Google your soil data

Vryhof’s world perspective changed

Throughout the years Vryhof has been involved in many projects and as such has been able to collect a vast amount of soil data, mostly in the form of paper files which traditionally were being kept in a large steel filing cabinet, jokingly called the “soil database”. On occasion, this database was consulted in order to assist clients with their preliminary studies for new projects and territories.

In order to optimize the utilisation of this valuable information, all paper files were recently digitised and implemented in Vryhof’s extensive digital knowledge database. Google Maps was then selected as the presentation interface of choice due to its extreme user friendliness. Implementation has just been finalised and now, detailed soil information of well over 500 locations throughout the world described by over 2500 documents is available to the Vryhof engineering team, all in support to clients projects. Technical Director Roderick Ruinen led the project team and explains how the database is used by the engineering department; “primary use of the database is to offer our clients information that they do not have or are unable to obtain from existing resources. This way, the mooring system can be engineered in much more detail than without this data giving our clients a competitive edge in their bidding process. Secondary, in cases where our clients have limited or very local data we are able to benchmark their data with our database and are such able to either support clients ideas or fine tune their initial mooring system design. In addition, the database is used as a filing system for the extensive test data collected by Vryhof over more than 35 years and serves in the execution of new R&D projects.”

Continued on next page.
A colourful world
With the winning Google map layout, the home page of the database shows the world map with the well-known balloon-shaped icons in different colours indicating whether there is test data available, detailed soil data or other.

The zoom function provides better detail of the actual location defined by the factual geographical coordinates. With a simple click on the specific location, the underlying document menu is accessed and all available documents are listed in their respective categories. Dense areas such as the Gulf of Mexico and the North Sea are covered by many reports, some of the same location with complementing data.

A Googled project
On one occasion, test data generated by Vryhof during the introduction phase of the Stevmanta anchor actually served as basis for the design of the anchor point years later, with an additional dose of conservatism of course as age of the data and distance between the test and the new anchor point can be critical in the design process.

Says Roderick; "even though our means of giving clients access to this online database is limited due to reasons of confidentiality, clients are more than welcome to contact us to see if we have any information on the location of their next project.

West Australian record
During installation projects off Western Australia the Seatruck Group set a lift record for a SURF (Subsea, Umbilicals, Risers & Flowlines) contract of 710 tons with their new delivery vessel Jascon 25. The vessel also installed the full set of Stevshark anchors on deck pictured here. It was the second mooring system in a row offshore Australia for the Van Gogh and Pyrenees projects.
From BRIC to Stevbric

BRIC, or better said the BRIC-countries, is a term introduced by Goldman Sachs in 2001. It stands for Brazil, Russia, India and China. Countries that represent the emerging markets and who according to the investment bank, would become a significant influence on world economy and politics.

The countries combined cover 25% of the world’s land coverage and 40% of world population. So that was quite a good start. The bank also stated that, by 2050, these 4 economies combined would eclipse the economies of the countries that were considered the richest then like the USA, Japan and Germany.

As per today, the USA is still the largest single country economy in the world, but China is already second. India fourth. Russia sixth. Brazil ninth. That is just after a few years, 2050 is still far away. And for those interested, the smallest economy in the world is Tokelau, with a last calculated GDP of US$ 1,5 million.

Needless to tell our readers, all 4 economies have invested heavily in their hydrocarbon sectors and are regarded as hot spots for investments and business opportunities.

Vryhof Anchors has done business in Brazil for 30 years, and regards that beautiful country with great people as a priority for the future. We build our anchors locally and have a solid commercial presence there. In fact we just renewed and intensified our cooperation agreement with our agent and long time friend Roberto Chedid (see picture) to embark together on this exciting future.

In India we have been for over 20 years, with a solid representation. China for over 15 years, we currently supply anchors for newbuild semi submersibles for state owned CNOOC. They only want the best and they are getting it.

Russia has traditionally found most hydrocarbons onshore but is increasing offshore investments so as we speak Vryhof is performing a 6 month marketing study from Moscow to map the mooring business and infrastructure, upon which we will decide how to serve existing and potential customers there.

On October 14th we held our 3rd International Mooring Seminar in Rio de Janeiro, with an impressive level of speakers and participants, representing well over 20 companies with interests in the Brazilian mooring industry.

And in the meantime, we keep our eye on Tokelau. You never know.
And oh, on Goldman Sachs. A bank that paid 212 employees US$ 3 million bonuses, 391 employees US$ 2 million bonuses and 953 (yes, almost one thousand employees) a bonus of US$ 1 million. Each. After the government bailout.

