

UMBRA



words: David Pelly
photography: courtesy of Amels

MORE TRAILBLAZER THAN TRAILER, THIS NEW GENERATION SUPPORT VESSEL IS PURPOSE-BUILT FOR ALL THE TENDERS, TOYS AND GEAR THAT MIGHT OTHERWISE HAVE CLUTTERED UP HER MOTHER SHIP, AND AT AN ALL-WEATHER 28 KNOTS DEFINITELY GETS THERE FIRST



It was not until after an enjoyable couple of hours aboard the 50 metre Fast Yacht Support vessel *Umbra*, romping around the North Sea at over 20 knots, that I worked out what it most resembled: a very good-looking SUV pick-up truck. With lots of power and a special kind of hull it is a sea-going 'off-roader' that can keep up a good speed over nearly any surface. In the front there is comfortable accommodation for the crew and meanwhile you can carry anything you want in the back.

The family of vessels that the Dutch ship-builders Damen call Sea Axe is the result of quite a lengthy and interesting development process. Damen has 34 yards in many parts of the world that have delivered literally hundreds of supply and service vessels to the oil and gas industry. Since 1991 they have also owned the yacht builder Amels, which means that appropriate Damen products can be offered to the yacht market.

In recent years they have seen a demand for a boat with much higher performance than the normal supply boats that plough along at 14 knots or so, crashing and slamming through the waves. To meet this, Damen worked with the Delft University of Technology and the MARIN test tank to develop a relatively slim hull capable of high speed with suitable

power, referred to as the 'Enlarged Ship Concept', and this has proved very popular as a patrol vessel for the navies and coastguards of several nations. Damen have delivered 23 of them while their US and Canadian licensees will build 60 of these Damen designs for United States and Canadian Coastguards.

The 'axe bow concept' called 'Sea Axe' by Damen is based on the principles of the 'Enlarged Ship Concept' but taken to the extreme. This involved making the bow even slimmer, minimising the V-section and eliminating any flare. To compensate for this slimming, the stem has been extended both up and down to provide the necessary reserve of buoyancy. The result is a very fine bow that cuts easily through waves without harsh vertical acceleration and without losing speed and – most importantly – without diving under the sea surface.

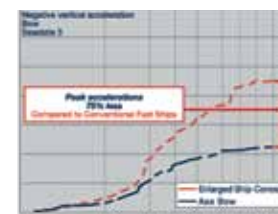
The improvement in performance is really quite astonishing; in calm water, at speeds between 20 and 30 knots, running resistance is 10 to 15 per cent lower than comparable fast ships. Even more dramatic is the 75 per cent reduction in peak vertical acceleration, running into a sea-state 5 head sea. Rather surprisingly, this also brought improvements in handling, including a reduced tendency to broach in following seas. This design

Umbra (above) is the second of Damen's Sea Axe vessels to be built, with its distinctive slimmed down 'axe bow' hull (far right) that cuts through waves rather than taking a battering like a conventional hull (below right). Damen uses this standard hull as a basis for designs that can be adapted for specific users (right). All-round glazing gives the helmsman perfect visibility (top right)





While Umbra (above) has been customised for her role as support vessel to a large motor yacht, renderings (left) show how the basic hull of the Fast Yacht Support vessel can be adapted for different requirements. The Sea Axe's astonishing 75 per cent reduction in peak vertical accelerations compared to a conventional fast ship is illustrated in graph form (right)



takes the idea of 'wave-piercing' to a much higher level and it is interesting that Delft University, which invented both the 'enlarged ship' and the 'axe bow' was working on the concept as long ago as 2000, long before wave-piercing started to emerge onto the commercial and yacht scenes. Crucially for the commercial operator, it is no more expensive to build a Sea Axe than a conventional hull shape of comparable size.

To maximise the advantages of the axe bow, Damen have introduced a new standard hull design with a waterline length of 50 metres and moulded beam of 9 metres. This can be fitted out in a great variety of arrangements and with a big choice of power systems but with the emphasis always on simplicity and reliability. One of these versions is a Fast Yacht Support Vessel, two of which have now been delivered including *Umbra*.

Although it is a striking-looking vessel, *Umbra* is pretty much the standard product and the hull is not faired or painted to yacht standards although it could be if required. *Umbra's* job will be as support ship to a

very large motor yacht and its work will involve fetching and carrying anything that the yacht needs, especially tenders. Not only does this relieve the yacht from needing to devote a lot of space to storing tenders, but it also allows it to get under way quickly by simply abandoning all toys and tenders and leaving these to be picked up by *Umbra*. And since *Umbra* is able to run at over 20 knots in a rough sea, it will normally be able to overtake the 'mother ship' and be ready with the tenders at the new destination.

