

Excerpt out of the book

CATAMARANS “Tomorrows Superyachts”

By

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CATAMARAN PROJECT MANAGEMENT

Definition, planning and managing a custom build

Anyone looking for a mid-sized production catamaran has a variety of choices, however the selection is non-existent beyond the 70' range. There simply isn't a large series built cat over this size. Consequently a custom built boat becomes the only alternative for the realization of a particular project. In this case it may prove essential to hire a project manager to coordinate and oversee the build. The position of a project manager of a custom yacht often conjures visions of exhilarating overseas travel, unlimited access to the most well equipped shipyards, featured interviews in glossy magazines and shake-down deliveries to exotic locations. And while this position certainly has its many perks, the details and challenges involved leave little room for fanta-

sy.

In reality, managing the construction of a new vessel requires a great deal of hard work. A project manager must be dedicated, possess excellent organizational skills and a high degree of overall familiarity within an array of crafts and materials. He must understand all facets of construction including, mechanical, electrical and plumbing outfitting. In addition, a working understanding of design and engineering principles is highly helpful. Clear and unbiased views of the project's goals must be maintained throughout the duration of the process.

Aside from the task of actually supervising the building of the vessel, project management responsibilities include defining the mission, planning the building of the vessel, selecting, as well as supervising the daily hands-on management needs in order to keep the project on an even keel.

Many projects require pre-planning and advanced research, some may be far into the design phase prior to the selection of a project manager, while for others, it is a prerequisite for complex design decisions. Regardless of the character of the situations, effective managers understand the importance of advanced planning, as well as a review of all prior decisions.

Defining the project

Building a custom yacht, whether power or sail, monohull or multi-hull, requires 'definition'. It is vital



to the smooth construction process that the expected outcomes, specific performance requirements and the project 'driver' be established.

The goal of all projects is to complete a vessel that meets the specific goals and requirements of the client. Individual goals vary; one vessel may be constructed to enter the charter business and another designed to be an exploration type, to sail to remote destinations that offer limited time near shore facilities. The goal may even be the production of a racing yacht with sights aimed at a series of international regattas. Each presents a unique challenge. Defining the goal of the project is vital, exactly what

the vessel is expected to be when construction is completed, and plays a major role in the overall planning and management.

The goals we have just identified are relatively straight forward. However, in many cases, the owner of the project may not have clear concepts and comes to the table with complexities. For example, a client envisions a catamaran that will essentially be used for cruising but also expects to race 'in some regattas'. A conflict has been presented here and the goal then takes on a percentage or balancing factor as a compromise. Choices must be weighed as to make the yacht dual purposed.

above The main saloon of this 85' catamaran is laid out with the dining table to port and the forward facing nav station and galley opposite. An alternate arrangement would be to split the kitchen area with one part in the hull and the wet bar section on the main deck.



above On cats there are numerous areas to string your favorite hammock to relax and forget about time. As a bonus feature they can also be used underway while sailing and will gently rock you to sleep.

In many cases the objectives of the project have been defined or at least discussed by the time the project manager is selected or appointed. If they are clear and firmly accepted by all principals, steps toward initiating construction may begin. Conversely, if the goals are not well characterized then his/her responsibility may include working with the principals of the project toward a defining clarity. In this case a good project manager will present all information in an accurate, objective manner. This will likely include presentations from industry specialists. To maintain a seamless operation it is critical to define targets up front. In a perfect build program the goals will not change, but this is not always the case. Be aware and be prepared!

Once the goals are defined the focus shifts to identifying the requirements to meet those goals. The planning is gathering momentum since the project is now at the dream-versus-reality stage. How will these wishes of the client fit into the constraints of time, cost and quality? It is the interplay between these parameters that keep a project manager on his toes. Ideally the client wants the best finish in the shortest amount of time for the least amount of money. The manager has to prioritize with the client to reach a reasonable balance with the ultimate goal still in mind. Build time should be viewed from two perspectives. How long will it take to build the catamaran and how much time is 'acceptable' in order to complete the

yacht? In many cases these situations may be conflicting. Time is also dictated by the complexity, level of finish and size of the cat. For example, there will be fewer man hours in a 65' vessel than a 110' yacht. Complexities involving onboard systems and the required fit and finish will have a huge impact on the time required to build the boat. The other major factor affecting the duration of a build is the expertise of the builder selected, the resources at hand and freedom from other commitments.

A good project manager will be invaluable at this point of the planning process. He will develop a short list of builders with suitable experience and expertise in constructing similar vessels and will be able to suggest real options to the owner. In some cases it may be necessary to select a yard for the main components such as, for the hulls and overall assembly, and outsource other major areas, for example, the interior joiner work. In order to keep expectations realistic there should be an agreement between the estimated construction time and the owner's expectations. Indeed, the owner of the project may demand completion within a specific time frame. The reasons may be financial, personal, climatic, or even governed by other factors, such as a centenary anniversary of a yacht race. It is important to respect the owner's time constraints and develop a realistic build timeline so as to meet the goals of the project.

