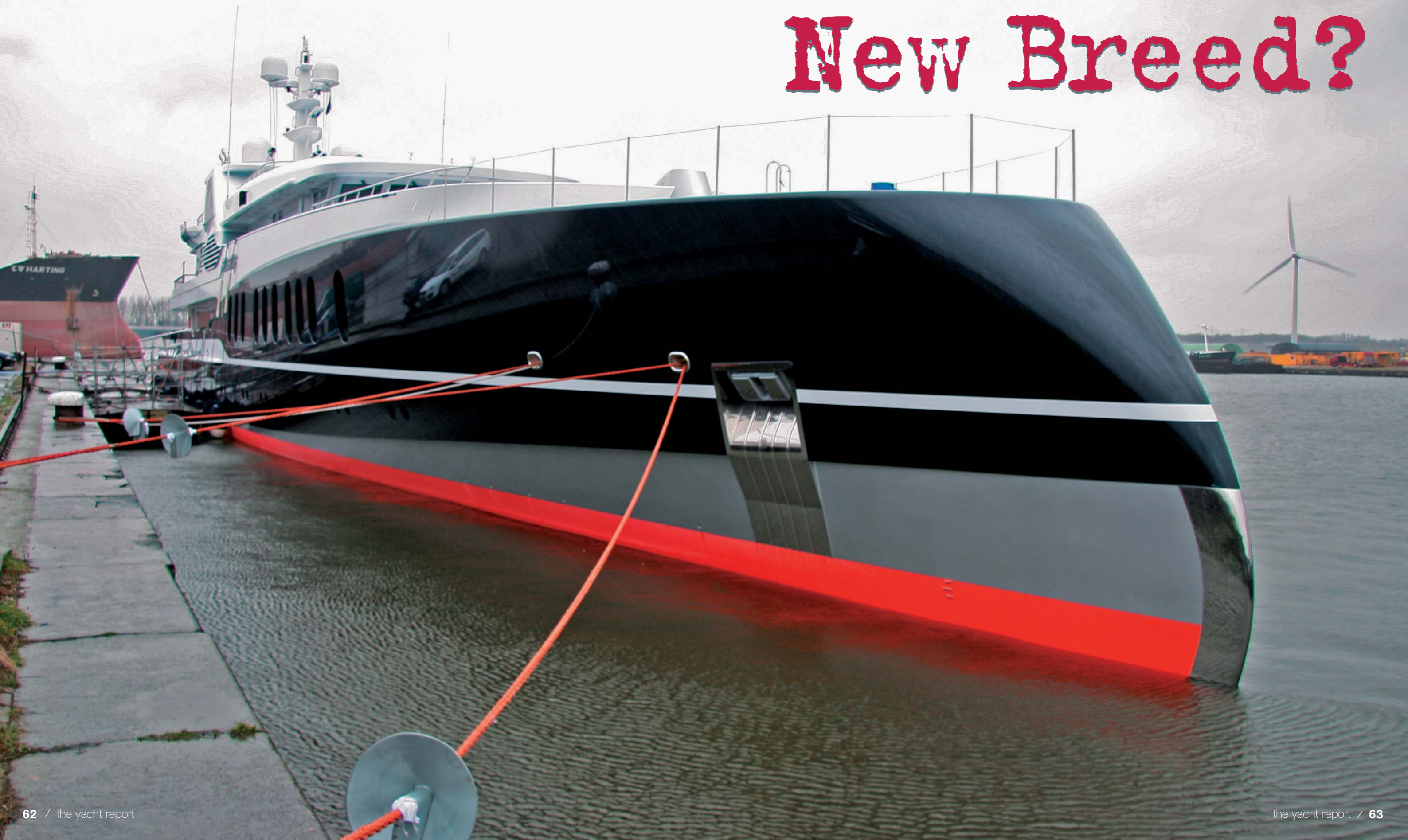


Predator

First of a New Breed?



