



**PILOT COMPETENCIES FOR HELICOPTER WILDFIRE
OPERATIONS**

**Helicopter Association of Canada
BEST PRACTICES TRAINING AND EVALUATION**

Subgroup of AIR TAXI Committee

DISCLAIMER

The Air Taxi Committee Pilot Qualifications Working Group, **Pilot Competencies for Helicopter Wildfire Operations - Best Practices Training and Evaluation** provides guidance to members of the Helicopter Association of Canada (HAC) wishing to establish or adopt these **Pilot Competencies for Helicopter Wildfire Operations - Best Practices Training and Evaluation** guidelines. ("The Guide")

This document is not, and is not intended to be, all-inclusive, but only a guide.

The Guide sets out in general principal recommended actions for conducting operations in the Wildfire environment based on consensus-based discussions which have taken place in HAC's Air Taxi Committee, Pilot Qualifications Working Group.

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ACKNOWLEDGMENT

The HAC and the members of the Air Taxi Committee would like to gratefully acknowledge the participation and commitment of the members of the Pilot Qualifications Working Group in the development of this document.

BACKGROUND & PREAMBLE

Through the Helicopter Association of Canada (“HAC”) and under the direction of its Air Taxi committee the Pilot Qualifications Working Group sub-committee was formed. This resulting document is a joint effort between representatives of the HAC Operator membership (“Operators”) and Government Agencies who are Associate and Individual HAC members (“Customers”) involved in forestry flying, in particular wildfire operations activities. The twelve members of this Working Group have over 300 combined years of helicopter aviation experience representing a valuable cross section of the overall Canadian industry. The Working Group was formed to address the HAC Operator member’s concern that the minimum fixed hours currently required by Customers is an imprecise measure of a pilot’s ability, further making it difficult to introduce competent pilots into forestry’s wildfire operations activities. Through a previous HAC Working Group many years ago, the minimum fixed hourly requirement was developed to assess competency of pilots. Today’s Operators and Customers agreed a refining and specifying of the criteria for assessing pilots’ abilities was necessary to reflect the current wildfire operations requirements.

A mentorship program based on achieving higher levels of competency through additional and specialized training is necessary industry wide as a succession program. Developing specific pilot skills and providing in-depth training in those competencies used during Wildfire Operations are designed to increase pilots, Operators and Customers knowledge, safety and an improved alternative to a minimum fixed hourly requirement alone.

The Working Group identified the areas with the greatest exposure and risk due to the unique operating environment posed by wildfire operations where an advanced level of pilot competency is requisite. The Working Group developed eight Pilot Competencies; each of these competencies begins with the **Aim** of the training competency followed by the **Industry Best Practice** to operate in these circumstances:

1. General Wildfire Operations Knowledge
2. Mountain Flying
3. External Load – Short Line (horizontal reference), Long Line (vertical reference), Precision Load Placement, Water Bucketing / Tanking
4. Class D External Loads
5. Aerial Ignition Device (AID) and Drip Torching
6. Hover Exit
7. Confined Area Operations
8. Low Visibility Flight

The **Pilot Competencies for Helicopter Wildfire Operations** document will be a HAC/CIFFC (Canadian Inter-Agency Forest Fire Centre) document which the Customers would adopt as the framework for their specific set of standard expectations. The document will be publicly available as **Pilot Competencies for Helicopter Wildfire Operations - Best Practices Training and Evaluation**. This document would be the standard for Operators to use to ensure their pilots meet the competency expectations of the Customers. Each of the Forestry Agencies at their discretion will select their specific compilation of the eight pilot competencies that apply to their Wildfire Operations environment.

As the minimum general competency of pilots is that of a Pilot Proficiency Check (PPC), it is recognized that advanced competencies not specifically evaluated on a PPC are required for the risks associated with Wildfire Operations flying. Many of these advanced skills will be common to all operations but it is

recognized that some of the required competencies will vary between Customers depending on factors such as operating terrain, type of wildfire activity, and individual Customer's risk assessments.

