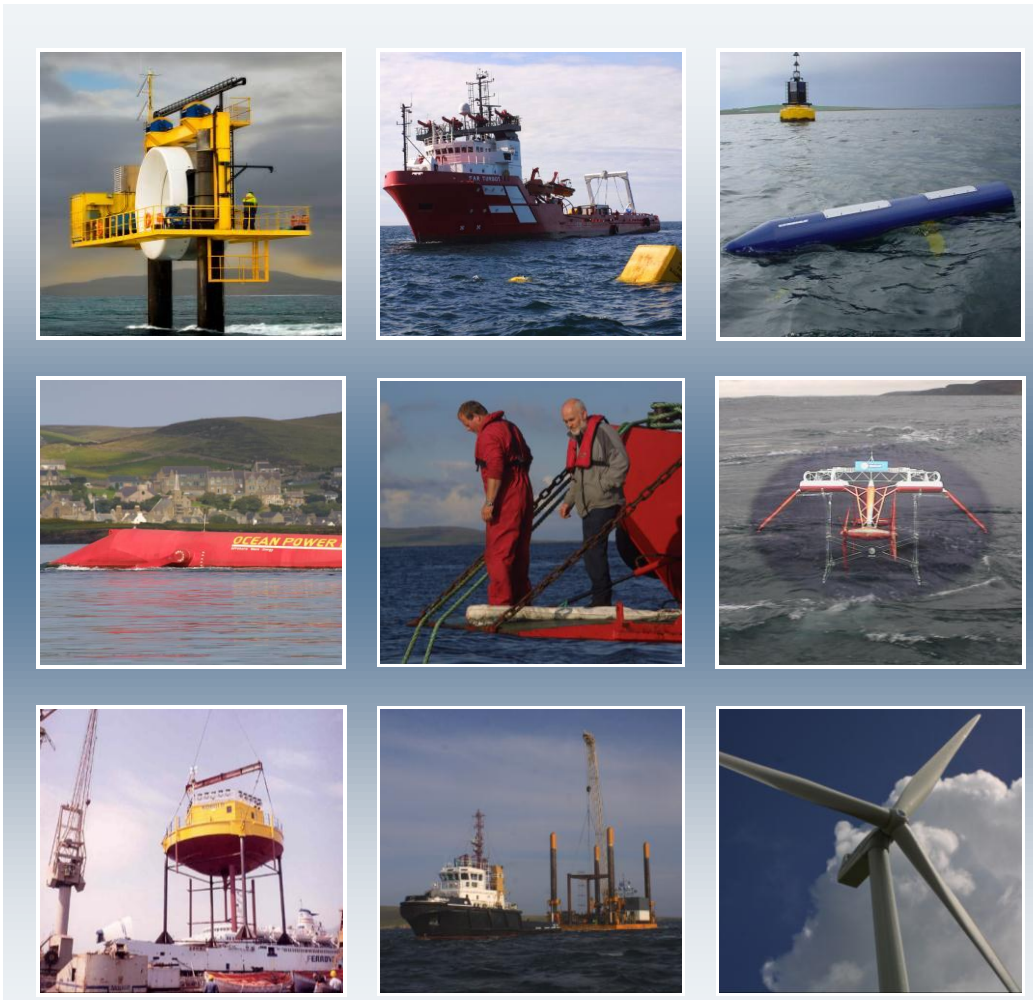
environmental services and products

Technical and Operational Support



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Introduction

Aquatera was established in 2000 to provide a modern and innovative suite of environmental services and products. The company delivers to local, UK and worldwide markets and has established a strong track record in the renewable energy and other energy sectors. This work includes preparation of strategic environmental assessment (SEA) and environmental impact assessment (EIA) documents for renewable energy projects and strategies, as well as resource assessment studies, risk assessments, design advice, operations support, environmental surveying, developing visualisation tools and producing information and awareness materials. Aquatera also organised the highly successful Renewable Realities conferences and exhibitions in 2002 and 2003.

In addition to experience in renewable energy, Aquatera and its associates have a vast knowledge of wider environmental and social studies, particularly in offshore and coastal areas. The team has completed numerous research projects, including a number funded by the UK Department of Trade and Industry (DTI) and other government bodies, and are expert practitioners in their various fields. Aquatera's support IT, multimedia and graphic design specialists are also leaders in their respective fields.