Several years ago during a new construction project a customer made it clear that he wanted the best possible yacht, to 'leave no stone unturned and, that cost was not a concern'. At the end however the price of the boat completely spiraled out of control because the expenses were not monitored -but it was too late. The lesson here is that in custom projects the project manager must keep up to date with the financial concerns and a firm idea of the duration of a project. The attention to costs should be paramount. Expenses are broken down into two major categories with some minor sub-categories. I will focus on the two major areas.

Man hours required to build the yacht equate directly to cost. Man hours in terms of price will likely, depending on the complexity of construction, constitute between fifty to sixty percent of the total expense of the project. The balance of the cost will be absorbed by materials and equipment. If the objectives of the project demand an extremely high degree of fit and finish, then labor hours will obviously be high.

The cost of materials can vary considerably, and again, we need to return our attentions to the project's targets, pare down the materials list, wisely choosing substitutes to fulfill the intended objectives. Materials will affect direct and indirect expenditures associated with their characteristics or the builder's preferences .



Similar choices apply to the equipment and the complexity of systems requirements. Again, there are many options and a myriad of products on the market today. The selection of systems, whether it be a VHF radio or a complete rigging package is dictated by the type, size and pur-

above The vessel in the foreground belongs to the Alliaura range of yachts. They are one of the very few catamaran builders which elongate the center nacelle and place the master stateroom in this forward area. While cozy at anchor this part of the boat can get lively underway.

below The giant trampolines of catamarans serve as ideal playgrounds for all ages. This cat is rigged with a Solent and a Reacher – both conveniently fitted to furlers.

pose of the catamaran. For example, our exploration type vessel will likely place a high priority on multiple systems and require complex power plants, whereas as a performance multihull will focus on lightweight construction and substantial rigging.

Having reached this point in the calculations the expenses are now estimated to a fairly high degree of certainty. It is again the role of the project manager together with the owner, to review, long and hard, the best suitable selections for the project. This appraisal process will most likely include the design and engineering costs as the expenses and options associated with these groups are significant determinants for a custom project. When completing

the costing exercise it is prudent to add a percentage as a contingency factor and establish a budget with a low and high figure.

Of three constraints, time, costs and quality it is the last that is most difficult to define. As we mentioned earlier in this book, quality can mean different things to different people. Inherently subjective, it is, nevertheless, a final point for examination in evaluating the overall endeavor. To some it is the very best of equipment, or a flawless paint job, and to others, it may be perfectly executed joiner work. Quality will most likely be influenced and defined by the written specifications for the project. It is the sum of all the individual details and choices





that unite a custom project.

For any new build that falls within the area of a custom project it is often assumed that the quality will be high which is often the case; however reaching that level is a factor defined by the remaining two constraints: time and cost. It is often held that from time, cost and quality, a choice of any two can be made, but one can't have all three. This is similar to Dick Newick's accepted wisdom of: you can only have two out of following in your catamaran (or any boat): performance, space and a low price. Once all the goals and requirements are established and agreed upon, the next step is to determine the 'driver' of the project.

Shall the 'driver' be time, cost or quality? One of them will be the overriding influence on the project and become the unwavering focus of the project manager. To wander from the 'driver' is possibly the worst situation. 'Time' usually means that the yacht is to be delivered by a fixed date so the other two constraints are not necessarily the focus. 'Cost' means that no matter what, the build budget must be met. This requires a high level of estimating prior to the initiation of construction. Lastly, 'quality' usually means that costs will be higher and that a fixed delivery date is not the owner's first concern.

Planning the project

above Teak decks frame this sumptuous, traditional interior. Note the paneled ceiling and library style wall-hung lighting fixtures which give an ambiance of 19 Century yachting lifestyle.

below Here two different interpretations of the same yacht – the Exclusive 76, can be studied. While one is fitted with teak decks and a hydraulic platform the other one features plain decks and davits.

Once the objectives and requirements that define the project are agreed upon, the real task of planning commences. The project manager now needs to establish an overall time line covering final engineering, building, commissioning and sea trials. This is a critical phase of the project and the more realistic the timeline, the greater the chances of delivery 'on-schedule', will be.

