SECTION 2.3 AERIAL APPLICATION RATING AND ENDORSEMENTS

Unit 2.3.1 AAGR: aerial application rating – all aircraft categories

1. Reserved

2. Flight rules

2.1 Legislation

2.1.1 Explain the privileges and limitations of an aerial application rating.

2.1.2 State the responsibilities for supervision of a pilot where required.

2.1.3 State the requirements for the conduct of aerial application operations below 500 ft AGL, including pilot responsibilities.

2.1.4 Explain pilot responsibilities for carrying out the following in relation to role equipment that is fitted to an aircraft:

(a) repairs;

(b) replacement;

(c) overhauls.

3. Operational planning

3.1 Pre-flight and after-flight inspection

3.1.1 Describe the areas of the aircraft that should be inspected to ensure the safety of aerial application operations.

3.1.2 Describe inspection and flight preparation of aircraft exposed to outside parking and harsh environmental conditions (for example, wing and control surfaces exposed to freezing conditions, engine, battery care, etc.).

3.1.3 Explain inspection requirements for aircraft role and equipment, including secure fittings of booms, spreader, hoses, pumps and operations of the dump equipment.

3.1.4 Explain fuelling procedures, including drum stowage, use and care of pumps, fuel testing, use of safety equipment/fire extinguishers, vehicle positioning and fuel quantity checks.

3.2 Operational inspections

3.2.1 Explain operating area inspection methods and purpose.

3.2.2 Explain limitations of ground inspections.

4. Flight between airstrip and operating area

4.1.1 Explain the low-flying restrictions, planning notice, precautions and procedures with respect to overflying or in close proximity to buildings during aerial application operations, including stating the required safety distances and minimum height from buildings.

5. Operations on, or in vicinity of, non-controlled and controlled aerodromes or airstrips

5.1.1 State restrictions and conditions on aerial application operations at aerodromes with movements of regular public transport aircraft.

5.1.2 Explain the circuit requirements at various types of aerodromes and ALA, including conditions applying to exemption from compliance with CASA notified procedures.

5.2 Aerial inspection

5.2.1 Explain the method and purpose (i.e. how and what are you looking for).

5.2.2 Explain key considerations for operations between airstrip and the treatment area and for general low-level navigation.

5.2.3 Describe how to locate and plan for the management of obstructions and ground undulations from the air.

5.3 Weather

5.3.1 Describe the effects of inversion on aerial application.

5.3.2 Describe indicators of mechanical and thermal turbulence and shifting wind and explain implications for low-level aerial application.

5.3.3 Describe winds affecting low-level flying and associated flying conditions.

5.3.4 Describe the effect of mountainous influence on airflow and associated flying conditions.

5.3.5 Describe weather phenomena hazardous to low-flying operations.

5.3.6 Recall the terrain and weather conditions that may lead to disorientation during low-level flight (for example, flight into rising ground and toward low ground, false horizons, ridgeline and valley effects) and explain pilot corrective action.

5.3.7 Explain typical terrain and seasonal effects on local wind direction, strength and mechanical or thermal turbulence.

5.4 Planning and risk control

5.4.1 Describe the planning tools available to an aerial application pilot, including:

(a) describing the process of risk assessment, including the following:

(i) identifying potential hazards or risk;

(ii) describing what a risk assessment matrix is, and how to use it;

(iii) assessing risk — probability versus severity;

(iv) assigning priority to identified risk.

5.4.2 Describing risk management, including:

(a) using risk management hierarchy such as eliminating risk, substituting for a smaller risk, engineering and administering around risk.

5.4.3 Explaining what is an Aerial Application Management Plan (AMP), including:

(a) describing its key components and how it affects safety of the flight, the importance of monitoring an AMP, and the need for pilots to meet changing conditions;

(b) describing typical changing weather conditions that require monitoring, for example, wind direction and speed and estimating their magnitude and direction; inversions and changing atmospheric stability; position of the sun and the danger of its glare, and importance of maintaining a clean, clear and serviceable windscreen.

6. Flight – aerial application

6.1 Operational techniques

6.1.1 For the treatment area, describe methods of managing the following given factors (for main runs and clean up swaths):

(a) wind direction;

(b) sun glare;

(c) obstructions, particularly wires and powerlines.

6.1.2 Describe hazards associated with application, such as hilly terrain, downdraughts, turbulence, false horizon effect, high country and irregular areas.