The ability for Aquatera to organise and deliver has been recognised by its clients and the wider business community, notably via the 2001 BP Helios Awards and the 2002 Highlands and Islands Enterprise Business of the Year Awards. Aquatera received a Highlands and Islands Small Business of the Year Commendation in 2003, and a Scottish Planning Awards Commendation in 2007 for its part in developing The Highland Council's renewable energy strategy. Also, in 2008, Aquatera was invited to participate in an Entrepreneurship and Innovation Scholarship at the Massachusetts Institute of Technology (MIT) Sloan Business School.

Aquatera has a passion for renewable energy development, believing that it can provide substantial amounts of quality energy, which can be used to offset energy produced from carbon-emitting technologies.

Furthermore, renewable energy schemes provide a means for redistributing wealth and enterprise to many peripheral and remote areas. Finally, by being based in Stromness in Orkney, Aquatera is at the heart of the 'renewable energy revolution'. The company is exposed on a daily basis to the processes that create renewable energy, and its employees and associates have a wide experience of living and working in such environments. Aquatera, therefore, has a strong practical understanding and knowledge of renewable energy that can be used to its clients' advantage.

Aquatera's core focus is upon the environment, in its broadest sense. Whether considering plankton or people, habitats or homes, birds or businesses, the company will ensure that any policy, plan or project meets the highest standards of stewardship and stakeholder expectations, whilst also working for the overall success of the particular scheme. Aquatera specialises in the management of interactions with, and impacts on, the environment.

The success of Aquatera's approach can be seen from the number of projects it has carried out for a wide array of clients, and the loyalty these clients have shown to the company.

This brochure summarises as case studies a selection of key technical and operational support that Aquatera has provided to its clients.

Technical and Operational Support

Operational Support for Pelamis Deployment in Orkney

Pelamis Wave Power, 2003/6

Pelamis undergoing sea trials in the North Sea

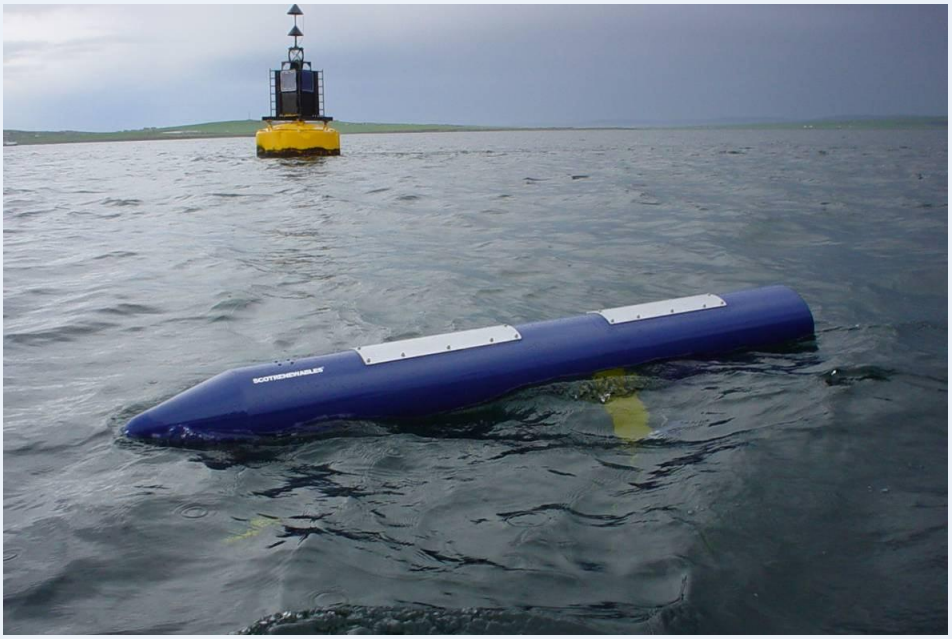
Pelamis awaiting deployment in Orkney

In 2003, Pelamis Wave Power (PWP; formerly Ocean Power Delivery) selected the European Marine Energy Centre (EMEC), Orkney, as the location for trialling its prototype Pelamis Wave Energy Converter device.

Since then, the company has been keen to develop strong links with local companies to provide support for its business. Aquatera teamed up with Scotrenewables, a Stromness-based company with a long-standing collaborative relationship with PWP. Together, Aquatera and Scotrenewables have provided a variety of logistical, light engineering, marine operations, PR and local communications support to PWP during its time in Orkney.

