Transport Canada Transports Canada

Advisory Circular

Subject: **DHC-6 Twin Otter – Reduced Ground Roll Take-off: Special Authorization/Specific Approval and Guidance**

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1.0 Introduction

(1) Subject to paragraph (3), this Advisory Circular (AC) provides the conditions and associated guidance applicable to the Special Authorization/Specific Approval (SA) for Reduced Ground Roll (RGR) take-off. It describes the acceptable means of demonstrating compliance with regulations and standards. This AC on its own does not change, create, amend or permit deviations from regulatory requirements.

(2) Operators are expected to follow the means of compliance described in this AC in all respects.

(3) The conditions of the associated SA appear in Appendix A of this AC:

(a) For air operators, the conditions published in Appendix A of this AC constitute part of the air operator certificate (AOC). As such, compliance with these conditions is mandatory; and

(b) For private operators, the conditions published in Appendix A of this AC constitute part of the private operator registration document (PORD). As such, compliance with these conditions is mandatory.

1.1 Purpose

(1) Canadian air operators and private operators require an operational approval to conduct reduced ground roll (RGR) take-offs, in accordance with the applicable Transport Canada (TC) approved Supplements to the DHC-6 Aircraft Flight Manual (AFM) as listed below:

(a) SUPPLEMENT 40 REDUCED GROUND ROLL – 20 DEG FLAP TAKE-OFF for DHC-6 Series 300 and Series 400 Aeroplanes; and

(b) SUPPLEMENT 19 REDUCED GROUND ROLL – 20 DEG FLAP TAKE-OFF for DHC-6 Series 100 and Series 200 Aeroplanes.

(2) The above-noted TC approved Supplements to the DHC-6 AFM each state, in part: “Operations employing the RGR – 20 Degree Flap Take-off procedure in this supplement will require an operational approval from the local regulatory authority.” In Canada, this operational approval consists of the SA titled: **DHC-6 Twin Otter – Reduced Ground Roll (RGR) Take-off** (hereafter referred to as the “SA for RGR take-off”). The SA for RGR take-off may be issued to air operators who have been issued an AOC under subpart 702, 703 or 704 of the *Canadian Aviation Regulations* (CARs); and may also be issued to private operators who have been issued a PORD under subpart 604 of the CARs.

(3) The conditions for the SA: **DHC-6 Twin Otter – Reduced Ground Roll (RGR) Take-off** are stipulated in Appendix A of this AC. Canadian air operators, private operators and their pilots are only authorized to conduct RGR take-offs when complying with these conditions, as well as the limitations and procedures stipulated in the above-noted TC approved Supplements to the DHC-6 AFM.

1.2 Applicability

(1) This AC applies to:

(a) air operators conducting operations pursuant to Part VII, subparts 2, 3 and 4 of the CARs;

(b) private operators conducting operations pursuant to Part VI, subpart 4 of the CARs;

(c) pilots and other operational personnel employed by the aforementioned air operators and private operators; and

(d) Transport Canada Civil Aviation (TCCA) personnel, including principal operations inspectors (POIs) and Civil Aviation Safety Inspectors (CASIs) who conduct certification and safety oversight of Canadian air operators and private operators.

1.3 Description of changes

(1) AC 700-048, Issue 3 includes the following changes:

(a) The term "Special Authorization" is replaced by "Special Authorization/Specific Approval".

(b) Subsection 1.0 (1) is modified to clarify that the purpose of the AC is to provide the conditions and associated guidance applicable to the Special Authorization/Specific Approval (SA) for Reduced Ground Roll (RGR) take-off.

(c) Paragraph 2.3 (1) (c): Addition of a second note clarifying the applicability of V_1 to the RGR takeoff procedure.

(d) Appendix A, Condition (c): The language is modified to better align with the conditions listed in the AFM supplement.

(e) Appendix B, Condition (c) (2) now specifies "safely land the aircraft" vice "land the aircraft without damage to equipment or injury to persons".

(f) Appendix B, Condition (c) (3) now specifies "It is recommended that the value for accelerate-go […] be used" vice "The value for accelerate-go […] is to be used".

(g) Appendix B, Condition (l): References to implementation and transition period to the RGR take-off procedure are removed; and

(h) Appendix B, Condition (r): References to implementation and transition period to the RGR take-off procedure are removed.

