DESIGN: STRANGE BOATS BY GLIDER YACHTS
CANTIERE DELLE MARCHE: A RECORD YEAR
TECHNICAL: CRUISING ON AN AIR BUBBLE
LYNX YACHTS: HEADING TOWARD EVOLUTION
VSY: WILL HYDROGEN FUEL THE FUTURE?
BENETTI YACHTS: A FULL SEASON
CANTIERI DI PISA: AN APPRECIATED RETURN

MANGUSTA YACHTS MGS54 EL LEON
ARCADIA YACHTS A105 RJ
CBI NAVI STELLA DI MARE
PERINI NAVI SEVEN

TANKOA YACHTS - S701 SOLO
Today VSY is again at the forefront of things in proposing a large yacht equipped with hydrogen fuel cells. We’re talking about Waterecho VSY’s new 65 metre designed by Espen Oino which is scheduled to be the first yacht to be installed with a system based on hydrogen, fuel cells and lithium-ion batteries to produce 200 kw which will serve the stern electric engine (deployed when manoeuvring in restricted

brands are promoting this technology with new zero emission models.

The shipping industry, with basically commercial ships has invested in passenger vessels cruising inland water-ways and are currently building large units to cruise with offshore.

In Norway for instance Norled ship yard is about to commence construction of what will be the first ferry in the world powered with hydro-electric energy which will be carrying up to 299 passengers and 80 motor cars.

And what about the yachting world? This segment too has found support and interest coming from owners who’ve become more sensitive towards eco-friendly solutions. So too are project designers and ship yards seeking more sustainable solutions for yachts on which to install “clean” technology, thus minimizing toxic pollution.

VSY is one of those yards which has always been at the forefront when it comes to these topics. VSY has been pioneering over time to install adequate modern systems to treat waste water on board of its yachts. Likewise solutions aimed at reducing pollution from exhausts, introducing “green” anchoring systems as well as other energy saving solutions.

VSY, with Lloyd’s Register and Siemens are together to bring hydrogen technology on board of a large yacht, an innovative VSY 65m Waterecho.

Travelling with zero emissions after having been sheer utopia for years is now a dream which is gradually getting close to becoming reality. One of the most promising scenarios to make this dream come true is hydrogen, or better what we know as fuel cells. These deploy hydrogen to obtain electric energy. We’re talking about a technology which fell short of the grand promises made back in the nineties and soon looked like a forgotten technological dream, nothing more. But surprisingly hydrogen has come back as never before.
**VSY: will hydrogen fuel the future?**

**VSY 65M WATERECHO: A COULD BE "GREEN"**

The road to environmental sustainability is a continual work in progress situation, also for a yacht! The new VSY 65 M Waterecho is no exception as old solutions blend into new ones to obtain materials and systems which empower a yacht’s “green” values. In fact in addition to the already mentioned ongoing partnership with Siemens and Lloyd’s Register, VSY’s new 65 M Waterecho is well integrated with several other solutions to bolster the degree of sustainability as follows:

- the optimization of hull efficiency and overhangs thanks to collaborative work with the most renowned institutes in the sector (MARIN) and with precious contribution by renounced experts,
- the installation of latest generation gen. sets which require considerably less fuel than earlier models,
- the installation of treatment plants to handle toxic exhaust gases deriving from main engines and from on board gensets,
- the implementation of heat recovery systems and the exploitation of water from radiators,
- the deployment of more ecological materials.

