

# **PART 4: TOWING OPERATIONS**

## **1 ADHERENCE TO THIS DOCUMENT:**

This document is intended to supplement the following documents:

- CAA Air Navigation Order
- EASA FCL
- Middle Wallop Airfield Manual

The documents listed above are of higher authority than this manual therefore any procedure contained within this manual that conflicts with any directives contained in the documents listed above, must be discarded.

In all other cases, towing operations conducted at Middle Wallop, under the umbrella of PNGC must be carried out in accordance with these procedures.

The authority for flying within PNGC remains with the Chief Flying Instructor, although responsibility for Aero-Towing operations is devolved to the Tug Master.

## **2 OPERATION**

### **2.1 Aim**

A tug pilot exists to provide a service solely for the benefit of the glider pilot(s) which he or she is launching. The default position should be to take the glider pilot to the lift in the most direct and efficient route possible, without compromising safety or airmanship.

The Following items summarise the order of priority for Aero-towing operations:

1. Safety
2. Accuracy
3. Efficiency

### **2.2 Safety**

The highest safety standards are expected from our tug pilots, ensuring that handling on the ground and in the air, potentially around unsavvy visitors and large amounts of traffic, is done with great care. The vast majority of accidents are avoidable.

The CFI or Tug Master may at any time suspend or revoke a tug pilot's Certificate of Competence (CofC) should it be felt that safety is being compromised. In such a case, a clear goal must be stipulated for reinstatement OR terms of any suspension or revocation of the CofC.

### **2.3 Accuracy**

An aero-tow is significantly more expensive than a winch launch. The glider pilot has elected to take the option of an aero-tow to ensure he or she gets the most effective launch for his task, whether that be training, aerobatics or cross country. It is therefore up to you; the tug pilot, to ensure you get the glider to where it needs to be to complete this task, at the height requested. Quite often this takes a significant amount of forward thinking and consideration of other airmanship factors.

### **2.4 Efficiency**

Every minute that the tug's engine is running, costs the club money, whether that be on the ground or in the air. Therefore, to ensure flying costs are kept to a minimum in PNGC, by accepting the position as a Tug Pilot in PNGC, it is your responsibility to ensure that the absolute minimum engine time is used to manoeuvre, provide the launch and recover the tug without compromising safety.

Utilise lift where possible such that your climb rate is increased, and equally, for the descent, remain clear of areas of lift. Fuel is extremely expensive. Every litre you can save, saves a huge amount of money for the club and helps to keep the cost of launches to a minimum.

If a glider pilot is not ready to launch and you are waiting on the ground, consideration should be given to shutting down the engine. As a guide, any waiting time expected to exceed 2 minutes should prompt you to shut down the engine.

## **3 LEGAL RESPONSIBILITY**

### **3.1 Command**

Whilst towing, the PIC of the tug is the PIC of the combination. This means the tug pilot is responsible for the safe conduct of the flight of both the glider and tug until such time as the glider pilot releases.

### **3.2 Lookout**

Due to restricted manoeuvrability and an elongated combination, an effective lookout is absolutely crucial to maintaining safety.

The combination is travelling much slower than other GA aircraft as well as climbing at a much lower rate, thus there is a very real threat of collision from the rear sectors as well as from underneath.

Lookout should be conducted from as far rearwards as possible in order to minimise collision risks.

### **3.3 Eventualities**

Should the tug suffer a partial or full failure, or the connecting cable suffer a failure, prior planning should enable the glider pilot to safely land back at the airfield when towing locally, or a suitable field in the event of retrieves.

The tug pilot is therefore responsible for positioning the combination, at all times, whereby the glider can safely execute a landing should a failure occur.

## **4 LIMITS**

The following limits are to be adhered to, although individuals may be restricted to lower limits based on experience or currency:

Max Cross Wind Limit	15kts
Max Wind Speed	20kts (gusting 25)

New tug pilots, less than 100 tows, will be restricted to 2/3<sup>rd</sup> of these limits.

