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Understanding Boat Surveys

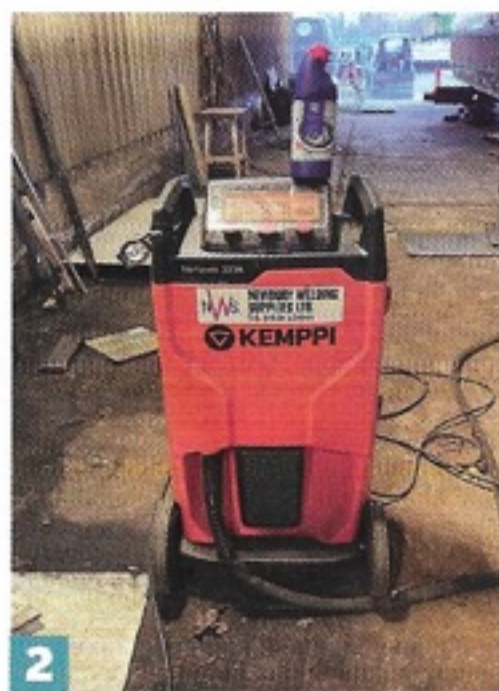
A survey is the only way of assessing the true health of a steel narrowboat. Marine surveyor and chartered engineer **Tom Keeling** explains the processes and offers advice

EVERY DAY ACROSS THE NETWORK, surveys of private leisure steel-built narrowboats are completed in dry docks, on hardstandings and slipways.

Surveys are carried out for insurance purposes, on behalf of prospective buyers and for owners' general information, and there are three main types:

Hull – the boat is docked to allow access to the hull, and the condition of the steelwork and structure of the vessel are assessed. Operating systems and onboard equipment are generally excluded. This survey is suitable for some purchasers, for owner information and for some insurers. A typical narrowboat hull survey costs between £400 and £500, and takes around two to four hours to complete.

In-water – with the vessel afloat, as much of the vessel as possible is assessed, but obviously the external wetted aspects of the hull can't be checked. This survey is generally completed for purchasers who already have knowledge of the hull of the boat they are buying. These surveys typically cost between £400 and £600 and take around two to four hours.



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Full – the vessel is docked to allow access and all aspects of the vessel are assessed for condition. This survey suits insurers and buyers who have a requirement to find out about the overall condition of the vessel. A full survey typically costs between £600 and £800, and takes around four to eight hours.

A valuation can generally be included with any survey if required, along with other allied assessments, such as gas safety checks or Boat Safety Scheme examinations, subject to the surveyor's qualifications.

1 A gantry lift and stands at Debdale Wharf allow full access to the underside of a boat.

2 & 3 The three-phase MIG welder, a fabricator coded to BS EN 9606-1, and the covered workshop at Oxford Cruisers make ideal repair facilities for steel hulls.

4 Stratford trip-boat *Rita Ellen* craned out on to hardstanding at Evesham Marina.

5 Deep pitting of this hull was identified after grit-blasting, and has subsequently been welded up.

In recent years, some insurers have been requesting a "full out of water survey" for continuation of cover; many narrowboat owners will find their insurers insist on this at 25 or 30 years old.

To avoid major problems, a buyer should always have a survey completed prior to purchase, except in some exceptional circumstances, for example if they have specific experience themselves, or perhaps know the vessel and provenance.

The emphasis of a survey for a buyer and for an owner is, of course, different. Put bluntly, the owner already owns the boat and associated problems, and might be quite happy with long-term known faults, e.g. an intermittently operating starter



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motor (similarly, their insurer is also unlikely to withhold cover for such a minor issue). This, however, would be considered a fault for a buyer who would want to know about it and have it repaired. This becomes more pertinent depending on the nature of any issue, with potential repairs being costly and time sensitive.

ARRANGING A SURVEY

It is important to establish some basic facts prior to arranging a survey. Special attention is required for insurance surveys which may require particular aspects to be surveyed, or



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specific qualifications for marine surveyors. Whatever survey is required, the following are key:

Find a suitable location.

Docking facilities are often busy and booked well in advance. For insurance surveys, the insured party will usually be given adequate notice (maybe as much as a year) and can often tie in a survey with planned hull maintenance, at a location of choice. For purchasing, busy brokers will have direct access to facilities. If buying privately, however, it can be more difficult to arrange short-notice docking.

Methods of docking vary and it pays to make sure access to the hull is adequate, particularly to the base plate. It is worth speaking to your preferred marine surveyor to find out about a particular location and any specific limitations. It is also important to think about any potential repairs that could be required; docking in a location that can repair the boat is a worthwhile consideration to make.