Strangely, the antsy creature the present Governor of California faced and finally prevailed over in the 1987 movie 'Predator' was neither new nor unique. The tale itself is old hat with astounding similarities to parts of 'Beowulf' penned (or told) around 1,200 years earlier: a bunch of élite foreign troops arrive in an area menaced by a nasty, invisible creature (Grendel then, Predator in the 1980s); most are killed but one wins through using intelligence, sneakiness and strength.

The latest handover from de Vries shares the creature's name but none of the characteristics of the eponymous movie's plot. De Vries' *Raptor* is indeed unique and furthermore may even be the first example of a new race of superyacht. That race may prove to be yachts that break the style mould in a manner which is both aesthetically unusual, eclectic and stylistically pleasing, yet are also of both sound design and naval architecture and are not so radical as to be very hard to ever sell on. I had the chance to visit *Predator* at Westpoort in a grey, wet Amsterdam, just prior to handover and before any interior photo shoot was done. Once completed pictures from that shoot will feature in Fleet Activity; for now, though, we have in-depth information from key players and the lush renderings of Dickie Bannenberg to go on with.



Naval Architecture

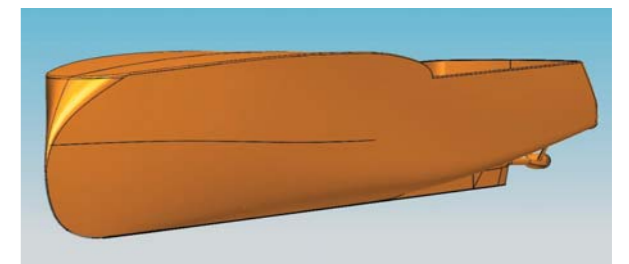
I wrote “look” above and in fact that’s mainly what the reverse bow is for. There is no real effect on the hydrodynamics of the vessel, though there were other under way aspects to consider – of which more later. I spoke with Naval architect Chris van Hoorn Design Manager of De Voogt and asked what special hullform and other considerations were needed to realise *Predator*. He told me “The very specific requirement of the owner was that he wanted to have a 25-knot speed at a reasonable engine load, without going to water jets and things like that; so was based on a conventional diesel (mains and) propeller arrangement. With a boat of this size and depth, the problem was the very high propeller loads – actually in excess of what we (and also others) have experienced so far – for a yacht... and very high noise and vibration (reduction) requirements.”

This meant large props. In fact they needed to be about 3 metres in diameter; that size reduced the loading but meant they needed to recess in large tunnels to ensure they were above the keel. Cavitation and prop pulse were a concern too, so tip clearances would be critical. Additionally a synchronising system was to be fitted. This would go beyond simple, conventional RPM matching and also allows control and matching of the relative blade position in rotation. The keel is raked from 3.5 to 3.6 fwd to 4.2 aft. Aft the hull is pretty conventional but fwd below the w/l is more unusual. Chris said: “We arrived at (a) particular hull form (right) which is a little bit in the direction of an X-bow.” The X bow

was featured in the de Voogt X- Streams’ design study – see issue 80 of *TYR* for this.

Predator has twin pairs of Quantum fins coupled to bilge keels for under way and at-anchor stabilisation. I asked Chris if given the contract speed of 25 knots, whether the drag of the fins or the speed range they operate across was an issue: “That was a little bit of concern for us. (As) you know zero-speed fixed fins or non-retractable fins are quite a concern for high speeds, both from a resistance point of view because zero-speed fins are not ideally formed for high speeds (and) if they are not very well designed and not properly aligned with the streamline you might suffer...cavitation problems (too) at high speeds.” But, it turned out, “In this case...in the sea trials, all the concerns that we had, (were) not (valid)”.