The Working Group addresses the fact that not all of the competencies have an inherent hour requirement, for example: a Customer requiring a pilot to operate in reduced visibility can expect a pilot with a minimum of 500 hours (CASS 712.17) plus competency in Low Visibility operations. The Working Group also recommends Human Factors and Pilot Decision Making play a strong role in the training of all the competencies. Each Customer will indicate their specific requirements from the competency list, and each individual Customer retains their right to require other qualifications, competencies, or terms.

Not unlike the minimum fixed hours requirement, the Operator will train, evaluate and certify their pilots' competency and be held accountable to the Customers for discrepancies. The Operator remains responsible to provide the training required by all regulatory bodies, their Operations Manuals Training syllabus and company standards and correspondingly indicate those qualifications of the pilot by a single-point-of-entry system.

The Operators will develop effective evaluation procedures that clearly demonstrate pilot proficiency in each of the eight Pilot Competencies. A guideline example for "Evaluation Protocol" based the 4-point marking scale in use by Transport Canada to evaluate PPC standards is included in this document.

"Web Air Canada" will be used as the medium to house the pilot competency record which makes it a "one stop shopping" record for numerous Customers that require access to this information. Operators involved in Wildfire Operations will realize little if any change to their current training programs. What they will experience is a streamlined reporting process available to all forestry agencies across the country in a unified format. Those skills a pilot has received training and experience in and has demonstrated to their employer a satisfactory level of competence will be indicated in the pilot information section of the Webair Canada program. This information will be accessible only to that Operator and forestry agencies.

It should be noted this group's work and dedication to this project's shift toward **Pilot Competencies, Training and Evaluation for Wildfire Operations** is intended to more specifically identify the competencies of the pilot engaged in this scope of work ultimately increasing safety.

GENERAL

The purpose of this document is to promote effective helicopter operations in wildfire operations. The information contained within this document should be viewed as HAC endorsed **Pilot Competencies for Helicopter Wildfire Operations**.

The **Pilot Competencies for Helicopter Wildfire Operations** outlined in this document are standards that pilots shall meet prior to being dispatched to work in wildfire operations. Pilots shall be trained in accordance with their companies training syllabus which shall outline the specifics to be taught for each skill. A check / evaluation is to be conducted for each competency annually by the company Chief Pilot or his/her delegate. Competencies may be evaluated concurrently.

Each Competency is described beginning with the **Aim** of the training skills followed by the **Industry Best Practice**. A guideline example for Evaluation Protocol is included at the end of this document to help define "Basic" and "Advanced" skill levels (The evaluation Standard is based on the 4 point marking scale from "PPC and Aircraft flight test guide") for each Competency

The eight Competencies are as follows:

1. General Wildfire Operations Knowledge
2. Mountain Flying
3. External Load – Short Line (horizontal reference), Long Line (vertical reference), Precision Load Placement, Water Bucketing / Tanking
4. Class D External Loads
5. Aerial Ignition Device (AID) and Drip Torching
6. Hover Exit
7. Confined Area Operations
8. Low Visibility Flight

1. GENERAL WILDFIRE OPERATIONS KNOWLEDGE○ **Aim**

Demonstrate and evaluate through on-line or computer based training & examination, an adequate knowledge of subjects associated with wildfire operations.

○ **Industry Best Practice**

The Customers, under the auspices of the Canadian Inter-Agency Forest Fire Centre (CIFFC) , have developed a wildfire operations general knowledge course that would provide pilots with a basic understanding of wildfire operations. This training covers topics such as:

- The Incident Command System;
- Wildfire Air Operations; Bucket/Tank use
- Fire-line Terminology
- Fire Behaviour; Fuel Types, Fire Rank, Fire Weather
- Fire Airspace and Traffic Coordination

It is expected that considering the complex nature of wildfire operations, the pilot will be completely conversant with the programming of their radios and GPS in the field.