Design and engineering requirements cannot be underestimated. At this stage of the project, design and structural teams will have been determined, and their final contracts under review. A dominant issue that will present itself will be the adherence to the plans-delivery schedule. This schedule must be part of the contract and included in the program timeline. Untimely delivery of plans may cause additional costs, building out of sequence and delay of delivery. Accompanying the program

timeline, the single most important document will be the budget for construction and associated areas. This document needs to include builder's costs, all subcontractor fees, equipment purchased outside of the builder's contract, travel expenses, commissioning charges, insurance, etc. Now is the appropriate time to take a thorough look at costs and provide adjustments as required. This document will be the guideline and will serve the project manager to track costs over the entire build.

Critically is a review of suitable, qualified, builders. The process of selecting a builder is not solely based on the pricing, fixed or estimated, but rather on a combination of factors. These aspects are other work the builder is committed to, available and qualified workforce, facilities, and contract requirements, availability of subcontractors, location and overall experience in the industry. The primary reviews of all these issues might be examined by the project manager, and presented within an objective format.

Managing the project

Our custom catamaran is now entering the building phase. The builder and subcontractors are selected, contracts are in place, deposits paid. The owner is keen to get started after the planning phase and the yard is looking forward to a new build after potentially a year of planning and negotiating.

The design and engineering team





will have submitted numerous drawings to the builder that will include the lines of the vessel, 3D geometry, the accommodations plan, structural requirements such as bulkheads and deck layout. These are considered the basic drawings and files that the builder will require to commence work. However this is by no means the end of the drafting requirements. It is extremely rare for all the drawings for the entire construction and fit-out process to be released prior to the beginning of construction. It is therefore the role of a good project manager to coordinate the plans release schedule to ensure that their delivery dates are in keeping with the build timeline. This is vital as any lapse in the receipt of drawings by the builder may result in insufficient time for drawing reviews and in the worst case, a delay in the

completion date. As mentioned earlier it is prudent to include a complete list of drawings with agreed release dates to the builder as part of the contract. This simple procedure will remove any doubt as to when drawings are due.

Maintaining the timeline is probably the single most important task during construction. The adherence to major build milestones is the best way to meet the delivery schedule of the vessel. It sounds very simple and too easy -but a smart guiding motto may be: 'plan the work -work the plan.' Proper maintenance or regular reviewing of the timeline will quickly identify schedule, labor, parts or materials issues. For example the building of 12 bulkheads might be scheduled to take 960 man hours and completed over a 10 week period. So

above To maximize interior volume the main saloon in these two designs have been pushed as far towards the front as possible. Both catamarans are shown flying a double headsail rig.



an average of 96 man hours per week are required. If the builder has scheduled three men to build these bulkheads then they should be completed ahead of time. If however it is noticed that a bulkhead is not completed about every week or so then the matter should be looked into more carefully. It may be a materials delivery problem, lack of correct drawings or many other factors.

The bottom line is that as soon as one area of the time line starts slipping then action is required before it has a domino effect on the entire project. This is especially important when there are multiple areas of the project being worked on at one time. A good example is the dry fitting of the hull and deck. For this to happen on the week that it is scheduled, various sub-tasks must meet their respective completion dates. A significant amount of work needs to be managed so as to meet individual target dates. With the major mile-

stone of the hulls and deck being dry fitted together being met, the yacht's joiner work, electrical, mechanical and plumbing fit-out can then be accomplished on time.

The resources for any custom project are finite and therefore need to be closely monitored. With this in mind it is imperative that the project manager has a very good understanding on how the resources are being used or spent. He will monitor the progress that the yard is making relative to the timeline and of course relative to major milestones. This sounds like a straight forward process, however the appropriate number of craftsmen with the necessary skill sets need to be timely deployed so as to meet actual build schedule and the financial agreements of the project. A good example here would be a new build project on a fixed cost with a fixed delivery date. The builder has over-allocated labor at the beginning of the project and as such, has left himself 'short' financially for the balance of the project. The most suitable way of managing labor is to meet on a regular basis with the yard and evaluate hours spent relative to overall expenses and milestones. Diligent managing or monitoring throughout the entire project will alleviate a lot of potential negative situations.

The managing of the subcontractors is again a vital part of any build program. These outsourced specialists may fall under the boat builder's 'umbrella'; if so then the regular project meetings with the builder will

take care of that. If the subcontractors are the direct responsibility of the owner and as such fall under 'owner supplied items' then the situation becomes a little more detailed. The most vital part of any subcontract situation are clear and defined specifications. We can then determine the cost and time involved. Once we know the timing we can then plan the most suitable schedule as to when the subcontracted work should take place. Again, this sounds fairly straight forward but as is always the case, all facets of the project are on a revolving review and the subcontractors are part of this process.

Financial oversight is a major portion of project management. Owners of custom build projects are outlaying a considerable amount of cash and accountability is key for a suc-

cessful result. There are essentially two types of contracts from a financial perspective: 'fixed price' or 'time and materials' (T&M). Of course there are some variations on these two but for this review we will focus on these two.