Such generous bonuses, these people must really know their stuff.

Øyvind Wathne
Managing Director
With too much activity in the Vryhof R&D Center, R&D Manager Dave van den Ende has been looking for a good addition to his team. Would this be the type of engineer that is investigative and always thinks out of the box? "Yes" says Dave, "but he also needs to distinguish a hammer from a nail and be able to drill a whole in something. What struck me about Victor is he took his own ‘Wellingtons’ to work. Yellow ones". On a more serious note Dave adds, "no really, Victor is hands on, experienced in mechanics, electronics and computing, the man is a true jack-of-all-trades. A nice guy who fits the team".

Victor Remmers (45) has been around the block a couple of times. He is a BSc from the HTS Mechanical Engineering in Rotterdam (Polytechnic Faculty) and started his career as Trainer Technical Software and computed strength calculations on mechanical structures. At Unilever Research & Development he designed food production machinery and at Eurotool worked at what became the Vandenbrink Carver, a slick 3-wheel carbike.

Victor; “an anchor is such a different product than an intelligent industrial robot, however I see the potential and tremendous value of information supplied by merging data acquisition technology and the traditional anchor. I feel we are getting close to a huge leap ahead in mooring technology and I am excited to be able to contribute with my knowledge and past experience”.

Making progress
Victor is already much involved in the end-stage of developing the Stevtrack Data Acquisition System. Dave is happy with their progress: “Tests sofar prove that the in house developed data acquisition technology works well, however we are fine tuning the communication part which should be off the shelf items but we need to make sure it performs flawless, meeting our high standards. So we started to look at the acoustic communications and the systems to manage them ourselves.” Victor has first untangled some complicated technical details, then developed a concept for an offshore acoustics buoy and radio modem system, linked all the hard and software and optimized Stevtrack’s signal. The man only has started yet. Recent field tests encourage us we can successfully test a fully operational system offshore later this year”.

Not so in-house
With recent field tests Dave refers to Victor and him taking the concept acoustics system out on the river IJssel and the Waalhaven where they trial/error tested the acoustics over different distances, in wet and dry conditions. Victor smiles, “this is hands on R&D and got us the ‘feel’ of how the equipment works. It makes our next step so much more focused.

Victor single handedly restores a 1976 Mercedes Benz Camper in his spare time and is Dutch Champion Precision Paragliding. He and Joanna have two sons (8 and 1) and live about 4 km from the R&D Center, to which he bikes to and from every day. Need we say more.

Must be lucky boots Victor, those Wellingtons.
Willemijn has arrived
New executive assistant knows the ropes

Willemijn Coenraads is the new executive assistant at Vryhof HQ. Although she has lived abroad for some time in Qatar and Egypt, she is typical of the Rotterdam ‘no nonsense’ spirit, matching the dynamics of the job with the daily work in the Vryhof office. She has worked for international companies such as BP Nederland, Volker Wessels Stevin and for the executive board of the world famous soccer team Feyenoord, so she must has extensive experience in kicking bosses around …. and still running a tidy office.

Willemijn, who lives with ‘her Aad’ in Rotterdam, clearly has an eye for the soft side of marketing and has worked as an account manager sales promotion. She is currently putting this experience to work in making changes in some of the ‘looks’ of Vryhof. Watch this space.

Øyvind says, “Willemijn is proactive and I mean PRO as in professional and ACTIVE as when we are underway to an appointment she ends her last phone call the moment she gets out of the car. She combines a tremendous work capacity with a perpetual smile, adding much quality to our organization, both internally and externally.

Most of our management team do quite a bit of traveling (which she calls being on the run) and it needs true skills to keep us ‘hooked up’ if we are in different hemispheres. So you could say Willemijn keeps us well anchored!“ Welcome Willemijn!

Meet the Vryhof voice

Joke Teuling joined Vryhof in June of last year on a temp basis, but now that she changed to a permanent position, we’d like to introduce her. “Why?” says modest Joke, “I have felt part of the team ever since I started here”.

Joke runs the reception of the Vryhof main offices which includes monitoring correspondence and email and further comes with a number of responsibilities that is best described as office manager.

Joke worked most of her life in catering, at first some 10 years in a large Hospital. She built a career as Catering Manager until an accident damaged her wrist. “That doesn’t work in catering, because you help each other, no matter the position you hold”, she explains. “In that respect changing to Vryhof didn’t change much. We are one team and help each other to keep things going in the most efficient way. So although I am on my own behind this desk, I am not alone. Vryhof is a people’s company and clients who visit us seem to appreciate that too. I really love this job.”