The Duty Instructor, Tug pilot, Tug Master, CFI or DCFI may cause the cessation of aerotowing should it be felt that the conditions are inappropriate for either the pilot's level of experience or the aircraft's safety.

## **5 NOISE ABATEMENT**

Towing aircraft use full power at relatively slow speeds, causing a significant amount of noise for a prolonged amount of time. Be cognisant of the fact that our neighbours (all within our local area) do not necessarily share the same love of aviation that we do. Therefore, in addition to ensuring the ANO is complied with for staying clear of built up areas and the 500ft rule, you should not overfly built up areas, whilst towing unless absolutely essential, and only then at the highest possible altitude. At an absolute minimum, this may be 1500' AGL whilst climbing.

Note that noise drifts with the wind, so better to fly on the downwind side of a built up area than the upwind side.

The initial part of the descent, whilst maintaining relatively high power settings, can be equally as noisy.

## **6 FATIGUE**

Ensure you are fit to fly. The standard duty can be quite tiring; so ensure you have had enough rest so that you are alert and able to offer the best service to paying glider pilots. As a guide, no tug pilot should be flying continuously, without a break, for more than 2 hours.

If it's hot, ensure that you take some water with you and give consideration to wearing sunglasses and a hat where applicable.

No Tug pilot is to undertake more than 5 hours of flying in one day.

## **7 FUEL**

### **7.1 Local Operations**

Under no circumstances is an aircraft to get airborne with either gauge reading less than 2 gallons (red segment).

### **7.2 Land-away and retrieve**

Sufficient fuel must be carried for a suitable diversion airfield at all times.

## **8 QUALIFICATION**

### **8.1 Minimum Initial Qualification**

In order to be considered as a Tug Pilot in PNGC Tugs, a pilot should have a minimum of the following qualification:

- Silver 'C' Gliding Qualification
- 150hrs total time (gliding and power flying)
- 50hrs total Time power fixed wing (Motor Glider / SEP)
- 10hrs on Group A aeroplanes (SEP, SEP tail dragger as applicable to the Tug)
- Suitable Tail wheel conversion
- Approval of TM and CFI
- Full / Ordinary / Special / Junior special / Honorary Life flying member at PNGC.
- Current glider pilot at PNGC
- Prior to flying a tug solo, for the purposes of towing, the following requirements must be met:
  - Minimum of 1 hour on type prior to towing
  - Certificate of Competence (Tugs) Held

Where a demonstrably exceptional case exists, these rules, i.e. any minimum requirements, may be waived with agreement of both the CFI and Tug Master.

P1 must sit in the front seat, unless he or she is the holder of a suitable and current CAA instructor rating and has been authorised to instruct by the Tug Master (TM).

The TM in conjunction with the CFI is to determine the number of pilots that are required in order to balance the currency levels with availability and demand. Should the number of tug pilots be deemed to be sufficient, the TM is to maintain a record of suitably qualified individuals on a reserve list.

Where a number of individuals exist on the reserve list, a selection process should be employed to ensure the best individual is selected for the task in hand. This should take the form of a flight with either the TM or authorised FI / CRI looking for ability, awareness and speed of learning.

## **9 TRAINING**

### **9.1 Ab-Initio Training**

No Ab-initio instruction is to be conducted in PNGC Tugs. This is a condition of insurance and may not be waived.

### **9.2 Training for differences or class ratings**

SEP conversion training or tailwheel may exceptionally be authorised by the Tug Master where a direct benefit to PNGC can be demonstrated. Generally it is expected that pilots wishing become involved in glider-towing operations gain these qualifications at their own expense elsewhere.

### **9.3 Ongoing Training / Standardisation Flights**

Once qualified to fly the aircraft, the Tug-Master, and any other pilots he authorises, may conduct training from the back seat. It should be noted, however, that unless a valid CAA FI /



CRI rating is held, the trainee must be legally licensed to fly the aircraft and must act as P1. Note that the Check-Pilot has no legal responsibility and is not deemed to be part of the crew, but is there to provide advice on towing aspects of the flight. In this scenario, the P1 must have conducted 3 takeoff's and landings within the preceding 90 days in order to carry the Check Pilot who is legally described as a passenger.