Incidentally, I wondered if this bow could be described as a dreadnought one – it does resemble one as well as that of Captain Nemo’s sub *Nautilus* in 20,000 ‘Leagues under the Sea’ and is reminiscent of the sub in the movie ‘League of Gentlemen’. I researched dreadnoughts and found that although halfway or so down the stem they curve out and forward above that (unlike *Predator*) they tended



JUST OVER THREE YEARS AGO IN 2005 HENK de Vries told me (and swore me to keep off the record) of a project that they were “investigating” with a reverse bow. I’d also heard similar rumours of a radical looking de Vries during a visit to Marin. *Patience* is its own reward and now we can write about that project which, it turns out, was M/Y *Predator*. In the intervening years reverse bows have not become common, but three are out there. One is detailed on page 45 of this issue as a concept study from stylist Scott Blee of SABDES Design; the other is the widely though unofficially publicised TKMS gigayacht *Sigma*, and while there is no race to deliver the first one – but if there were one – then Koninklijk de Vries won in late March, when they handed over *Predator* to her owner.

The owner is a young Russian and not a first-time owner. His previous yacht was quite a conventional 55-metre Benetti. However, I must assume that yacht was simply a dipping of the toe in the water of superyachting, before committing to a project uniquely his (not such an infrequent progression that semi custom builders may want to note). Although this yacht is 72.8 metres LOA, size was not it seems the main focus. He wanted a fast and very

unique-looking yacht that had style. Well, *Predator* certainly is all those and her volume is highly minimal at around 1,400 gt in fact I visited *Saint Nicolas* (issue 93) scant weeks before, and she is nearly 500 gross tons greater. So clearly *Predator* is a superyacht of very special purpose and aim. High speed – at least 25 knots – was one key criterion.

During initial designs and studies it became clear that this mandated (along with all the usual suspects of weight control, smart, slippery hydrodynamics and exotic propulsion) a narrow bulbous bow; one that also in normal operation would clear the water ahead of the bow. This was shown to the owner who was not keen on the bulb sticking up and – almost it seems in jest – reversed the bow and drew a line from the handrail above the fwd perpendicular – as a curve down to the fwd end of the bulb. At a later meeting with the contract close to signing with the price and timing agreed the profile with conventional bow was shown to the client. He was content with that, but then Henk produced another, which had been developed from that bold curving line sketch of the previous meeting. The client’s eyes lit up with pleasure and, once establishing this changed no key aspect of contract; it was agreed there and then to adopt this look.



to be plumb or even slightly raked forward above. Oddly, though, the under w/l bow form of HMS *Agamemnon*, a Royal Navy battleship, built in 1908 does resemble at least in profile the same area on *Predator*. I'd welcome thoughts and comment from any marine historians/naval architects on this.

It may have no aero- or hydrodynamic effect but the bow offers the potential for a wet boat so merited de Voogt's careful consideration. To prevent this there are two items above the water line. At the transition of the tapering grey "super boot stripe" and the dark blue is a spray rail. So well is it concealed that I did not even notice it on my visit to the yacht in Amsterdam's Westpoort and only 'found' it when Chris told me.

