



# Advisory Circular

## AC61-16

Revision 1 (5)

### Pilot Licences and Ratings - Pilot Chemical Rating

21 March 2023

#### General

Civil Aviation Authority (CAA) advisory circulars (ACs) contain guidance and information about standards, practices, and procedures that the Director has found to be an acceptable means of compliance (AMC) with the associated rules and legislation.

Consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices, or procedures are found to be acceptable, they will be added to the appropriate AC.

#### Purpose

This AC describes an AMC for meeting the CAR requirements for the issue of a pilot chemical rating.

#### Related Rules

This AC relates to Part 61 Pilot Licences and Ratings – specifically Subpart P.

#### Change Notice

ICAO 29th Assembly Resolution A29-3 of year 1992 urges States to promote global harmonization of national rules. In order to implement this Resolution, Mongolian Civil Aviation Regulation has been developed based on “Memorandum for Technical Cooperation” between CAA of Mongolia and New Zealand, signed on 06.May.1999.

Amendment 164 of Annex 1 to the Chicago Convention on International Civil Aviation urges pilots, navigators using radiotelephony, air traffic controllers and aeronautical station operators to comply with the language proficiency requirements; and

Under Article 14 of the Civil Aviation Act, “Use of foreign language in civil aviation” the AC has been released in English version only, in order to prevent any mistranslation and misuse of the aviation safety related documents.

This AC61-16 was issued based on NZ AC61-16 rev.5, dated on 18.Aug.2016.

AC61-16 rev.1 updates the Chemical Rating Syllabus in Appendix 1 of this AC.

---

## Table of Contents

|  |          |
|--|----------|
| <b>Rule 61.751 Eligibility Requirements .....</b>  | <b>3</b> |
| Training course.....   | 3        |
| <b>Rule 61.753 Issue.....</b>  | <b>3</b> |
| Logbook endorsement .....  | 3        |
| <b>Rule 61.755 Privileges .....</b>  | <b>3</b> |
| <b>Rule 61.757 Currency Requirements .....</b>   | <b>3</b> |
| Refresher course .....   | 3        |
| <b>MNS 4978:2000 “Dangerous goods Classification General technical requirements” .....</b> | <b>4</b> |
| <b>Appendix 1 Chemical Rating Syllabus.....</b>  | <b>5</b> |
| Section 1: Agricultural Chemicals.....   | 5        |
| Section 2: Equipment: Use/Application .....  | 5        |
| Section 3: Equipment .....   | 8        |
| Section 4: Toxicity .....  | 8        |
| Section 5: Emergency Preparedness.....   | 9        |
| Section 6: Protective Measures for Personnel Handling Hazardous Substances .....           | 9        |
| Section 7: Safety Management Systems and Risk Management.....                              | 9        |
| Section 8: Global Navigation Satellite System & Global Positioning System.....             | 10       |
| Section 9: Legislation Approved Codes of Practices, Standards and Guidelines.....          | 10       |

## Rule 61.751 Eligibility Requirements

### Training course

**Rule 61.751** provides that to be eligible for a pilot chemical rating, a person must—

- hold at least a current private pilot licence in the appropriate category of aircraft; and
- have successfully completed a training course in agricultural chemical application, with assessment, conducted under the authority of a Part 137 agricultural aircraft operator certificate or a Part 141 aviation training organisation certificate.

## Rule 61.753 Issue

### Logbook endorsement

**Rule 61.753** sets out the requirements for the issue of a pilot chemical rating. The person who completed the assessment must be satisfied that the eligibility requirements of rule 61.751 have been met before issuing the pilot chemical rating.

All relevant details must have been instructed, completed, and checked either orally, in writing, or in practice to the satisfaction of the certifying person who may issue the pilot a chemical rating by endorsing the applicant's pilot logbook with the following statement in accordance with rule 61.29.

*This is to certify that [name of pilot] has satisfied the requirements of Part 61 for the issue of a pilot chemical rating.*

The holder of the pilot chemical rating may apply to the Director to have the rating endorsed on the holder's pilot licence.

A pilot who holds a chemical rating granted under regulation 229 of the Civil Aviation Regulations 1953 is deemed to hold a chemical rating under Part 61 and thus eligible for endorsement of pilot's logbook and pilot's licence under rules 61.753(a) and (b).

## Rule 61.755 Privileges

A current pilot chemical rating authorises the holder to dispense an agricultural chemical from an aircraft on an agricultural aircraft operation.