## 10 CURRENCY

In order to act as P1 in a PNGC towing aircraft, the following currencies must be adhered to in addition to holding a valid and current Certificate of Competence:

Towing Experience	Minimum Currency requirements
<b>Greater than 200hrs towing experience:</b>	3 Tows in the previous 90 days
<b>Less than 200hrs towing experience:</b>	3 Tows in the previous 60 days
<b>Less than 50hrs towing experience:*</b>	Authorised Individually for each towing session

\*Pilots new on type, less than 50 hours towing, must have flown once on type in the previous 45 days.

If a pilot has not achieved the above currency, he or she must seek a check flight from an authorised Club Check Pilot.

If a pilot has not towed in the aircraft type with which they wish to tow in the preceding 90 days, he or she is to seek a check flight with the TM. The TM is exempt of this rule in order to bring other pilots into currency after an aircraft endures a long period of being offline, or a new / visiting aircraft is obtained.

In the case of a single seat aircraft, the above rules will still apply, however a briefing must be sought in place of a check flight.

Additional restrictions may be placed on any pilot at any time by the CFI or TM.

## **11 CERTIFICATE OF COMPETENCE (TUGS)**

All tug pilots must be in possession of a valid Certificate of Competence in order to fly PNGC powered towing aircraft, with the exception of those flying under the supervision of a nominated Centre check pilot as defined in Annex A

### **11.1 Initial Issue**

In order to gain a Certificate of Competence (Tugs) (CofC(Tugs)), a flight must be conducted with a Centre authorised check pilot as stated in Annex A

Prior to issue, the check pilot is to ensure the following has been met:

- 5 hours gliding in the preceding 12 months
- Minimum of a Silver Badge is held
- Current licence and medical details are held on the Centre's records
- The individual has passed the training and check flight and is capable and practised in dealing with all eventualities

### **11.2 Period of Validity**

A Certificate of Competence lasts for 12 months from the date of issue / revalidation. It may be revalidated within 3 months of the expiry date without loss of continuity.

### **11.3 Revalidation Criteria**

All tug pilots must have achieved the following as a minimum to revalidate their Certificate of Competence and continue towing at PNGC:

- 6 solo aerotow flights in a glider at Middle Wallop
- 40 tows
- Check flight with a Centre Authorised check pilot (See Annex A)

### **11.4 Failure to meet requirements**

Should any of the criteria listed in 11.3 not be met, the CofC(Tugs) will not be revalidated. Its privileges may be exercised until the expiry date of the CofC. The default position is that a Certificate of Competence will be suspended if the above requirements have not been met, unless the CFI and TM agree to over-ride this position for exceptional circumstances.

Should it be felt that the required standard is not met, the TM retains the right to withdraw a CofC.

### **11.5 Records**

The TM will maintain an online database with details of all medicals, licenses, ratings and CofCs. The online database is the master for CofCs and Licences. The list of authorised pilots listed at Annex A included in the log cabin copy of this document is to be the master.

### **11.6 Tug Master Requirements**

The TM is to provide the CFI with a list of gliding hours that each Tug Pilot has achieved during the defined year.

**12 PASSENGERS:**

Pilots shall not carry passengers when towing without the prior authorisation of the TM. This opportunity will only be granted in exceptional cases, where there is a clear benefit to the Service or the Centre.

For the purposes of these rules, a passenger is defined as anyone not listed in Annex A as a PNGC Tug Check Pilot. Tug pilots are not to fly with other Tug Pilots except those listed as Check Pilots in Annex A or by exception and with permission from the TM.

P1 shall sit in the front seat of the aircraft when carrying passengers, except for those Authorised as PNGC Tug check pilots who may act as P1 from the rear seat.

### **13 LANDINGS AWAY FROM HOME BASE**

Field landings or landings away from PNGC home base (or operating base if deployed on an expedition) are not to be conducted without express permission from the TM except in the case of an airborne emergency.