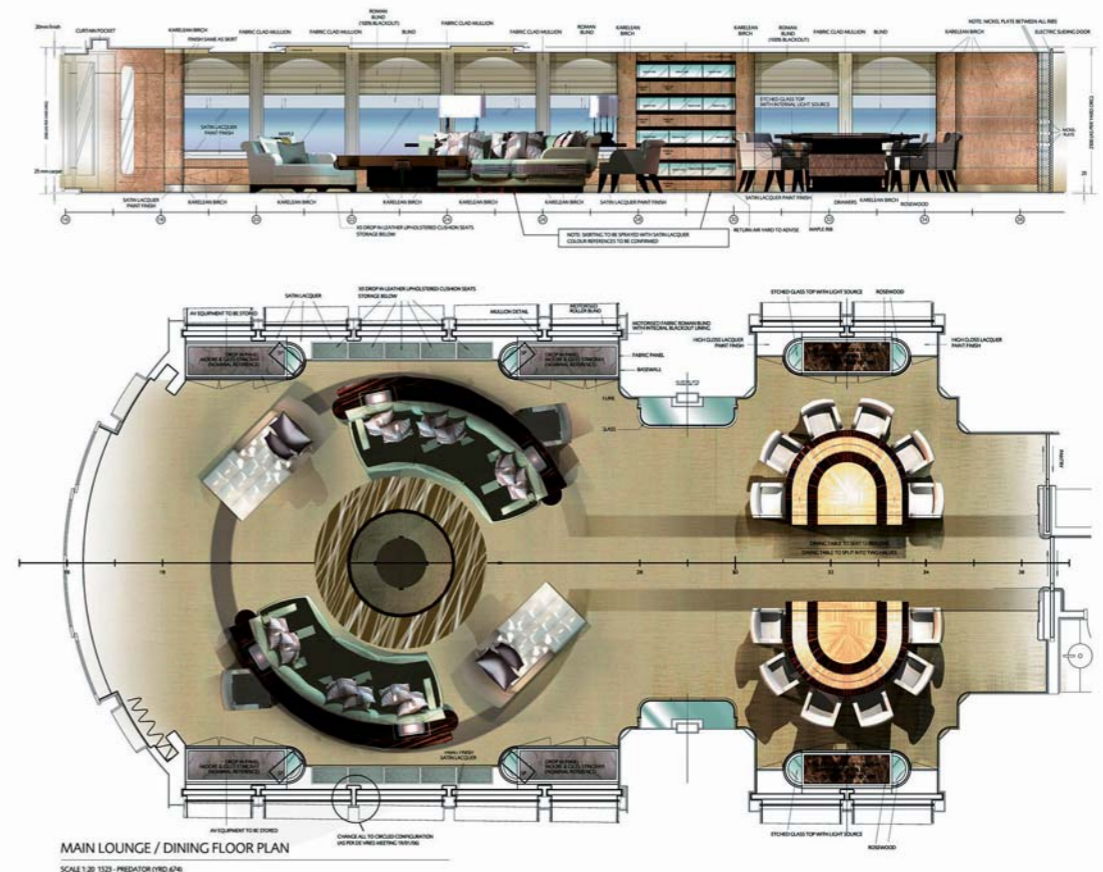
In common with many military ships there is also a breakwater forward (page 68, top). It appears to be a style feature matching the raked bridge windows, but is actually a functional item to stop water reaching aft on the main deck when under way in seas. Does all this work? It does, Chris explained, but in a rather counter-intuitive way. At 15 knots, he explained, the long foredeck can get quite wet, yet at high speed it's actually drier than it was at 15 knots. Was this anticipated? "Not really. Our (main) concern was at

high speed – that she would go through the waves or get high bow immersion, but actually it's a very dynamic thing...sea keeping at high speed, and the dynamic effects of spreading the water was so strong that at the high speeds there was not really a problem."

Propulsion

There was one problem, though, and a major one, right at the start of the contract. The yacht was planned to run with four Paxman engines, these were specced and designed in. "Suddenly," Chris recalled, "Paxman decided a few months after we had a contract to withdraw that engine from the market. It was most surprising, because we had discussed with them (in) great depth the application of those engines, because that was the biggest challenge of the design. (We'd had) face-to-face lengthy discussions with their engineers and we were in full swing and then came this message that they would not build the engines."

It was rapidly decided to change to MTUs and 595 T90s of 4,320 kW were chosen (this was before the availability of the 4000 series which would be preferred today). However, these were larger and more powerful than Paxmans, thus required redesign



MAIN LOUNGE / DINING FLOOR PLAN
SCALE 1:20 - PREDATOR (1902 676)



of the whole propulsion system including gearboxes. The principle remained the same: four rear-facing engines coupled in pairs to Renk combining gearboxes, from which stainless shafts run aft to the massive CP props. One result of the change of engine manufacturer was the need for air intake doors in the fashion plate on the upper deck (opposite bottom) to increase the air supply when all four are used. These were needed as the GA and layout was drawn and agreed; changing trunking arrangements and dimensions was not an option. These doors now automatically open when all four MEs are running.