2. MOUNTAIN FLYING○ **Aim**

Demonstrate the pilot's knowledge and practical skills of flying in mountainous environment, as outlined in the Operator's Training Program, while using sound judgment and ensuring safety of flight.

○ **Industry Best Practice**

The company certifies the pilot has successfully completed the mountain training outlined in the HAC Mountain Training Guidelines and their Company Training Program.

<http://www.h-a-c.ca/hacMountainTrainingGuidelines.pdf> (see Appendix "A")

3. EXTERNAL LOAD

- **Aim**

Demonstrate a pilot's understanding of and competency at External Load operations. Specifically, to develop and evaluate a pilot's theoretical and practical knowledge of rigging various loads. Also, to evaluate practical skills at flying loads with precision placement on both short and long lines utilizing horizontal and vertical reference. The pilot shall demonstrate the competency for weight/balance control and performance planning.

- **Industry Best Practice**

- **Short Line / Horizontal reference**

The helicopter in ground effect and, primary flight reference is to the horizon.

A test load (Load which gets the aircraft within 20% of the Max TOGW) is to be lifted from the ground without the load being dragged or swung, then flown for a circuit at appropriate airspeed for the load, or Vne, then placed back on the ground within a predetermined 10ft x 10ft (3m x 3m) area, while maintaining smooth coordinated flight. This exercise must be repeatable on the initial evaluation 4/5 times with tolerance of +/- 5ft (1.5m) on the target area, and zero tolerance for load placement velocity. *(Gently place load on target)*

- **Long Line / Vertical reference**

The helicopter is out of ground effect, line length is 50 ft (15m) or greater, and the primary flight reference is vertical reference.

A test load (Load which gets the aircraft within 20% of the Max HOGW) is to be lifted from the ground without the load being dragged or swung, then flown for a circuit at appropriate airspeed for the load or Vne, then placed back on the ground within a predetermined 10ft x 10ft (3m x 3m) area, while maintaining smooth coordinated flight. This exercise must be repeatable on the initial evaluation 4/5 times with a tolerance of +/- 5ft (1.5m) on the target area, and zero tolerance for load placement velocity. *(Gently place load on target)*

3. EXTERNAL LOAD – cont'd

- **Precision Load Placement**

A test load to be held on the end of a long line, 100 ft (30m) in length or longer, over a predetermined 3ft x 3ft (0.9m x 0.9m) area at a height of 3-4ft (0.9m-1.2m) AGL, for 30 seconds while maintaining smooth coordinated control. The tolerance is 1ft³ (0.3m³)

- **Water Bucketing / Tanking**

Ensure competency in water bucket operations from an open water source such as a lake, pond, slough or river.

Ensure competency of snorkel fill procedures for both, tank and bucket from a fixed source; either a tank or bladder as appropriate.

Evaluate accuracy of spot drops; where 80% of the water falls vertically within a predetermined 10ft x 10ft (3m x 3m) area. This exercise must be repeatable 4/5 times. Evaluate accuracy of line/string drops where the line is tied together by 4/5 drops.

4. CLASS D EXTERNAL LOAD○ **Aim**

Demonstrate and evaluate the pilot's theoretical understanding and practical skill at conducting Class D External Load operations.

○ **Industry Best Practice**

Pilots shall meet Industry Best Practice for Precision Long Line, Hover Exit, and Mountain Flying. (If applicable). Pilots conducting Class D operations are required to meet the standards prescribed by Operators approved Class D - training program, as outlined in the Company Operations Manual and S.O.P's if applicable. And, shall comply with, and be competent with all requirements as set out in CAR 702.21, and 722.21 and CASS 722.76, (6), (a) & (c) (See Appendix "B")

5. HOVER EXIT○ **Aim**

Ensure competency in Hover Exit operations as outlined in the Operators Company Operations Manual and be familiar with applicable Customer training procedures manual. (CIFFC Hover Exit document)

