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Day 1

The Design Forum

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Chairman—Martin Redmayne

This afternoon's Session 3 focuses on the world of design. To my left are three designers from different disciplines, in a way. One is very creative, as Jay just put it, a creative sexy designer and the other two are what they call the theoretical intelligent designers. No offence, Jay. You just do pretty pictures. The three gentlemen are what they call highly intelligent designers who want to look at the world of design today—what Billy was talking about earlier on--was how the world of design will probably change in the current climate from the point of view of it won't be the most outlandish ridiculous world of design, it may be much more intelligent design based on manufacturing, based on efficiency, based on logic perhaps. Without too much more introduction, Jay Miner from the local shipyard Delta Marine Industries will be delivering his vision and 15 minutes of fame on the world of design and then sequentially they'll deliver their own perspectives on the subject. Jay, thank you?

Jay Miner Delta Marine Industries Inc

Thank you Martin for the introduction. I appreciate the opportunity to speak to you today. I hope I can provide some perhaps more philosophical than technical perspective from my experience in the business.

Now we're certainly faced with interesting times. The large yacht marketplace has been affected and transformed in dramatic ways in recent months, and for most this has produced some degree of hardship. For some it's been a near death experience, for others it has been a fatal blow but for all of us it's an opportunity to look forward with a fresh set of eyes, anticipate how we can adapt and improve and see what we're doing, how we're doing it, and perhaps more importantly understand why we're doing it.

Firstly, none of us would be here if it weren't for the clients. Above all there has to be a pleasure in and a satisfaction derived from the process of creation and ownership. Otherwise why would they do it? This is a customer driven industry and it's our duty to listen and act on their priorities. Lest we forget, without them we're all unemployed.

Now the design engineering dynamic has always been an interesting one to me. Depending on which side of the lens one is on, you can see the image with a different perspective. And as a client said to me recently *"Designers are all a pain. But you need them. They bring something important to the table".* Now maybe that shouldn't be an exact quote because when he said they were a pain, I left something out! Now I personally agree with that observation. You do need designers, but that doesn't necessarily have to imply pain. From my experience many designers I have worked with--and I was tempted to say most, but I decided to stick with many—have been great collaborators. And you can have talent without the attitude. Now perhaps we all get too caught up in labels and hierarchy, whether we're naval architects,

marine engineers, yacht designers or as I have seen most recently in the magazines "*yacht architects"*. I know some professionals insist they need more than one label in order to adequately convey their full expertise. But before we conclude we have a unique situation in our field, I might note a few exchanges taken from the architectural world. In a recent interview in the Los Angeles Times, Frank Geary was asked about the distinction between art and architecture in his work. And his reply was *"there are artists who are offended when you use the word art, for a building that has toilets in it. So to support their narrow mindedness I avoid the use of the term."* He went on to say that the words sculpture, art and architecture are loaded and when we use them they have a lot of different meanings. So to keep it simple he just uses the title architect. In an example closer to home, Bill Bain, a local architect who was interviewed by the Seattle Times about his long collaboration with the late John Skilling, the highly respected and innovative structural engineer responsible for many of the high rise towers gracing our downtown core—*"Upon reflection, the best the architect could muster as a compliment was he was the most non negative engineer I ever met".* I had that one framed in my office as a reminder for me to be as non negative as possible.

So from my personal vantage point as the manager for both sides of the process in my organisation but a technical man by formal training, I tend to take a pragmatic approach to design challenges and keep first principles of engineering in mind, no matter how grand the vision and compelling the concept, if you lose touch with the fundamentals, you face the risk of not getting beyond the cartoon stage. That's not to say that what we create needs to be mundane, limited in ambition or repetitive. It just has to be conceived in a fashion that does not promise more than can be delivered. In the yacht world, engineering without design risks mediocrity. Design without engineering risks failure. After all, these vessels still have to go to sea and lives are at stake. I would add parenthetically in response to what I would predict from the design end of the spectrum, they may say engineering without design defines failure.

Consider for a moment the topic of machinery space ventilation. BTUs in, BTUs out. It seems so simple. You move the air, you transfer heat, you support combustion. However, you need to do it in a fashion that looks attractive or does not show at all, does not take an excessive amount of space, does not create unpleasant noise in public areas, and provides a proper environment for longevity in equipment. This is probably one of the most frequently encountered challenges to preliminary design. Where do you place the inlets, the trunks, the fans, where it doesn't interfere with the other aspects of design. This can not be an afterthought, but many times it seems to be. To give a specific case, I once inspected a brand new 100 foot yacht at a Florida Boat Show. I was interested in seeing the machinery space. The only access was a vertical ladder in a trunk perhaps 24 x 24 inches square, it landed on the port side of a pair of reverse mounted engines, crammed into the space bulkhead to bulkhead. I had to crawl over two V drives to the starboard side where the switchboard was located. The switchboard was placed directly below an air inlet trunk and the face of the board was already covered with salt crystals, deposited from the delivery from the dealer's dock to the Show. Granted, the interior woodwork was gorgeous, and the boat looked great dockside. But was it really good design, and a smart overall solution?

