

GOLDRING & GOLDRING P. ATTORNEYS AT LAW GA.

ENGINEERING ISSUES: HOW TO ADDRESS THEM MORE EFFICIENTLY FROM LEGAL AND ENGINEERING PERSPECTIVES.

One of the most contentious, expensive and complex areas of the superyacht industry is contract drafting and implementation. The primary reason for this is the inability or simple failure to sufficiently integrate engineering design and concerns into contracts based upon cutting edge technologies which result in many disputes as to performance and responsibility as well as compliance with an ever increasing and baffling complex regulatory scheme.

The industry has, in just a few years, come a long way from defining paint finish in terms of glowing and sexy terms, such as “highest European yacht finish”, but lags seriously behind in “engineering”, if you will, appropriate clauses when dealing with the design and implementation on integrated systems.

I must pause here and provide you with a bit of perspective as to where lawyers come from and how it can really foul up (no pun intended) what would seem to be a fairly straightforward exercise.

Back when I started practicing law I was engaged to address an insurance loss on a 118 foot motor yacht where a connecting rod had shot through a new engine creating a fine spray of diesel fuel which, in turn, created a rather large blow torch creating enough heat to cause the carpeting in the main saloon (living room) above the engine room to combust. As I entered the engine room I said to the insurance adjuster, “I bet you never knew a lawyer that knew his way around an engine room.” He replied, “I never knew a lawyer that could fit in an engine room!”

That was about 30 years ago and was a very valuable lesson. ***Lawyers don't know much about engines or engineering.***

Essentially most lawyers take the approach that they do not need to know engineering concepts or systems integration because they hire experts for that sort of thing. Worse yet, the very industries they are supposed to be working in have little respect for them and are considered fat cats that exist only to make the lives of others miserable. It is a formula for communication breakdowns and, therefore, the nurturing of conflict. (If you don't admit the problem, you will never find a solution1)

PAIN

A few years later I was involved in a case where a freshly painted yacht began experiencing bubbles in the paint...bubbles that when burst oozed water. And then sheets of fairing (the compound below the paint that makes a yacht's surface so smooth it looks like a mirror) began to peel off. How was this possible when the yacht was painted in a dry shed? There was not a metal or chemical engineer in sight; just a poorly educated painter that claimed he painted the yacht no differently than all the others he had.

The answer to the problem – I was to “learn” – was electrolysis. I mean that is what I was “told”. As a lawyer I would be scratching my head about what “electrolysis” was, but as a scientist I, fortunately, had a clue. But I could not understand where the electrical current was coming from...and there weren't any “experts” that were involved to tell me.

After much head scratching I found that two aspects of the “integral system” were defective: (1) the screws used to reattach the cap railings and various fittings were stainless steel and (2) the primer used to bind the compound to the hull was applied in the very humid Florida heat. Both of these problems could have been avoided if the Owner had taken the time to assure that specifications were drafted that took into account that he had an aluminum hull.

What had happened was that the use of stainless screws created the electrolysis that allowed rain and seawater to get behind the compound. The compound, in turn, had never truly adhered to the structure to begin with...because the ambient humidity suppressed the discharge of volatiles in the chosen formulation and, thus, required a longer setup time than was provided.

Before I discuss what should have been done, fast forward about 20 years. I was at a superyacht conference in Amsterdam in 2007 where contract provisions were being discussed and, in particular, paint contracts. Why? Because these multimillion dollar contracts (just for the paint) are the source of the most disputes and litigation in the industry.

I sat there and listened to a number of truly top of the field attorneys discuss the quality of the paint finish in their contracts being “highest Northern European yacht finish” or, in some cases, using a sample paint panel or another yacht as the measure. I paused before saying that I recall when it was “yacht finish” and then “highest yacht finish”, and that paint panels can degrade over time and/or formulations are altered.

In short, the lawyers were still writing contracts that laid the groundwork for conflict rather than defined the system in specific, engineering (if you will) terms. And with that someone in the back shouted out, “How about bloody good boat finish!” Point made.

