

The Engineers' FORUM

NEW-BUILD PROJECTS

An Engineer's Perspective

REMEMBER when I first got into yachting, I was offered an amazing opportunity, and from the chalkboard in a classroom, to working on a superyacht; I couldn't believe my luck. I settled into my new position within the engineering team, and as tough a learning curve it was, I knew I was being exposed to this fantastic industry and the incredible people in it.

Could it get any better? With the other engineers and crew I was being regaled with stories of working on new builds, fast cars, nice apartments, fancy uniforms, dinners out and generally top-gunning it around town. Working on a new build had to be the holy grail for yachties. For years I heard countless conversations of build opportunities, the lure of long refits in a beautiful city or exotic destination and the ultimate dream of working long term on a new build. I was caught up in it myself and often dreamed of the stability that it would bring, staying in one place with regular hours and almost a regular job.

From my own experience in yards it never quite matched my initial expectations. I probably had a much easier time when operational and cruising around rather than being on the ground in the yard; the project slowly takes over almost all your consciousness and before long all you're thinking about is the vessel in question.

We've had a tremendous response from engineers' experiences in yards and on builds as follows and I hope you can glean some valuable information for your own projects.

Engineers' Comments & Column Editor's Comments

HAVING DONE REFIT AND REPAIR WORK BEFORE, I was always interested in a new build and although realising the increase in workload, was still unprepared for the huge amount of work required to construct a super yacht, especially for one over 500 gt.

The engineering is the easy bit: it may be the latest fashion or high-tech, but the basic principles remain the same. It's the logistics, regulations, planning, certification, etc. that all adds up. If the authorities are changing the specs, how are we supposed to keep up?

As for the build, I recommend using a computerised system such as Techman for planned maintenance and boat administration. This system will not only help your crew cope with the ever increasing complexity of systems and inventories, but also save time and money in the long run.

The Engineers' Forum is intended to provide engineers with a platform upon which to air their views on any engineering related issues as a way of enhancing the industry. If you would like to send any thoughts you may have for the next issue, please do so to the column's Editor, Joe Hodgson, at joe@wizzwazz.com and also to rachel@theyachtreport.com

The additional work of acquiring and inputting this information really requires another full time crew member who can be in charge of a 'build portfolio'. This will not only be useful to crew but also can be shown to owners and agents and so on to keep them informed of build progress.

If I could have, I would have employed an engineering consultant such as CME to help with the day-to-day supervision of the build and the huge amount of data acquisition required. Unfortunately, it was felt that we could cope with this workload and we have tried to do all this work ourselves – A Whole Lot Of Work!

You need to watch and photograph everything, keeping meticulous notes and saving or noting every piece of correspondence so that you can refer back to previous information easily. Everybody on the project may have the same goals for a high quality yacht, but corners do get cut and unless you spot them early it makes it very difficult to change later on.

Building a yacht, especially in a country with such a different culture and language, has proved to be a huge challenge. You not only have to build the yacht but also live and socialise in a strange place for many months or even years. Find out as much as you can about where the yacht is to be built and get to know the basic customs and no-no's. Where we are, raising a finger is the worst insult imaginable and you have to learn to point the fingers down when you sign 'come' or 'go'. Check out the HSBC advertising for examples of different customs!

Learn the language; you'll be surprised how much more helpful people are when you say 'good morning' and 'please' and 'thank you'. We try to carry our phrase books just in case! Yacht T-shirts are also great for keeping the workforce happy.

If you can find one, a 'friendly' local is invaluable, especially for organising houses, phones, cars and pubs!

Chief Engineer Jed White
S.Y. Maltese Falcon

I agree with the data and information side. I would hire office staff to manage the day-to-day running and handling of all the files and paperwork generated. Let's face it, we all need personal assistants. I would also make sure you had your own digital camera; I've had a few where we've shared one with other departments and trolling through pictures of teak and shiny bits to find that corroded pipe fitting can be frustrating.

AT THE TIME OF BUILD, S.Y. ATLANTA WAS STATE OF THE ART. A lot of her systems were custom built, not only in order to perform to a discerning owner's expectations, but also because as a sailing yacht of her size (36.8 m/121 ft), you run into the big problem of SPACE in the engine room, and where to put things. This is the key factor to consider for a successful engine room layout to accommodate all of the systems you need to run a yacht like this.

Atlanta was built back in 1996 and she has not had a major refit until now. When the owner decided to refit the boat he asked 1st mate (Rick Chambers) and myself to make an itemised list of all the things Atlanta needed for repairs, and another itemised list of what the crew and owners wanted from a new yacht. The wish list started out as one page long but grew quickly to about three pages. After a couple of months we had it narrowed to about 80 major items.