Find a suitable marine surveyor. Marine surveyors are unregulated, meaning, theoretically, that anyone can start

trading, although they will struggle to get appropriate insurance and professional accreditation without qualifications and relevant work experience. A good place to start is to ask at your dock facility of choice; they will likely have a few surveyors they work with. Their credentials can often then be checked online prior to any enquiry being made.

Selecting a marine surveyor that is accredited by a professional body is also good advice. Such bodies include IMarEST, IIMS, YDSA, RINA and others. This is particularly



6 Think about when to attend the survey in person.

7 The transom band on this 1974 narrowboat was holed to the wetted area of the hull during routine hammer sounding, as a result of internal corrosion thinning the plate. The vessel was then stranded on hardstanding until repairs could be completed.

important when it comes to insurance surveys, because these are required to be completed by an accredited marine surveyor. A surveyor who is a member of a professional accreditation body has to work to a code of conduct and maintain their knowledge through continuing professional development.

Consider timing. If the boat to be surveyed is old, poorly maintained, wet inside and there is no known hull survey history, expecting a trouble-free survey to be completed in a day is a flawed plan. There is every chance the hull will require immediate repair, so time must be allowed for this.

For pre-purchase, buyers are best to visit the surveyor at

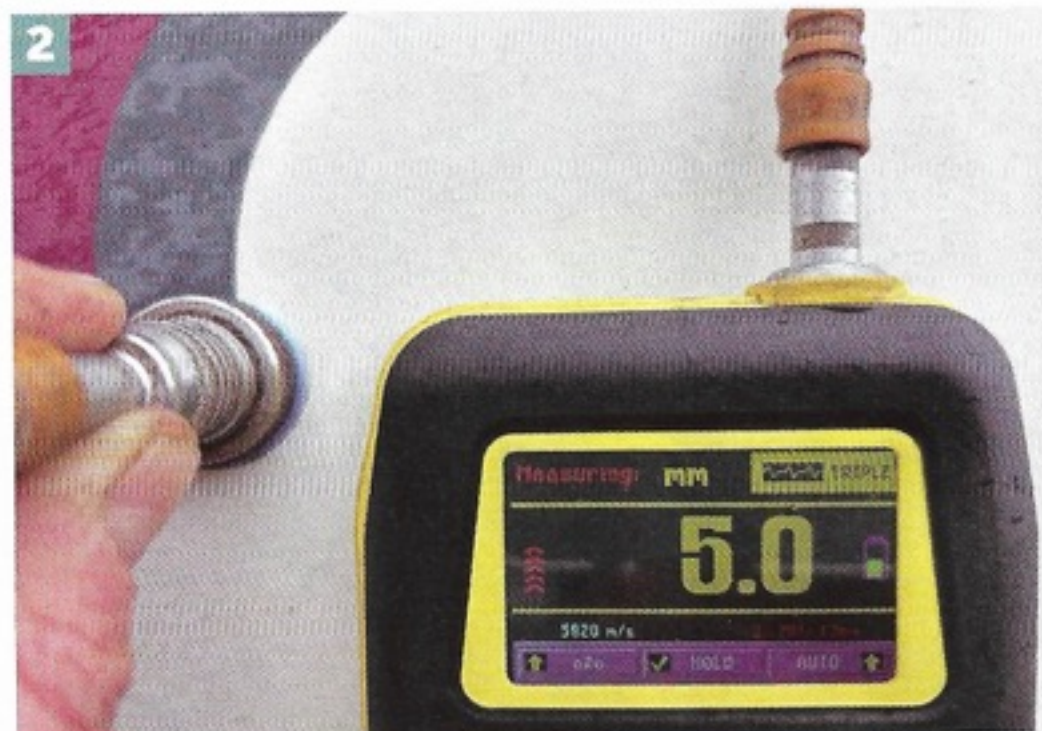
BSS AND SURVEYS

There is some overlap between surveys and BSS requirements as, clearly, both procedures have boater safety as a focus.

The BSS examination process follows a set of published, prescribed requirements with the objective of avoiding fire and explosion, with an emphasis on preventing harm to third parties. The idea is that all boats are third parties to each other and, as such, are protected by the requirements agreed by the BSS committees, which are applied by around 150 self-employed examiners.

The limited third party risk mitigation required by the navigation authorities (CRT/EA) means that some key elements of boater safety are not included in a BSS examination, but will be picked up by a survey. For example, the BSS has an advisory check for secondary means of escape, meaning lack of a second escape of a prescribed size will result in an advisory fail on a private vessel. However, the BSS does not check if the escape method is actually operational. Similarly, the BSS requires flame safety devices on most gas appliances, but does not check if they function; a marine surveyor should.