Thrusters are all hydraulic (Feadship won't reveal the manufacturers); one 220 to 250 kW forward and two of 65 kW, each aft; limited keel height made the doubling aft necessary to achieve the needed power. The forward thruster is an ultra-quiet unit. This is achieved through double-thrust tunnels, one resiliently mounted within the other that is part of the hull. I asked de Vries Project Manager Remko Kramer about the use of hydraulics. It is unusual at this size? "Yes, it would be better if we had an electric motor instead of hydraulic, because at the moment hydraulics are still fairly noisy. We...solve that by putting in pulsation dampers." But, there was no choice since de Voogt had carried out a study and found this approach was much lighter than using electric motors.

There are three modes of propulsion: manoeuvring, then two engines or four engines when under way. When you add the DP system and an unusual exhaust systems by Mecmar SA we see there are – based on a variety of parameters – considerable decisions to make and equipment to set up and select in sequence. This is all carried out automatically by the Machinery Automation System (although manual operation is possible). For the smart exhausts one must select the right combination of above and below water outlets. There is no smoke, Remko commented, but there is a fair amount of awe-inspiring clouds of steam especially in the Northern Latitudes and in Holland in early spring.

The dry stacked CAT C9 and twin C18 Gensets will not be smokers either since they are fitted with regenerating Unicat smoke eliminating catalytic converters. These are fitted in pairs allowing continuous use when one is in regenerating mode. The machinery automation is clearly a large and central feature of the yacht. With mains by MTU,

gearbox with PTOs by Renk, Mecmar smart exhaust, rudder (split for DP use) CPP and shafts all by Rolls-Royce and extraneous items like the aforementioned vent doors and intake and output fans, it's a considerable spread to integrate.

The integrator chosen was Rolls-Royce and they had the task to bring everything together. De Vries, though, kept a firm oversight. Remko commented: "At de Vries we don't want to put everything in the hands of a sub contractor so...we always want to know what's going on. (Therefore) we had one of our guys (the integration manager) who was dedicated to making sure that all the interfaces with all the companies worked, so he basically had all (equipment) signals going to and from each company, with each system. He was there at all the interface meetings and also during commissioning and starting up of all the systems on board... if there was someone having difficulty getting a signal or receiving a signal or getting an alarm ... he could (from) his list, check the signal, where it came from and what it will do or what it won't do."

In 2 and 4 engine under way modes the system uses a combinator curve of varying pitch and RPM. Manoeuvring is more complex; at least in automation requirements. Engines run at 900 RPM, 50% of maximum and forward or astern, and the amount of force is by pitch change, while rudders turn together and bow and stern thrusters are controlled by proportional joysticks. The technically more complex mode – but far simpler for user – uses the DP, which combines all the above (and now splits the rudders too). DP may be controlled in two modes: point and go joystick, or specify direction and distance and it will be done.

The yacht made contract speed easily and in fact recorded an unofficial (that is straight from GPS with no account of current etc, and not on a measured mile two-way run) 29.3 knots. Interestingly to do the official speed sea trial (and like Royal van Lent's speedy sister *Ecstasea*) *Predator* had to go out a long way into the North Sea. The reason is that shallower than a remarkably deep 40 metres, the ship "feels the bottom" and loses significant top speed. One risk of using PTOs and hydraulic power for the thrusters is that an engine failure loses a thruster too. For this reason the hydraulic system architecture is carefully structured and arranged across both a number of PTOs and on both port and starboard gearboxes. This means the loss of one engine would not deny all thruster power.

