Aussie superpower PART 4

Receiving diesel from USNS Supply.

A replenishment at sea – or RAS [pronounced raz] – is what they call it, and it's achieved by pulling alongside another ship in open ocean, receiving a hose from that ship, plugging it in and pumping the fuel from one ship to the other.

Officer of the watch.

Keeping the distance measuring rope taut.

Last issue I left off telling you how thirsty HMAS Melbourne can be. With two gas-guzzling 'jet' engines, her considerable fuel capacity can be severely depleted in just a few days, depending on what she gets up to.

For example, at a reasonable cruising speed of around 20 knots, she drinks around 12 US gallons, or 46L of F-76 marine diesel per minute. Nudge the speed up to 30 knots, though, and she guzzles down something a little north of 30 gallons a minute – or more than 150,000 litres per day.

So, you can imagine that even with her capacity to carry 750 tonnes of diesel, HMAS Melbourne needs her tanks topped up fairly regularly. And this she usually does without pulling in to port.

A replenishment at sea – or RAS (pronounced raz) – is what they call it, and it's achieved by pulling alongside another ship in open ocean, receiving a hose from that ship, plugging it in and pumping the fuel from one ship to the other.

Sounds simple, doesn't it? But it's not. And it's actually quite dangerous to the integrity of both ships.

I discussed earlier how HMAS Melbourne is pretty stable when traveling fast, cutting through the water, as opposed to bobbing up and down on the waves.

The same goes for any ship, to one degree or other. So, during a RAS, both ships are moving, at around 15 knots, parallel and in close proximity to each other. Which can create its own issues. Not getting too technical about it, but, when two ships run parallel to each other like this, the Bernoulli principles of fluid dynamics dictate that they are drawn to each other by suction as water passes between them, and it's only through skillful driving that the two hulks are kept a safe distance apart.

That safe distance is about 150 feet, give or take – or about 50m. But that distance can be chewed up quite quickly if even the slightest steering error is made or close vigilance is not kept. In fact, just a 1-degree error in steering can close the gap at faster than 20 feet per minute.

Because the gap is so critical, it is vital to know exactly how far apart the two ships are at all times, and vital that any variation in this distance is recognised quickly.

And, yet, despite all the technology available in the modern, electronic world, the device that measures and constantly monitors that distance and displays it to the captain is elegantly simple. A rope is strung from ship to ship with coloured and numbered flags at measured intervals, tied at one end to the tanker and either played out or hauled in by two deckhands on Melbourne's focsle to keep it taut.

But, hey – if it works! And, of course it works very well indeed, and works as part of a network of devices and people designated with their own part to play in keeping these two steel behemoths apart.

Another simple device is a hand-held, A-4-sized whiteboard displaying vital ship statistics such as engine states, speed, rudder settings and heading, which is kept up to date by a junior sailor and held in convenient view of the captain whenever the ship is engaged in this or any other sensitive manoeuvre, such as port entries and exits.

Keeping things low tech like this means there's fewer things to go wrong during this very sensitive mating.

But lets back up a bit.

The RAS is planned well in advance, with a rendezvous at sea scheduled via radio with 24 hours or more notice.

In the mean time, as life goes on as normal onboard, several people keep a watchful eye on speed and distance and consumption and every other relevant parameter, calculating whether the ship has enough fuel to make her rendezvous. And, if there's any doubt or concern, and much like a my ~~nagging~~ helpful wife on a highway drive, suggest adjustments to speed or other 'driving' styles to ensure the next fuel stop is met without having to walk the last 5km.

Of course, that could be difficult and even more embarrassing in a capital warship than a car on the highway.

Anyway, when HMAS Melbourne finds USNS Supply, just after dawn, in the middle of nowhere – aided by good navigation, radar, GPS and a host of mod cons – she first draws up behind and to one side of the tanker. Then, when the tanker's captain is ready, Melbourne is invited to take her place, and catches up with maybe 5 knots difference in speed (just remember here that I'm an Army dude observing my first Navy RAS, so don't take my figures as exacts, just painting a picture).

Melbourne eases alongside then slows to match speed with the tanker, and positions herself about amidships, with the tanker's hoses almost exactly opposite Melbourne's receiving nozzle, which is just behind her bridge superstructure.

Obviously, the two ships can communicate by radio, and do. But there is also communication between decks using hand-held flags and a set of signals I saw the boys on the GDP practicing for long periods the day before.

With the two ships now settled on their course, and at this stage about 120 feet apart, a shot rings out. I knew it was coming, but I flinched anyway – I couldn't help it.

This was the first physical connection between the two ships. A light rope, harmlessly shot across the gap, caught, then pulled across, bringing with it a 'messenger line' and eventually the fuel rig line. This latter steel cable, secured at both ends and hauled high on the tanker end, becomes the rigging for the hose that will carry the fuel.

When the hose comes across, it comes quite quickly, gliding on sets of pulleys on the steel cable, and its big brass nozzle slams effortlessly into the waiting receptacle and is locked in place.