A fixed price contract is most likely linked to major milestones and predetermined monthly payments. This type of situation is relatively straight forward to manage. The project manager monitors work in process versus completed work and reports to the owner about once a month, that the build schedule is on track -or not. The materials aspect cannot be overlooked and it will be necessary to verify that the resources outlined in the engineering and layout drawings along with detailed equipment noted in the specification are being used. There will

below At 105 " ALLURES is one of the largest cats in the world. Since her launch in 2004 she has been a highly successful charter boat and has often stunned her guests by sailing at 20 knots on a beam reach.



below Fine teak planking from select forests grace the wide decks of this 75' catamaran. Recently yards have joined the eco consciousness and advertise their exotic woods stemming from renewable resources.

likely be a clause in the contract whereby the builder can substitute 'for-like materials' -not likely an issue, but verification is prudent.

In the case of a time and materials build (T.&M.) the project manager will be required to develop a more detailed method of tracking labor and materials. Again, the basis of this will be the program timeline and in this case the greater the definition of each area of construction the

more accurate the tracking will be. At a minimum, labor will need to be confirmed on a monthly basis. This may be achieved in several ways. The project manager can log daily or weekly the hours expended on each task. This becomes arduous and may not be the best long term solution. The preferred method is to agree up front with the builder as to how labor will be monitored and to have direct access to these records. A reputable yard will have no issue with this method and the labor hours can then be compared to the agreed project timeline and work completed.

The tracking of materials in out T&M contract will be equally important. The materials portion of new construction will likely run at 45 to 55% of the overall budget. This is significant. The builder may have several projects underway at any given time and it is not uncommon for resources to 'walk' to another build. While in the vast majority of cases this is unintentional, a good system needs to be set up to avoid this situation. Again, some early and documented discussions with the boat builder of how materials tracking will take place will pay off in the long run.

One part of managing a new build project that can cause a lot of contention is the somewhat gray area of 'quality'. As mentioned before quality can mean different things to different people but each custom project is just that -custom. So in the planning phase it is imperative to





determine the level of fit and finish. The project is held within the three primary constraints: time, quality and money. The owner will need to define what the expectations of the project are with regard to fit and finish. This can be achieved in several ways; looking at a variety of yachts built by several yards, past experience, magazines or by a series of renderings and drawings. No matter how the requirements are defined (and by the way these need to be documented in the specifications and drawings) it is the responsibility of the project manager to make sure that these prerequisites are met. The single biggest mistake a project manager can make is to make the yacht his own in the interests of bet-

ter quality.

Not every new build (in fact many never do) runs exactly as planned and looking forward to potential pitfalls or problems should be very much part of the overall plan. A list of potential matters that could slow or alter the build program should be noted. One example might be that the catamaran needs to be built to CE (European Community) or another classification construction standards. All well and good; however there will be certain points during construction where independent inspections need to take place. These inspections may result in some rework or additional documentation. It is important to allow for such exam-

above Another mid-sized cat is being launched via a truck in France. Catamarans need to be constructed extremely strong allowing trailers to simply lift them from their bridgedeck without creating any damage.

opposite The twin satellite domes grace the flybridge of a Yapluca catamaran. This yacht is on her 2nd circumnavigation and while her owner is not using the boat, she serves as a part time charter yacht.

inations and additional work in the build timeline. Aside from anticipating potential problems, certain issues will develop during the build program that cannot be foreseen.

Here it is important to keep the owner fully informed. History has taught us to deliver bad news early. Once this is done it is imperative to work with the yard and evaluate the time and cost impact, if any, and work towards a suitable resolution.

Towards the final weeks of the build owners are extremely keen to go sailing and enjoy their new catamaran. The final phases prior to the yacht leaving the yard is to work through a number of check-lists prior to the commissioning phase and sailing trials. These checks should include; a detailed review to establish that the specifications have been met, systems checks, any discrepancies noted, final accounting, sea trials agenda and warranty information confirmed. The final stages of the build process will be in-water testing at the dock and sail trials that are suitable to the intended use of the catamaran. These procedures should be well documented and each and every line item that is included in the trials needs to be verified as being satisfactory or requiring rectifying. This sounds like an arduous process and it can certainly be just that. However, just like the planning phases a detailed commissioning and sea trails plan will ultimately be an advantage to both the builder and the owner alike. The completion of the project is equally important as the commencement. It might well be

the end of the build cycle but it is the beginning of the life of the yacht.

This chapter was researched with the assistance and contributions by David Lake. He is the founder of David Lake Yacht Management of Bristol, RI., a specialized company offering clients project management for the construction or refitting of sail and motor yachts.