Field landings for the purpose of retrieving a glider that has 'landed out' will be individually authorised and briefed by the TM. In exceptional circumstances, the CFI / DCFI (if current PNGC Tug Pilot) may authorise this activity in the event that the TM are uncontactable.

The authoriser and pilot are to satisfy themselves that the following criteria have been met:

- Land-owners permission has been granted in advance (legal requirement)
- Airspace / NOTAMs / navigation aspects have been briefed / covered.
- Undershoot / overshoot has been surveyed by the glider-pilot.
- Charging rate agreed in advance (IAW current pricing structure)
- Combination weight / slope etc all within safe performance margins
- Glider pilot briefed on eventualities and what each aircraft will do in either:
  - Engine failure / rope failure
  - Poor performance – i.e. the tug / glider combination is unlikely to clear the far-end obstacles if the launch continues.

## **14 USE OF PNGC TUGS FOR NON-TOWING OPERATIONS**

### **14.1 Private Use**

Subject to the following restrictions, PNGC aircraft may be flown for private use when:

- No gliding operations requiring the use of the tug are taking place or likely to take place
- Sufficient hours remain to fulfil all PNGC requirements before the next Scheduled service.
- CFI or TM authorisation has been sought.
- Reimbursement for costs is made at the current published rate (Part 2 Annex A .
- Pilot is a flying member of PNGC and current on type.

### **14.2 Non-Towing PNGC Operations**

It may be necessary for PNGC tugs to be used for non-towing PNGC operations such as ferry flights. In this case, it would be expected that PNGC would cover the costs of the flight(s).

These flights are to be kept to an absolute minimum and should only be conducted with specific, prior approval from the CFI. There should be a demonstrable case for such an occasion, where the journey by car or other means of transport is either more expensive or inappropriate. Remember that this luxury is not free; the club members are footing the bill for such an occasion.

In such cases, the most efficient flight profile must be employed, making full use of height vs wind and leaning.

## **15 PRE-FLIGHT**

The Duty Tug Pilot should conduct a 'Check A' in accordance with the aircraft manual. A log sheet is to be placed in the aircraft, ensuring that a pen is available in the cockpit.

Care should be taken to ensure the rear seat and locker are secure prior to flight.

A cable release check must be conducted prior to first tow.

Ensure sufficient time remains prior to the next scheduled service to complete the day's task.

Ensure all documents are current and valid to include:

- Certificate of Insurance
- Certificate of Airworthiness / Permit to fly
- Airworthiness Review Certificate (If applicable)
- Radio Installation Licence

## **16 AIRCRAFT OPERATING PROCEDURES**

### **16.1 Taxying**

Aircraft are not to be taxied using more than 1200rpm unless the engine is fully warmed through.

Aircraft are not to be taxied across winch cables at any time. Should this occur inadvertently, a suitable individual should be requested to check that the cable has not been picked up by the tug prior to moving off.

The aircraft should not be used to position the rope with use of excess manoeuvring.

### **16.2 Pre-Take Off Information**

PNGC requires tug pilots to record the following information:

- Time of Takeoff
- Glider Registration
- Height of Aero-tow
- Paying Person / Organisation
- Tug Pilot's name

Those items in bold must be ascertained prior to getting airborne.

### **16.3 Pre-Take Off Checks**

Pre-takeoff checks should be conducted to include, as a minimum, the following items:

Flaps	Set as appropriate for takeoff*
Fuel	On, sufficient §
Carb-Heat	Cold
Magnetos	Both

\* Depending upon the surface, glider weight and wind conditions, either zero or 1<sup>st</sup> stage of flap.

§ In the case of a Supermunk, An aero-tow may not be commenced if either tank indicates the fuel quantity is below 2 Gallons (denoted as the red portion).

### **16.4 Take Up Slack**

Tug pilots may start moving forwards to reduce the 'up slack' time, once the aircraft is connected and once personnel and other aircraft are not going to be affected.

Tug pilots are not permitted to launch the combination until such time as the Duty Instructor has commanded the launch.

The up slack process should be performed such that the rope does not 'snatch' upon the rope becoming taught.

### **16.5 Launch**

Once the Duty Instructor has commanded the launch, the tug pilot should apply Full Power, only once he or she is content that it is safe to do so.