Now it's no news to anyone that we have a broad and clear mandate to improve fuel economy, reduce emissions, reduce our industry's impact on the environment and in general to innovate and reinvent ourselves. This is inherently a good development and many opportunities exist that we're only beginning to appreciate, and while the term green yacht may be considered by some of the general public as an oxymoron and yachts in general as unnecessary, it's simply a part of human nature and

expression as thinking creatures to create things. Be they buildings, automobiles, works of art or yachts. It's what marks the distinction between civilisation and mere existence. And although large budgets can support grand efforts, such as building megayachts, it's part of our nature to want to create, regardless of the scale. I for one do not believe we need to apologise for this industry, but would certainly acknowledge that we need to respond to the direction we're getting from the clients to develop more thoughtful and efficient designs. And that to me is a welcome departure from the opulence and *big for big's sake* that has largely driven the market for the last decade.

From my vantage point I see much of the opportunity for advancement in the industry coming from the technical end, even though the mandate is societal in nature, the underlying drivers are based on scientific factors and solutions will be derived from the application of improved understanding of science and engineering.

Now let me give you a few examples of both successes and failures in a technical sense, starting with a bit of 19th Century history. Now for anyone who has known me for any length of time, they'll have some clue as to why this vessel appears on screen and any of you from the UK will immediately recognise this image. As a fan of the Victorian era engineers and I.K. Brunel in particular, I've always been intrigued with this ship. The Great Eastern was a technical marvel in her day. Commissioned in 1859 she was by many multiples the largest ship ever built. The mission statement of this ship was simple, but very challenging. She had to be able to make the trip from Britain to Australia or India on a single load of coal. Brunel's calculations for the size of the ship predicted the need for an enormous capacity for coal. As the technology for steam engines was still in its very early stages, the boiler operating pressures were dismally low, producing correspondingly poor horsepower output. Screw propellers were still an early development so paddle wheels were also utilised to propel the vessel. The result was a floating structure almost 700 feet long, dedicated largely to providing for itself the means of getting from place to place in a self sufficient but rather cumbersome fashion. And though this ship was a structural masterpiece, she was largely a financial failure. A decade or two later, as machinery technology improved, the necessity for this size of vessel with the same mission statement would have been considerably less impressive but much more efficient.

Now here's a more recent and successful example of how improved understanding of the fundamentals can produce dramatic results. This is an image of the new Opera House in Valencia, Spain. This dramatic work by architect Santiago Calatrava incorporates a feature that at first glance seems to defy gravity, and I have to admit confounded me and a few of my engineer companions when we first saw it. Calatrava takes his inspiration from organic forms and the large overhanging structure is shaped like a feather plume. It emerges from the ground on one end of the building and carries over the top in a giant cantilever at the other end. And as I just want to point out here for a moment, that span is a cantilever—there's no support at the end of that structure. It was only after inspection from a number of angles that we were able to determine that this arched feature was supported at the very top of the building with a slender pillar that was cleverly disguised from virtually every vantage point that someone from the surrounding terrain would have. Clever design but also a concept based on simple engineering principles, as illustrated by the relationship shown here. This, for anyone involved in structural engineering, is recognisable as a classic case of beam theory, where there are two support points and a distributed load. Now granted Calatrava's building is more complex than the beam diagram shown, but as a structural engineer as well as an architect he knew there was a way to solve the problem and still convey the dramatic nature of his vision. In other words, he knew the second support was necessary.

Now as an aside, it's interesting to note that beam theory was in its infancy during the Industrial Revolution, and Brunel applied it to his calculation for determining the hull plating and framing of the Great Eastern, as there were no classification society rules to be applied at the time!

But getting back to Valencia. The other critical piece of the solution for Calatrava was the modern application of computers and finite element analysis, or FEA. Given the changes in shape and curvature over the length of that feature and the implication of the associated possible vibrations in a strong wind, the details of construction could not be developed without it. Thus due to the development of FEA we're able to do things with structures that seemed impossible before. Even though the underlying fundamentals have not changed, only our ability to apply them with greater accuracy and more depth of understanding, along with the modern materials that we have now, that have opened new doors.

Is the same thing happening with vessel propulsion and electrical power systems? Are we just beginning to gather technical knowledge we need to develop significant improvements in energy conservation? Perhaps we are. Perhaps the yachts of today are in some respects like the Great Eastern, waiting for that revolution in propulsion. Given emergency developments in batteries, super conductors, fuel cells, nano-technology who knows? Technical advancements can happen unevenly, as we've seen from experience. It may very well be the case that the most important innovation will come from another industry so we all need to keep an open mind. If we keep pushing forward, the next chapter in this industry may be the most dramatic we have seen. So in conclusion—dare to push the envelope, but don't lose track of the fundamentals they still will govern.

Martin

Jay, thank you very much indeed. We'll leave Q & A until the end of the whole session, so Robert, please follow on.