○ **Industry Best Practice**

Ensure pilots competency at Hover Emplaning / Deplaning operations while in a 3 ft (0.9m) hover, and with the aircraft toed in, while maintaining smooth coordinated control. Ensure theoretical knowledge of procedures and limitations for Hover Exit operations as set out in Operators Company Operations Manual; in particular fire-crew briefing prior to conducting Hover Exit maneuvers, and ensure understanding of related CIFFC documents. Ensure competence with all requirements as set out in CAR 702.19, and CASS 722.19. (See Appendix "C")

6. AERIAL IGNITION DEVICE (AID) AND DRIP TORCHING○ **Aim**

To ensure that pilots have the required practical knowledge to safely assemble and operate the Aerial Ignition Device and/or Drip Torch, and are able to use the equipment in accordance with the fire ignition plan.

○ **Industry Best Practice**

Pilots shall meet Industry Best Practice for Short Line operations prior to conducting Aerial Ignition operations.

Evaluate competency in assembly, ground testing, in-flight operation and emergency procedures for the specific AID / Drip Torch to be used. Pilot shall successfully complete and be evaluated on ground school which includes the following topics:

- Knowledge of, and the safe handling procedures of the combustible mixture used.
- Personnel protective equipment to be used.
- A theoretical and practical understanding of how the AID /Drip Torch operates.
- Complete pre-flight briefing with equipment operator.

Pilots shall be able to assess the fire ignition plan and flight path in relation to the burn; against the specific aircraft operating limitations.

* With the exception of competency in Short Line operations, the competencies and knowledge for the AID and Drip Torch may be achieved on site through direct supervision and “on the job training” by a current /competent AID/Drip Torch pilot.

7. CONFINED AREA OPERATIONS○ **Aim**

Determine a pilots understanding and competency in Confined Area Operations, by ensuring competency at confined area reconnaissance, steep approach procedures, precision hover exercises, max performance take off profiles, and rejected take off procedures. Assessment of constructed helipad structures including factors that may result in the rejection of a helipad.

○ **Industry Best Practice**

Evaluate accuracy of confined area reconnaissance utilizing an eye level pass if applicable and the primary assessment procedures of size, shape, slope, surface, surroundings and sun. Confirm the pilot uses sound judgment and Pilot Decision making skills during the reconnaissance portion, and evaluate early recognition of main rotor and tail rotor clearance.

Evaluate pilots' ability at performing a steep approach procedure as outlined in Operators Training syllabus, with emphasis on theoretical understanding of Ground Effect and Translational Lift and the effects of each on rotorcraft performance.

Evaluate pilots' skill at precision hover techniques including turns around the mast, nose, and tail while maintaining smooth coordinated control. Evaluate skills at max performance take off and rejected take off procedures as outlined in the Operators Training syllabus.

8. LOW VISIBILITY OPERATIONS○ **Aim**

To evaluate pilot competency during flight in Low Visibility situations; including flight down to ½ mile (0.8 km) flight visibility.

○ **Industry Best Practice**

Ensure pilot competency in performing maneuvers as outlined in Operators Training syllabus and Company Operations Manual for reduced VFR visibility limits of ½ nm.

Ensure competency in flight maneuvers at company approved minimum airspeed. Tolerances on flight maneuvers of +/- 100 ft (30m) on altitude, and +/- 5° heading (roll out), while maintaining smooth coordinated flight and utilizing appropriate cockpit scan.

Ensure compliance with requirements as outlined in CAR 702.17 and CASS 722.17(2) (See Appendix "D")

EVALUATION PROTOCOL

Each of the eight Pilot Competencies is to be evaluated by a 4 point marking scale. *(Using the 4-point marking scale in use by Transport Canada to evaluate PPC standards)*

- Basic skill level is awarded to a pilot for grading “2” – Basic standard on the evaluation standard scale.
- Advanced skill level is awarded to a pilot for grading “3” – Standard or “4” – Above standard on the evaluation standard scale.
- Scoring a “1” – Below standard on a skill for which performance standards apply will temporarily disqualify the pilot from working in wildfire operations, until such time as the appropriate amount of prescribed training has taken place to elevate the pilot’s evaluation on the particular skill to at least Basic skill level.