Weight Control

This is not the first fast Feadship. Recent de Vries examples include *Detroit Eagle*, *Sussuro* and – from Royal van Lent – *Ecstasea*. Thus weight control is not by any means unknown at the yards. Even so, making contract speed meant they had to have a repeat performance of past weight-control successes. This was done through a meticulous procedure of weighing in and out. Everything that went on and off the build was added to on-going software records. This was carried out by yard and sub contractor (Feadship are reluctant to say whom). They were highly successful and indeed the yacht came in under weight, which in part may explain the extra knots available. At de Voogt Chris commented ruefully, “Oh yes, we did too (well)! (though) not everybody agrees, because...if they are building light there is also a price tag to that and (some) say we spent too much effort in weight saving. I see (it) the other way. Because overweight you have a much bigger problem.” He is right, and in any case all yachts suffer from the handbag syndrome (if you can build it, they can overfill it), which may well happen quite quickly, so less weight in reserve is a very good thing indeed.

Considerable effort went into minimising weight at a naval architectural level, with plate thicknesses, very careful FEM and material choices (areas of the yacht on the upper deck are carbon or else composites from Rhebergen and also Rondal – a Feadship with some Royal Huisman genes!). As a result of the noise and vibration study by an anonymous sub-contractor some parts of the hull were plated in high-tensile steel. There is an unusual active thrust bearing. Remko explained: “It’s what they call an advanced thrust bearing; it’s got eight hydraulic pistons inside that put the thrust from one side to the other side, so you don’t have...metal to metal contact.” That also helps isolate vibrations. A very large part of weight reduction and speed enhancement is of course as simple as having narrow beam and low volume. Long and lean is good in both supermodels and fast superyachts.