Being an eight-year-old yacht, a number of big items needed to be replaced, including electrical systems, navigation systems, air-conditioning systems, communication systems, entertainment



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systems, main engine and generators. Advanced Marine Systems of St Maarten designed the new electrical system. It is a compilation of Master Volt and ASEA components. The satellite/navigation and communication systems are also being designed by Marine Systems.

The generators were upgraded from 40 kw to 55 kw with full paralleling capability. The larger generators were required to meet our needs for redundant operational capability in the event of one generator failure and to provide for hydraulic power to run the thrusters. The new generators had to be lowered considerably to fit in the engine room. This meant customising the generator beds and sound shields to fit.

The shore power system was upgraded from two 24-kVA isolation transformers feeding an obsolete frequency converter to two 30-kVA ASEA frequency converters running as a master slave pair.

A deep cycle 24-VDC Mastervolt battery was specified as a house battery for use with all 24-VDC equipment. This included a 15-kVA Mastervolt inverter driving a 10-hp, 3-phase motor through a VFD to provide hydraulic power for extended 'silent operations' capability as required by the captain. A new customised battery box was built to house the battery. Space was a factor in what style of batteries we could use, although the new battery was smaller than the one being replaced. Mastervolt 2-volt gel cells were chosen.

Next on the list was the air-conditioning system that went from an 180,000-BTU unit to a 210,000 chilled water system with a reverse cycle. With the idea of adding a hot tub, the water makers were increased from two 1,500 silver series units to one 1,500 silver B series and one 2,600 silver series unit. Again space was the issue here. One of the best things to do in cases like this is to build cardboard mock-ups and move them around until a workable solution is found. We used this to great success in all layouts of the engine room. It is a simple yet very effective way to design a new engine room.

When one starts making large changes like this there are hundreds of small things to consider. Most problems are due to new versus old equipment interactions and how to accommodate everything in a new layout. Space is restricted and many mounting limitations exist such as how near or far one piece of equipment can be placed away from another. New mounting hardware must be fabricated and existing hardware often needs modifications. Everything takes time, money and plenty of patience. Electricians are pitted against mechanics in a constant struggle for SPACE!

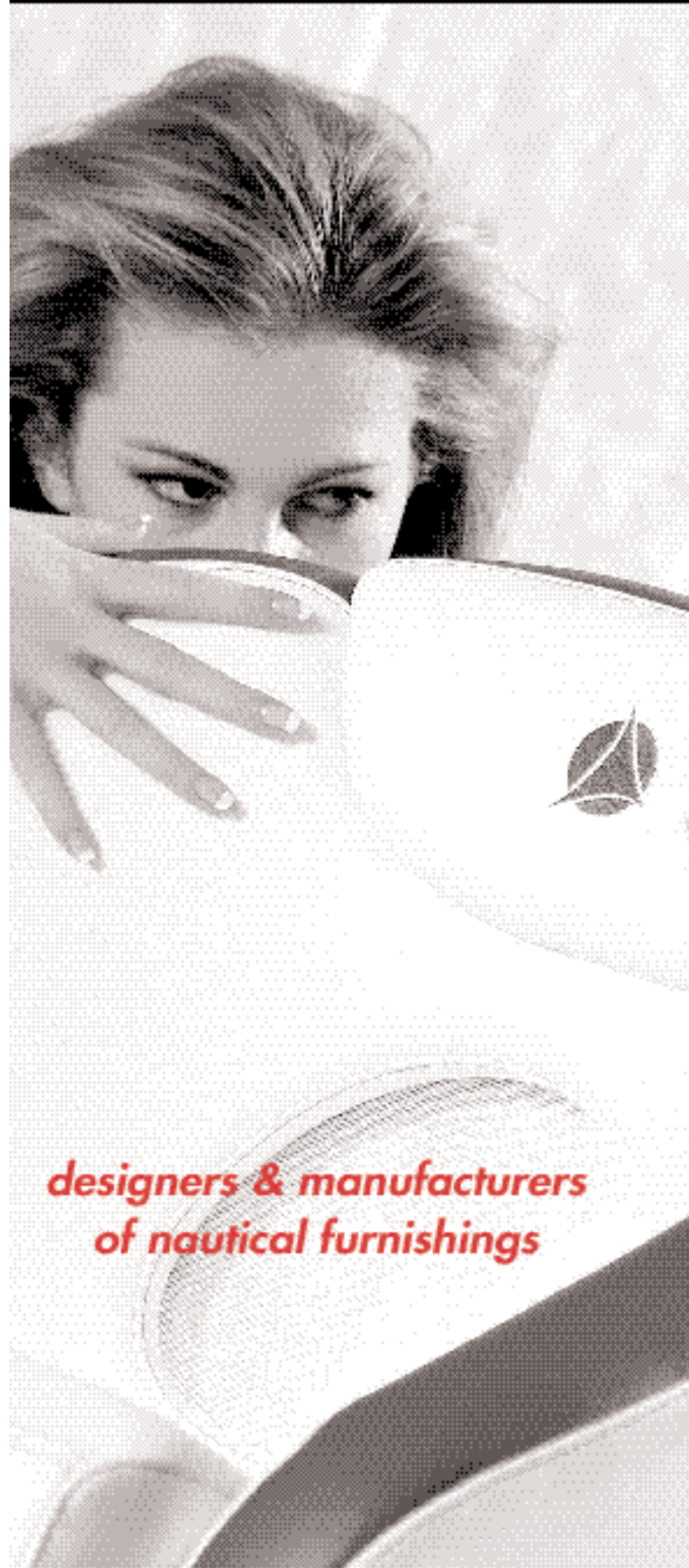
After the old systems are replaced with the new there is a definite cost saving in maintenance for the owner to realise. The crew is able to spend more time running the ship instead of fixing it. Safety is increased and downtime is reduced. Everyone benefits.