When applying the 4-point scale, award the mark that best describes the weakest element(s) applicable to the candidate’s performance. Remarks to support mark awards 1 or 2 must link to a safety issue, a qualification standard, or an approved technique or procedure.

4	Above Standard	Performance remains well within the qualification standards and flight management skills are excellent.	<ul style="list-style-type: none"> - Performance is ideal under existing conditions. - Aircraft handling is smooth and precise (i.e. Well within limits). - Technical skills and knowledge exceed the required level of competency. - Behavior indicates continuous and highly accurate situational awareness. - Flight management skills are excellent. - Safety of flight is assured. Risk is well mitigated.
3	Standard	Minor deviations from the qualification standards occur and performance remains within prescribed limits.	<ul style="list-style-type: none"> - Performance meets the recognized standard yet may include deviations that do not detract from the overall performance. - Aircraft handling is positive and within specified limits. - Technical skills and knowledge meet the require level of competency. - Behavior indicates that situational awareness is maintained. - Flight management skills are effective. - Safety of flight is maintained. Risk is acceptably mitigated.
2	Basic Standard	Major deviations from the qualification standards occur, which may include momentary excursions beyond prescribed limits but these are recognized and corrected in a timely manner.	<ul style="list-style-type: none"> - Performance includes deviations that detract from the overall performance but are recognized and corrected within an acceptable time frame. - Aircraft handling is performed with limited proficiency and /or includes momentary deviations from specified limits. - Technical skills and knowledge reveal limited technical proficiency and /or depth of knowledge. - Behavior indicates lapse in situational awareness that are identified and corrected by the pilot/crew. - Flight management skills are effective but slightly below standard. Where applicable, some items are only addressed when challenged or prompted by other crewmembers. - Safety of flight is not compromised. Risk is poorly mitigated.
1	Below Standard	Unacceptable deviations from the qualification standards occur, which may include excursions beyond prescribed limits that are not recognized or corrected in a timely manner.	<ul style="list-style-type: none"> - Performance includes deviations that adversely affect the overall performance, are repeated, have excessive amplitude, or for which recognition and correction are excessively slow or nonexistent, or the aim of the task was not achieved. - Aircraft handling is rough or includes uncorrected or excessive deviations from specified limits. - Technical skills and knowledge reveal unacceptable levels of technical proficiency and /or depth of knowledge. - Behavior indicates lapses in situational awareness that are not identified or corrected by the pilot/crew. - Flight management skills are ineffective, unless continuously challenged or prompted by other crewmembers. - Safety of flight is compromised. Risk is unacceptably mitigated.

APPENDIX "A"**HAC Mountain Flying Training Guidelines**

The following are the HAC recommended guidelines for Mountain Flying Training. Since operational parameters of mountain flying vary considerably from one operation to another, these guidelines do not purport to be complete nor are they universally applicable.

Individual operators remain responsible for tailoring their company policies and training methodology used to achieve these training objectives, to the experience and aptitude of individual pilots, the type of equipment operated, the prevailing geographical and climatic conditions of the local operational environment and other particulars, proper to each operator and/or the local training environment.

The ensuing training program may be incorporated into the air operator's operations manual. Also, to facilitate field verification of pilot competency, the chief pilot or his delegate may wish to certify initial and recurrent Mountain Flying Training in the pilot's logbook.