Let me give you some real life examples of contract language that “works” and “doesn't work” and, of course, allow me to explain why.

The Shipyard shall not deviate from the requirements of the Plans and Specifications without prior written authorization by Purchaser. If Shipyard wishes to deviate therefrom, Shipyard shall clearly set forth the reason for, and advantages of, each proposed departure therefrom, the increase or decrease in the Purchase Price, if any, the change in weight and moments and centers caused thereby and delay in the Delivery Date, if any, (as defined below). Said proposal shall be submitted to Purchaser in writing and same shall be promptly reviewed by Purchaser. Purchaser shall signify its written acceptance or rejection of same on a true copy of Shipyard's proposal, same being forwarded to Shipyard within fourteen (14) days of its receipt by Purchaser. If Purchaser does not so respond within said 14 day period, then the proposal shall be considered rejected; and Purchaser shall not be considered in default of this Agreement.

(a) If the Plans and Specifications do not contain the specificity required for the completion of the Vessel, or any part thereof, or if they contain an error, conflict, discrepancy or omission, Shipyard shall promptly notify Purchaser of the plans and/or specifications needed and/or requiring modification. Shipyard shall use due diligence in determining same and in notifying Purchaser in such a manner so that there will be no delay in the Delivery Date. Contemporaneously, Shipyard shall advise Purchaser in writing of change in weight and moments and centers, same being without delays in the Delivery Date. Purchaser shall promptly review the proposal, signify its written acceptance or rejection of same on a true copy of Shipyard's proposal, same being forwarded to Shipyard within fourteen (14) days of its receipt by Purchaser.

As you can see, there is a rather explicit deferral of anything technical away from the contract, but it is incorporated into the contract anyway. While that makes practical sense as you don't want to have a 600 page base contract, what it does is create a situation where lawyers and technical people tend to go their separate ways. The lawyer's contract is, obviously, done and the technical data (if it really is technical) is slapped on the back as "Plans and Specifications".

Now, looking at the Specifications, I have highlighted a number of terms. Discussing them individually is not necessary, but a few are worthy of talking about because of what is said...or what is omitted.

PAINTING AND VARNISHING

In general only best quality marine finishes shall be used in the vessel. The builder is to ensure that all coatings are suitable for the material and application for which they are being used. He will keep a list of type, manufacture and color code of all paints used for future matching. All products will be applied in dry warm conditions to cleaned grease-free surfaces as recommended by the manufacturer. Colors will be to owner choice from standard manufacturers color charts. AWLGRIP paints and filler will be used throughout the hull and deck, or alternate to Owners choice. Paint manufacturer shall specify all finishes, filler, primers, etc. including their method of application, thinners and solvents to be used, humidity and temperature limits during application, curing times etc. The paint manufacturers representative shall approve all stages of application. At least 10 coats of varnish shall be applied.

Aluminium Preparation

After aluminium work has been completed and exterior welding surfaces ground flush on hull topsides, superstructure sides, and cockpit areas, aluminium surface will be sanded or wire brushed, washed with deoxidine, and then alodine, with washcoat primers and barrier coats then being applied. This procedure shall be used for all bare aluminium on exterior surfaces above or below waterline. As part of Owner's manual, a final prep and procedure list shall be supplied giving exact directions as well as manufacturer's address and material used.

Hull Fairing

After hull has been properly washed and primed, Builder shall fair hull from deck edge - rail cap, down to keel area using suitable light weight filler, microballoons or equal. Fairing shall be kept to a minimum to reduce weight. Fairing to be done to a high-grade yacht finish and as per standard yard detail. Once fairing has been completed, Builder will apply primers and undercoats per finishing list as stated in these specifications.

Topside Painting

After hull fairing has been completed, and appropriate undercoats and primers applied from the manufacturers as stated earlier in the Specification, the Builder shall apply one (1) coat of undercoat material and two (2) coats of final paint to entire topside and transom area. Final finish of paint shall be full gloss. Colour of topsides to be chosen by Owner per standard colour list of suppliers. Paint finish will be of polyurethane type by Awlgrip.