Dr Robert Ranzenbach Donald L Blount & Associates Inc

Thank you very much. Jay, thank you very much for that nice introduction. I won't be quite so philosophical but I completely concur with this issue of engineering the fundamentals. As we move forward in fact what I'm going to talk about a little bit today is the necessity, as people decide they want their boats to go at certain speeds, be a certain size, we're actually losing sight a little bit of historic norms. So I want to talk a little bit about speed/length relationship of various boats that are moving into a gap between what we normally associate as classic displacement yachts and classic or pure planing craft. If we don't engineer the fundamentals as we make this change, because of our lack of common wisdom in that area we'll have a very high expectation of failure if we don't do that.

The other area that we're responding to in our own business is in spite of the fact that yachts may not necessarily be getting bigger there is a decided interest in more passengers and looking at 13 plus passengers is an issue that we have to resolve. And the change in regulatory landscape that that will entail.

So the first trend I wanted to discuss is this--yachts operating in the region between displacement and planing. If you look at the figure that's on the screen right now we're looking at the resistance over speed of various yachts and I think most people appreciate that as the speed increases the wave making resistance of boats actually

changes quite a bit in relation to the resistance. This is the wave making resistance here, you see the classic hump speed that we all sort of appreciate and this is the resistance coefficient of the friction. Most boats, when we talk about hull speed, which is well below this hump area here, are where most boats tend to operate. And then planing craft, if you give enough power, you can extend beyond that point and push the boat harder and faster and you move into a different regime of physics, where the wave making resistance actually is decreasing. What we're finding here is that that we want to be able to describe this phenomenon in a way that isn't dependent upon the exact size of the boat, and so we use a special nature of a number called the Froude number, which I have overlaid here in red, that describes this. Generally when we talk about Froude numbers, it's un-dimensional, it's a combination of the speed of the vessel and the size. So I overlaid that and so we can generally say if we talk about Froude number we can generally speak about displacement yachts of a Froude number of about 0.4 and less, and generally speaking when we talk about planing yachts we talk about a Froude number of 1 or higher. Both of these areas are really pretty well understood at this point by the engineering community. Most people can without a lot of extra analysis and research generate a very very successful boat that meets its speed and performance requirements from 0.4 and lower. The same thing is true for planing craft, where the Froude number is greater than 1, it's fairly well understood science, there are lots of tools and experimental techniques that we can use to ensure that the boat's performance in fact meets your expectations.

The rub is that we're finding, and I'll show this on the next slide, which is a little complicated but if you'll bear with me, on the vertical axis is a resistance per unit weight and on the horizontal axis is the Froude number. So you can see from the Froude number of 0.4 here—this is the displacement speed of boats that we're all familiar with, large craft doing 17 knots as an example, and then above that we see boats above the Froude number of 1, those are pure planing craft. Examples of those boats might be for instance boats like Hermes that was launched just recently, Destriero was a boat that we did in the 80s and Fortuna, which is the King of Spain's boat. Those boats are very very high speed boats, and we understand that pretty well.

But what we're seeing in the last few years is in this in-between range, between 0.4 and 1, boats like Predator, which is the 73 metre vessel about 28 knots with an advance hull form, the X bow, boats like Silver, another boat 73 metres, that boat also has maximum speed about 30 knots, those boats have moved outside of that region of below hull speed and in that area where we have a very high degree of confidence. A little bit on the higher side you have boats that are essentially almost the same speed, roughly 30 knot maximums, but much shorter boats, like Lazy Me and Pure One, that are roughly 40 metres in length that are going 30 knots. And because of that relationship between speed and length it raises their Froude number up to the higher range closer to 1. But they're still in this in-between range. Now the key is why is this important to us? And so overlaid over this you'll see a set of curves. One set is round built boats, and as you'd expect, at the higher speed ranges they had very high resistance. Whereas a pure planing boat has a very nice lower resistance at these higher speeds. But in this in-between range what you'll see is a flip flop in that relationship. And there's some fairly significant differences in the resistance that one can achieve for hulls that are properly designed for this range. And yet when you look at types of boats that are often launched in this size range you see hull forms that tend to have, that look familiar, and yet may not necessarily be appropriate. So this issue of efficiency, that Jay brought up, there's 20% or 30% reductions in resistance possible in this speed range, and we see more and more yachts being applied here. Now the danger of over applying our knowledge about

round built boats is that if you move up into the higher speed range you can actually get into situations where you have yachts that could actually exemplify dynamic instabilities so there's a trade off there.

We were talking about the tools that are available. For planing craft people we have a very nice set of tools to apply ourselves to that problem, and the same thing is true of the lower Froude number range. But in this medium range the tools that we commonly use actually oftentimes are completely inappropriate, and so you have to be a little more, I think most people think of engineering as being very mundane but it actually requires great creativity in many senses. Because you don't always have the perfect tool so you have to be creative about the application and the design of a set of tools to help you design in this speed range. The importance is that if you're a little bit off from using or are reliant on common wisdom then we can have great differences in our expectations which can lead to a lot of pain and agony for all involved. So that if you believe that you can go a certain speed with a certain horsepower and it turns out that your old school approach is insufficient you can have multiples of knots of speed difference missed, which would be quite unfortunate and very difficult.