Full power, when selected, should be introduced over a minimum of 3 seconds.

As the glider becomes airborne, particular caution should be paid to the potential for the glider to raise sufficiently above the tug that pitch control of the tug could be lost. It is recommended that the tug pilot places his left hand close to or on the release knob during this phase.

## 16.6 Climb

The following figures are to be used for standardised climb speeds unless the glider pilot requests an alternative:

Glider	Tug ASI Reading
<b>Wooden aircraft</b>	55-60kts
<b>Glass aircraft (Empty)</b>	65kts
<b>Glass aircraft (with water ballast)</b>	70kts+

The tug should not be flown below 55kts IAS to avoid overheating the engine.

Once safe to do so, the flaps are to be retracted (300' as a rough guide). Flaps are not to be used for the whole climb.

The tug Angle of bank should not normally exceed 15 degrees and all rolling manoeuvres should be made slowly and progressively, with consideration to the level of skill of the glider pilot on tow.

The tug should always be flown such that if the glider pilot releases or the rope fails, the glider can get back to the airfield.

Should it be thermic, once above 700ft every endeavour should be made to drop the glider in the nearest area of lift at the lowest altitude. For early training flights, or in non-thermic conditions, the glider should be dropped upwind of the airfield, subject to the bounds of airspace and local restrictions.

Temperatures and pressures should be monitored regularly, paying particular attention to the CHT, which is not to exceed 250°C, but normally not above 235°C.

If there is any doubt about the performance of the tug or any indications, ensure that the glider is able to make it back to the airfield safely and 'waive off'. Continuing on regardless could be catastrophic or cost huge amounts of money and down-time if failure occurs.

Avoid flying in perfectly straight lines as a large blind spot exists ahead and below the tug. Utilise gentle turns every 30 seconds or so to ensure the area you are climbing into is clear.

## 16.7 Release

Prior to manoeuvring, the tug pilot must ensure that the glider has released by visual confirmation.



The convention at PNGC is for the glider to perform a climbing turn to the left, whilst the tug performs a descending turn to the right. This may be ignored if the glider is turning into a thermal, in which case the tug should oppose the direction of turn of the glider.

The tug should be accelerated to 100kts by gently lowering the nose, whilst retarding the throttle slightly to maintain the climb RPM (nominally 2450). The RPM should not be allowed to pass above 2500 for noise abatement.

Once stabilised at 100kts and 2450rpm, the throttle should be further retarded over a minimum of 30 seconds to 2100rpm maintaining 100kts.

## 16.8 Descent

The stabilised descent should be performed at 100kts (max) and 2100rpm. These figures **MUST** be adhered to in order to prevent unnecessary engine fatigue.

The max speed for side-slipping a Supermunk is 106kts (full rudder deflection). A constant turn in the descent with a small amount of top rudder results in a large difference of rate of descent, whilst allowing a constant lookout.

Remember that you are potentially transitioning rapidly through several layers of aircraft who are not necessarily expecting you to do so therefore a good lookout is vital.

The descent should be planned as a constantly descending profile towards the end of downwind. There should be no requirement to fly straight and level at any point (wasted fuel).

Once the CHT has dropped below 180°C, the engine may be treated as normal, but the power should be reduced throughout the descent, with no increases in power being demanded.

## 16.9 Tug Circuit

Tug circuits must be flown in accordance with Middle Wallop power circuit.

Tugs in the tug circuit must give way to all gliders and other power traffic if there is any risk of interference.

Tugs are not to be flown at less than 1000' AGL over build up areas under any circumstances (except in an emergency).

Tugs should not cross over the winch line unless it is obvious that either the winch is not out, OR it can be guaranteed that a launch will not occur, either by RT confirmation of your intentions or if no aircraft are lined up in the winch queue.

## 16.10 Final Approach

Tugs are not to cross the airfield boundary for approach below 300' AGL. It is not necessarily the actual height of the rope over a road / path, but the perception of the individual who is not versed in aviation techniques. A single occurrence of a 'near miss' or perception of a low rope passing a car / individual in the undershoot will have dire consequences for PNGC.