Boot Top

Builder will lay in boot top with exact location as determined by Architect. Boot top itself shall be a solid band of colour located between the topside paint and the bottom paint. Boot top will be laid in with an increased dimension rising towards the bow as shown on profile.

Note: Awlgrip system to be installed as per manufacturer specs.

Obviously what should be done is utilize terms that are used in the industry to define everything from thickness to smoothness to shininess. In fact, it was incomprehensible to me how multimillion dollar paint contracts didn't set out such obvious (to me) things as detailed specifications for each coating, fairing material, etc. And, in the end, measure what seems to the layman as being a very subjective thing: Does the paint look pretty...with known engineering terms such as:

“Instrumental gloss” - How much light is reflected at the opposite angle

“Distinctness of Image” – How much ripples, orange peel, micro-scratches, hazing, affect the gloss.

“Quantification” of ripples, orange peel, etc. based upon a per square meter basis and, to be sure dependent on various parts of the yacht. For it would not be fair or practical to require the same level of near perfection in areas that the public will never see up close.

And defining color by specific lightness factors and yellow, blue and red spectrums (yachts are no longer just white) rather than by colorful marketing names like Awlgrip's Sky, Empress Marlin and Ice Blue...as opposed to Blue Tone White.

EXHAUST SYSTEM

In a more “hard” engineering situation a case study is most helpful. To appreciate the engineering difficulties a quick look at some yacht engine rooms is worthwhile. For as they say, a picture is worth a thousand words. And these photos show cramped, low ceilinged spaces focused more on “looking pretty” than being functional. And, as this last photo shows, what the ultimate result can be after years of mismanagement and slap-dash repairs can look like.

In this case study, a 192 foot superyacht engaged in the modification of a yacht's propulsion system, exhaust system and discharges; all being performed contemporaneously, but by different entities (outside vendors, the shipyard and subcontractors) with different design criteria and performance standards.

As tends to be the case when you bring your car in for service, a repairman claims to know what the problem is and how to fix it. If he is wrong, you get to pay him and try something else. If he is wrong again, you get to do it again.

And then you may well be left with an even more complex issue because you not only paid for unnecessary work, you have changed the variables and, hence, have made actually engineering the solution potentially far more complex.

From a systems perspective, the engineering must be coordinated and complimentary. In brief, the limiting factor essentially comes down to exhaust flow and back pressure at various points in the integrated system. The engine manufacturer's focus is not on what is down the exhaust line, but rather its needs at the engine's terminus. What occurs thereafter is not of its concern.

Meanwhile the exhaust manufacturer must engineer a system that fits within the cramped confines of a superyacht's engine room...with its notoriously low ceiling height wreaking havoc on its design, so that it not only is capable of meeting the engine manufacturer's requirements on the one end, but the muffler/silencer manufacturer or custom engineered design on the other end. And, of course, it must be pretty...because it is a superyacht.

However, the muffler/silencer contractor is concerned primarily with noise suppression (which does not like back pressure) while designing a system that provides sufficient back pressure for the engine.

But at the same time it must provide sufficient flow for a wet exhaust system...but, alas, a sufficiently protected system so that backwash from rough waters do not infiltrate the exhaust system (or is that the responsibility of the exhaust manufacturer...or is the shipyard?)

This, of course, must mesh with the wet exhaust which must be both stylish (it is a superyacht) and functional from a sound and smoke perspective.

With this convoluted background, contracts must be created which balance the desires of the owner (who simply wants what he is paying for) with the practicalities of dealing with contractors who know the owner has more money than they do and do not want the exposure if their engineering is incorrect against the economic realities of limited budgets and profit goals.