So in the future I think that what you'll see is a much changed level of analysis and experiments that will be required for designing yachts of this type, to ensure that we meet the expectations of our clients and the performance of the boat.

The last area that I want to discuss just a little bit is the trend towards interest in 13 plus passengers. As it stands now, 12 passengers or less and 13 plus passengers there's a huge jump in the regulatory challenge associated with those two solutions. And it's been a real impediment to the increase in number of boats with 13 plus. We are looking forward to learning more about the Red Ensign group's work in the 13 36 code—I'm hoping that that'll be a topic of discussion later in the week at one of the later sessions. We're very eager to find out, and I'm sure most people are very eager to find out, what will occur there. And with the hope that the step or jump from 12 to 13 will be reduced, and the consequences of changing regulations and the resulting changes in yachts to accommodate those types of passengers.

And with that, I'm complete, I'll pass it on to you, sir.

Jonathan Quinn Barnett JQB Ltd, Design

Good afternoon everybody. I'd like to take this opportunity to thank Martin and Tork and all his colleagues at superyachts events for putting this on and I'd like to thank you for the opportunity to sit before you today and share some thoughts with you.

I suppose when I was invited here as one of the luminaries I kind of felt obliged to shed light on this subject and I have to admit that unfortunately I'm entirely unqualified to speak on the subject of bad design! So I'm afraid I'll try to take this opportunity to focus on good design and how I think that can benefit a project.

The subject topic today, the future of design and the impact of bad and good design and what that has on a project was an interesting one and these are unique opportunities, these get-togethers, and also the chance to speak before my colleagues in the industry—it allows one to kind of analyse what they do, and think a little further into why it is you do it. I guess you get up every day and you do it, but you never really stop and take a breath, and try to figure what your point is.

I'm kind of in the carrot business, I guess. In some senses as a designer I'm trying to build that carrot that keeps that entrepreneur and client excited to keep innovating, and with that building these carrots I work with enormous numbers of designers and engineers and craftsmen, so I'm kind of an orchestrator of a lot of skills but optimism is an important part of what I do. I run a small design firm of 5 people, which I started in Seattle in Belltown which is just up the street from here, very close to where we are right now, in 1995. for those of you who aren't familiar with what I do, or myself, I was going to give you a little background. Over the past 14 years since my original training in London under Jon Bannenberg I developed designs for private individuals and, when one talks about shedding light on a subject and understanding what the impact of good design is on a project, while I was designing for private individuals the project's success is really measured in '*atta boy*'s from the customer. He says *'Atta boy, I like that, that's good*. And he's a happy customer and his family's happy and they have a wonderful life. And hopefully they come back again for another project. But recently I have accepted commissions for several production yachts. And the situation in production yachts is—success is really measured in sales, and it's very difficult in these current circumstances to gauge my new beginnings in that area. But one of the projects I recently completed was for Northern Marine. Now they've sold 3 of their 151 foot motor yachts that I designed for them, the exterior and the interior design—by the way, I'm not a naval architect, so I have to use these guys for just about everything I do. But the exterior styling and the interior layout, and all the furniture and what you have you in this 151 foot series I did for Northern—now I think 3 yachts and the fourth is now under construction in a 2½ year build period is a pretty good measure of success under normal circumstances, but really the current climate right now makes that really difficult to judge, because their success, if all things were equal being maintained chances were that those projects would go on. Right now the jury is out on Northern, I know they have no. 4 under construction but they're having bumps in the road, I'll put it that way. I've also begun work with Crescent, their 144 foot series, which is a brand new production motor yacht built up in Canada. Crescent Yachts has been restructured with a company called World Span, and they also picked up the Queenship facility and they've combined them together and I've designed a new 73 foot motor yacht under the Queenship name. I'm also currently working on a Horizon 64 footer and so you can see a lot of my focus has moved towards some production yachts over the past 5 years.

I am currently however involved in a 55 metre motor yacht doing the exterior consulting and the interior design at Delta Marine, and many of you who are going to have the tour of Delta will probably get the chance to see some of Jay's handiwork there at Delta—they're doing a fantastic job on a new—I call it composite, but it's an aluminium hull and a fibreglass superstructure combined to make a brand new motor yacht there at Delta, shallow draft.

