Glider Towing Operations

Fuel Management

Fuel (Mis)management

Fuel (Mis)management

- **19/11/2011 QSA – Exhaustion:** During an aerotow launch the glider tug ran out of fuel and safely executed an off-field landing. The tug pilot reported that he did not 'dip' the tanks but visually examined the fuel tanks in the morning and misread the fuel level, resulting in him miscalculating the flight duration.
- **30/03/2013 VSA – Starvation:** The tow pilot did not notice the selected fuel tank was almost out of fuel during his pre-take-off checks and the selected tank ran dry during the launch.
- **18/05/2014 VSA – Exhaustion:** The engine stopped on base leg following a glider tow. The pilot did not adequately monitor the aircraft's fuel state nor notice the 'low fuel' warning light was illuminated. It is probable that stress and fatigue degraded the pilot's attention and decision making. Weather conditions were challenging, with low level turbulence possibly contributing to a destabilised approach.
- **23/05/2015 QSA – Starvation:** The newly endorsed tow pilot commenced flying with the tanks half full and miscalculated his fuel burn rate. The engine lost power during launch at 300ft AGL and the glider pilot released and both flew modified circuits and landed safely.
- **23/05/2015 WAGA – Starvation:** The tow pilot did not notice the selected fuel tank was almost out of fuel during his pre-take-off checks and the selected tank ran dry during the launch. The pilot conducted a forced landing with one tank still full.

Fuel Exhaustion

- Exhaustion occurrences are normally either the result of a gross error in the fuelling of an aircraft before flight, or the result of a number of seemingly minor aspects in fuel planning and management during the flight.
- They are normally related to a lack of awareness of information that is readily available at the pre-flight planning stage. This includes both the amount of fuel on board, and the rate of fuel consumption.

Fuel Exhaustion

- The chance of fuel exhaustion is reduced if the pilot accurately determines the amount of fuel on board prior to starting.
- This should entail the use of a fuel quantity cross-check using a number of sources, including:
  - Fuel quantity gauges;
  - Dipsticks;
  - Flowmeters/ totalisers; and
  - Calculations from previous refuels and fuel usage (regularly checked for accuracy).

Fuel Starvation

- Leaving the fuel supply on an emptying tank, when there is a fuller tank available.
- If a pilot is disciplined in always writing down a tank change with the time of the change (and launch number), then any doubt about whether a tank was changed can be checked against the fuel log or launch record sheets.

Tug Pilot Human Factors

- Tug pilots are subject to human errors, like any pilot
- Glider towing can be high fatigue, repetitious, routine
- Unreliable estimates and arithmetic errors can ruin your day
- Fatigue and complacency can reduce vigilance and attention
- Sometimes it is hard to say no, easier to say yes, when one should not agree
- Normalised deviance can occur (e.g. living with erroneous gauges or unreliable warnings)
- Club culture – how much pressure is put on tug pilots by crew at the launch point?

Summary

- The chance of fuel exhaustion can be reduced by:
  - using more than one source of information to obtain consistent results about the fuel on board before each flight
  - the use of a consistent procedure that is regularly checked to know the exact rate of fuel consumption
  - if in doubt, assuming the worst and refuelling early
  - refuelling at pilot breaks or changeovers
  - Club culture – having club members prearranged to assist with refuelling after nominated number of launches
  - knowing your aircraft, and its fuel system, and key numbers

Summary

- Fuel starvation usually happens when the selected tank is run dry. In addition to the factors relevant to fuel exhaustion, the chance of starvation can be further reduced by:
  - ensuring the pilot is fully familiar with the operation of the fuel system for both normal and abnormal operations;
  - adhering to pre-flight procedures and checks to ensure the correct tank is selected before takeoff and landing; and
  - using a fuel log and launch record sheets during flight to provide a record of the fuel usage from each tank.
- Tug pilot human factors apply – club culture also affects these
- There is nothing quite so useless as air in the tanks when you need more fuel