AUSTRALASIAN INSTITUTE
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Shipshape

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Bulk carrier safety, efficiency reshaped by new rules, tools

YEAR'S END A TIME TO REFLECT

Which NDT test should you choose for welds?

ONE question that pops up almost every time I am involved in a ship repair job is: "Once the welding is done, which non-destructive test (NDT) would you recommend for the weld?"

It's a good question – and the answer isn't "one-size-fits-all", We have several tools in our NDT toolkit:

- dye penetrant test (DPT);
- magnetic particle inspection (MPI);
- ultrasonic testing (UT); and
- radiographic testing (RT)

Let's quickly break these down.

1. Dye Penetrant Test (DPT)

– Best for detecting surface-level cracks.

– Simple and cost-effective.

– But it can't detect sub-surface defects.

2. Magnetic Particle Inspection (MPI)

– Can detect slightly below-the-surface cracks due to the strong magnetic field.

– Not suitable for non-ferrous metals or most stainless steel grades.

– Can't catch deeper weld flaws like slag inclusion, blowholes, or air entrapment.

3. Ultrasonic Testing (UT)

– Uses ultrasound signals to detect internal defects.

– Portable and flexible — equipment is easy to carry and deploy.

– Great for thicker welds or critical structures.

4. Radiographic Testing (RT)

– Uses X-rays to reveal deep-seated weld flaws.

– Offers the advantage of a permanent record of the weld condition.

– Less portable and not always easy to use on-site compared to UT.

So, which one should you pick?

For thin weld pieces (just a few weld runs) or non-critical parts, DPT or MPI can be a good choice.

For thicker welds (involving double-V or double-U preparations, multiple weld runs) or mission-critical components, UT or RT is the way to go for true peace of mind.

At the end of the day, choosing the right test is all about balancing practicality, cost, and the level of confidence you need in the weld's integrity.

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