So having given you a little background here, let me say this. If I can help at all to shed light on this subject before us, I guess I can help with my never ending optimism. And a belief in the industrious dreamer, that customer, the client and the fact that whatever happens he's going to pick himself up and keep going in some way or another. I've always considered yachting a sport whether it's motor yachting or sailing yachting, it is a sport in a sense, and a sport with all the same traditions of a sport. At least I wanted to elevate it to that for most of my life. And in this sport the opponent is the banal and the mundane world around us. And the contest is really the playful pursuit of beauty. And I say that because my mantra right now is being happy and looking towards the positive. It's too easy to get down on yourself these days and it's too easy to have people tell you that it doesn't look good tomorrow and it doesn't look good for 6 months. But where's that going to get you? So let's face it,

we Americans we're going to get really bored really quickly with being poor and with following some mandate. It's going to get really easy to excite people after they've heard enough doom and gloom out there. So this forum will provide some of you with the opportunity to visit the Boeing factory. And the picture in front of us is Bill Boeing fly fishing somewhere up in the Pacific north west. Somewhere around Canada I think. And two years ago I had the unique opportunity to redesign the 150 foot motor yacht for the corporate use of the Boeing company, it's now affectionately known as the Daedalus. Now Bill Boeing, seen here fishing, somewhere north of here, came from considerable wealth at the time before Boeing was a company, having made his money in the Taconite business in Detroit. In fact his original yacht, kept in Seattle, was called the Taconite. And flying was a hobby of the very wealthy and putting floats on his creations was really an example of this playful pursuit of beauty and in his case fishing. So after he caught a few fish and probably saw some of the most beautiful countryside he'd ever seen in his life, coming from the Mid West, we got into a nasty war, No. 1, and well the rest is kind of history. Boeing and those float planes had a real place in helping win the war. But during that experience doing the Daedalus I had this marvellous opportunity and it was unique, because I got an opportunity to visit the archives of Boeing, where they store an enormous number of historical records but also fantastic photographs, an amazing photographic archive from the beginning of aircraft flight. I was searching for material, both for inspiration for the design and also ultimately to serve as artwork aboard the yacht when it was complete. And I came across a record of photographs, taken mainly by some of the engineers of some of the testing they were doing on the aircraft which was the original China Clipper. It was actually more boat than airplane but it was a fantastic aircraft and it had bollards on it and a captain with epaulets and a hat and very much a ship as much as it was an airplane. And they took off from Lake Washington, right here in Seattle and they were built on Lake Washington, at the bottom end. But what really struck me about them--and I show them here really to illustrate a point--these were photographs taken by engineers of their work, to document it, but they really showed some amazing detail. This one reminded me of an Ansel Adams photograph of a mountain range but taken by an engineer as a clear document of the work they'd done but this is inside one of the engine casings, that's the back of the engine mounted head of it and the fuel lines and the air lines and the rest. And when I think of Frank Geary and I think of design, and I think of architecture and what have you, these kinds of structures, I get the same sort of warm feeling when I look inside how a bulbous bow is fashioned, or I look into the way an engine mount is done. It's a remarkable thing, these yachts that we build. And I think all too often some of the detail such as this is not documented carefully. Once it's covered up with insulation and linings--and as a designer of interiors I'm often credited with covering up all Jay's beautiful work--but behind the scenes these are amazing vessels. And I thought some of these photographs, which I framed and used on the boat, were a thing of great inspiration. Boeing is a company of engineers, that's effectively what they do. So I wanted to make the point at least that in the essence of this photograph, and really the core of my work, the simple fact is it is the essence of good design if that's a part of a project, is in the details. It really is the details. And they're clear here, but maybe hidden from view.

So in this playful pursuit of beauty there is nothing sweeter than exciting detail. And value for a client is added to my work for the enlightened clients willing to invest in it when those details are unique and individual to that project. Once I have inspiration derived from each client's individual taste and the lifestyle they wish to pursue be that technological or romantic I begin to find materials and shapes that reflect those ideas. 5 years ago satin nickel was my metal of choice. It had a wonderful romance in the marine environment and it was something I'd seen many times on old ships and nickel content in many metals was what protected them from corrosion. So nickel

seemed like a really reasonable metal to us. And unfortunately I kind of used it to death and so did everybody else after a few years and now satin nickel is really the material of choice in any hardware store, if you go there. But at the time it was new, and I sought out something that would be different and a way to use it. Now I've recently fallen in love with matt bronze. It reminds me of old cannons in the 19thCentury deck fittings and the things that reminded me of yachts in some way. It has a wonderful almost satin nickel feel, but it has a warmth to it, and a patina. Not antique brass or antique bronze that you might see, but just matt bronze. Just clean, as it if was new. But it's still bronze. A totally unique custom door handle such as I'm showing you here sets the stage for many more parts, and details to follow, this is from the new 180 foot 55 metre I'm doing at Delta. Once you liken to a particular period or interest or style or what have you, it flows from some of those things and some of these unique details are that. And in the hands of excellent craftsmen and first class engineers the execution of exquisite details with precision is what defines a yacht. It's what sets it apart from every other product you might buy. As opposed to a ship or a boat. And raises the banal to a thing of beauty.