This started out as a five-month project and has grown into a six- to seven-month project due to many factors. One of the biggest problems we have faced is ordering spare parts and new equipment and not having them on time. This has slowed down the project considerably. The project schedule has been updated weekly to work around these hold-ups.

The core team in this project is as follows: 1st mate, engineer, captain and a very good electrical designer.

Atlanta is about two and half months away from completion and will have state-of-the-art electrical, satellite/navigation, and communication systems. She will be back in pristine condition with new paint, new sails, new tenders, new teak decking and a new interior.

Engineer Chris Henderson
S.Y. *Atlanta*



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Lead time on equipment and spares can be very frustrating, constantly calling to check on progress especially when you've sourced it yourself. A good engineer can save a project a fortune in product and supply knowledge, but procurement can also take up valuable time.

I WOULD LIKE TO TELL YOU ABOUT MY EXPERIENCE with a build in Italy. My biggest hope would be that I am able to inform and help any one else about to participate in such an event; of what they might endure and hopefully give some beneficial direction from the experiences that I had.

It all started towards the end of summer 2003. I was studying whilst trying to pass the USCG engineers' test, as I was attempting to upgrade my licence to an unlimited horse power, and I received a phone call from Italy. On the other end was a captain that explained he was working on a build of a 38-metre high speed yacht named *Bellissima* at Baglietto shipyard. He asked me if I was interested in applying for the engineer's position of helping complete the build and then deliver the vessel to California. I explained that I had a good amount of time and experience through yard and refit periods and that I would probably make an excellent candidate for the position, especially for the delivery part of the process. I had not yet received a definite answer from this captain but I did feel like I was about to be asked to travel to Italy and fulfil the job. I complete and pass my licence test, and on the same day I go back to my car and there is a voice mail on my cell phone waiting for me. There it was, a message that the company would like to fly me to Europe. It all felt like a good omen to me. I started my first day in September 2003. I went straight for the engine room to have a look around. You could hardly make head nor tail of what was going on in there, it looked so far from completion. I walked in as they were trying to align the engines with the gear boxes as they had a Z-drive system in place. I could tell they were having some problems with the cardinal shafts lining up with the gear boxes and I asked the mechanics what was wrong. They only spoke Italian. This is not good I thought to myself; I have come to their country to work and I do not speak the language.

The boat had been under construction for over a year at that time. I had been called in on the last half year of it and I had some serious catching up to do. Learning from yard personnel and engineers was not an

option with the language barrier. Trying to crawl around the engine room figuring what was what was not an option either with an army of workforce in there everyday putting it together. I had an idea.

I walked into the tech department and found out who spoke the best English. Petra spoke about the best, but it was very broken up and very limited. I asked him for all the blue prints. He was so helpful to me as he gathered up heaps of drawings, books and papers and what ever else he could find to throw at me. I was thrilled, with my arms full of information. I was making my way back to the office and was getting ready to do some intense studying. It was just about then I realised that this was all in Italian as well. That language barrier problem was not going to go away so easily. I went back and asked if they had anything in English for me. Petra thought for a moment. Shuffled through some piles of papers on his desk and then found what he was looking for. He threw me an English-to-Italian dictionary. I thought that was hilarious. I did, however, accomplish the task of ordering the prints in English, but they would not arrive for a couple of weeks. This was a perfect time to not only learn the design of the boat but to learn some Italian too.

