be detected only through a series of eye fixations at different points, each becoming a field of focus. By fixating every 20 degrees, it should be possible to detect any contrasting or moving object in each visual block. Across the total scan area, this involves 9 to 12 blocks, each requiring one to two seconds for accommodation.

One method is to start at the far left of the windscreen and make a methodical sweep to the right, pausing each time to focus. The other is to start in the centre, moving progressively to the left, then swinging quickly back to the centre and repeating the performance to the right. While your head is moving, vision blurs, so unless a series of fixations is made, there is little likelihood of detecting all targets in the scan area.

Concentrate on critical areas. In the circuit, a systematic lookout before turns is crucial. This is due to the potentially large number of aircraft in close proximity to each other and the high workload. Start your scan by looking well back in the direction of the intended turn, raising/lowering the wing to give you a view above and below. Then move your eyes to scan back in the direction opposite to the turn and as far as the cockpit vision allows. Once this scan is complete, a turn can be initiated.

On descent and climb-out, make gentle 'S' turns to ensure no-one is in the way. On final do not fixate on the touchdown point. Look in front and behind this point for other traffic.

Summary

- Keep the windscreen, windows, and coaming clean and clear of obstructions.
- When cleaning windows, wipe in a vertical motion to reduce false horizons.
- Minimize head down time by having charts folded properly.
- Navigational lights and anti-collision beacons should be used at all times.
- Make accurate position reports and listen to other position reports to paint a situational picture.
- Scan constantly – 90 percent outside the aircraft, 10 percent inside the aircraft.

Adapted, with thanks, from *Flight Safety Australia.*

Water or Fuel

Early in our flying careers, we were taught as part of the pre-flight ritual to take a fuel sample from each of the various fuel drain points on our aircraft. Most of the time, these samples revealed nothing amiss, and occasionally we would be rewarded for our diligence by the appearance of a small amount of water at the bottom of the sample.

This sample shows 100/130 avgas above water – the division is quite apparent.

How did we know when all was well? The sample would be uniform with no water/fuel interface, the colour was as we expected, and it looked and smelt like the 'real McCoy'. Avgas used to be available in several octane ratings, each with its own distinguishing colour, but currently is available in only 100/130 octane, coloured green. Nowadays some engines (normally on private or sport aircraft) are permitted to run on motor gasoline (mogas), the colour of which also differs between octane ratings.

Jet A-1 (aviation kerosene), on the other hand, comes in one colour only, or more correctly, no colour at all. Much like water, really. To a helicopter pilot who took a sample drain from his Jet Ranger, the sample looked clear, smelt "about right", but there was something about it that aroused his suspicion. A water test capsule put the issue beyond doubt - the sample was all water, and the fuel tank took considerable further draining before actual fuel was encountered. Some maintenance action was required before further flight.

This subtle trap can also be encountered with avgas – be aware that in a narrow-gauge fuel drain receptacle such as those commonly carried on light aircraft, the fuel colour may be hard to distinguish, particularly in poor light or where the receptacle itself has discoloured over time. Usually any ambiguity can be resolved by smell, feel, and the behaviour of the sample when poured on a hard surface. Another strategy is to add water to the sample – if the sample is fuel, there will be an immediate separation of the water and fuel, and if the sample is all water, there will be no change in its appearance.

There are several proprietary water-detection products on the market; however these are more often used with Jet A-1, which can contain suspended water, not visible to the naked eye. The danger with an excess of this suspended water is that it can precipitate out at low temperatures, and freeze in critical locations such as fuel filters and sumps.

This sample is actually Jet A-1, but on appearance alone, is hard to distinguish from water.

Take the time, particularly when you are in a rush, to verify that the 'clear and bright' sample you have drawn from the fuel drain is actually fuel – not water. Water contamination still occasionally causes engines to fail at the most inconvenient times! Once you have confirmed that the sample is actually fuel, remember to dispose of it in an environmentally-friendly way, such as in a dedicated waste-fuel drum.

Further reading: GAP booklet *Fuel Management*.