In addition to my love of great detail and how it elevates our work to a high art form, I spend an enormous amount of my energy in the pursuit of good design of light, and using light. And how to manipulate the natural and artificial sources to complement the art of the design. In looking towards the future I think this is an important thing to study. We've had a lot of enormous and excellent changes in the lighting business and how to use light in environments and in spaces has become probably one of the most important parts of my work at the moment. In 2003 I accepted a commission to rebuild and redesign the private estate home for Mr Francis Coppola, the movie director and his family, in the Napa Valley. Sometimes I get away from boats if it's an interesting project. Especially if it's nautical. The original home was built by a ship's captain in the 1880s in high Victorian style. Utilising original stained glass windows I discovered on the estate in different places I flooded the dark panelled interior with natural light and then we created these modern LED fixtures to replace the old gas lights at the bottom of the staircase, to provide a romantic warm glow at night, something that’s hard to show in a drawing, you have to mock it up and explain it to somebody. And when they see it they realise why you were spending so much money on the details. It's because it's about the romance, and it's hard to put that in a spreadsheet, and it's certainly hard to put that on an invoice. But it's critically important.

So staircases which connect decks can be a very important unifying element in a design, and truly functional, but also thematically aesthetic. The theme and the aesthetic are really important. If you're able, and this is a computer rendering of a new design, if you're able to connect the bottom guest foyer of a deck, which are so often dark and confining spaces, to the main deck entry by way of sky-lighting the glass elevator shaft and using reflective surfaces on the walls and open stair treads, as we are doing here aboard our new project, now in build, you can invite people to explore new spaces inside the yacht and fill the spirits of any man in this pursuit of beauty. So bringing that natural light all the way through the boat can not only connect all decks, thematically, but it also has a warmth because it connects the owner to the boat, it connects the individuals experiencing that space to the boat. They don’t feel they're going into a dark cavern any more. They feel like they're just as well as on deck, when they're on the main deck or the upper deck. This can invite one to explore.

Another challenge for us is with new future details is in the use of LEDs and low power lighting. We have the requirements in emergency lighting in order to put them all over the boat that are critical but in this case full of low power consumption we can

also make a feature out of them. And in this case the trace lights were used as a decorative architectural element along the baseboard. To find your way out of the boat they were on the emergency circuit but why turn them on only then? They're so beautiful we use them, we leave them on all the time. And they're actually a kind of playful detail that made the interior both functional and safe, but also more attractive. My office has considerable investment right now as I'm sure many of yours do in the latest computer software for analysing the effects of lighting as I talk about that subject, natural and artificial, on both the interior and exterior of yachts. So getting the light positions right in the computer model as you can see here, or off-centre, or what have you, is something you can study early on. And we're at a really unique time in our industry where running some of these tests and some of the software allows us to avoid mistakes and pitfalls that we would have made before. So there's never been a better time to build a quality yacht than right now because we have all this technology at our fingertips. As Mr Gooch explained, lights underneath the hull, you've got to get them in the right position. Well, I don't want to be critical of whoever installed those but we run tests on all our exterior lights before we ever put them on a boat, on the overheads, and underneath the boat, with computer model simulations in order to see just what the lights are going to do and make sure we don't make that mistake, because it's pretty costly, as you can imagine. We have considerable investment in the latest software and that allows us to do things like study headboards and lights within a cabin. This is a computer model, and all of the fabrics and materials within that space are real fabrics, bedcovers, headboards, real light fixtures and the real wattage on that light fixture. The down-lights and the rest. And if we don't like the way the colour comes out, or we don't exactly have the balance of it, we can try another light, we can try different surfaces, we can try different colours on the beds, we can raise and lower things until we're happy with what we're getting. It's important, when a client is spending that kind of money, to be sure that you don't make mistakes.

And as I said before, I think this is an exciting time to be building boats because we have this technology at our fingertips. So I want to say that I've always believed that quality is a noun and it is a thing that one recognises right away and the simple act of every day things, like washing your hands in a washbasin, and as you walk up, if the tap is just right and the feel is just right and the water pressure is just right, and all of those things, you can't put your finger on it but it's a thing, and you recognise it, and you feel it, and you feel good about it. And it's that interaction with luxurious details made possible by good design, that a great lucky guest, or in the case of Mr Gooch, as he said, a proud owner—and I like to hear that—a proud owner, he can feel honest, genuine, unashamed happiness in the playful pursuit of beauty. Malcolm Forbes once said that opportunity is when ability meets circumstance. And I feel that we as an industry and the world as a whole right now has a unique opportunity in this circumstance and that is because we should be very happy. We have amazing new designs ahead for us, we have marvellous opportunities and new materials and great engineers to work with, we know more, and we know more at this time in our lives than we ever will to make this a better industry and build better products. And so I think it's an opportunity for some awesome cross fertilisation and a lot of that has to do with the internet. My clients are more intelligent and more informed and better informed as buyers than they ever were before. They come to me and tell me exactly what they want, because they've seen something on the internet, or they know how to get that piece of furniture, or they know exactly where that carpet comes from. And a lot of the middlemen are actually being put on the side and I'm getting much more direct conversation and input from my customers. I think that's going to make for better products in the future, and I'll do my part to see that I keep that optimistic spirit. So thank you very much.