## Rule 61.757 Currency Requirements

### Refresher course

**Rule 61.757** requires successful completion of a refresher course that is acceptable to the Director within the previous 5 years from the date of issue to be able to continue exercising the privileges of the rating, providing the certifying person has endorsed the holder's pilot logbook in accordance with rule 61.29.

Currently the only courses acceptable to the Director, are conducted under the authority of a Part 141 aviation training organisation certificate.

A pilot who has completed a refresher course within 90 days before the expiry date is deemed to have completed the course on the required date.

## **MNS 4978:2000 “Dangerous goods Classification General technical requirements”**

While MNS 4978:2000 “Dangerous goods Classification General technical requirements” and storage of agrichemicals does not form part of Part 61 requirements, it does not however preclude course providers from providing guidance information or instruction or other regulations.

## Appendix 1 Chemical Rating Syllabus

### Section 1: Agricultural Chemicals

- The functional and chemical classifications of HSNO agricultural chemicals and substances.
- General characteristics of insecticides, biopesticides, miticides, fungicides, herbicides, fertilisers, agrichemical pesticides Vertebrate Toxin Agents (VTA).
- Substance formulations (and their physical properties and ingredient).
- Corrosive, flammable and oxidizing properties of agricultural chemicals.

#### Physical properties

- Solutions, suspensions, emulsions, dispersions, dusts, pellets, granulated materials and encapsulates.

#### Firefighting foams

- Fluorinated surfactants: aqueous film-forming foam - film forming fluoroprotein, and Fluorine-free firefighting foams.

#### Adjuvants, surfactants and additives

- Oils, spreaders, stickers, wetting agents, drift reduction agents, pH buffers and conditioners, anti-foamers.

### Section 2: Equipment: Use/Application

#### Aerial application and handling of hazardous substances

- Risk assessments for mixing, handling or loading agrichemicals, insecticides, biopesticides, miticides, fungicides, herbicides, fertilisers, agrichemical pesticides VTA.
- Methods of application for hazardous substances for pest types; animals, insects, Arachnida (mites), plants, and substances.
- Identification of hazardous substances prohibited from aerial application.
- Calibration and testing of mixing and spreading equipment and use of formulae.
- Managing a loading site, risk assessments, communication with the pilot on wind speed, wing direction, new and other hazards.

#### Dispersal system components

- Dispersal of liquids, made up from tanks/hoppers, pumps either hydraulic, fan or ancillary engine driven, filtration system, flow meters.
- Dispersal of solids, made up from hoppers, buckets, either manually or variable release.
- Quality and type of solids applied, granule vs dry flowable, including VTA baits.

#### Calibration

- Calibration theory/practical based approach - why it is important to understand how to calibrate an aircraft including; speed, pressure, nozzle type, droplet production and size, nozzle orientation and the use of spray modelling to confirm the data.
- The importance of pattern testing for aircraft that discharges solids, baits and liquids.

---

**Weather**

- Recording and use of digital recording wind vane/sensors with time base recording systems including hand held vane or other equivalent systems.
- Smoke or other visual indicators.

**Application methods**

- Nozzle type
- Selection and size
- Nozzle configurations
- Particle/droplet size, size range, and stability, i.e. volatility (liquid) and fragmentation (solid)
- Effective height of product release
- Operating pressures
- Flow rates
- Spray patterns
- Boom height and configuration
- Agitation
- Fan pitch
- Fan speeds
- Flight paths
- Track spacing
- Swath width and distribution
- Aircraft performance during application

**Drift mitigation**

- Drift of agricultural chemicals and the hazards associated with drift outside target area and mitigating the effects to non-targets
- Drift modelling
- Drift reduction spraying equipment and techniques, including weather effects on drift
- Fogging ultra-low volume application techniques
- Dusting application techniques
- Low flying and ground effects performance
- Selection of airstrips and helipads

- 
- Environmental effects considerations and mitigation of sensitive areas and non-target species, such as bees
  - Aquatic agrichemical application
  - Withholding periods

### **Decontamination and disposal**

- Understand the triple rinse method
- The use of approved recycling organisations
- Understand the procedures use for recycling process
- The disposal of dilute and concentrate agrichemicals
- Decontamination of mixing and application equipment