The engineers know of the problems, but do not take the steps necessary to address the issues fully. An example is the MarQuip B.V.'s website

*Due to our vast experience with numerous refits, we understand that it takes a different kind of approach then during new build. **From changing only silencers to overhauling the complete exhaust system of main- and generator engines**, we have delivered them to the satisfaction of our customers.*

Tips for a success full exhaust refit:

*1. **Be early** - It is imperative to contact us well in time before the yacht arrives at the yard. **Our engineers are very creative in finding space for all the new components.** But before we can make a custom design that works efficient, we really need your information as soon as it is available to you.*

*2. **Get as much info as possible** - For us to design the optimal exhaust system we would like to have the engine room as build drawing in DWG. **We also would like to receive from you the engine output data as extensive as possible.** If the refit will include an under water exhaust, we also need **the wave pattern at different speeds.***

*3. **Check the available data** - In our experience **data can change after delivery of the yacht.** Please check all data on accuracy.*

This is, in reality, but a baby step that if integrated with **A LAWYER'S PASSION FOR FINDING HOLES AND AN ENGINEER'S PASSION FOR FINDING SOLUTIONS**, something a bit more elegant can be achieved.

For example:

*It is an essential and material term of this Agreement that **all materials and services provided by the Contractor shall be considered part of an integral system** which involves a number of different suppliers of materials and/or services and which, due to the nature of working within a yacht environment, **may be subject to change or modification; which is specifically acknowledged and accepted by the Contractor.***

*The Contractor shall be **required to interface with all contractors working on this integral system** and shall provide each contractor not only raw data and requirements of the supplied material and services, but any particular or **specific information which may have an impact on the materials or services supplied by others.***

*In that regard, should there be a condition which is anticipated or discovered that requires the modification or alteration of a portion of the integrated system, the Contractor shall interface with the Owner's Representative and all relevant contractors to determine the most cost-effective and performance efficient solution(s) which shall be submitted (including all reasonable alternatives) to the Owner for its approval in accordance with the terms of this Agreement; noting that the **Contractor is responsible for specifying the materials supplied for this integrated system.***

*By way of example, and without limitation, **an engine supplier must provide the Owner and the contractors ranging from the engine room ventilation contractor to supplier of the through-hull fittings** with any and all specifications and data which it reasonably believes may have an impact on the performance of the other contractors materials or those of any aspect of the integral system beyond the terminus of the Contractor supplied materials. **If, for example, the moisture content, temperature or chemical content of the exhaust discharged from the main engine is such that it may adversely impact upon the anticipated performance or useful life of the designed and approved silencers, baffles, ducting, through-hull or other fittings or exterior finish,** the contractors shall work together to find a joint acceptable solution at no additional cost to the Owner.*

The Owner represents that each contractor engaged to supply services and/or materials on this integrated system shall have entered into an agreement with identical or substantially similar provisions.

CONCLUSION

What we need to do is *CHANGE THE DISCUSSION*. We need to direct those who are involved not to look to a single Specification and say, "I complied, so it is not my problem!" It keeps everyone honest and working with something more than a monocular view.

I believe formulating and nurturing these interrelationships from an engineering perspective and with a sufficient scientific approach, it is possible to do business (especially important in this economy), at a profit, and without setting up conflict. Obviously, if these interrelationships are not appropriately considered it can be an engineering, legal and ownership nightmare.

Eric J. Goldring, Esquire is a graduate of Union College (N.Y.) Bachelor of Science, Biology with Honors, a member of Sigma Xi (The Scientific Research Society) and a graduate of University of Miami (FL) School of Law. He is a member of the New Jersey and Florida Bars. Mr. Goldring specializes in maritime matters, with an international focus on the superyacht industry concerning issues of construction, refitting, chartering and ownership. He is also the former co-owner and Managing Director of Australian Yacht Builders Pty. Ltd. of Brisbane, Australia which was engaged in the design and construction/refitting of superyachts and commercial catamarans. Mr. Goldring regularly lectures and appears on panels concerning a variety of issues facing the superyacht industry from regulations to design to contractual issues in the United States, Europe and the Middle East.