Italian drawings work a bit differently from what I had been accustomed to. They show the design and function of how the system will work, not the way the system will be installed and where all the piping or electrical operating devices will be located. An example of such is where they show a manifold having three valves. There will be a manifold in the engine room somewhere with three valves, but not installed as you would expect to see from having studied the drawings. But look hard enough and you will find it, and it will work just the way the drawings had intended it to work. This was very much a problem, with trying to use this information to learn how to operate the vessel; but I had an idea.

I explained the situation to the captain. I told him that I needed to do something a bit different from what would probably be normally expected. I told him for the next undetermined short period of time it would be best that I come in at 11 or 12 in the afternoon and work till 8 or 9 at night. That way while the boat is full of people I could study the vessel in our office, and once the people leave for the evening I can go aboard and do my research, getting past this learning curve. The captain was all for it, he told me to do whatever it would take, and that's just

what I did for the first month. Once the people had left for the evening, I would run through the engine room trying to re-study all that I had studied that afternoon in the office. I would then also make my own drawings of exactly where everything was located with each individual system. By the end of that month I knew that vessel almost as well as the design engineers. In doing so I would also find a lot of small mistakes and faults that would need correcting. But how was I going to convey these problems with the yard? Fortunately, I had another idea.

Penco was the Baglietto chief engineer, who could speak straight-to-the-point English. I set up a meeting with Penco. When the time came I explained what I had been doing and that while studying the vessel I had been finding small things which needed to be corrected. I also explained that it was not necessarily him that I wanted to bring these issues to, but that I did not know how to convey these things to the proper people doing the work. I asked him if I could submit to him a punch list every week of things wrong or needing to be completed and or done, and then he could translate these issues to the proper source to have them done. Penco told me he thought that was an excellent idea. He explained to me that it would actually help him immensely in trying to complete this vessel, and that these small things could be costly overtime projects that can be avoided by submitting this weekly report. I told him I had a few things already written down in my office and asked if he would like to start this process right now. This was my first submitted report:

- 1.** Lighting transformer panels with circuit breakers on the port and starboard side of main saloon have no access with the cabinets being installed. Access panels are vital in order to prevent damage to wood when trying to disassemble carpentry for simple repair of lighting system.
- 2.** Pipe insulation of chilled water lines for A/C system is bare in numerous places through the engine room and under the wheelhouse. Chilled water pump housing is also in need of insulation.
- 3.** Engine room bilges in need of cleaning.
- 4.** Number 3 generator has no lift pump for fuel priming in event of lost of prime.
- 5.** Various number of valve handles are broken throughout engine room.
- 6.** Starboard side roll dampening fin under aft state room flooring has a loose protective stainless steel covering that needs to be removed with the floor being partly dismantled to do so.

DETROIT DIESEL

LEWMAR

7. Davit on boat deck has cracked chipped paint on top of the arm and is in need of repair.

8. Alfa Laval fuel separator has leaks on or in the fuel discharge sight glass area that calls for the service techs to repair.

9. Breaker panels through out the vessel need to be marked in English.

Every Friday evening or early Monday morning I would submit these kinds of reports to Penco. Of course, as time went on the list would get longer and far more complicated. I was amazed at how fast they would move on these issues as I submitted these reports. This was working out better than great. All I wanted was a good solid dependable working engine room that I could have to operate while under way to California, and all they wanted was that final cheque that my boss would owe them upon completing this vessel properly. It was a match made in heaven. We all worked together very well.

About the end of October it was time to do our first sea trial. The boat was not really near to being completed. Only the vital systems would be on line. The rooms and interior were still bare wooden walls and flooring with no furniture on board. The tanks were empty with less than two thousand gallons of fuel on board. The seas were a bit more choppy than what we would had liked, but nevertheless fine. We headed out for the open waters and the throttles were put down for the very first time. Not right away, of course, but slowly, in increments of about 100 rpm at a time. In each increment of 100 everything was logged down by the Baglietto engineers. Finally, we got to the point of 2,100 rpm and those new MTU 4000s were giving the boat all she had. We were up and planing on top of that water as perfect as could be. I saw a top speed of 32 knots. Some say they saw 32.9. Either way the vessel had out done its design speed of 30 knots and the engineers were all very happy.