The selection of flaps should be timed to avoid putting power back on. Having successfully cooled the engine, it is less than ideal to introduce more heat and use more fuel.

Once inside the airfield boundary, every effort should be made to land as short as practicable.

### 16.11 Landing

Never land towards parked gliders or similar obstructions and allow for movement of people crossing the airfield and gliders being moved or towed. Assume the brakes may fail, there has got to be somewhere ahead where the tug can go without causing an incident.

### 16.12 Go-Round procedures

The vital thing in this case is that the tug maintains its approach heading while starting to climb. Once abeam the launch point, angle away from the runway by about 15 degrees making sure it is clear to turn, this will ensure separation from any winch cables which may be in the air. Be aware there may be a winch cable in the air or gliders hangar flying. Use full power to climb whilst staying under the flap limiting speed. Raise the landing flap to half, and climb to about 500 ft before turning onto the downwind leg.

### 16.13 Emergency Procedures

#### 16.13.1 Engine Fire on the Ground

The following actions are suggested should a fire be detected or suspected whilst on the ground.

Aircraft	Bring to a halt across the wind
Brakes	Apply
Canopy	Slide back
Throttle	Idle
Mixture	Idle / Cut-off
Ignition	Off
Fuel	Off
Brakes	Release
Aircraft	Vacate

#### 16.13.2 Engine Failure After Takeoff (EFATO)

EFATOs are not to be practised unless with a PNGC approved Check Pilot on board.

EFATOs are not to be commenced below 350'AGL absolute minimum.

The speed must be kept at a minimum of 65kts IAS until rolled out on the final approach.

Turns should be carried out into wind unless other factors over-ride.

EFATO should be discontinued at the 90 degree mark should it become apparent that sufficient height is not available. The aircraft should be landed / ditched elsewhere.

Be aware of the rope – release if possible.

#### 16.13.3 Failure of release hook

Should the glider pilot be prevented from releasing for any reason, the combination should be manoeuvred to the overhead of the airfield. The glider should remain in the normal towing position and the rope released from the tug following communication using RT if possible.

If RT is not available and the glider pilot cannot release, he or she will manoeuvre out to one side sufficiently for the tug pilot to be able to see any hand signals. Once the glider returns to the normal position, the tug pilot should release the rope.

#### **16.13.4 Rope break**

The primary concern is the safety of the glider in returning to the field.

The tug and glider should initially retain their respective parts of the rope unless this poses a threat to the safe return and landing of either aircraft.

The tug should be able to retain its part of the rope indefinitely through to landing.

The glider pilot should position in the overhead, if possible, before releasing the rope. If this cannot be achieved, it should be released clear of all persons and obstacles.

#### **16.13.5 Glider Too High on Tow**

Should the glider move to a height where the tug pilot is having to use considerable aft stick inputs; either on the ground or in the air: consider releasing, particularly if the stick input has a required a high rate of onset. It can take many hundreds if not thousands of feet to recover from being tipped up.

## **17 PARKING AT LAUNCH POINT**

Aircraft must be parked into-wind, mixture lean, throttle at idle and switches off. The parking brake should be applied.

Ensure that the location chosen to park the aircraft does not interfere with winch operations or present a perceivable problem for powered aircraft using the runway. Likewise, care should be taken to ensure the approach paths for the grass runways remain unaffected.

## **18 COMPLETION OF FLYING**

The following are to be ensured upon completion of flying each day:

- Aircraft refuelled to max.
- Aircraft parked in the hangar
- Tech Log completed
- Tug Log reconciled against Glidex and any discrepancies discussed with the DP / DI.
- Aircraft washed / cleaned
- Defects reported to the TM / Tug Engineer PRIOR to recording in the tech-log.

## **19 REFUELLING**

Aircraft are only to be refuelled in open space, i.e. not in hangars or confined spaces.

Aircraft brakes must be released prior to refuelling

Refuelling must only take place once the aircraft has been earthed to the bowser and that the bowser has been earthed to ground.