Mountain Flying Initial Training Criteria

Ground School should address:

- Topography and formations
- Weather and wind
- Density altitude vs. helicopter performance
- Reconnaissance, approach and departure techniques
(side hill pads, mountain top sites and operations from ridges)
- Hazards and illusions
- Physiological and psychological factors

- Flying training should assure competency in:

- Emergency procedures
- Precision handling techniques
- Confined area operations
- Illusion recognition techniques
- Reconnaissance, approach and departure techniques
(side hill pads, mountain top sites and operations from ridges)

(Mountain Flying Training Guidelines)

APPENDIX "A" – cont'd

(Flying training should assure competency in: cont'd)

- Slinging operations
- Wind effects
- Snow operations
- Contour flying

Mountain Flying Recurrent Training Criteria

! Recurrent Ground School should review:

- Density altitude vs. helicopter performance
- Reconnaissance, approach and departure techniques
(side hill pads, mountain top sites and operations from ridges)
- Hazards and illusions
- Physiological and psychological factors

! Recurrent flying training should assure continued competency in:

- Emergency procedures
- Confined area operations
- Reconnaissance, approach and departure techniques
(side hill pads, mountain top sites, and operations from ridges)

APPENDIX "B" Helicopter Class D External Loads**702.21 Class D External Loads**

(1) Subject to subsection (2), no air operator shall operate a helicopter to carry a helicopter Class D external load unless

- (a) the helicopter is a multi-engine helicopter that meets the transport category engine-isolation requirements of Chapter 529 of the Airworthiness Manual and that is capable of hovering with one engine inoperative at the existing weight and altitude;
- (b) the air operator is authorized to do so in its air operator certificate; and
- (c) the air operator complies with the Commercial Air Service Standards.

(2) An air operator may operate a helicopter other than a helicopter described in paragraph (1)(a) to carry a helicopter Class D external load if the air operator

- (a) is authorized to do so in its air operator certificate; and
- (b) complies with the Commercial Air Service Standards.

722.21 Helicopter Class D External Loads

(1) The standards for authorization to operate a helicopter to carry a Class D helicopter external load are:

- (a) the helicopter is equipped to permit direct radio intercommunication among crewmembers;
- (b) the personnel carrying device is airworthiness approved for the carriage of human external loads;
- (c) the load is jettisonable if it extends below the landing gear;
- (d) the air operator has applicable one-engine inoperative performance charts for the operating weight and density altitude at which the Class D external load operation is to be conducted. Performance charts may take account of wind speed providing wind speed is 10 knots or more;
- (e) the air operator's Company Operations Manual includes operational requirements, operational procedures and air operator employee qualification and training requirements.

APPENDIX "B" – cont'd

(2) The standards for authorization to operate a helicopter to carry a Class D helicopter external load using a single-engine helicopter or a multi-engine helicopter unable to comply with one engine inoperative requirements are:

(a) where the load does not extend below the landing gear:

- (i) the helicopter is equipped to permit direct electronic or visual communication among crew members; (amended 1998/09/01; previous version)
- (ii) the personnel carrying device is airworthiness approved for the carriage of human external loads;
- (iii) the helicopter is turbine powered and equipped, where approved for the type, with an auto-ignition system and a detector system to warn flight crewmembers of excessive ferrous material in the engine(s);
- (iv) only flight crew members and persons essential during flight are carried; and
- (v) the air operator's Company Operations Manual includes operational requirements, operational procedures and air operator employee qualification and training requirements;

(b) where the load extends below the landing gear:

- (i) the helicopter is equipped to permit direct radio intercommunication among crewmembers;
- (ii) the personnel carrying device is airworthiness approved for the carriage of human external loads;
- (iii) the load is jettisonable;
- (iv) the helicopter is turbine powered and equipped, where approved for the type, with an auto-ignition system and a detector system to warn flight crew members of excessive ferrous material in the engine(s);

APPENDIX "B" – cont'd

(v) only flight crewmembers and persons essential during flight are carried;
(vi) persons are transported externally between geographical points only to the nearest suitable landing site;

(vii) the authorization is for the purpose of law enforcement operations, forest fire suppression operations, urban fire fighting operations or rescue operations;

(viii) the air operator has a formal written agreement from the user of the service and the agreement stipulates that only suitably trained and qualified persons will be assigned; and

(ix) the air operator's Company Operations Manual includes operational requirements, operational procedures and air operator employee qualification and training requirements.