**VSY 65M WATERECHO**

LLOA: 66.0 m  
Beam: 11.0 m  
Draft: 3.1 m  
Engine: 2 CAT 1765 kW engines  
Top speed: 16 knots  
Range: 5200 nm at 12 knots  
Construction material: steel/aluminium  
Available interior surface area: 660 square metres  
Available external surface area: 493 square metres  
Gross tonnage: 1320 GT

In practical terms even if only used for limited time and limited use in terms of energy such as night cruising at slow speed, the new VSY 65 m Waterecho will not pollute at all. To reach this objective VSY has involved several prestigious partners with whom, they signed an agreement by which to develop a project through which to outline and define fuel cell construction for on board use in the course of the latest Monaco Yacht Show. Basically we’re talking about a feasibility study which is to be accomplished within 12 months covering every aspect as well as cost/benefit projections derived from the deployment of hydrogen fuel cells on board of a yacht with specific features and size. This partnership other than VSY involves Siemens and Lloyd’s Register who are giants in their respective fields. To clarify roles it is expected that VSY study technical and commercial feasibility concerning hydrogen fuel cells and their installation on board ship, set up and oversee performance targets related to the production of energy required. Instead Siemens will supply know-how pertinent to its field, will deliver technical solutions for specific areas and will develop further technical solutions accordingly. Lloyd’s Register will evaluate needed preliminaries at each step, to qualify the yacht for certification, will highlight necessary technical requisites by which to guarantee safety, use and stocking of hydrogen fuel cells on board. The project in fact foresees deploying Siemens’s SISHIP Blue Drive system together with hydrogen fuel cells supplied by PowerCell Sweden AB and with Siemens Blue Vault TM lithium ion batteries. We’re in fact talking of a system where the SISHIP Blue Drive originally built to serve naval industries has been downsized for smaller units such as yachts. It allows the management and optimized distribution of energy. Furthermore the system can be easily integrated with diverse sub systems as in the given case where the make-up is battery banks and hydrogen fuel cell modules which produce and deliver a supply and a stocking system of efficient and sustainable electric energy. In other words will tomorrow’s yachts use hydrogen? In a few years surely! In the very foreseeable future VSY’s, Siemens’s and Lloyd’s Register’s feasibility studies for Waterecho the new VSY 65 metre project will tell us what to expect in the short term and which are the limits and or restraints if any, concerning the deployment of hydrogen fuel cells applied to yachts.

Sande is the project name of “Scripps” a research ship for San Diego University’s oceanographic institute. It runs on hydrogen thanks to 10 packs of fuel-cell capable of delivering 1800KW with which to run on board appliances, services and electric engines. The ship’s range is of 2400 nautical miles at 10 knots.
VSY: will hydrogen fuel the future?

INTERVIEW WITH VSY’S TECHNICAL MANAGER

In order to know a little more about such an innovative solution for a yacht like the exploitation of hydrogen and fuel cells we asked Silvia Fogliuzzi Technical manager at VSY a few questions.

VSY has always been involved in producing more eco-friendly solutions for its yachts. This time by soliciting Siemens’s and Lloyd’s Register’s contributions, they’re giants in their respective fields. How did this come about?

Yes at VSY we spend considerable time in research work to find new solutions which can make our yachts more sustainable and eco friendly to the environment but not only. We also endeavour to find ways of surpassing current limits both technical ones and normative ones as well. And that is why Lloyd’s Register and Siemens have been the first we contacted right from project WaterEcho’s initial phases. Siemens, has been involved with the specific intention of the yard to exploit latest generation machinery and technology which means the generation of energy and its distribution on board. We found much reciprocal interest in hydrogen and fuel cells intended as fuel in general and for gen. sets respectively and to be integrated to a large yacht’s main diesel-electric power house.

This interest was later shared by Lloyd’s Register which will be acting as controller and will be examining all the implications arising which concern safety and liability.

According to the partnership signed September last which asked for a feasibility study to evaluate the limits and implications arising from the use of hydrogen fuel cells on a large yacht, we’re about half way through the allotted time by now. What’s the current state of play? Could you tell us a little more?

Following the presentation of the project at the latest MYC (Monaco Yacht Show) much ground was covered in little time to finalize concepts, define and delegate work accordingly. In the course of the meetings held between the end of last year and January of this one, we’ve come up with a preliminary Risk Assessment Analysis. At this point in time we’ve completed the first design screening phase in compliance with ship-right procedure and Lloyd’s Register Risk Based design which will be addressed accordingly. This means that technical feasibility will be thoroughly assessed in all of its aspects.