The sea trial only lasted about four hours. It was just enough time to see how it would handle and if there were any major flaws. It was a perfect sea trial by all accounts. It seemed to defy the law of yachting, without one thing going wrong. I was absolutely amazed.

There were many more sea trials to go with ABS surveys and equipment testing to be done; ABS testing was a blast. We did many things to this yacht that you would never want to do. My favourite part was the emergency breaking test. That was when we took the vessel up to full speed at 30 knots and flipped it in reverse at full load. Not only

once, but a few times. Then we had to test the steering and stability at full speed by throwing the rudder hard over each way. I didn't like that one. If that test would have failed we would probably be dead. The boat took a mean list, but she did well and handled the way she should. We had travelled in reverse for a good period of time and dropped the anchor and chain all the way out in deep water to see if it would hold, and a number of other small tests of the sort were carried out.

Then December came and the yard was scrambling to get the boat completed. They wanted a completion date of the first of the year, to hand over for final payment. Things were getting hectic. I had to stock the boat up with spares and supplies. It was looking like we would be shipping out towards the middle of January 2004. That's when I would receive a great lesson in doing business the Italian way.

I would have to forget everything I had learnt about stocking up a boat in America. Back in the States, if I was in Florida and needed a part that was in say Washington State, I would just call them up, tell them what I needed and have it overnight if necessary. It would be in my possession the next day; and God forbid I did not receive it the next day, I would be on the phone with them asking for the Fed-ex tracking number, trying to figure out as to why I did not have my package and who did what wrong.

In Italy I am not even sure if they have an overnight service. What I would come to learn was that the Italian Government would tax stores on merchandise that they had on stock. So of course all the businesses would keep a very low stock of inventory and only what they thought would sell quickly, which was absolutely nothing that I needed. Also, Italy does not have a return policy like you have in the States. Unless the merchandise was damaged due to the supplier's fault or was not what you had ordered, it was yours. If you bought the wrong thing, that was your fault and you own it now. The best that you might do in certain situations, and talking very nicely to them, was exchange the item. But you would never get your money back if you had made a mistake. I made out my order in a week and handed it over to the yard to purchase all of my items. Fortunately for me the boat was delayed in shipping because it would take months for me to receive all my parts. You cannot be in a hurry in Italy and live very long.

It really was a fortunate thing that the boat was delayed in shipping – not because of

Baglietto's fault, but because we were having the vessel delivered to Ft Lauderdale with one of the ship transporters; they would be to blame in this very fortunate delay. We would need every one of those delayed days to get things right on board as the problems started to mount up.

The boss rolled in around the beginning of January to take possession of the boat. The boat still wasn't really completed, with small problems still being located, but it was agreed that the yard would continue their work after possession and final payment had been taken. That's when the delay in shipping problems would be such a blessing: the plan was that the boat would be shown around five in the evening. The boss would be happy with everything and the final transactions would be made to make him the sole owner of this brand new yacht. Then afterwards he and his guests would take the boat out for the weekend to enjoy. That would also mean that this would be my first time operating the vessel on my own with no help from the yard. My days of study would pay off greatly.

The first night out was wonderful. After doing a few speedy runarounds, we anchored off ChiqaTerra, which was very near by. The next morning it was planned to go to Portdevinera, about 50 miles down the coast. That is when all hell broke loose for me. The MTUs went off the charts with alarms, and I swear the MTU alarms sound like depcon 4 nuclear annihilation threats in process. The electronic system went hay-wire, especially the starboard engine. Every five minutes the alarms started to sound off false readings and errors. I was getting alarms like water in the fuel, low gearbox oil, high exhaust temperature, and so on. It was nerve racking. The engine would then just shut down of it is own accord. The port engine started alarming RCS control failure, can bus error, and so on. Then the stabilisers would start alarming because they were running off of the starboard engine that was not giving the system hydraulic power anymore. Then the wind speed indicator would alarm because someone set it to alarm at wind speed of 20 knots to make my life miserable. Everything on that boat seemed to beep at me and I would jump each and every time.

It seemed like an engineer's nightmare to me. Bells, sirens, whistles going off constantly all around me. I was running around crazy the whole trip trying to make things work and feeling quite powerless over it all as if the boat was purposely toying with me. We turned around and went back to anchor where we had left close to the yard. The next day we dropped the boss

and his guests back off at the Baglietto facility. The boss came over to shake my hand and say goodbye. I thought that this was probably the worst yachting ride he was ever taken in his life with all these problems we had. I was feeling embarrassed as though I was partly responsible for all the problems he was paying me to make sure don't happen. I started apologising to him and told him just that. He was very understanding and knew that I did my best. "No, please don't be embarrassed," he said. "It was all fine". Later, much to my surprise, I would learn how much he had enjoyed that trip. With everything going wrong I guess it gave him this feeling of being involved in the project as he was always trying to help. For the most part of the time during the build he was too busy with business to get involved much. That might have been the first time he would have really felt involved and liked the experience. It went to show me how relative 'good' and 'bad' is, for we do not always know at times.