There will be a permanent crew of six in quite generous accommodation and there are four more cabins for tender crew or visitors of any kind, which is also a big benefit to the mother ship as it adds more flexibility to the crewing situation. Two of these 'staff cabins' are in the optional deckhouse which is fixed to the deck just abaft the wheelhouse, using standard cargo container lugs. It does not reduce the deck space because it has a flat top easily big enough to carry a couple of big RIBS. The deck, incidentally, is covered with a Bolid artificial teak which includes the

traditional black seam lines. This material is slightly flexible which helps to stop heavy items from sliding around until they have been secured.

Power is provided by four MTU diesels of 1320kW each, driving fixed-pitch props. It would be possible to devise much more sophisticated arrangements using controllable-pitch props or by combining gearboxes so that four engines drive two propellers but the primary wish was to keep things as simple and reliable as possible with a maximum of redundancy. Controllable-pitch props might be slightly more efficient at slow speed but most owners are not interested in going slowly because this removes the key advantage of the vessel. The MTU set-up on *Umbra* gave a speed of 21.6 knots on trials in loaded condition. An alternative configuration with larger Caterpillar or MTU engines could give speeds of around 30 knots. At a cruising speed of 18 knots, *Umbra* has a range of 4,000 nautical miles – easily enough for a transatlantic delivery. Fuel consumption is roughly 18 per cent less than conventional supply boats.

Up to 200 tonnes of cargo can be carried on the aft deck and there is a



The interior provides accommodation for 12 crew and staff, and with flexible layouts available, additional berths can be provided. In typical supply boat style, the helming station has both fore and aft facing control stations (below) to facilitate backing up to platforms or docks



UMBRA

LOA
51.3m

LWL
50m

BEAM
9m

DRAUGHT
3.2m

DISPLACEMENT
330 tonnes

ENGINES
4 x MTU 12V4000 M60 1A,
1320kW

GENERATORS
3 x Volvo D7A T, 114kW

DECK AREA MAX WEIGHT
225m²/250 tonnes

CONSTRUCTION
Steel hull, aluminium alloy
superstructure

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SPEED (MAX)
25-28 knots

FRESHWATER CAPACITY
125m³

CREW
Max 16

NAVAL ARCHITECT
Damen Shipyards

RANGE AT 18 KNOTS
5,000 nautical miles

FUEL CAPACITY
225m³

CLASSIFICATION
Bureau Veritas
BV+Hull•MACH•AUT UMS
Special Service/Fast Crew
Supplier Unrestricted
Service

BUILDER
Damen Shipyards,
The Netherlands

BOW THRUSTERS
2 x Veth 75kW

CONSTRUCTION
Maritime Coastguard
Agency MGN 280



powerful 'knuckle-boom' crane which can lift 12 tonnes at the full extension of 10.3 metres. Large freshwater tanks right aft are used to adjust the trim. Another version of the design would have a stern ramp to handle a substantial tender of 13 or 14 metres, while a third would have a clear aft deck for use as a helipad. A special feature that you almost never find on yachts is that the main engines can be lifted out via a large hatch in the centre of the cargo deck. In commercial service, these vessels run for as much as 6,000 hours per year and it makes sense to do major servicing or repairs ashore with a quick engine change rather than working in situ.

The pilot house is pushed well forward to maximise deck space and is arranged in the normal style for a supply boat with all-round glazing and two control positions, one facing forward and one aft. This is because supply boats are often backing up to a platform or dock. The watch officer sits in a very special arm-chair with controls for the steering, the four engines and two bow thrusters built into the arms. As this leaves his hands quite busy, there are PTT buttons for the VHF and public address on the floor so he is a bit like an organist who has to play a tune with hands and feet at the same time! The corners of the transom are heavily fendered so the vessel can push backwards without damage.

The accommodation is below the pilothouse and is spacious, reflecting

the fact that six people will live on board plus the need to respect the new ILO requirements. The captain and chief engineer each have single en suite cabins with a desk and a small seating area and there are two more twin cabins plus the two in the deck module. There is full air-conditioning, reflecting the fact that *Umbra* may be used anywhere in the world.

When I spent time aboard *Umbra* during her sea trials, the weather was obstinately pleasant so I was not able to confirm the performance in rough seas, but these boats are beginning to gain the reputation for an astonishing ability to keep going at full speed in bad weather and I am ready to believe it.

In the past 'shadow' vessels that have been offered are normally converted supply vessels which suffer from being basically old and slow with mediocre sea-keeping. *Umbra* and her sister-ship, on the other hand, are new and fast with excellent sea-keeping and offer an impressive capability to fetch and carry a great variety of tenders, toys, supplies and staff for the mother ship. There is also a 67 metre Sea Axe Fast Yacht Support vessel under construction with an impressive 360 square metre deck and 140 square metre internal storage, which can carry a substantial load of fuel for transfer to the yacht. As yachts continue to grow ever larger, I am sure we will see more of these very interesting specialised 'Fast Yacht Support vessels'.