

# STAYING

# ONE STEP AHEAD PART 1



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Surviving the GFC in the Australian boatbuilding industry has meant staying one step ahead of the bunch, as realistically everything has been or is stacked against us and it's estimated that the industry has been reduced by 95% since 2007 when the GFC was officially documented as underway.

First we saw as did most other industries the 'last in first out' situation where boatbuilding companies that had just got on the bandwagon folded equally as quickly.

#### ***This happened for a number of reasons:***

- No established market or customer base to build from
- A product that was just a copy of an already established brands product
- Owners that had got into the industry to make a quick dollar in what they saw as a prestige market
- Did not have the financial strength, experience or desire to battle it out.

We then saw another wave go under as even manufacturers who had been around and successful for a number of years folded or just closed their doors. With some it was a case of having only one model with which they had already filled the market segment. With others it was because they were close to retirement, so they went early rather than battling on.

This second wave of business closures was also exacerbated by a glut of cheap imports coming in to Australia, particularly small power boats from the USA with the collapse of their financial system, as their system allows people to walk away from their debts by just handing back the keys. On top of this, the Australian dollar rose to an unexpected high of over a \$1.10 to the US dollar, making it even harder for the

local industry to compete with imports from Europe, America and Asia.

During this time we also saw the demise of the amateur boatbuilder and a slowdown in businesses that supplied them, with so many used boats on the market at such low prices there was no incentive to build themselves. Added to that, water front land values become so high and environmental restrictions near the water so tight that the cheap and cheerful boat parks that catered to the amateur boatbuilders are now mostly priced and regulated out of the market.

#### ***SO WHO WERE THE 5% THAT SURVIVED?***

They were the older and larger manufacturers that had a good financial and client base so were able to keep developing new models with the customer loyalty to find purchasers for these new models. As the dollar has weakened, some have been able to move back into the export market through their long established overseas dealer networks to a point now where around 50% of their production is heading overseas.

They were those who could diversify and take on repairs, maintenance and alterations, or move into industrial moulding in the short term. By keeping their

**ABOVE LEFT:** Modular deck and cabin top panels stacked up ready for assembly

**ABOVE RIGHT:** With the DECKIT System the whole deck and cabin can be assembled on the floor then lifted onto the boat like a fully moulded superstructure.

**OPPOSITE:** Modules can be designed to be easier on backs when working with the least possible wastage.

doors open they not only showed potential clients their staying power, but were also ready to go again when things picked up.

They were the custom boatbuilders that had something different to offer, particularly those involved in power catamarans, higher tech sailing multihulls and specialist craft like game boats. By having a different product or by being able to build a type of boat that couldn't be purchased as a production boat, they gave themselves that most important advantage: a point of difference.

As part of surviving everyone has had to get more efficient by cutting overheads in the form of waste or unproductive staff and facilities – you see far fewer



A new 52ft bottom will be moulded to further extend the Pathfinder M range.

styles. We then complimented the variable dimensioned mould with a new version of the P.A.C.K. (Prefabricated Assembly Component Kit) boatbuilding system we started developing in 1998, and this new addition we called DECKIT. DECKIT allowed us to construct an infinite variety of superstructures using a series of standard moulded sections and joiners, all with a gelcoat finish.

We knew we could

not compete with Asia's lower labour costs or challenge the size and marketing power of the European boatbuilders if we just competed with them for the type of inshore-bareboat charter boats they were all focusing on. We also knew that if we could minimise the amount of capital required to maintain a range of sizes and styles as well as reducing the amount of labour in building a different type of power cat, we were in with a chance. By not having to pay for external designers, by not having to ship large distances, by being able to market direct to the customer we were able to eliminate three large costs that added nothing to the boat itself. Then it was a matter of streamlining the construction where possible to minimise the labour and therefore the cost difference between us as local boatbuilders and the imports.

The second part of the plan which we will examine in the next issue was to define what our points of difference were compared to imported power cats and other power boats, and to target emerging markets where these points of difference would give us an advantage.