Martin

Jonathan, does quality ever have a price limitation? In the current climate?

Jonathan

Does quality have a price limitation? In today's climate it absolutely does, because what I'm finding right now, at least, is that a lot of the things where there was such an enormous amount of let's say enthusiasm for a particular detail, there are companies that probably would never have priced that in that way before and are now willing to negotiate and bargain, and if you show up at the table with more than one quote you'll find they'll go even lower. And I've learned that from my clients, not necessarily myself. I was always intimidated by a lot of the artisans I worked with, they were unwilling, let's say, to go any lower. But I've had customers push me recently to get another quote, and I find out there's quite a lot more round there. So that's either an example of how hungry they are or the climate as a whole, but there's certainly some corrections going on in the costing of quality these days. But I think there's excellent quality available at a reasonable price today and you don't have to pay exorbitant prices for good quality. It can be done with good design. And good solutions. Another thing is—I don't think you just throw money at the problem.

Martin

OK. Any questions from the floor, please? Wow, it's a ghost town.

Jay

I wanted to make one observation. Relative to what's going on in the industry right now. I think part of the advantage we have with the reassessment that's going on is that the clients are becoming more open to ideas that perhaps they wouldn't have been in the past, and from a technical standpoint relating back to the topic of hull design—you know a couple of years ago we had a client come to us requesting a concept for a motoryacht that was fast, shallow draft, fairly significant size, ocean capable, and we looked at all the controlling parameters and I concluded that what this client really needed was some sort of hybrid multi hull concept. And there are a number of yachts out there that follow this sort of design brief but the client was too caught up in convention to go down that road, because their peers were running around in the big white boats and even though from a technical standpoint maybe that solution was better, they weren't willing to take it. So I think what we have now is maybe an opportunity to reassess some of the decisions that have been made and instead of operating in this puzzling zone that so many yachts are finding themselves in, you know maybe there is going to be a bit more open mindedness about solutions that are in front of us, that maybe we can take now because clients are talking about fuel efficiency as a higher priority than they used to. One of the first questions we get asked when somebody comes in the door and we sit down in the conference room is—how can I make my yacht green? Well, how do you make it green? One of the ways you define a green yacht would be a fuel efficient yacht. So some of these technical solutions which are there, all we need is a different mindset on the part of the clients to embrace them in order to take those sorts of advantages that we have right in front of us.

Tork Buckley

Presumably you have to make some degree of compromise on that? I mean Silver, for example, is extremely efficient, startlingly so. But it's also very low volume and very narrow. So I also think it's probably one of the most spectacular yachts ever produced but—

Jay

Yes, to me a great concept. I've never been aboard but that concept to me I've been attracted to because it's a leaner approach to a vessel that goes fast but in a more efficient manner.

Tork

But it's also a very conspicuous extravagance in the same way as Limitless is, in that for its length, and therefore its price, it doesn't give that much. It's like a wonderfully exotic sport car—totally gorgeous, but on the other hand you don't get as much accommodation as you would get on another 80 metre yacht.

Jay

It's interesting that both boats that operate in that speed range and in that size both have really looked at essentially unconventional approaches to their solution, because you can't just push a boat faster and faster and have it be efficient, you have to look at different options.

Tork

So therefore, I mean, in the current climate can we look towards inspiring owners to be so extravagant?

Jay

Well, it's a personal choice, but I guess my point being that there are options out there that may be the owners are more willing to consider because the yachts that we're seeing coming on line right now, by some of the noted sail boat designers who have a reputation for conceding more efficient hulls, you're seeing configurations that maybe a few years ago were considered not appropriate to the yachting community at large when you consider what the common denominator was for a configuration. So I think it's expanded the opportunity to suggest alternative solutions for clients that they were just a little bit too ready to close off without fully exploring.

Jonathan

It may also be related to the types of clients—I mean we talked a little bit today about how the perhaps the fad client is fading and the more committed yachtsman is more interested. There'll be more opportunities and more resources within the industry that bring to bear on more interesting concepts and solutions.

Tork

Certainly in the case of Predator it was far from being an experienced passionate yachtsman. It was a first time owner who wanted something fast and unusual. I mean, power to him, he created something quite wonderful. But he didn't fit that profile. The owner of Silver probably did.

[From the floor]

Yes. Jay and Jonathan, we're currently building a 280 foot yacht down in Chile and before the crisis the owner had a pretty big budget for the interior which went out to bid and the designer well, is a perfectionist, and so he spent days and days and weeks coming up with a beautiful design and then shows the owner that design costs just that features a couple of million dollars here or something. So I think the climate has changed a bit, maybe how in some cases designers have to work with shipyards in that if there is a budget maybe in today's world they have to stick with that but it's sure a challenge to have perfection yet not changes to those budgets. I don't know if you have to deal with those same kinds of issues?