### **Notifications**

- Affected parties
- Public notifications
- Sensitive areas
- Warning signage

### **Administrative**

- Documentation
  - Spray plans
  - Record keeping
  - Tracking records of discharged agrichemicals
  - Permissions
  - Approvals and permits (Ministry, Departmental, Territorial, Regional, Tangata Whenua)
  - Client and operator contracts
  - Pre-operational agreements
- General safety requirements
  - Accidents / incidents
  - Loss
  - Spillage or misapplication of hazardous substances

### Section 3: Equipment

- Effective use of equipment loading tables, buckets, spreaders, tanks, hoppers, cutting and mixing equipment
- Digital recording wind vane/sensors
- Hand held vane sensors
- Smokers and other visual weather indicators
- Decontamination, disposal, and emergency spill kits
- Pressure systems
- Hazards associated with poorly performing or maintained equipment
- Airworthiness requirements

### Section 4: Toxicity

The toxicology of agricultural chemicals classified as insecticides, herbicides, miticides, fungicides and of VTA and biopesticides, including exposure routes of absorption. It must include the following.

- Herbicides
- Dinitro
- Insecticides
- Organochlorines
- Organophosphorus
- Carbamate
- VTA (but not limited to Sodium monofluoroacetate (1080) Pindone and DRC1339)
- Biopesticides
- Microbial
- Biochemical
- Plant-incorporated-protectants (organisms such as, *Bacillus thuringiensis* sub-species *kurstaki* or *Cydia pomonella*).

Candidates should understand of the toxicology of fungicides, insecticides herbicides, fertilisers, pesticides, miticides, VTA and biopesticides organisms for health and wellbeing.

Candidates should understand the symptoms of poisoning and effects together with appropriate emergency and first aid measures.

Candidates should understand the value of health monitoring and medical surveillance (such as red cell blood cholinesterase test) including reference to the workplace exposure standards and biological exposure indices.



## Section 5: Emergency Preparedness

- Emergency procedures that cover all aspects for an aerial operator who is in charge of a range of hazardous substances, including transport, storage, loading sites, and when the aircraft is on the ground.
- Understand what is required to prepare emergency procedures for a site, including testing the plan and providing a copy to the local fire department.

## Section 6: Protective Measures for Personnel Handling Hazardous Substances

Safe handling of hazardous substances

- Protective clothing and equipment including its storage and maintenance
- Personal hygiene
- Food consumption
- Fatigue management
- Hydration, dehydration, nutrition, and physical wellbeing
- Heat and cold stress

### Product labels

- Importance of chemical labelling
- Safety data sheets and haznote requirements
- Priority identifiers

### Safe loading zones

- Importance for safe loading and unloading zones, when handling substances
- Communication between ground crew, the pilot and others

## Section 7: Safety Management Systems and Risk Management

Risks identified, assessed, reviewed; monitored, remedied, and reasonably practicable steps are undertaken to mitigate adverse effects, taking into account likelihood, degree of harm and consequences resulting from exposures to harm.

Risk assessments should include but not limited to the following:

- application target site
- identification of sensitive areas
- weather conditions
- spray particle size
- toxicology
- buffer zones
- shelter belts
- human exposures
- loading site safety

Candidates should understand the risks to human health and safety, the environment, including Mongolian primary industry, animal welfare, and agricultural security.

### **Section 8: Global Navigation Satellite System & Global Positioning System**

- Recording of aerial application using:
  - Differential Global Positioning System (DGPS)
  - Global Navigation Satellite System (GNSS)
  - Global Positioning System (GPS)
  - Geographic Information Systems (GIS)
- General uses
- Types and characteristics of DGPS, GNSS, GPS and GIS Systems
- Methods of recording primary and secondary track logs and waypoints using GPS or GNSS receivers
- Mapping of boundaries
- A - B lines (or base line)
- Setting the swath width
- Limitations

### **Section 9: Legislation Approved Codes of Practices, Standards and Guidelines**

Candidates should understand the following and their application in the aerial agrichemical industry, including an explanation of the authorities, agencies, legislation, regulations, and approved codes of practice, standards and best practice guidelines that govern them.

- Civil Aviation Act 1999
- CARs
- ACs
- Toxic and Hazardous Substances Act 2006
- Environmental Protection Act 1995
- Agriculture Act 2016
- Livestock Health Act 2017
- Labor Hygiene Act 2008
- Health Act 2011
- Convention on Biological Diversity 1993

(Or any legislation superseding any of those listed).

--oOo--