Environmental Support During Design and Testing Activities

Scotrenewables, 2002 – 2007



View of a 1/20th scale prototype tidal generator device

When Scotrenewables was starting up in Stromness, Aquatera was able to offer a wide range of support, including back-up office facilities, assistance with grant applications and discussions about concept development.

As Scotrenewables grew as a company, Aquatera was engaged on a more formal basis to undertake a number of tasks, including the completion of an environmental scoping information report required as part of its application to deploy a device at the European Marine Energy Centre (EMEC) tidal energy test site at the Fall of Warness, Orkney.

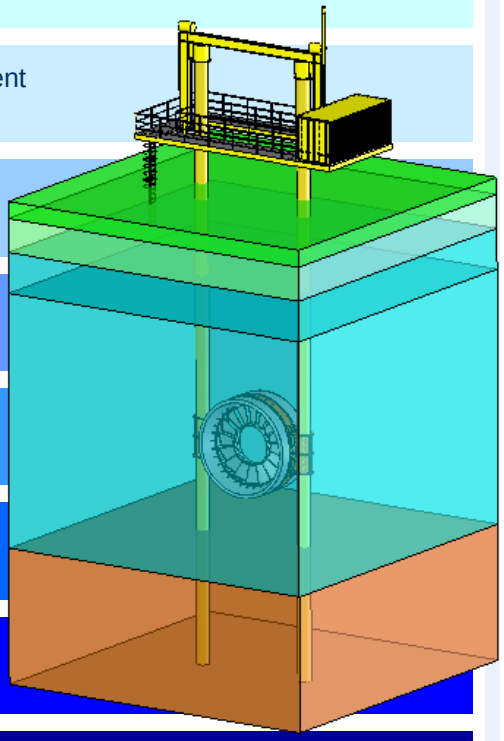
Aquatera has also helped to prepare of a number of public awareness and display materials for a number of the company's projects.

As both Aquatera and Scotrenewables are based in Stromness, the companies have been able to collaborate on providing operational support services to companies such as Pelamis Wave Power (previously Ocean Power Delivery) who have been operating at EMEC.

Tidal Device Operational Risk Assessment

OpenHydro Group Ltd, 2006

Task 1	Establishment of background, principles and scope of a project.
Task 2	Definition of work activities and work environment across relevant phases of a project.
Task 3	Expert panel HAZard IDentification (HAZID) of all potential activities
Task 4	Assigning responsibility or risk management
Task 5	Risk assessment through classification of likelihood and consequence
Task 6	Identification of potential risk avoidance, mitigation, management opportunities
Task 7	Description of residual risks, roles and responsibilities in their management
Task 8	Production of Safe Work Method Statements and emergency response plans for all activities.
Task 9	Maintaining and updating the risk register



Generic Aquatera template for effective risk assessment and implementation of safe practice

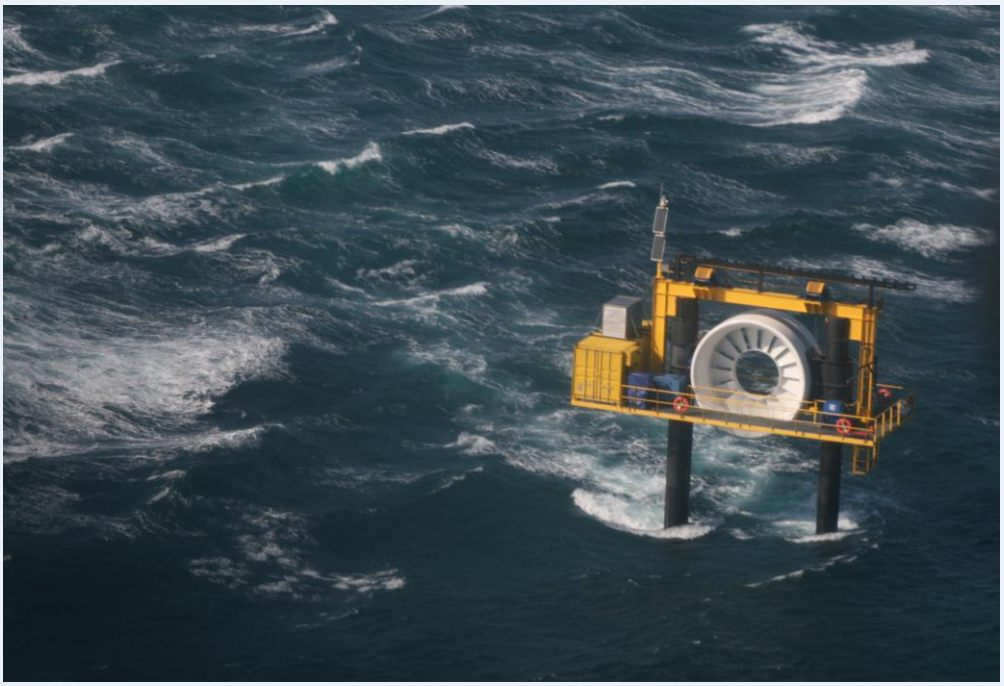
OpenHydro is developing an Open-Centre Turbine to harness marine tidal energy. The device is being tested at the European Marine Energy Centre (EMEC) tidal energy test site at the Fall of Warness, Orkney.