(3) Authorization may be granted for deviation from the standards of 722.21(1) and (2) for the Production of Commercial Motion Pictures and Television filming provided:

(a) the aircraft is operated within approved limitations;

(b) a co-coordinated plan for each complete operation is developed;

(c) all persons involved are knowledgeable of equipment to be used and pre-flight briefed; and

(d) only flight crewmembers and persons essential during flight are carried.

(4) Where helicopter Class D External Load Operations are to be conducted for the purpose of providing a rescue service the following standards shall apply.

(a) Pilot Experience

Pilots-in-command for rescue service operations shall have achieved:

(i) at least 2,000 hours total helicopter pilot flight time;

(ii) at least 200 hours on the aircraft type which the pilot is to fly on initial assignment to rescue operations and at least 25 hours on types to be used thereafter;

APPENDIX "B" – cont'd

(iii) at least 1,000 hours experience in the operational area if rescue services are to be conducted in Designated Mountainous Areas 1 or 2 as defined in the Designated Airspace Handbook (TP 1820); and

(iv) have completed training for Class D load operations in accordance with section 722.76.

(b) Rescue Service Operations Control

A close working relationship is required between the air operator and the emergency response user organization to ensure coordinated proficiency and mission safety. Terms of reference shall be documented in a written agreement and will define the following:

(i) responsibility of pilot-in-command and rescue specialist(s);

(ii) required operational capabilities and scope of operation;

(iii) coordinated rescue mission standard operating procedures;

(iv) mission authorization and control process, including communication procedures; and

(v) coordinated air operator and emergency response user agency training program on at least an annual basis.

722.76 Training Program

(6) Aerial Work Training

(a) Pilot training shall be provided where the aerial work requires particular flight maneuvers, aircraft performance considerations or knowledge of equipment to safely conduct the operation.

Training shall include, as applicable:

(i) training related to contents and requirements of flight manual supplements or airworthiness approvals;

(ii) pre-flight inspection requirements of aerial work equipment;

APPENDIX "B" – cont'd

- (iii) procedures for handling malfunctions and emergencies related to the aerial work equipment;
- (iv) operational preparation procedures related to reconnaissance of aerial work areas before low-level flight operations;
- (v) operational restrictions; and
- (vi) flight training and practice in required flight maneuvers.

(c) Training - Class D External Loads

An approved initial and annual recurrent training program is required for pilots assigned to Class D External Load Operations. The training program shall include:

- (i) instruction on the applicable flight manual supplement or airworthiness approvals, including weight and balance calculation procedures, method of loading, rigging and attaching the external load and pre-flight procedures;
- (ii) instruction on operational requirements, including calculation of one engine inoperative performance as applicable, co-ordination communications procedures and operational restrictions;
- (iii) steps to be taken before commencing Class D load operations, including flight and ground crew briefings and instructions and pre-flight inspection requirements; and
- (iv) flight training with representative Class D loads including, as applicable to the load attachment configuration:
 - (A) precision hovering in and out of ground effect, including vertical reference maneuvering;
 - (B) pick-up, departure, approach and delivery of Class D loads;
 - (C) simulated emergencies and malfunction procedures with representative Class D loads.

APPENDIX "C"**702.19 Entering or Leaving a Helicopter in Flight**

For the purposes of paragraph 602.25(2)(b), the pilot-in-command of a helicopter may permit a person to enter or leave the helicopter in flight

(a) where:

- (i) the helicopter is operated at a low hover,
- (ii) the person is able to enter directly from or alight directly onto the supporting surface,
- (iii) the air operator is authorized to do so in its air operator certificate, and
- (iv) the air operator complies with the Commercial Air Service Standards; or

(b) where

- (i) the helicopter is operated to enable hoisting or rappelling, and
- (ii) the air operator complies with Section 702.21.