Glad you stayed Joke!
More than one milestone

Bexco scoops Jubilee mooring lines order

The Jubilee Field is one of the largest oil fields discovered offshore West Africa in the past 10 years. It is being developed by Tullow Oil, in phase 1 of the project with an FPSO which will be capable of processing more than 120,000 barrels of oil per day. On behalf of the Jubilee Field Partners and Tullow Ghana Ltd. (Operator) MODEC will provide and operate the FPSO currently under construction at Jurong Yard in Singapore. First oil is scheduled in 2010.

The Jubilee FPSO will be named Kwame Nkrumah MV21 and be equipped with an external mooring turret, subcontracted by Modec to Sofec. It is to be moored in 1,100 meters deep water with a 9 leg spread mooring, in clusters of 3. The mooring legs will consist of chain and polyester mooring lines for which Modec awarded Bexco the supply of 19 DeepRope mooring lines of 550 T in lengths between 530 and 980 meters.

Milestone order

“Winning the Jubilee project is really a milestone for Bexco” comments Thomas Agnevall from his Moorwest office in Houston. “This is a heavy competed market which we monitor closely as their representatives. We have seen prices erode over a decade to a point where for some suppliers it became impossible to maintain profitable, let alone maintain the quality level. These manufacturers are taken over or disappear all together. It is a accomplishment of Bexco to have kept investments and product development on target under these conditions”.

Thomas refers to investments of Bexco over the last 5 years into doubling their production capacity, further optimising rope constructions and splices, the development of torque matched ropes and recently installed new exact length measurement equipment. This tremendous effort payed off in winning the prestigious Jubilee order”.

Inspiring project

Karel Devos, Bexco’s Offshore DeepRope Engineer adds, “We knew we were doing the right thing. Having successfully completed previous orders such as the 750T ropes for Sofec’s Fluminense and proved our ability to supply several 2000T ropes. That served as a good reference for this project and our capabilities were not ever questioned. Jubilee was the reward for all our hard work”.

Torque match rope tests in Houston.

Exact length measurement system installed at Bexco. Below a length read-out graph.
Multiple milestones
First a prototype rope had been produced. “We then performed 5 break tests on full size samples, which showed a strength variation coefficient of not more than 0.6%!” says Karel, “That is pretty good for even the most stringent requirements in terms of strength variation. It helped ABS with their certification.”

Over spec thimbles
Sofec required thimbles to be manufactured to their new material requirements. They were analysed for end-of-life strength and fatigue lifetime using finite element analysis. The resulting fatigue lifetime was calculated by Ghana site metocean to be... 123,000 years, slightly over spec of 20 years.

Exact length
The client had set a very strict length tolerance (-0.0% /+0.5%), a perfect way for Bexco to prove its new rope length measurement system, now applied with brand new hardware especially for the Jubilee project. Every single DeepRope was length measured at a tension of about 2% of the rope’s MBL. As such every rope could be cut to the exact length, as required by the client.

“This really did it for us”, continues Karel “We have applied the length control system for subropes for over a decade and the difference between the produced (set) subrope length and the measured DeepRope length was never more than 0.3% (see graph). This is perfectly in line with the expectations, and shows we can manage length accuracy in every step of DeepRope production, from subropes to full size ropes.”

Short production time
The production of all the 19 ropes was performed in stunning 6 weeks. Says Karel; “being the market leader for fiber rope inserts in the North Sea with its challenging delivery times means we know how to keep a deadline. For us Jubilee proved we can stay ahead on quality standards, satisfy special client requirements and still manufacture economically. It safeguards our future.”

VA 1000 at performance
The new Stevtensioner VA 1000 has recently been used to pre-tension a mooring spread of a 3-leg CALM buoy in Korea in only 28 meters of water offshore Usan for oil company SK Corporation.

It was the first time the VA1000 was used at its maximum tension, a test it passed with flying colours.
Wind Energy comes new to nobody, nor does the concept of placing wind farms offshore. Northern Europe accommodates well over fifty wind farms, generally based on the driven single pile concept. StatoilHydro developed a concept to install wind farms further out offshore, where the wind blows best.

A pilot called Hywind, was recently installed in 220m deep water, some 10 km offshore Norway, not with the intention to derive power and income, but to serve as a two-year test bed on how wind and waves affect the structure.