In preparation for the deployment of the device, Aquatera established an appropriate risk assessment procedure and inherent risk identification process.

This work was undertaken as part of ongoing support being provided to OpenHydro by Aquatera.

Installation and Operational Support for Marine Tidal Turbines

OpenHydro Group Ltd, 2006 – 2008



The Open-Centre Tidal Turbine at the EMEC tidal energy test site at the Fall of Warness, Eday, Orkney

During the preparations for deployment of OpenHydro's Open-Centre Tidal Turbine, Aquatera provided facilities and helped to co-ordinate services from subcontractors who subsequently provided excellent support to the project. This covered diverse areas, such as turbine delivery, fabrication facilities, aggregate supply, work sheds, waste reception, photographic services, and marine support including marine superintendence.

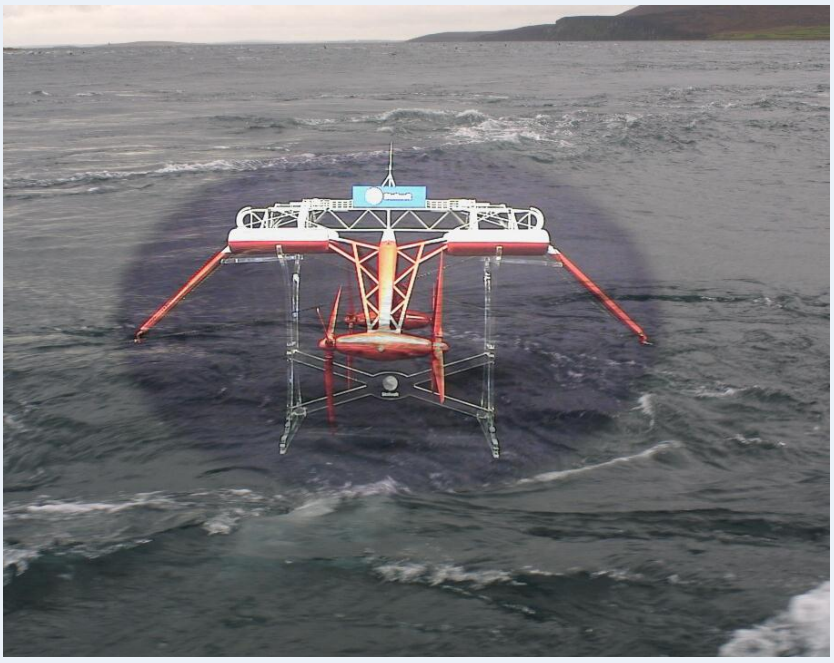
Following on from this process and throughout the operation itself, Aquatera worked closely with OpenHydro in the development of the necessary Safe Working Method Statements, project change control and related updates to the risk register. Aquatera also provided an Environmental Management Plan and an Emergency Response Plan for both marine- and shore-based operations.

These preparations were well tested during the initial installation work due to the toppling of the temporary works. An approach was, however, quickly developed to deal with this setback and soon afterwards the turbine was successfully installed.

Aquatera has played a hands-on role through most of the major stages of this deployment, with personnel sitting alongside the OpenHydro management team (in the office and at sea), and contributing to the ongoing decision making process. Both parties now recommend this approach due to the time and financial savings that can be made from early operational co-ordination and identification and management of key environmental and risk challenges during the project design phase of the project.

