

## INTERVIEW WITH STEVE BERGLUND, PRESIDENT AND CEO, TRIMBLE

# What is the Manufacturer's view?

In the previous series of interviews, Hydro international has paid much attention to conferences, standards of competence, survey companies, etc. Aiming at the total field of hydrography we also wish to pay attention to the section of developers and manufacturers of equipment. Steve Berglund, CEO of Trimble, an internationally known manufacturer of hydrographic equipment and thus a representative example, agreed to be interviewed and disclose some insight information from that part of the hydrographic scene.

Please give our readers a summary of your education, career development and your involvement in hydrography (if any)

Steven W. Berglund joined Trimble as President and Chief Executive Officer in March 1999. With more than 24 years of industry experience, Berglund has a diverse background in engineering, manufacturing, finance and global operations. Steven Berglund began his career as a process engineer at Eastman Kodak in Rochester, New York. He attended the University of Oslo and the University of Minnesota where he received a B.S. in chemical engineering in 1974, later gaining his M.B.A. from the University of Rochester in New York in 1977. Prior to joining Trimble Mr Berglund was President of Spectra Precision, Inc., a pioneer in the development of laser systems. He spent fourteen years at Spectra Precision in a variety of positions, including four years based in Europe. During his tenure as President he initiated the merger of five companies to form the Spectra Precision Group, of which he remained President. With global sales of approximately US\$ 230 million, Spectra Precision develops and manufactures surveying instruments, laser-based construction alignment instruments and machine control systems and software. In the early 1980s, Mr Berglund spent a number of years at Varian Associates in Palo Alto, where he held a variety of planning and manufacturing roles. Varian is a technology company specialising in microwave communications, semiconductor manufacturing equipment, analytical instruments and medical diagnostic equipment.

Can you give our readers a brief description of the Trimble organisation, outlining which segment of hydrography the company is interested in and how this stands in relation to the total?

Trimble's key business segments are Engineering and Construction (construction – land and marine, survey, infrastructure) Field Solutions (agriculture and GIS), Component Technologies (OEM components), and Mobile Solutions (vehicle and asset management). We employ more than two thousand people in over twenty countries. Hydrography is part of the Engineering and Construction segment. The Marine Construction products consist of GPS receivers and radio link systems, as well as our software (HYDROpro) products. In addition, Trimble also has two wholly owned subsidiaries, Applanix and MENSİ, which also serve the hydro market. Applanix provides inertial solutions and MENSİ addresses 3D laser scanning. When measuring or managing crucial resources in a marine environment, reliability and accuracy are extremely important. You must be able to accurately record the resources in and under the sea and how they are changing. Trimble produces positioning systems for this harsh environment. Hydrographic surveying is carried out in port and inland waterways, as well as offshore when related to petroleum exploration or pipe and cable route surveys. Pre-surveys are carried out to map the site, then the construction tasks are carried out and afterwards ongoing maintenance surveys are completed – all require the positioning systems to be reliable and accurate. Trimble technology improves the process and ensures accuracy, helping preserve vital resources.

With rapid technological developments in mind, what is generally the estimated Product Life-Cycle (PLC) for survey products? Is there much difference in this respect between various products, e.g. 'total stations' and satellite positioning systems? With technology advancing, our customers typically replace products every five years, even though we design them for a much longer lifetime. For example, our model 4000 GPS receiver is still being used today, although it was introduced more than ten years ago. While the form factor of GPS is starting to plateau (weight, power consumption and size), the signal structure is being modernised and users are expected to move to new products as the new benefits become available. The same argument applies to terrestrial survey equipment such as Total Stations - built to last and incorporate new technologies, such as robotic and reflectorless features.

Further to the previous question, in terms of research and development, is Trimble's emphasis on improving existing products or do you also intend to enter new disciplines like laser applications or underwater positioning?

Trimble's emphasis is on improving our existent products and entering new markets, both through R&D investments as well as acquisitions.

In 2003, we also made significant investments in purchasing companies complementary to our business but with different positioning technologies. For example, Applanix, with expertise in inertial technology, gave us entry to a sector of the hydrographic market in which we had not previously been heavily involved - precise attitude for multibeam vessels, and also underwater positioning for ROVs. In addition, MENS provides Trimble with terrestrial laser scanning capabilities, which have been used in 3-D surveying 'as-built' offshore production plants. These technologies will be integrated into our standard products in the years to come so that we can produce premium positioning products for surveying and construction.

Is Trimble participating (and, if so, to what extent) in new GNSS developments either in the US and/or Europe?