Swedish PowerCell is part of the development team involved inasmuch as it is producing hydrogen filled fuel cells with which Siemens is working to develop and implement these cells in their own energy and propelling integrated plant named SISHP Blue Drive through which to supply more sustainable and efficient energy in a nut shell each one of us actively makes specific know-how available to the others involved in this team work.

Which are the main issues you’re confronted with at this point in time? Is it just a matter concerning the stocking of hydrogen? If so how are you planning to resolve it?

The main issue here is the use of fuel cells on board a yacht. In fact the deployment of this technology on board of ferries and work boats has even, if only recently become a reality. And surely stocking hydrogen is the main problem we’re confronted with evidently, being able to dispose of considerable quantities of hydrogen which correspond to a given range requires hefty considerable volumes of available space. It is therefore a question of optimizing the necessary space in which to lodge tanks according to the type of use envisaged in total “green” mode meaning zero emissions released in the atmosphere. Following this there’s another issue which needs to be addressed compliance to several requisites so as to guarantee safety of both personnel and passengers, nothing new mark you when dealing with LNG propelled ships: But on board of a yacht where the value per square metre is very high you need to find suitable spaces without over penalising the layout of the interiors. Out feasibility study not only considers the importance of environmental impact in relationship to the availability of adequate interior spaces but also takes into consideration related costs as well. All things considered, this factor is not lightly dismissed when it comes to the bottom line. Are fuel cells stockpiled in separate areas or are they installed in the engine room?

Fuel cells and tanks will have to be installed in separate compartments that have been built in compliance with current norms and requisites. The tanks built to contain hydrogen for example in addition to being highly robust to endure high pressures will necessarily have to be installed at a pre set distance from the yacht’s sides as a safety measure. Likewise the area of the sides closest to the tanks will be strengthened accordingly to avoid breaking in case of exceptional loads and or collision with the tanks themselves.

Fuel cells and hydrogen translate into zero emissions. And just this would be enough to justify all of the rest. But are there other positive factors linked to this way of generating energy?

The aim of the study that is underway with Siemens and Lloyd’s Register is to define what is in store for a specific case in given parameters which comprise; a system capable of delivering 200KW on board of a large yacht measuring approximately 65 metres in length with integrative power from hydrogen fuel cells and lithium ion batteries by which to power up the stern auxiliary engine without deploying diesel gensets. This leads to a clear definition of the complex construction and functional specifications needed in relationship to pre set performance standards. And according to the results obtained it will be possible to determine how large or small fuel tanks will have to be in the future. This is, in our opinion the real value of the current study. To know how far we can go while considering both actual technological aspects as well as what they imply in terms of cost to benefit ratios and projections.

Given your experience do you think that the deployment of fuel cells on board of a yacht and quantities of hydrogen can be a doable solution? or due to the difficulties involved in stocking hydrogen is it still an un-resolvable issue?

According to you how many years will it take to see a full hydrogen yacht cruise the seven seas?

Well from the shipyard’s point of view as mentioned earlier, it has always been prized for its special dedication to sustainable themes, this project is conceived as an “evolved” and sensitive portion of the market to which whoever objects that there is no problem on this score most probably has little availability to hydrogen, nor an adequate distribution network, we wish to respond, that today there is a strong tendency to overcome the current scenario in virtue of the fact that there is a growing demand deriving from innovative projects which till recently were considered impossible or at any rate not feasible. Even if at this stage of the current state of play it is difficult to envisage a full hydrogen yacht cruising in the short term since a large yacht is built to cover long distances and therefore needs considerable range and consequent adequate spaces for fuel tanks which are necessarily limited specially on yachts by comparison to ocean going ships and more so when it comes to deploying hydrogen.