

Robertson's tester takes the TATS and anchors through their paces. INSET: Adelaide Stage 1.

Testing times for Anchors



The marine industry is a competitive world of marketing claims, patents and necessity resulting in some astounding inventions. This applies to gadgets and equipment of all sizes, but none more crucial to boats than the anchor. By Jeni Bone.

Rex Francis is a seasoned mariner who says he has experienced every known difficulty over the past 20 years developing and testing anchors. Primarily an inventor – he has introduced a number of new anchor designs to the market, including the SARCA anchor in 1995, which patents proved was the world's first Sand and Rock Combination Anchor – Francis is also acutely interested in the testing of anchor capabilities.

In the competitive world of development and marketing anchors, Francis and the team from Anchor Right have been focusing on quantifiable testing and thus, the evolution of the Tidal Anchor Test Skid (TATS).

As Francis explains: "Anchors are used in an environment subject to an immense number of variables including wave height and length, seabed characteristics, wind age of the vessel type and length of anchor rode, operator performance – the list is endless. While all of these are measurable, it is not feasible to assign a factor to all the variables so as to develop a test incorporating each variable so as to test anchors fairly, says Francis. "Consequently it is important when testing the holding power of an anchor to eliminate as many variables as possible whilst still testing in as realistic environment as possible.

TATS has been developed to meet this need."

Most anchor designers and independent testers of anchors are well aware of the inherent inaccuracies when using a motor vessel, commonly a tug boat, to test different anchor designs. According to Francis, tug boat testing has ignored the many variables, lumping them into the "too difficult category", and skewed results are published as fact.

"TATS can reduce these problems by producing measured data in increments to peak load, break out, load. There is no wind age, currents (if any) are similar for all anchors under test, rode or warps are the same length and weight. Specifically a constant and reproducible speed of load is used and this gives all anchor designs the best, or same, chance to perform. The reproducible speed of setting and loading in 1-2 meters of water provides a real life environment and eliminates many of the expensive variables. Seabeds can be examined prior to test and confirmation that a new, undisturbed, area of seabed is used for each test. Irregularities in seabed can be defined and excluded as test venues. TATS also advantageously minimizes spiking which occurs when an anchor breaks out under load and on immediately resetting erroneously generates a spike, High

holding power load that can then be mistakenly used as peak or break out load.

"TATS takes all anchor designs through a rigorous test schedule with any advantages being those of the anchor design itself. The results are quantifiable, realistic in terms of actual anchoring situations and reproducible. TATS can be repositioned accurately for each test in unbroken substrate to allow each anchor an equal test. The TATS machine is designed to be used in seabed between high and low water, although it can be used in areas accessible to wading just below low water, the type of substrate can be defined, by digging if necessary (to check if there is hard clay under soft mud) undulations can be plotted and marked. A steel cable is used to give a constant warp of 10:1."

Another application of TATS is in the definition of holding characteristics of a region being surveyed to be used as a mooring area.

"The characteristics of the substrate can be defined and the environment can be quantified as to the type and weight of an anchor required. TATS can be used in the areas pinpointing the holding power of an anchor in that specific seabed and can be used where a tug boat would be inappropriate or simply could not access."



Anchor Right's unique designs can also be used for securing other precious possessions.

Reproducing results is critical and one of the benefits of the TATS equipments is that its testing methods can be standardized, unlike tugboats which all have their own characteristics. "Moreover tug boats are expensive," adds Francis, estimating their cost at a minimum of \$2,000 per day. "Additionally it would be essential to have a visual image of the anchors in the test environment which necessitates under water cameras and a diver (\$1,000/day), to examine the seabed. Tugboats are commonly used to test anchors with winch cable that is wholly out of

proportion to a real situation. Vessels, to which this study applies, commonly would carry 8mm to 12mm chain and 14 mm or greater, wire cable is commonly used to test anchors from tugs. Moreover testing an anchor at 10:1 scope: depth, ratio with wire cable in 10m of water, introduces a rode weight considerably heavier than reality. The question arises: how much of any test results of an unrealistically heavy rode and how much due to the intrinsic design of an anchor?"

Another major drawback of the system is that TATS is cost effective and allows a visual exami-

nation of the tests, the actual anchors being tested, by any independent observer.

"TATS could see anchor technology develop more quickly than in the past, allow accurate monitoring of progress thus making R&D quicker and cheaper," continues Francis.

The TATS anchor test is usually carried out between high and low tide indicators; by the time the tide has retreated studies confirm that little or no evidence of the anchor testing is visible. TATS test rig can easily be maneuvered to avoid sensitive areas, improvements in anchor design will reduce dragging, couple this with better retrieval methods, anchors will have lower impact.

Independent testing authority, Robertson's recently conducted a thorough anchor test at Sandy Point, on the Shallow Inlet Beach (South Gippsland region Victoria), comparing a variety of anchors, one of them accredited by Lloyds Register as a Super High Holding Power anchor.

Super SARCA and Excel came through with flying colours and were accredited with Super High Holding Power.

Described by Francis as "a break through in convex anchor technology", Excel has yet to be released but is delivering holding power figures that no brands have been able to match. "The Excel will fit all open fair lead bow roller designs, and all enclosed or bull pit fair lead designs. It's self launching, self aligning and great for super yachts."

More at www.anchorright.com.au



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