

# HYDROGRAPHIC SURVEYS OVER THE WHOLE WORLD

## Gardline Hydro

Gardline has been undertaking hydrographic surveys in the north west of Europe and all over the world since 1974. Large-area nautical charting surveys to UKHO standards have been regularly undertaken since 1982 in UK waters. During this time techniques and equipment have been continually improved and upgraded to meet the changing demands of the hydrographic user community.

Gardline has significant experience with regional nautical charting surveys for the UK Government. The company has been particularly successful in fulfilling contracts in UK waters in 1982, 1983, 1984, 1985, 1988, 1990, 1994, 1996 - 2003, and the current 2004/05 contracts in the Western Approaches to English Channel and in Scotland on behalf of MCA. The company underwent restructuring on 1st May 2003 and three operating companies were established to serve geophysical, environmental and geotechnical markets within the offshore industry. The restructuring allows a more focused approach to offshore survey services and enables the Gardline Group to offer a bespoke service to existing and new clients requiring offshore and nearshore survey services.

- Gardline Geosurvey Limited: hydrographic and geophysical surveys and  
Gardline Hydro: a division of Gardline Geosurvey specialising in the provision of seabed mapping
- Gardline Geosciences: geotechnical surveys including CPT, vibrocoring and other sampling techniques
- Gardline Environmental: environmental, oceanographic and coastal marine surveys.

### Current Profile

Gardline Geosurvey is an established provider of marine geophysical and hydrographic survey services. Gardline Hydro, a division of Gardline Geosurvey, specialises in providing seabed-mapping services to support installation of undersea telecommunication and power cables from landfall to landfall. The company was established after Gardline recognised the need to invest in accurate hydrographic surveys, improved navigation systems and means of preventing collisions, grounding and other shipping incidents to meet IMO SOLAS Chapter 5 requirements. Today Gardline Hydro undertakes surveys for nautical charting, submarine cable routing, pre-dredging and UNCLOS surveys for EEZ delimitation. In addition it provides a range of ancillary support services for hydrographic surveys through industry partnerships, not to mention solid experience and expertise in the design of routing measures, nav aids and nautical chart compilation for manuals, tide tables and notices to mariners.

In order to fulfil the requirements of UNCLOS 76/EEZ surveys, Gardline has invested in state-of-the-art deep-water swathe bathymetry equipment including KS EM120 and EM12 multibeam systems, which have both been utilised to undertake deep-water mapping programmes in the Norwegian Sea and other areas. The Gardline response to changing client requirements, such as the push to deeper water operations, has led to a greater focus on the development of sophisticated tools and techniques. This process of evolution is being maintained to meet continued challenges and is seen as fundamental to the future growth of the company.

### Survey Fleet

Seven ocean-going survey vessels are owned and operated on a worldwide basis. In general, these vessels are mobilised with both analogue and high-resolution digital seismic packages. Vessels of opportunity are also chartered, particularly for specialised work programmes such as geotechnical studies and inshore surveys, with oceanographic and environmental surveys being performed either independently or integrated with other data acquisition programmes through Gardline associated companies Gardline Geosciences and Gardline Environmental.

Using its fleet of dedicated survey vessels Gardline Hydro undertakes annual government-sponsored surveys to update British Admiralty charts. These government-sponsored surveys are generally multi-vessel programmes requiring specialist hydrographers and equipment to produce surveys and ancillary data to rigorous IHO S-44 standards. Requirements include bathymetry, side-scan sonar, magnetometry, wreck investigations, tidal and current observations, inspections of nav aids and photographic views.

### Large Projects

Gardline has surveyed a total area in excess of 35,000km<sup>2</sup> to UKHO standards. The scope of most surveys includes bathymetry, side-scan sonar, magnetometer, grab sampling, wreck investigations, tide and current observations and inspection of navigational marks. Surveys are rendered as fair sheets, associated digital products and a comprehensive Report of Survey. Details of the most recent projects are appended to this section.

The diagram illustrates the extent of the charting surveys performed by Gardline Hydro on behalf of the United Kingdom Government (currently administered by the Maritime and Coastguard Agency) to IHO S-44 Order 1 standards.

In addition to the surveys for the UK Government, Gardline Hydro has also performed hydrographic surveys for the purposes of implementing new Traffic Separation Schemes in the Southern Red Sea and Arabian Gulf.

In the Southern Red Sea an area through Bab el Mandeb and extending 100 nautical miles north was surveyed in 2001 to IHO Order 1

standard using SBES and side-scan sonar. The proposed scheme has been submitted to the International Maritime Organisation (IMO) for ratification. It should also be noted that the UKHO have based a new set of charts on the data obtained from this survey, which were subject to rigorous appraisal. The accompanying images illustrate the extent of this project.

In the Arabian Gulf an area for the approach to a major oil terminal was surveyed in 2001 to IHO Special Order standard using a high-resolution MBES system. In addition to bathymetric data, backscatter data was used to produce a sonar mosaic from which seabed interpretation was undertaken.

The proposed scheme has since been submitted to the International Maritime Organisation (IMO) for ratification and was approved in July 2004.

#### Safety Policy

Gardline employs over 250 permanent staff from a wide variety of backgrounds and specialisation. This multidisciplinary approach has ensured fully integrated capabilities using in-house personnel and resources and made possible the selection of an experienced project team to match the precise requirements of each project.

Continuous in-house training is carried out, the progress of which is monitored by means of performance reports for field operatives and an annual appraisals for all personnel.

To ensure familiarity with prevailing operational, quality and safety procedures, a policy has been developed whereby survey and marine crews are deployed consisting predominantly of permanent employees. This has the advantage of increased safety and efficiency, while at the same time the survey and marine crew is able to operate as an effective integrated unit.

Gardline is committed to providing safe and healthy working conditions for all employees. The company also aims to maintain a safe and pollution-free operating practice that complies with national and international regulations, standards and guidelines. The company operates a Safety Management System that is fully compliant with the International Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM Code). This system is certified for Lloyd's Register for Compliance with the ISM Code of practice and is subject to continuous external assessment.

The continuing success of the company's Health and Safety, and the Environment policy, and Safety Management System depends on the support and co-operation of all personnel. In order to safeguard human, physical and environmental resources, all employees are expected to comply with safety and Pollution Prevention Procedures at all times.

Level 1 -Company Safety Management

Level 2 -Shipboard Safety Management Manual

Level 3 -SMS System Manuals

#### Future Developments

Gardline developed a Quality Assurance System that was certified to BS 5750 in 1994 and since then the system has evolved steadily with strong emphasis on top-level commitment, customer satisfaction and continuing improvement. There is particular emphasis upon project and vessel auditing in recognition of the importance of effective processes rather than rigid compliance based upon procedure, as reflected in the Quality Management System ISO 9001:2000.

Other important developments have included the introduction of Quality Improvement Teams, increased use of computerisation based on CD-ROM and hyperlink technology, and incorporation of an office-based Health and Safety System for a more integrated management system.

Gardline Hydro is currently undertaking its second two-year Civil Hydrographic Programme (CHP) contract offshore Scotland, funded by the UK government agency responsible for maritime safety, the Maritime and Coastguard Agency (MCA). This award follows the news earlier this year that Gardline Hydro had embarked upon its first two-year (CHP) to survey the Western Approaches to the English Channel and a two-year vessel charter in partnership with Survey 2000 Limited.

The acquisition by the Gardline parent company of Lankelma CPT Ltd in December 2003 and SEtech in May 2004 fit perfectly with future strategies for Gardline Hydro. Both ventures are proving to be successful and this can only help strengthen the company's ability to provide integrated services to clients at home and overseas.