Baglietto upheld their word and were working very closely with us to get these things right. MTU was called in immediately and I would receive the best lesson ever in electronic repair the Italian way. I would try my best to get a straight answer as to what exactly happened, but never really did. I would watch as MTU changed out all the suspected faulty controls and then reinstalled them into the other engine and see if that then would send the alarm signals. For such high-tech engines I would have expected some more sophisticated technology in troubleshooting these systems, but their way of doing things did work. It took some time but eventually all the faulty parts were located and replaced under warranty.

It was a frantic race against the clock to get out every last bug in the system before our new shipping date to Ft Lauderdale, 20th February 2004. Again, just as it would seem that we had it all right, we would then find something else that frantically needed correcting. By February 15th, we had it about as good as we were going to get it and I was pleased with the position that we were in. We had to travel to France for our shipping date and we were now under way again completely on our own. The trip over to France proved to be successful. There were no problems that would cause immediate alarm. We put the boat in position on the transport and were ready to head to America.

My Italian experience was coming to an

end and I was feeling quite sad as I knew I had to move on. With all the trials and challenges and thrills of victory I had in trying to complete this job, I felt it was about the best time of my life. I enjoyed almost every moment of the experience, even the roller-coaster ride of fear and stress and then the relief of accomplishment and satisfaction of success. I had become the first and only American Baglietto experienced build engineer, as the *Bellissima* had been the first boat to be sold directly to an American client from Baglietto.

Engineer Joel Antoinette

MY EXPERIENCE FROM THE NEW BUILDING OF M.Y. *El Bravo* and cargo ships modifications could give some ideas on what to do during a new build. Let me share my observations:

The new building should be divided into two phases. Firstly, design and documentation. The influence of ships' engineers on this is not so significant, but in my opinion it should be. With the possibility of over-viewing technical descriptions, drawings of installations, pipe diagrams etc., future engine-room staff could give a lot of valuable advice here. Very limited room for appliances should be one of the main factors in how to design an engine room the right way, not only for running, but also for future required maintenance. Well done maintenance, done in the right time, could save a lot of money for the owner. Always look for piping diagrams with torch shows – simple is best! The engine room with all containing engines, pumps, compressors etc. is a source of noise and vibration, which should be minimised as much as possible. It is not possible to move on motor yachts without engines; it is not possible to use the galley, showers, or toilets without water and ventilation; it is not possible to stay on without electricity. However, it is possible to find compromise and build a yacht with smooth working engines, pumps, hydraulics, compressors, and well isolated air ducts with proper calculated air inlet and outlet. The yacht's engineers could share their experiences and advice on what is best, for example whether to install a high-capacity pump, which creates cavities noise, or maybe install two smaller, four- or six-cylinder auxiliary engines; or whether one big A.C. compressor or maybe six compact ones, with noise levels of home refrigerators, should be installed.

This is also a great time to create or adopt

a supporting computer program, including spare parts stock control and maintenance calculation for future engine-room staff. Well made user software could save a lot of money for the owner and keep the engine room in perfect condition for a long period.

The second phase is to bring the design from documentation to reality with the highest quality of work, with friendly but professional supervising. Bear in mind that every single detail is important. Some margin for corrections and modifications should be provided and recorded in the contract of a new-building. Nobody else, other than future engine-room staff, could note and enforce what escapes the designer's attention. What else is also very important? The trials and first hours of running, and correct start-up of the engine-room – which reflects greatly on the next months and years of the vessel.

From the very beginning, from the documentation phase up to running the first pump or engine start-up, the chief engineer should be the eyes of the owner to ensure his satisfaction on his first day on board, with reasonable expenses.

Chief Engineer Ryszard Szawczukiewicz

HERE ARE SOME BULLET POINTS TO CONSIDER when working on a new build:

- To be on good terms with the yard foremen and workers is a must.
- If you see something wrong point it out carefully.
- If you don't understand what's going on, let a foreman or a yard worker explain it to you; they will get a feeling of importance.
- If you see something that is wrong, take it easy, you must be 100% sure something is wrong before you make any claims.
- All external pipings and installations such as purifiers, air compressors, and coolers to be installed should be approved by the C/E or the superintendent.
- There will be one superintendent engineer from the engine maker, to check and approve the engine installation.
- Together with electricians from the yard, the superintendent engineer will connect the engine electronics to the control room equipment. All set points and alarm points to be checked.
- He also has to check all pipework connected to the engine, such as SW, FW fuel and exhaust systems. All have to be installed according to the engine maker's specification, not according to the yard.