StatoilHydro combined wind energy and offshore technology in a prototype design in 2005, a floating concrete cylinder with a rising tower on top. This successfully tested concept was then further developed to a single column that is ballasted in the lower 100m long floater with a top section that rises 65 meters above water and carries the rotors in an 83m diameter. The 8m diameter floater is moored to the seabed with a 3-point mooring system. These floating windmills suit water depths between 170 and 700 m.

An anchored windmill

Development of Hywind was subcontracted to Siemens for the topsides and electrical, while the floater and installation were contracted to Technip Norge AS. Although for the pilot project only a single mooring system was required, the design faced the challenge that the windmills in an eventual wind farm will be relatively close to each other, so that the mooring spreads might interfere with each other and early on Technip turned this positive by designing a pattern that uses 1 anchor out of 3 in the mooring system of two towers. “But there was more to it than that” says Senol Ozmutlu, who worked on the mooring system with Technip. “One of the design criteria was that in the event of a broken mooring line, the other two were required to hold. The pattern they designed serves that criteria well. This in combination with the small foot print initially led to choosing the Stevmanta (VLA). Stevmanta is a Vertical Load Anchor as well as capable of withstanding multi-directional loads, it seemed like the perfect match”.

In developing the mooring system however, Technip determined that the mooring lines were to be able to uptake considerable load from the vertical movement of the floater, so that instead of a taut mooring line, they chose a catenary line with a clump weight mounted to damp those movements.

Senol continues, “Technip’s economical model changed completely due to the catenary uses much greater wire and chain lengths, so we too recalculated and found to offer a better match with Stevshark anchors. It is interesting to see that in a project that originally specified suction anchors, we can satisfy project criteria better, twice …”

The Hywind pilot came on stream on September 8. StatoilHydro aims to have a full scale offshore floating wind farm operational within a decade. With the use of light weight generators offshore wind farms with 200 turbines and a combined capacity of 1,000 MW. will be feasible. Ultimately, the steady offshore winds in Northern Europe could power wind farms that produce 4 TWh a year. Per wind farm.
More than 8500 anchors!

Each Vryhof anchor carries a unique number that connects the anchor to its certificate for life. An identification tag is welded into each anchor to enable tracing of the certificate back to its source and certifying authority. The number is the chronologic production number and with number 8500 in sight it seemed a good opportunity to plan a celebration! Rather than the actual built 8500 it turned out to be # 8422 a 3rd generation Stevmanta anchor with which 7 FPSOs are moored in Brazil, 2 systems in West Africa and the first Stevmanta’s are to be installed later this year in the North Sea.

Mrs Maya de Vreugt, Vryhof’s long-time manager of back office services was asked to perform the honours. She headed a group of staff and friends -at Vryhof referred to as family - on a rainy afternoon to the anchor yard in Rotterdam to spill some champagne without leaving a scratch on the fresh paint.

Maybe not by coincident this was also the largest Stevmanta ever built. It has been installed for a one-off confidential application in a remote location.

Anchor jewelry

It takes careful selection of each item to compensate or prevent torque and tension in the anchor line. For this reason Vryhof keeps in close contact with the key manufacturers of these components and in some cases have a commercial cooperation agreement in place to ensure quality and availability. Fit for purpose mooring systems is the term Vryhof is known for.

A new generation
Whereas earlier on a swivel would consist of two mirror image forged steel components, the latest generation swivels will be self lubricating, engineered hi-tech pieces of equipment designed on pc’s in stead of in the forging shop.

A recognised industry leader is GN, formerly known as Grofsmederij Nieuwkoop. This Dutch specialist has existed many years and is tried and trusted. Their new CRD connector (see image) is an easy and quick to use connector serving a variety of applications connecting different combinations of wire, chain and synthetic ropes. It replaces a range of conventional connectors, saving both cost and installation time.

The new series of universal mooring line connectors from GN,
Dredging anchors

Increased dredging productivity tempting proposition

Vryhof’s anchors are mostly associated with the offshore industry simply because they are the most applied offshore. The origin of its anchors however, stems from the dredging industry. An employee in a Dutch dredging company by the name Van der Haak worked on improving the then existing anchors. The result was a concept for a versatile anchor with a stunning holding power. Stevin, his employer after which he had named the anchor, was not interested to develop it further so that the Stevin anchor became the first of the successful series of … Vryhof Anchors.

Today, more current versions of Vryhof’s anchors are still used in the dredging industry and even the good old Stevin is supplied and used on a regular basis. The dredging industry uses anchors not only for mooring but also as reaction anchor during pipe pull-ins etc. In this article a combination of the two is being discussed.