Advice on Tidal Device Deployment in Orkney

Statkraft AS, 2005



Technical model of potential tidal energy devices being explored by Stakraft AS overlain on tidal waters around Orkney

As technology developers reach the stage where they need sites to test their ideas and machines, there is value in getting input from specialists who understand the sea, the constraints that may affect successful deployment and who preferably have first-hand knowledge of the potential deployment areas.

Aquatera employs three marine biologists who have experience of many tidal narrows around the UK and further afield. This has been gained either as part of professional work or through a desire to visit interesting marine areas during holidays or whilst travelling.

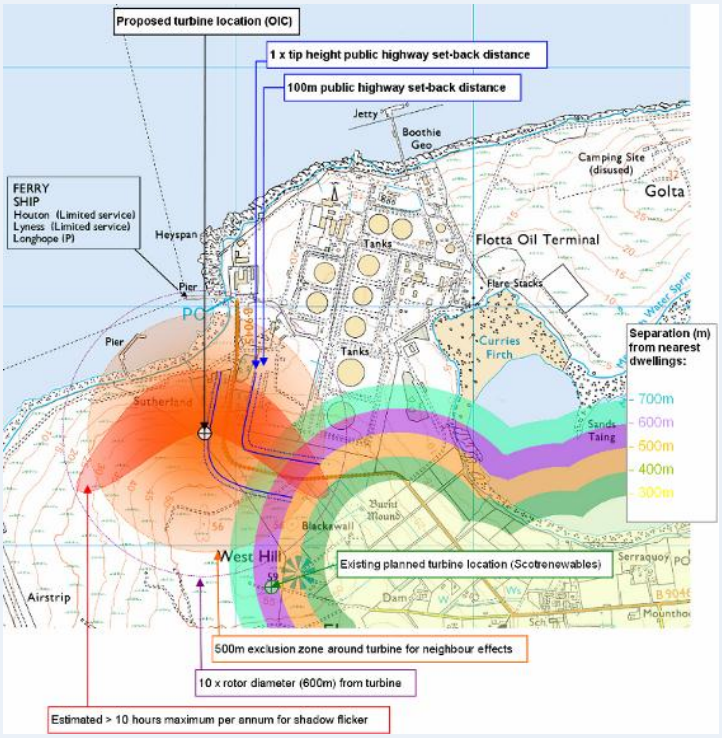
Nowhere is this first-hand experience stronger than Aquatera's own backyard of Orkney. Aquatera staff regularly travel across the various tidal streams by ferry and have also viewed them from the air, from under the sea and from kayak. With a network of lifelong seafarers to draw upon, the prevailing sea condition at any given place can often be gleaned by informal discussion.

Scientists and engineers may sometimes treat anecdotal knowledge with less respect, but if your life or the survival of a technology depends upon knowing about tidal streams and what they can do to you, the lesson is quickly learned that it is invaluable to benefit from practical experience.

Aquatera has participated in a number of sessions with Statkraft engineers, sharing with them knowledge about tidal streams around Orkney and across Scotland and the wider UK. This practical experience has also been used to perform a resource assessment study into the theoretical potential for tidal energy generation around the UK and Ireland.

Technical and Financial Viability Study for a Commercial-scale Wind Project on Flotta

Orkney Islands Council / Carbon Trust, 2007



Proposed turbine location and near-site interactions

This study was carried out for Orkney Islands Council by Aquatera in conjunction with a number of the company's specialist economic, financial and electrical engineering associates. It was part funded by the Carbon Trust, whose activities in Scotland are primarily funded by the Scottish Government.

The potential for establishing a commercial-scale wind project in association with the existing grid connection at the Flotta Oil Terminal, Orkney, was investigated. Study objectives included:

- Forecasting the potential export capacity within the existing grid connection
- Recommending possible development scenarios for timing and identified risks
- Scaling and positioning devices based on capacity and risk profiles
- Identifying connection and pricing options
- Providing a business model for the identified development options
- Recommending a suitable, tax efficient mechanism to progress local investment

Findings of this study indicated that the project would be technically and, in all likelihood, financially viable. The key obstacle was the availability of a grid connection. Another consideration not included in the scope of the study was the local community's attitude towards the project. Given this situation, Aquatera recommended that the results of the study would need to be discussed with Talisman Energy, as well as with the Flotta community, before a project strategy could be finalised.

Advice and Planning Support for Kobold II

Ponte De Archimede, 2004

Kobold device being lifted by crane for trial deployment in the Mediterranean.