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- External lube oil pipes to and from L.O. cooler to be pickled before being connected to the engine. Today most engines have an internal L.O. system, with filters and coolers are usually built on to the engine. It is enough to flush the system before start.
- Usually a new engine is equipped with running in-filters for the main bearings. These bearings have to be removed after 50–100 hours running. Done by the crew.
- Alignment between engine and gear should be checked. Deflection of crankshaft to be checked. After adjustment of engine foundation to good crankshaft deflection, the foundation can be casted by chock fast or similar compound.
- For alignment of engine to gear and deflection of crankshaft, it is recommended that C/E and 2/E take part in this procedure as it is very important for later measurement.
- The service engineer will also be in charge of the first start-up of the engine.
- There should also be engineers to start-up purifiers, control-room equipment, pitch propeller, and air conditioners, etc.
- For the C/E, 1/E this is a good opportunity to ask questions and let the service engineer demo the basics for his installation. (Take his business card for future telephone consultations).

Chief Engineer Göran Dolk
M.Y. Unlimited

I AM THE CHIEF ENGINEER ON A BRAND NEW 60.96-m/200-ft yacht. The vessel was built in one of the top yards in the world, but under seriously 'lousy' circumstances. Strange forces played a large role in these lousy circumstances and at the same time economic pressure forced the yard as always to choose the shortest route (cheapest), most of the time, much to their regret. So here is my advice:

Good Principles

Prospective owners and captains looking to build the 'best yacht in the world' or even just a good solid quality yacht; approach your new build like a business transaction and make sure that at all times good business practices are adhered to. Choose your team very well and do not think that one person can do three people's work. Make 100% sure you use the knowledge and expertise of experienced people and companies to advise you in every inch of the build process; it will definitely pay in the long run. Get help to write a very good build specification and find a lawyer to oversee the technicalities of the process. Make sure there is

a penalty clause for assistance to finish the yacht in reasonable time. Be very careful during the writing of the specification, since at the time of the yacht's completion everything is referred back to it. At the same time, get at least three companies to present you 'their' version for the general arrangement of the vessel – you won't believe the difference and added space some people can find.

Correct Team & Consultancy Firms

Depending on the size of your vessel make sure you hire the correct team and not drinking buddies; 'drinking buddies' decisions always come back to haunt you when you least need it, trust me! Most vessels these days are technical marvels. Make sure that you have at least one highly experienced engineer on the build, and if the size of the vessel allows it, bring in your IT/electronic engineer as soon as possible. At the same time hire back-up to oversee and advise you on all your yacht-building decisions. This may come in many forms, an experienced management company or experienced consultancy firm, etc. They serve as a third party who will hopefully help you build your owner a better yacht.

Lloyds and/or the MCA

Unbeknown to some people, Lloyds and/or the MCA simply do not have the time to pour over every detail of the new yacht. They cannot always be relied upon for 100% working and safe systems, and I have personally found a lot of oversights on their behalf, which really, at the end of the day, is understandable. Double-check everything yourself and get your consultancy firm to do the same; make the consultancy firm add value for the top dollar they ask.

Right Yard & Designer for the Job

This subject is a touchy one; all I can say good luck and make sure you do your homework.

Contractors & Manufacturers

Make sure that when you choose, you leave the first timers and gimmick companies to the NASAs of this world. Use a company with a long-standing track record of making exceptional equipment which works and hardly ever fails. Why all yards and new builds are always so eager to give the guy with the 5% lower quote 'a chance' only to run into serious problems later beats me. Just to mention a few problems of these 'fly by night' companies: bankruptcy, total loss of technical knowledge to make good their 'quoted' promises, and lastly equipment which never works properly or fails very early in the vessel's life span. Engineering

wise; in simplicity lies strength. Follow the KISS principle.

Warranty Periods

It's a pain for everyone. It costs the yard money and eats their profit into non-existence. For the owner it means less time to use his/her brand new yacht. No one wants it and nobody likes it. Through continuous quality control and sound principles it will reduce the amount and time everyone involved with the vessel will have to spend with these unwanted issues. Get it right the first time. GOOD LUCK!