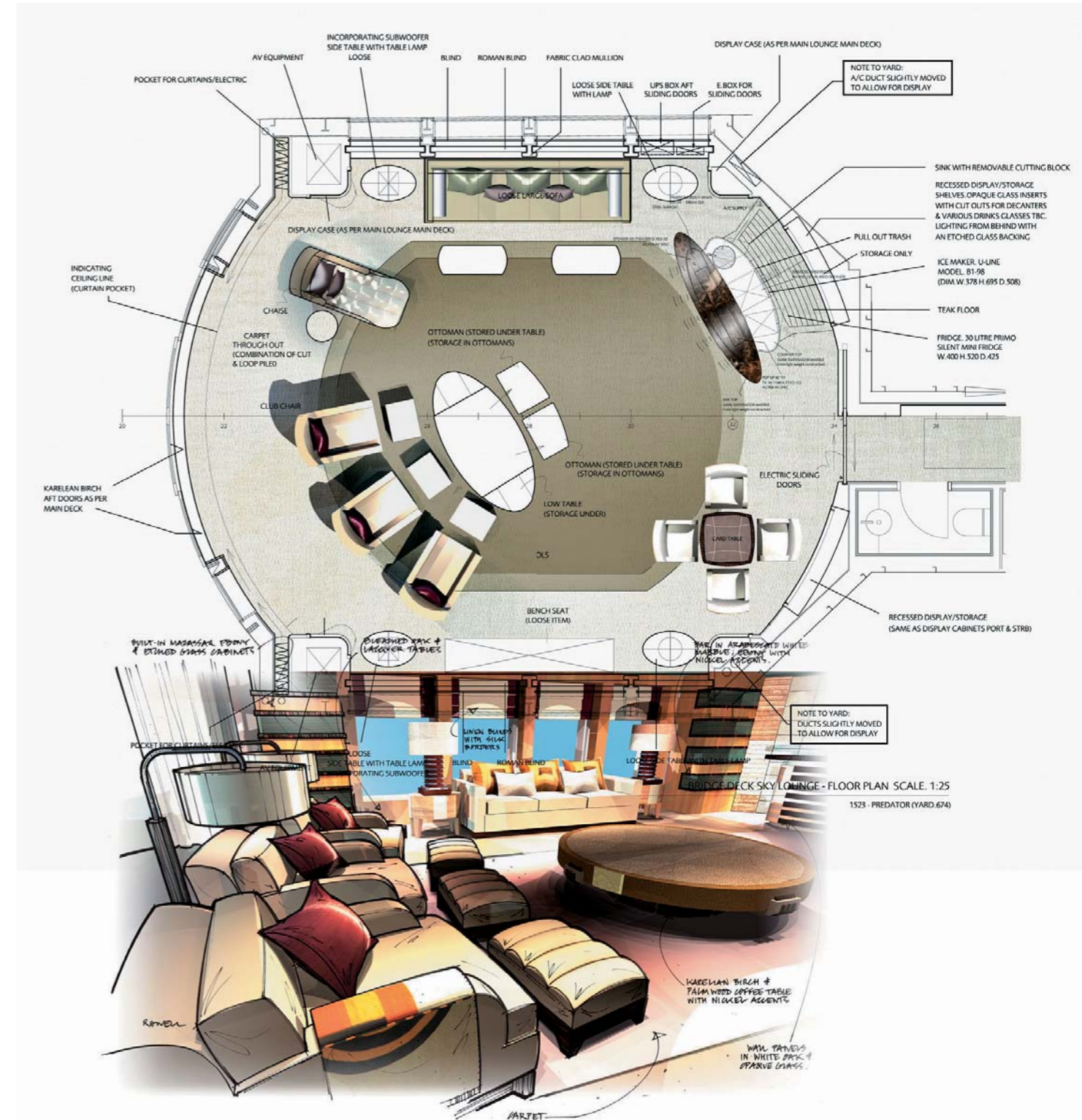
Accommodation

The interior is designed by Dickie Bannenberg and, as he explained, grew from a basic GA devised by De Voogt. He told me: “We were able to... tweak a little bit, principally in relation to guests’ bathroom layout more than anything else. But it was reasonably well established at that stage of the project.” He added as an overview, “As you know – (you) have

walked the boat – (it has) spectacularly little guest accommodation.” “Spectacular” is a good choice of word; the minimal volume is indeed different, but as I wrote at the beginning “Size was not, it seems, the main focus”; a great living space and a spectacular interior was. Unsurprisingly Karelian Birch originates from the Russian Federation republic of Karelia – and is one of the symbols of that land of lake and forest. There was, beyond the agreed GA, no strong brief from the client on the interior style save “use Karelian Birch”. Karelia borders Finland some 1,130 km north of Moscow. This birch is not a tall tree at usually 5–7 metres. Such a small size must bring its own challenges in using as a veneer. Light in colour, Dickie says: “(It’s) a very pale veneer with a very distinctive look; more than a fleck really... sort of dark ribbon in it.”

The client’s previous yacht had a very light interior and Dickie wished the same for *Predator* but not overdone. “By no means”, he agreed. “There’s some really nice dark timber which goes with the birch; there’s some Macassar ebony and some Zebrano to make sure that it does have some strength, and it’s not just a big pale sea. We also designed a few custom pieces in there: the dining table, the two huge coffee tables in each of the saloons, the bar, the games table – they’re all one-off designs from the studio here.” These were realised by Linley in a variety of complementary materials; Zebrano, Macassar and inlaid nickel. Dickie commented: “The two coffee tables are each slightly different, the main saloon one has got a big limestone top and then fluted, Macassar and Karelian birch detailing, and the one in the deck above is a variation on the theme but specially designed so stools can slide in underneath it.” I suggest the look falls within the beach-house-style genre? “Well, a pretty sophisticated beach house, but yes, (I) certainly don’t (envisage) too much formality...on board. You know, groups of friends sitting around, shooting the breeze, talking, playing cards, watching TV.”

I did not have a chance to see the yacht “dressed up” as it was in the “few days to handover” stage but I had the impression that it had a fair amount of Jon Bannenberg “DNA”. Dickie confirmed, “I don’t know whether you picked it up, there’s a slight retro style –by which I mean slight ’70s, ’80s Bannenberg feel to it.” He continued: “Yes, I think the DNA certainly is there. Actually, curiously, particularly more in that yacht than in some of (our) other (designs) that are coming out at the moment.”