Ponte De Archimede's Kobold tidal energy convertor was one of the first such devices to be deployed at sea. Following successful trials in the Straits of Messina, the device's developers wanted to investigate the potential for deploying the device in the "best tidal waters in the world" around Orkney.

Aquatera, along with a small group of local companies, provided advice and support for the early investigation into the potential of deploying the second generation Kobold II device in Orkney. Aquatera also advised on planning for the installation and operation of the device.

This preliminary work was used to prepare a proposal for funding, which to date has not been backed. It is, however, hoped that at some stage in the future the Kobold II device might be deployed for testing in the more sheltered tidal channels in Orkney.

Collaborating Companies

Subcontractor Collaborations

Aquatera has forged excellent working relationships with a number of local subcontractors which can enhance Aquatera's technical and operational support services. This is particularly relevant for developers wishing to deploy at the European Marine Energy Centre (EMEC). This subcontractors can provide support in areas such as device transportation and delivery, fabrication facilities, aggregate supply, construction, work sheds, photography, diving services, remotely operated vehicle (ROV) equipment and marine support (including marine superintendence).

Company	Brief Description
Currie Brothers Ltd	Currie Brothers offers a wide range of civil engineering, coastal engineering, haulage services and facilities. The company has recently been involved in the fabrication and installation of the OpenHydro's Open-Centre Tidal Turbine at EMEC tidal energy test site at the Fall of Warness, Orkney.
Delta Marine Ltd	Established in 1985, Delta Marine Ltd is a tug and workboat operator, chartering vessels to the dredging and marine civil engineering industries. Main areas of operation include: UK Coast, Scandinavia, Baltic States, Caspian Sea and the Mediterranean Sea. The vessels are all specially designed for coastal construction, anchor handling and towing contracts. They are powerful tugs, yet shallow drafted for inshore operations.
Orkney Towage Co Ltd	Orkney Towage is primarily engaged in providing the towage services for the oil port of Scapa Flow. It has also been involved with a number of the early deployments of renewable energy devices in Orkney. Each tug has an experienced and well trained crew of five: Master, Mate, Chief Engineer, Deckhand and Cook/Deckhand, all certified to STCW 1995.
Orkney Aggregates Ltd	Orkney Aggregates Ltd was formed in July 1999, following acquisition of assets from Orkney Builders Ltd who had been in the quarrying/concrete business since 1964. The principal activities of the company are quarrying, ready mix concrete, blocks, precast, haulage hire and plant/container/accommodation sales and hire. Its employees have invaluable experience of the company and its products, ensuring a high level of service throughout the company.

Company	Brief Description
SULA Diving	SULA Diving is located at the Old Academy in Stromness, next door to the EMEC offices. Its core activities focus around the provision of marine survey and hyperbaric related services. Its core staff team are all qualified divers and marine biologists who have extensive knowledge of the marine environment, having worked in Orkney for many years. The company largely specialises in projects requiring special scientific input.
Leask Marine	Leask Marine started operations in 1985 to meet the demands of a construction program for new piers around the Inner and Outer North Isles in Orkney, as well as Kirkwall Harbour, Stromness Harbour, Houton Terminal and Flotta. The company also undertakes much of the ongoing maintenance and upgrading work on these piers. The company's skills base includes: underwater burning and welding, shuttering, concreting, placement of pre-cast concrete units together with all the budget and man-management requirements prevalent in large construction projects. Leask Marine's previous contracts include scientific surveys, underwater inspection, construction to aquaculture and renewable energy projects.
Roving Eye Enterprises	Roving Eye has over ten years' experience as a provider of cost-effective ROV equipment and parallel small work boat services in a variety of industries. The company can conduct ROV surveys for pipelines, cables, jetties, piles, seabed and hulls. It can also co-ordinate a complete survey package, including multi-beam, bottom sub profiling, side scan sonar and acoustic Doppler current profile (ADCP).
Combustion, Energy and Steam Specialists Ltd	Combustion, Energy and Steam Specialists Ltd (CESS) was formed in 1990. Based in Stromness, Orkney, it has rapidly become one of the world's leading sourcing, valuation and marketing agents, and suppliers of surplus and advance-order power plant and related equipment. CESS also offers a turnkey service on surplus plant, which ranges from evaluation and marketing, through to sale, decommissioning/ dismantling, relocation/shipping, re-erection and commissioning.

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