Anon

WITH MY TWO EXPERIENCES ON NEW CONSTRUCTIONS, I joined one close to completion and the other just prior to final commissioning. It is possible that an engineer who is involved with the project from its inception may preempt some of the pitfalls that I encountered, but there are a few areas that appear common with all new builds.

Waste Oil Tanks

On both boats the waste oil system was reasonably well executed for a system that never gets top priority or location. However, in both cases, the waste oil tank was of a smaller volume than the lube oil tank. This would appear to be a legacy handed over from our commercial cousins who readily burn off a lot of their lube oil waste products. For a modern yacht with many systems requiring 50-hour initial services, plus self-cleaning fuel separators, tenders and even the chef looking to renew the contents of the fat-fryer, by the time the first change is due on the mains, the tank is already more than half full and the service beckons. So, you make arrangements with the local agent to have Oil Wastes 'R' Us drop by and relieve you of your unwanted stock, mentioning just before you hang-up that you have a 2-inch cam-lock attachment and the hose will need to be at least 25 metres to reach from the bunkering station to the quay and past the three cars in the 'No Parking' Zone which you requested the day before. Mr Waste duly arrives the next morning, complains that the cars are in the way and hands you a greasy, black, 10-metre hose with a piece of sawn off drain-pipe duct taped to the end of it. You then present him with the cam-lock fitting and he carefully inspects it as if he has never seen one before in his life! Now on our trusted vessel that has been doing the rounds for years, you locate the hose you always use for this job and dig out that box of connections which has enough unions in it to allow you to

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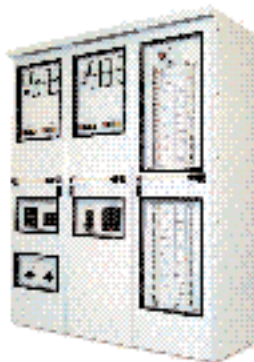
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connect an aircraft re-fuelling nozzle to a steam iron. Unfortunately, on your new shiny vessel, the accumulation of these precious fittings has yet to occur and you must suffer the indignation of begging them from your neighbour (if you have one).

Pre-empting this scenario on one boat, I approached the engineer from the yard who had spec'd the hydraulic system and who was also responsible for the majority of the other pipework. Having asked him what he would recommend to carry as spares, he happily produced the list of fittings that he used in the build. As the yard regularly bought all these unions in bulk and all were readily available, the most comprehensive box of fittings was assembled the following day at minimal cost.

This may appear basic, almost trivial, but it does highlight an area of benefit that cannot be measured – first-hand knowledge from the people who built it. The people who assemble the systems upon which we will inevitably be working on are often justifiably proud of their product and more than willing to share their knowledge of the systems they installed. As I now have the mandatory digital camera permanently in my pocket, I set it to video mode and record that vital piece of information about how to access the set-up menu of the owner's suite remote control. Providing that you can be diligent enough to copy the file to your PC and give it a recognisable file name, this can save you hours scouring the manual when the charger gets un-plugged to make way for the dust buster.

This leads nicely onto the latest new build nightmare – The Password! It would appear that any electrical manufacturer cannot place their product without having at least one password for general use (without which you cannot even turn the unit on) and another for 'Trained Service Personnel Only'. I'll accept that you don't want the whole world to have access to your alarm system monitoring, but is it really necessary to have the same level of security to replace the PCB on a washing machine?

The video/still picture works well for safeguarding against the loss of this tiny piece of paper which bears the hallowed code. So providing that you can remember the password to unlock your screen saver, this information is now safe.

Slightly more seriously, the role of computers and IT in any new build is increasing at an exponential rate, and the installation and management of these systems is becoming a major part of the workload of a build engineer. Without the use of a computer network and the instigation of a planned maintenance system, the chances of the engineer being able to manage effectively the amount of information and equipment that is being installed on the vessel are slim.

Part of the problem is that although the information regarding each piece of equipment is available, the system ordering the equipment and storing of that data is often incompatible with the system being used by the yacht. This means that once the equipment has arrived, the information, specifications, part numbers and service details must be manually entered into the database. To compound this problem, the computers that the yacht will ultimately use in service have often not even been purchased yet to prevent premature obsolescence, and all the information must be entered into one shared PC or a personal laptop as the network system will not be up and running until the boat is almost ready for trials. Whichever way you choose to tackle this problem, identifying that this problem is going to arise and formulating a strategy to deal with it at an early stage means that the battle is already half won.

The final thing to remember is to cancel any aspirations that you have towards a normal life from three months before launch and until six months after delivery. One thing seems to be common to all new builds – if it wasn't for the 'last minute', some things would never get done.

Anon