Work horses
The dredging industry is primarily associated with exotic large land-winning projects in the Middle East performed with huge ‘Jumbo’ Hopper Dredgers spraying large amounts of sand on the shores. The real work horses of the industry however are cutter dredgers, persistently producing mile after mile of work. They are applied in for example the excavation of canals and harbours in relatively hard soils. These flat bottom floating barges generally move on their anchors which they often bring out with their own multicats. Once anchored, they can move forward on their position and pull from one side to the other, dredging whatever the width required. “Anchoring this way is quite a laborious process and the time not spend on dredging is lost to their dredging production,” says Norbert van Vliet, Vryhof Commercial Manager, “so the less time they have to spend on resetting their anchors the better it is for the progress of the project.

Dredging companies tend to use box or gravity anchors, they’ve always done it that way, but they do see the advantage of drag embed-ment anchor provided it can penetrate the hard soil – the exclusive territory of cutters. As it happens the Stevshark anchor can.

Production is king
More than just one dredging companies equipped their cutters with Stevsharks, and they are not all Dutch. There are some differences between any anchor and the Stevshark anchor that makes it very suitable for dredging applications. The Stevshark anchor has special features to improve cutting through hard soil. It has shark teeth shank edges, enforced fluke tips and a hollow fluke so to that extra ballast weight can be added to the anchor. When set on dredged soil, the Stevshark will penetrate immediately where other anchors would simply slip. Moreover, due to its high holding power it does not need to penetrate much to do the work, so that recovery of the anchor is also easier.

Simple maths
The Stevshark can produce 15-20 times its weight in holding power in hard soil conditions offshore, however in dredging
Pipelines on anchors

Acergy uses Stevmanta as initiation anchor

The use of reaction anchors is not new and the Stevshark is known in different industries for its qualities. For the installation of the Block 15 Gas Gathering Project in Angola the Stevmanta was used to do the job. The Block 15 pipeline network delivers gas from 4 FSOs to an onshore Angolan LNG plant. In all it is some 162 kms of pipelines extending from 1200m water depth offshore to ~22m of water near-shore.

To initiate two new 10" flowlines in this deep water considerable uplift capacity was required of the anchor and although the Stevshark takes considerable uplift, the Stevmanta was believed to do better in combination with the local soil conditions. Two 6 sq.m Stevmanta’s with a tail end of wire and chain were installed from the AHT into a target box with narrow margins (5 or 7 meters). Connected to the Acergy Polaris J-lay tower they were proof loaded to 75 tons at only 9,5 m embedment to assure they were fit for the job, after which they were recovered by the Acergy Polaris.

Norbert explains further, “a box anchor of 125 T will need 125T in pennant wire force to reposition, a clumsy weight that wears out the winch and takes time to handle when repositioning. Although feedback from dredgers says they had to get used to the size of the Stevpris, it only weighs a fraction of a box anchor used for a comparable application, so the handling is easier. When compared to other anchors Stevpris allows the vessel to stay dredging on its anchors longer. One and one is, eh... four”, he smiles.

Stevsharks improve dredge production substantially and a conservative projection would easily show a delay reduction of 30% per anchor cycle and in adverse weather conditions they would really make all the difference.

“We have just received a repeat order from Vosta for the new cutter being built by them for DEME Dredging of Belgium. DEME already had equipped the d’Artagnan with Stevsharks so I guess they have confidence in the anchor as well. We have also equipped the first dredgers in the Middle East and I am working with our agent, Petrocolm there to inform dredger operators of these simple production gains they can make by choosing the right anchors.”
On station again

A long tradition at Vryhof is the Dutch new herring party, introduced by the late Jan Mouthaan on the event of his birthday, which was on June 2. Since the old days, the arrival of the seasonal new herring is celebrated throughout the country whereby the fermented herring fillet is eaten by hand accompanied by a shotglass of old jenever.

To honour Jan and his massive contribution to the company the Vryhof management commissioned famous Dutch sculptor Lia Krol to make a bronze in his image, based on the many photographs available. Meticulously the bronze was made over a period of 6 months and last June the entire Vryhof staff gathered to witness Financial Director Rolf Bakker and Managing Director Øyvind Wathne unveil the result, claiming; “Being a man of detail, Jan however did not like to draw detailed attention to himself so the dark coloured bronze perfectly outlines his character which can be recognized at a glance.

He would have liked that.