Trimble was the first manufacturer to release a GPS survey product that will take advantage of the new GPS Modernisation signals. The Trimble R7, Trimble R8, and Trimble NetRS receivers are capable of utilising the L2 civilian signal (L2C). We also ensure our products accept the SBAS signals such as WAAS and EGNOS. We will have Galileo receivers available to the market well before the satellite constellation becomes operational.

Can you, as a manufacturer, forecast what kind of developments can be expected in positioning (not only GNSS) in future and (if any) what the impact will be on our profession?

The L2C GPS frequency will further the use of dual-frequency receivers as the signals are easier to acquire, track and decode. For example, the standalone code solution is expected to be more accurate for offshore users. Also, the centimetre-level RTK solution will be available in areas that are potentially difficult for RTK today. The third civilian frequency (L5) is expected to allow RTK to be more robust - longer ranges and faster initialisations. The commercial suppliers of satellite corrections are already quoting decimetre-level in 3D over many of the oceans. We also expect that there will be further technology integration for advanced positioning. For example, tightly coupled solutions based on inertial and GPS will be more readily available for orientation, position, and attitude with high update rates.

As a manufacturer, do you harbour wishes for more fundamental university research into positioning techniques and, if so, in what subjects? Do you feel that the expertise of manufacturers is sufficiently used in new developments like GPS and Galileo?

We recognise that much of today's advanced positioning technology has grown out of early academic research efforts; a number of our most talented engineers have come from academic backgrounds. With this in mind, we consider ongoing fundamental research to be vital for the continued advancement of the profession. As for manufacturer involvement in GPS and Galileo developments, extensive and open industry consultation has been conducted as part of the GPS Modernisation Program.

Land-surveyors face a gradual replacement of manual work by automated equipment. What do you expect for the offshore/hydrographic surveyor?

In some ways hydrography has already experienced the paradigm shift in automation and two products did that: GPS and "off-the-shelf" Windows PC hydrographic software. Trimble lead the way in producing GPS for the offshore survey market seventeen years ago and hydrographic surveyors were early adopters of the technology. In addition, the software we have been producing for fifteen years easily integrates the variety of sensors automating the data acquisition process. Looking to the future, we believe that systems will be more accurate, operate faster and operate anywhere in the world.

In spite of the current economic slow-down, analysts still foresee growth in offshore oil and gas activity. Has Trimble reason based upon its share in such activities, to confirm such a statement?

Today, the offshore positioning market is much different than the late 80s and early 90s. Positioning service providers have consolidated, new technologies have been introduced and the challenges for offshore field development are even greater. To meet these challenges the offshore oil and gas industry is investing in higher-accuracy positioning technologies to perform a number of tasks, from seismic surveys to oil and gas production. This translates into incremental growth for Trimble in this sector. DGPS infrastructure such as radio navigation beacons and L-band code corrections are now in place; however, there is a growing demand for decimetre-level accuracy offshore, especially for the vertical component. With this in mind, the provision of more accurate and wider-area positioning solutions via commercial satellite-based systems is an area of growth for the industry. Trimble offers GPS receivers that take advantage of the variety of the corrections sources available.

Is it difficult to find highly qualified personnel for your company and do you have to rely on in-house training and education?

As a global company we are fortunate in being able to attract some of the best talent from around the world and we are usually able to find even the most specialised skill-sets needed. Although we do not solely rely on in-house training and education, we do choose to make a substantial investment in the continuous educational development of our employees through both internal and external training facilities.

What is the majority background of your personnel? Do you mainly employ electronic engineers or hydrographic/land survey personnel? How do you integrate field experience in your developments?

We employ staff with a good mix of academic qualifications and field experience. The hydrographic business is a demanding niche business. Most of the staff in the Marine Construction business and support areas have land or hydrographic tertiary qualifications, plus periods of offshore experience. One staff member is IHO CAT A qualified. It is important to note that no two installations are the same in the hydro business - what is of importance to one client maybe of limited value to another. Therefore staff must understand the principles as well as the task they are helping to solve. Our team interprets user requirements and passes customer feedback into the planning process so products are built to include many special marine requirements. Our clients similarly demand products with multi-use capabilities for applications such as hydro, land, and construction uses. The Marine Construction business area does not employ electronic engineers. Our hardware is built by teams of Trimble engineers outside the business areas.

Is there any message you would like to convey to our readers?

We would like to take this opportunity to thank all of our customers in the hydrographic surveying profession for their business and to assure them of our ongoing commitment to the development of innovative and productive technologies.