The original spec calls for only three cabins plus a master and owner's study. Just before handover the owner chose to scrap one of those cabins to enhance the space in the master and thus in operation will accommodate six passengers only. That may initially seem bizarre in a 72-metre yacht, but, ask yourself, is it really? Not everyone wants to go cruising with 10 (or more) of their friends; rather smaller groups is – at least for me – more fun. Just because the LOA of a given yacht is X doesn't mandate maximising volume. Who knows – a long, yet low-volume yacht may indeed be a statement in itself: "Yes, I can afford this size, but I prioritise looks over space"?

There are crew accommodations for 18 crew plus a captain's cabin and reasonable proportioned galley and dry and chill/freezer storage. This yacht does not have a lot of storage and that is an inevitable price to pay for low-volume elegance. That also of course, means a different type of cruising than a yacht with 10 freezer/chill fridges and a walk-in. Of course that yacht will probably carry 12 guests. Low-storage volume too will challenge *Predator* crew operations; but the crew size is relatively large in relation to guest numbers and volume; really it's a swings and roundabouts scenario.

The toughest omission for crew is the foredeck (or lack thereof). Indeed there is no place where they can hang out outside when off duty. Given the yacht's profile, that never could have existed. Indeed she has (as does *Ecstasy*) no bits or windlasses on deck forward; rather there is an enclosed line handling deck forward; this has fold down doors that become platforms from which to moor or observe anchor warps and anchors on deploying or recovery. This is a nice, private semi-open space at anchor but, under way or in port crew will have to use their mess or leave the yacht for fresh air. Toys are stored right aft, adjacent to a fold down swimming platform with two very unusual looking 27-foot tenders by Yachtwerft Meyer; these have bows and are styled to match the mother ship's and are stowed in bays to port and starboard. Volume considerations dictate that these bays are lower than one might expect or prefer.

While the last few paragraphs may seem a bit negative they are not; here you have low volume but you have plenty of crew. I have seen yachts with high volume and too few crew and between the two I know which I'd choose and it wouldn't be the latter.

Looks

So does the profile work in terms of looks? That is a very subjective question but speaking personally it does so very well indeed. I have a minor carp, which is that the profile would look better to me if the superstructure were all one colour at least up to the bridge deck; however, the overall effect is still spectacular: the form of the bow is more complex than it seems with a very harmonious collection of curves. While at the de Vries yard and (again – for now) sworn to secrecy, I was shown the profile drawings of the bulging order book of custom yachts. What struck me was how few were what one might term "Classic Feadship" in looks. Granted there were some, but there are also some very innovative profiles and looks to come our way over the next four years or so.

I will return to de Vries to carry out a Yacht Report on the first SL 39; in fact that platform too is capable of supporting a wide variety of looks; both traditional and innovative, while retaining a single repeatable platform. *Predator*'s forward raked bridge windows are not what would be expected on a fast yacht (though normal on fast ferries and ideal for conning any vessel) yet they

are a minor and defining detail. Interestingly they are found also on *Ermi*² – another very, very fast yacht that will feature in the next issue (95) of the magazine. There was at one time a plan to put a viewing window in *Predator*'s bow at the level of the line handling deck. Either Class or practicality put paid to that, but what a wild and wonderful idea it truly was! Some may not agree and dislike *Predator*'s looks but love or hate them, one can't deny a yacht such as this excels on technical and stylistic levels. Incidentally that long, long nose reminiscent of a Borzoi or classic car's bonnet offers a clear view forward from the bridge that a conventional bow could never offer at this eye height.

Technology and style are both areas where at times owners and yards often tread safely and so (in these terms) conspire together to achieve mediocrity. There is no way "mediocre" could ever apply to *Predator*, however, stylistically, technically, in performance or in quality terms.

Tork Buckley

Photos: Tork Buckley and Feadship; renderings by Dickie Bannenberg

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