1 Damage caused by rudder contact requires a small welding repair.

2 Modern triple-echo ultrasonic thickness gauges measure through paint, giving reliable thickness results.

3 Hull plating pitting can be measured with a depth gauge. This vessel had excessive spread and depth of pitting; here the depth was 4.1mm against a 6mm plate, which required welding repair.

a specific agreed time, in order to ensure the survey process is undisturbed. For insurance, it might be useful to be present throughout, depending on whether the location permits it and the surveyor is happy with it.

Buyers can learn a lot from attending the survey but being present throughout is a distraction and things can get missed.

THE HULL SURVEY PROCESS

The ideal way to present a hull for inspection is to grit-blast it; however, this is rarely possible. It is obviously preferable for the hull to have at least been high-power washed prior to survey. While most surveyors will do their best, they can only work with what they have got, and the report and results will reflect that. Preparation is often complicated in the pre-purchase scenario, because the prospective buyer would have to pay for washing, and in the event that they don't buy the boat, have possibly left the vendor requiring recoating work. As the buyer doesn't own the vessel, they haven't got any right to wash it, although in reality a good broker/yard will have a solution to this, such as an incentivised blacking offer.

There is no standardised hull survey process, meaning surveyors generally have a unique methodology. However, the following steps



serve as a guide to what to expect the surveyor to do.

Steelwork appraisal:

- ✓ Visual inspection around the hull.
- ✓ Mark out 1m intervals along the hull, from stern to stern.
- ✓ Complete ultrasonic thickness testing at chosen intervals and as found necessary; draw out and record thicknesses. Most surveyors use triple echo gauges that measure through paint to give reliable readings.
- ✓ Assess weld condition for erosion, corrosion, fatigue and failure.
- ✓ Assess pitting depth and frequency.
- ✓ Inspect hard-wearing areas for excessive erosion, such as the transom wear-edge aft from rudder contact, or commonly the wear-edge, often worse at the aft of the vessel.
- ✓ Inspect guards and rubbing strakes.
- ✓ Inspect weedhatch and bow-thruster tubes.
- ✓ Complete hammer sounding – a physical process of knocking the hull with a hammer to reveal defects, e.g. internal corrosion that can't be seen externally.

Steering and stern gear:

- ✓ Assess steering for wear, play and damage, including the tiller, swan's neck, deck bearing, rudder stock, rudder blades, skeg and cup.
- ✓ Check propeller and stern tube boss for damage, to ensure fixings are complete and there's no slip from the propeller on the shaft.
- ✓ Verify the shaft bearing is free of significant play, and inspect packing box or watertight bearing.

Other key hull aspects assessed include:

- ✓ Hull coating condition.
- ✓ Through-hull fitting condition and location.
- ✓ Anode condition.
- ✓ AC and DC bonding, e.g. galvanic isolator.
- ✓ Superstructure condition, including decks, scuppers, windows and hatches, doors, lockers, paintwork and covers.
- ✓ Identify tanks; check construction and, where possible, condition.
- ✓ Cabin bilge; ensure it is free of pooled water.
- ✓ In-water and full surveys.

Full surveys will look at the hull as outlined above but will also include the internal aspects.

TOP TEN SURVEY PROBLEMS

Unwashed hulls – surveyors will look at what they are given, and report accordingly. For the best survey, get the boat as clean as possible, including blasting off part or all of the base plate to improve access.

Welding repairs – from minor marks to major structural issues, being unprepared for all eventualities is a recipe for a poor outcome.

Docking in a location with no repair facilities or skills can be an issue.

Pooled water in the cabin bilge causing internal corrosion; as many as 50% of boats have no access in the aft cabin to allow routine inspection, yet as narrowboats age those with long-term water lying internally are corroding inside to out. Ultrasonic testing often reveals this, as plating thicknesses decrease towards the aft of the vessel, reflecting where water accumulates.

Corroded gas lockers are common, and can be a BSS fail too. Cleaning and painting lockers are essential maintenance and great survey prep.

Unclean and corroded engine spaces – out of sight, out of mind, but they certainly shouldn't be.

Unmaintained tanks – surveyors can't access closed tanks but integral tanks still need maintenance.

Flat batteries – no voltage, no checks completed. Making sure the batteries are serviceable and charged is imperative before a survey is completed.

Poor access – lockers and decks full of stored goods and poor base plate access.