### PART 1: THE DESIGN AND BOATBUILDING

With 23 years of continuous development of the displaning hull form, we were comfortable with our hull design and with the addition of the CVD (Controlled Vapour Dampening) features we knew we had a good sea boat. What we had to develop was a way of being able to use a gelcoat finish for the whole boat that would free us from the most difficult part in custom or semi-custom boatbuilding, and that is to accurately cost and plan the filling, fairing and painting. Anyone who has been involved with either

paying for, organising, or undertaking this operation will tell you that it is not only a totally subjective issue of what is good enough, but it is also backbreaking, demoralising and dirty work. It requires huge quantities of expensive materials, most of which end up on the floor. It requires huge amounts of labour, much of which is very unreliable as it is a job that no one really wants to do. And most frustrating of all, it requires constant stopping and starting of all other trades while the boat is scaffolded, masked up, all the equipment in the shed covered up while the boat is sprayed and then everything is stripped off so it can be sanded again. This procedure needs to be gone through with each coat from primer to topcoat, so it is not hard to see why we considered it the highest priority to find a way around it.

On the other side of the equation, funding the design and construction of a full set of hull and deck moulds for a power catamaran particularly at this stage of their development and with Australia's small domestic market is no simple matter either. If we were to follow the conventional production boatbuilding set up of a complete mould for each model in the Pathfinder 'M' range, not only would it cost in the millions of dollars to build the plugs and moulds, but it would also require around 1000sqm of factory space just to store the moulds. Both these costs would need to be amortised over each boat, either potentially pricing them out of the

market or making them not financially viable, so finding a way of getting the best of both worlds was absolutely critical to our plan.

Boat construction is not easy to modularise as there are curves going in all directions, however power catamarans are easier than monohulls in this respect as a reasonable proportion of the superstructure in particular is fairly simple in its shape. The important thing in developing a modular system was that it didn't look like one, so a huge amount of thought and planning was put into how all the sections would match up and how to join them. The systems development also required extensive design and development on how to finish the corners and edges and how to join these finishing and joining mouldings to the larger modules. We also decided that in order to get the most out of the system we should include all structural members such as beams into the modules and incorporate into the system as many aids to lining the walls and ceilings as possible. As all sections of boatbuilding are part of the total build, better design, planning and labour saving will pay off. And as if this whole concept was not challenging enough, the building of the first superstructure with the system got even more so when the owners of the boat asked could they have it in commercial survey. Just as the first P.A.C.K. boat we built in 1998 was in survey, it adds another level of supervision and demands, however this is not all bad,

flashy offices these days and more owners answering the phone when they can, rather than having a receptionist. Another way to become even more efficient is to change boatbuilding methods, however this can be more difficult than you think. For large production boatbuilders, it means a complete retraining of their staff and for custom boat builders that use systems developed by suppliers, changing the way they build their boats could mean losing the work provided by these suppliers.

In our case surviving was a bit of all these factors, we had a loyal customer base and this provided enough work coming in to keep the doors open. We were also small and flexible enough to expand the variety of work we undertook to keep the doors open, plus we were also able to work alongside our employees on the floor when required which helped keep the overheads down. By holding onto a reliable loyal core of tradesman during the toughest times, we were then able build around them as work picked up.

Having specialised in displaning power cats since 1993, we had a point of difference and we still had confidence that the type had a huge future regardless of the state of the economy, so we used this quieter time to set up a business plan that had two distinct sides to it, yet would ultimately come together. This business plan would also be developed as a template for other boatbuilders that wanted to build our designs using this system.

The first part of the plan was to develop a new range of designs around the principle of platform engineering using a variable dimension mould to retain as many economic advantages of production moulding as possible, while still providing flexibility in size and

because if I could not explain and prove the system to the Naval Architects, engineers and surveyors, then I would be unable to explain it to clients and other boatbuilders.

We had also decided to use a different bonding system for all the major components in the boat and although the bonding system had been accepted by Lloyd's, DNV and RINA, we set up a number of in-house tests to prove it to ourselves and for Australian survey. It was important to confirm its adhesive qualities and engineering characteristics and how I wanted to use it with my system to James Stephens the Naval Architect and Russell Behan the surveyor, as they needed to have confidence in what they were approving. To help with this process we brought in a registered engineer, Peter Schwarzel from Carbonworks, to witness, document and analyse the test results. Both James and I have worked with Peter on a number of projects over the years and we both respected his independent advice and knowledge of composite engineering.