Jay

The dollar is relative, human nature is constant. So it doesn't really matter what the budget is. You're still going to be always challenged with that dynamic. We've never had a client come through the door who wasn't concerned about budget. The budget might have been different, but it's something that we're all challenged with. And when it comes to the interior, part of what I see as a successful approach is to work collaboratively with the designer to make sure that we're not compromising the essence of the design but inviting our production people into the dialogue directly with the designer so that they can show ways of producing the effect in a more cost effective manner. So I think one of the keys is making sure the production people work closely with the designer.

Jonathan

I'd say exactly the same. That those production meetings are really critical. Fortunately for myself and having a firm here, Delta is more local, so I spend as much time as I can down at the yard brainstorming ideas and ways that we can maintain the effect but reduce the overall complexity of the cost. You know a carpenter will chip away at something gladly and come up with some fantastic solutions, but design is your friend, and you can find ways to minimise his reworking or hand-carving, and those sorts of things by some of the technology that we have today. I'll tell you a funny story—I went to Delta one time, I'm not going to say the designer, but I was down at the yard one day and I was going through the cabinet shop and I saw this beautiful mock-up of a guest bulkhead with a door and with a ceiling detail all lit up and what have you in the cabinet shop. And my project—not this one, but this was some years ago—my project didn't have any mock ups like that. I said wow that's really neat, you're building that mock-up. I mean what did the owner think? He said this isn't for the owner. This is for the designer. And I was shocked. I said but the designer needs a full size mock up of the interior to make a decision on what colour to use here or how to finish that detail there? Doesn't he have it in his head? Can't he do it in the drawings, can't he use his computer models? What do you need to mock up stuff for him for? Maybe to convince the owner? I guess I work a little differently from others, but I have seen that, where designers have to put their hand to their head and figure out what they're going to do next, and what have you. There's plenty of them that use some special formula and can spend an enormous amount of money really easily but we try to listen carefully to the customer and I can only speak for how we do it. And we mock up a lot of stuff ourselves on the computer, we do a tremendous number of renderings, we probably had fifteen meetings on the owner's dashboard with various renderings in order to make sure his dashboard is important and right on the boat. Jay will recall some of

those meetings. But that’s the most important place in his whole world. It's the most important space in his entire life. He spends incredible amounts of time building businesses and working on all kinds of things, but if you don’t get his dashboard on his yacht right, you really have screwed this thing up. And life isn't as good as it could be. So I guess working together with the yard, working together with the carpenters and craftsmen is critical to a success, without a doubt. You can't live in a vacuum and be a *prima donna*. There's no point.

Jay

I would have to say that from my experience that sometimes mock-ups still tell you things that you don’t see on the computer. And what we have to realise with a lot of these clients is they may be brilliant in their field but when it comes to assessing something on an interior, no matter how beautifully you’ve modelled it on the computer sometimes they still want something that they can physically touch. And it's the same thing when we do a hull or an exterior. We can do all sorts of beautiful renderings on a computer and print copies for the conference room table, but what they really want is a physical model that they can move around and touch and assess. It's part of that tactile aspect of human nature to want to interact with something. And I don’t think you can entirely get away from it but I agree, the more you can do on the computer the more you're going to be cost effective in the total process.

Dan Wood Crow's Nest Yachts

I'm a broker here in Seattle with the Crow's Nest, and Martin I don’t think it was dead silence, I think everyone was absorbing what this panel had to say, this pretty esteemed panel here. In a previous life I was plying the seas, in the Baring Sea I should say, in a steel boat and the newer designs are coming up with plum bow and now the X bow. And my question to the panel is we had a technical term up there, and I don’t know if it's the same that you guys use, but when the shit had hit the fan, how do these bows react in like critical situations in big seas? Has any tank testing or anybody had one out?

Robert

There's been substantial tank testing of the X bow. It was actually developed by a scientist who's associated with tank facility, but as a general statement those types of bows are actually quite good in the sea way. A few designers feel really strongly, I know Donald does, about ensuring that the forefoot actually stays in the water as much as humanly possible, so you don’t get that kind of in and out slamming type loads. So the X bow has been very well validated, both for superyachts but also it was actually looked at for large ships as well when they were looking at extreme seas for survival conditions and things like that. So those papers—there's a quite a bit of availability and literature for those studies. Does that answer your question?

Jay

I guess the question I'd have to ask myself when I'm looking at a hull shape like that is how much is the owner on board when the conditions are as you colourfully described? And my guess is that for the most part the owner is not on board. And when the owner is on board, what are they interested in? Something that deposits salt spray over the entire vessel under moderate conditions or something with some bow flair so that the people on board enjoy a more comfortable environment during the majority of the conditions when they're on board? So as a naval architect

designing a military craft as opposed to a naval architect designing a yacht, I might approach the bow design differently even though I'll accept from the ultimate sea keeping standpoint there may be some merits to the X bow. I guess I'd have to put myself in the category of if not being a sceptic, because I understand the principles involved, at least I'd like to know what the operating profile was when the owner was on board before I made a recommendation of the bow design to them.

Martin

Right. We'll wrap it there for the design session. Gentlemen, thank you very much indeed.