Poor presentation – untidy and cluttered boats are harder to assess.



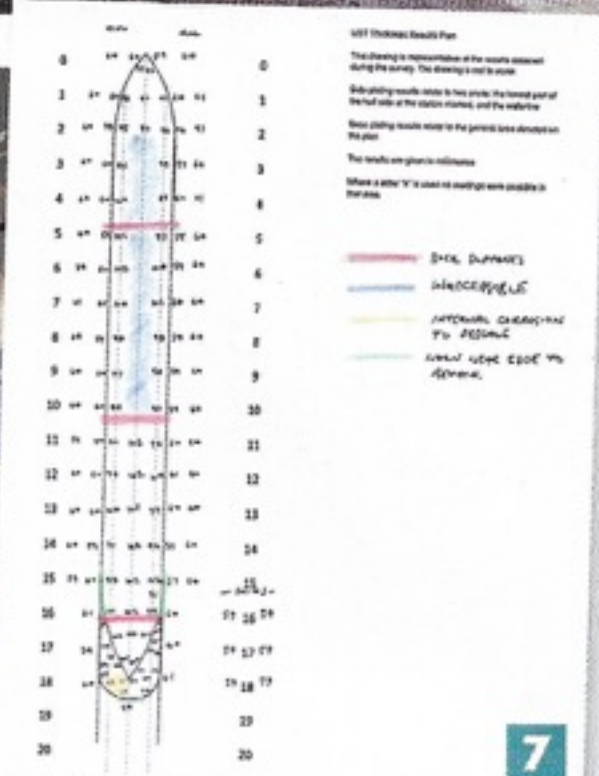
4 This base plate has been grit-blasted prior to survey at Droitwich Spa Marina.

5 Post-survey the base plate transverse joints were rewelded and the plating was epoxy coated to prevent pitting from worsening.

6 Thicknesses are marked on the hull in chalk...

7 and are later transferred to a plan that's included in the report.

8 A bent rudder blade requiring straightening.



of the vessel. In-water surveys will look at what can be seen of the structure, but in the main focusses on the internal aspects. These can be summarised as:

- ✓ Engine and associated ancillaries.
- ✓ DC system.
- ✓ AC system.
- ✓ Gas system.
- ✓ Appliance operation.
- ✓ Ventilation.
- ✓ Water systems.
- ✓ Fire extinguishers, alarms and escape.
- ✓ Lighting and signalling.
- ✓ Roof and deck gear.

For each of the above, the condition and operation of the system will be assessed. It is worth speaking to your marine surveyor in advance of any survey if you have particular concerns

or requirements. For example, not all marine surveyors will actually break into a gas system and carry out a tightness check, perhaps because they have no gas training. Similarly, the advent of electrical propulsion and complex DC systems requires different and sometime specialist knowledge; conversely, so does a traditional marine diesel engine.

THE REPORT

Through all of the aspects listed above, the surveyor has to use professional judgement as to whether the vessel remains in good order. For a buyer, the

stakes are high because they desire a decent boat and need to know it is a good investment, and they want to be informed of any problems before they inherit them. For the owner, the focus is slightly different, insofar as they already own the problems (although they might not know about all of them). Either way, the marine surveyor has to remain objective; identify the issue, establish the severity and implication, and recommend repair. In the survey report, the issues found are often graded; for example, cleaning an integral steel water tank might be merely maintenance (good to know for the buyer and owner), whereas a failed stern tube bearing is costly and could be graded a priority item, and repair could form a condition of sale.

A recent complication has been presented by some insurers insisting on a minimum of 4mm of steel. This means, after pitting, the residual steel on a narrowboat hull must be 4mm. This has caused some consternation among boat-owners, particularly those with perfectly serviceable but lighter-built boats.

A recent paper (available at smallcraftservices.com) discusses

this issue in depth, and shows it in many ways to be an arbitrary approach. The truth is that thinner-built boats, and those with pitting that has reduced the thickness to below 4mm, are often sound and an appropriate course of maintenance and/or repair can be recommended and insurance maintained. It is also worth noting that third-party-only cover can be found, and that this does not require a survey, meaning a licence can be obtained and boating can continue, albeit the vessel itself is not insured against loss.

POST-SURVEY

For a buyer they will either proceed with or withdraw from the purchase, perhaps following a further negotiation. For insurance, there may be some tasks that require completing that an underwriter would insist on. For some, they choose to carry on with third-party-only cover where remedial works may prove too costly or uneconomical. Surveyors should always be available to talk to should any further explanation be required and, in some cases, may need to revisit the vessel or update the report.