722.19 Entering or Leaving a Helicopter in Flight

Authorization to permit a person to enter or leave a helicopter in flight other than by external load attaching means is subject to the following standards:

- (a) operations are conducted under day VFR conditions while the helicopter maintains a stabilized hover;
- (b) the longitudinal and lateral centre of gravity shall be calculated for embarking and disembarking operations and shall not exceed the limitations of the applicable flight manual. The operating weight shall be calculated and shall not exceed the applicable weight/attitude/temperature (WAT) hover performance charts for the helicopter type and configuration at the operating altitude;
- (c) persons to be embarked or disembarked have been instructed on related hazards and techniques;

APPENDIX "C" – cont'd

(d) crew members shall be trained in accordance with section 722.76 of the Commercial Air Services Standards;

(e) any equipment or cargo to be loaded or unloaded shall be secured to prevent shifting in flight except during loading and unloading. Cargo or equipment shall not be loaded or unloaded from a baggage compartment remote from the main cabin unless the applicable centre of gravity calculation is completed and cargo handlers have been instructed on procedures; and

(f) the air operator's Company Operations Manual content includes embarking and disembarking operational procedures, briefing procedures and crewmember training requirements.

APPENDIX "D"**702.17 VFR Flight Minimum Flight Visibility - Uncontrolled Airspace**

(1) Where an aeroplane is operated in day VFR flight within uncontrolled airspace at less than 1,000 feet AGL, a person may, for the purposes of subparagraph 602.115(c)(i), operate the aeroplane when flight visibility is less than two miles if the person

(a) is authorized to do so in an air operator certificate; and

(b) complies with the Commercial Air Service Standards.

(2) Where a helicopter is operated in day VFR flight within uncontrolled airspace at less than 1,000 feet AGL, a person may, for the purposes of subparagraph 602.115(d)(i), operate the helicopter when flight visibility is less than one mile if the person

(a) is authorized to do so in an air operator certificate; and

722.17 VFR Flight Minimum Flight Visibility - Uncontrolled Airspace

2) Helicopters

The standard for reduced VFR visibility limits of one half mile in uncontrolled airspace for helicopters is as follows:

(a) Pilot Experience

Before conducting operations in reduced visibility, pilots shall have achieved at least 500 hours of pilot-in-command experience in helicopters. (amended 1998/09/01; previous version)

(b) Airspeed for Operation in Reduced Visibility (amended 1998/09/01; previous version)

Helicopters shall be operated at a reduced air speed that will provide the pilot-in-command adequate opportunity to see and avoid obstacles.

(c) Pilot Training

The pilot shall receive training as follows: (amended 2000/12/01; previous version)

APPENDIX “D” – cont’d

(i) initially and every three years thereafter, pilot decision making training which shall include the following topics: (amended 2000/12/01; previous version)

(A) the decision-making process, including modules on factors that affect good judgment; (amended 2000/12/01; previous version)

(B) human performance factors, including modules on physical, psychological and, physiological phenomena and limitations; and (amended 2000/12/01; previous version)

(C) human error countermeasures and good airmanship; (amended 2000/12/01; previous version)

(ii) initial and annual recurrent flight training in procedures specified in the Company Operations Manual for operations in reduced visibility. (amended 1998/09/01; previous version)

(d) Company Operations Manual (amended 1998/09/01; previous version)

The Company Operations Manual shall contain low visibility operational procedures and pilot decision making considerations for operation in visibility conditions of less than one mile which shall include, but not be limited to:

(i) gross weight;

(ii) wind;

(iii) weather;

(iv) route / terrain;

(v) time of day;

(vi) communications; and

(vii) the potential for whiteout.