Getting a set of test results back from a lab is one thing, but as another very senior engineer said to me years ago "it is as important to see how things break, as it is to see at what loads they break." The tests backed up the suitability of the adhesive for the modular system with some very satisfying results and set the basis of an even more comprehensive rethink of how to put a composite boat together. The glue manufacturers were claiming other boatbuilders had achieved a 60% reduction in labour when bonding all the structural components such as bulkheads, partitions and floors into the boat and to date these figures look pretty close to the mark, which is a substantial labour and therefore cost saving. If we could repeat these labour savings over more components of the boat, then the effort we put into the design and testing was looking even more worthwhile.

Moving to a modular boatbuilding system in combination with a variable dimensional mould also required a different business plan, because more skilled labour is needed to accurately assemble multiple parts than the usual production boatbuilding, chopper gun, slushy (commonly used, but not a description I like), mentality. This will not suit everyone in the industry as they are so committed to this setup, however we had found that when we moved to infusion 10 years ago, we had had to go down the path of more skilled labour as infusion requires a more technically skilled employee anyway. Interestingly, once you move away



After extensive testing a new system is being used to bond in the bulkheads and other structures.

from the less pleasant jobs like chopper guns and filling and fairing, you end up with happier, more settled employees as the work is cleaner and more satisfying.

So what are the advantages of a modular moulding system?

- (a) The parts of the superstructure are easier to physically handle during both construction and assembly as they are smaller and lighter.
- (b) Quality control is better as each part is smaller and therefore quicker to lay up and then can be easily inspected and signed off. If a part is not of sufficient quality, it is not the scale of financial loss that a large panel would be, therefore there is less temptation to use it anyway.
- (c) The modules are small enough to infuse in a temperature controlled room or shipping container if controlling the temperature is an issue.
- (d) The moulds can be designed to be ergonomically better to work on, reducing the risk to backs and joints.
- (e) The modules can be sized to minimise wastage and cutting time of materials.
- (f) Each module can be engineered for a specific load or have extra re-inforcing built in if required for mounting items such as davits.
- (g) The modules can be easily stored and transported, so a complete set of deck and cabin modules could be produced and shipped to another location for assembly.

### HAS DEVELOPING THE MODULAR BOATBUILDING SYSTEM BEEN WORTHWHILE?

Definitely. With this new system, the labour time to mould a 6m x 1m cambered deck panel, completely finished with its non-skid pattern, beams and ceiling flanges is the same as making two moulded deck beams alone, so when you multiply these labour savings over a whole boat, the difference is substantial. To a business in a tough environment, that difference might be survival or not because it keeps you both competitive and profitable. We are still in the 'working out better ways to do it with practice' stage, so we know it will get even better the more familiar everyone becomes with it. We have also had to develop jigs and adapt tools to set up for the joins and as we perfect these, everything will get faster again.

The development of the variable dimension mould in combination with the DECKIT System has allowed us to extend the 'M' range to 52ft with a new hull mould from the chine down that will join onto the rest of the moulded sections of the hull. By being both the designer and builder, these sort of developments are able to be done without any great drama as I am so familiar with the design, its performance and its potential on a technical level. On a business level, there are also no issues with copyrights or royalties, as everything is in-house. This new hull shape will be wider and deeper so we can fit larger engines and carry more payload, making it suitable for small passenger ferries and other commercial applications such as crayfishing and patrol or rescue boats. The development of the DECKIT modular superstructure system will be particularly suitable for commercial vessels of any size as it will provide all the weight savings plus sound and thermal insulation benefits of a composite boat, at a cost similar to an aluminium boat. We have even completed the preliminary work on using the modular system for a large part of the hull construction as well as the superstructure on a new series of designs from 60ft upwards and can see where it will have potential for the construction of other composite structures like truck and bus bodies along with architectural moulding like awnings and foot bridges.

### IS THE TOTAL SET UP A BREAKTHROUGH IN COMPOSITE BOATBUILDING TECHNOLOGY?

Words like breakthrough and game changing are used so often in advertising these days that unfortunately they have lost all meaning and credibility. Time will be the judge of its impact on the industry, but given the lack of any technical advances in boatbuilding over the last few years we are quietly confident that we are moving in a very positive direction. Hopefully it will show others that Australia is not a spent force in developing innovative new technologies and give some credence to what often sound like clichés when continuously voiced by politicians.

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