6.1.3 Explain precautionary actions before starting a clean-up.

6.1.4 Explain how to identify wire runs, and minimise associated risks, with the following:

(a) preliminary inspection of treatment area;

(b) how to judge distance to the wire;

(c) the danger and forms of distraction;

(d) considerations for flying above or under the wire;

(e) considerations for crossing oblique wires;

(f) visual cues of wire locations such as pole runs, type, numbers and attitude of;

(g) insulators, cross-stress and angle of cross-stress, supplementary or spur wires buildings;

(h) characteristics and dangers of high wires and guy wires;

(i) factors affecting misjudgment of wire clearance;

(j) how to maintain awareness of located wires;

(k) the hazards of mental overload.

6.1.5 Describe the operation of DGNSS for track guidance, including the importance of maintaining an active scan outside the cockpit while referencing the DGNSS.

6.1.6 Explain considerations for dumping a load.

6.2 Human factors

6.2.1 Demonstrate knowledge of the following human factors issues and their impact on the safety of an aerial application operation:

(a) dehydration and its impact on pilot cognitive function and reaction time;

(b) fatigue and its impact on pilot cognitive function and situational awareness;

(c) stress and its short-term and long-term impact;

(d) drugs (particularly OTC) impact on pilot cognitive function, reaction time and coordination;

(e) spatial disorientation and illusions.

6.2.2 Explain the use of mnemonics as an aide-mémoire to key operational planning issues (for example, 'WISHSTANDE').

Unit 2.3.2 AAGA: aerial application rating – aeroplane endorsement

1. Reserved

2. General operational knowledge

2.1 Aircraft performance

2.1.1 Explain how loads and turn rate affect aircraft performance (stall speed, angle of attack, inertia).

2.1.2 Explain the effects of rolling 'G' on aircraft.

2.1.3 Explain ground effect and its impact on aircraft performance.

2.1.4 Explain possible aerodynamic and controllability effects associated with load dumping.

2.1.5 Explain how temperature, height above mean sea level (*AMSL*), pressure, humidity, weight, field surface and relative wind affect each of the following:

(a) lift-off distance;

(b) climb angle;

(c) rate of climb;

(d) landing stop distance.

2.1.6 Explain how temperature, pressure, height and humidity affect power available.

2.1.7 Calculate pressure and density height.

2.2 Flight and duty times

2.2.1 Explain the flight and duty time limitations for pilots conducting aerial application operations.

Unit 2.3.3 AAGH: Aerial application rating – helicopter endorsement

1 Reserved

1. Aircraft performance

1.1 Environment affects

1.1.1 Explain how temperature, pressure, height AMSL, humidity, weight, ground surface and relative wind affect each of the following:

(a) hover performance;

(b) distance to achieve translational lift;

(c) climb angle;

(d) rate of climb.

1.1.2 Explain how temperature, pressure, altitude and humidity affect power available and power required.

1.1.3 Calculate pressure and density height.

1.2 Determine payload

1.2.1 Determine payload (under IGE and OGE conditions) and helicopter balance using performance charts, including the following:

(a) maximum payload and fuel that may be carried;

(b) calculation of CG under different load configurations;

(c) calculation of payload and fuel to retain CG within limits throughout the flight;

(d) arithmetic calculations to reposition internal equipment to adjust CG position;

(e) distribution of internal equipment in accordance with deck loading limits.

1.3 Helicoper landing sites (HLS)

1.3.1 Recall the standards recommended for “basic” and “secondary” helicopter landing sites (*HLS*).

1.4 Explain ground effect, Vne and retreating blade stall.

1.5 Rotor disc behaviour under reduced/negative “g”

1.5.1 Explain the relationship between cyclic input, disc attitude, rotor hub and shaft position and fuselage responsiveness on a teetering head helicopter system under 1 “g”, negative “g” and normal disc loading conditions.

1.6 Control power

1.6.1 Explain the term “control power” and how it relates to aircraft performance.

1.7 Dynamic rollover

1.7.1 Explain each of the following:

(a) what is dynamic rollover; and

(b) how to avoid dynamic rollover; and

(c) how to correct in a dynamic rollover situation.

1.8 Loss of tail rotor effectiveness (*LTE*)

1.8.1 Explain each of the following:

(a) the phenomenon of LTE; and

(b) factors that contribute to LTE (high density altitude, high gross weight, turning down wind at low airspeed i.e. below the speed for minimum powered level flight, exceeding manufacturer recommended relative wind and operating gross weight limits); and

(c) indications of LTE; and

(d) recovery from LTE.

1.9 Height-velocity curve

1.9.1 Explain the implications of flying inside the helicopter height-velocity curve.

1.10 Blade contamination

1.10.1 Explain the degradation of performance with contamination on rotor blades (e.g. mud picked up by rotor wash during hovering operations).