2.0 References and requirements

2.1 Reference documents

(1) It is intended that the following reference materials be used in conjunction with this document:

(a) *Aeronautics Act* (R.S., 1985, C. A-2)

(b) *Canadian Aviation Regulations* (CARs)

(c) *Commercial Air Service Standards* (CASS)

(d) Special Authorization/Specific Approval (SA): **DHC-6 Twin Otter – Reduced Ground Roll (RGR) Take-off**

(e) Pilot Operating Handbook and Aircraft Flight Manual DHC-6 Series 400 (Twin Otter) and Variants

(f) Pilot Operating Handbook and Aircraft Flight Manual DHC-6 Series 300 (Twin Otter) and Variants

(g) DHC-6 Twin Otter Airplane Flight Manual (Series 200)

(h) DHC-6 Twin Otter Airplane Flight Manual (Series 1 & 100)

(i) Viking DHC-6 Twin Otter Reduced Ground Roll (RGR) Take-off – Pilot Procedures and Training Guide (PPTG)

(j) Transport Canada Publication (TP) 6533 — Approved Check Pilot Manual, Appendix A – Safe Checking Practices

(k) TP 14727, First Edition, Revision 1 (06/2017) — Pilot Proficiency Check and Aircraft Type Rating, Flight Test Guide (Aeroplanes)

(l) TP 219 — Flight Test Guide - Multi-Engine Class Rating — Aeroplane

(m) TP 13747 — Stall/Spin Awareness

(n) Federal Aviation Administration (FAA) Advisory Circular (AC) No: 61-67C — Stall and Spin Awareness Training; and

(o) Transport Canada AC No: 700-031 —Prevention and Recovery from Aeroplane Stalls.

(2) The table below lists the regulatory authorities under which the SA for **DHC-6 Twin Otter – Reduced Ground Roll (RGR) Take-off** is issued to air operators and private operators.

Operations conducted under the following subparts of the CARs:	**The SA for RGR take-off is issued pursuant to the following provisions:**
604	Subparagraph 604.74(1)(a)(ii) of the CARs
702	Subparagraph 702.08(g)(xii) of the CARs
703	Subparagraph 703.08(g)(x) of the CARs
704	Subparagraph 704.08(g)(xi) of the CARs

2.2 Cancelled documents

(1) With the issuance the SA for RGR take-off and this AC, the following documents are to be cancelled:

(a) Issue No: 2 AC 700-048 DHC-6 Twin Otter – Reduced Ground Roll Take-off: Special Authorization and Guidance.

(2) By default, it is understood that the publication of a new issue of a document automatically renders any earlier issues of the same document null and void.

2.3 Definitions and abbreviations

(1) The following **definitions** are used in this document:

(a) **Air operator** means the holder of an air operator certificate (AOC).

(b) **Critical engine** is the engine that, upon failure, would most adversely affect the performance or handling qualities of an aeroplane. For the DHC-6, this is the left engine.

(c) **Decision speed (V_1)** during an RGR take-off, is the highest airspeed at which, as a result of engine failure or other reasons, the pilot will either continue or reject the take-off.

Notes:

1. **During an RGR take-off – unlike a conventional take-off – V_1 occurs while the aircraft is airborne.**
2. **Regardless of whether the aircraft is on the ground or airborne, V_1 is the maximum speed at which a decision to reject or continue the take-off is to be made.**

(d) **Minimum Control Speed – Air (V_{MCA})** is the lowest speed at which the aircraft is controllable in flight in the take-off configuration with one engine operating at maximum power and the propeller of the other engine feathered. Below this speed, it is not possible to maintain control of the aircraft if maximum continuous power or maximum take-off power is set on the operating engine.

Note: The acronyms "V_{MC}" and "V_{MCA}" both appear in the DHC-6 AFM. For the purpose of this AC, "V_{MCA}" will be utilized.

(e) **Minimum control speed – ground (V_{MCG})** in general terms, is the minimum speed, whilst on the ground, that directional control can be maintained, using only aerodynamic controls, with one engine inoperative (critical engine on two engine airplanes) and take-off power applied on the other engine(s).

(f) **Private operator** means the holder of a private operator registration document (PORD).

(g) **RGR flight training** for the purpose of the SA for RGR take-off and this AC, means training which is intended to address the required knowledge, skills and abilities to conduct the full task related to RGR take-off manoeuvres. A flight simulation training device (FSTD) must be specifically validated and approved by TC for flight training as stipulated in Appendix A, Paragraphs (m) and (s) of this AC. (See also RGR Procedural Training)

(h) **RGR procedural training** for the purpose of the SA for RGR take-off and this AC, means training which is intended to address the required knowledge and procedural skills related to RGR take-off. A flight simulation training device (FSTD) must be specifically validated and approved by TC for procedural training as described in Appendix A, Paragraphs (m) and (s) of this AC. (See also RGR Flight Training)

(i) **Special authorizations/specific approvals (SA)** are authorizations issued by the Minister under subpart 604 or Part VII of the CARs that permit the carrying out of an activity in respect of which the Minister has established requirements. SA's are included as part of the Operations Specifications.

(j) **Stalling speed (V_S)** (or minimum steady flight speed) is the lowest speed at which the aircraft is controllable.

(2) The following **abbreviations** are used in this document:

(a) **AC**: Advisory Circular

(b) **AEO**: All-Engines-Operating

(c) **AFM**: Aircraft Flight Manual

(d) **AFMS**: Aircraft Flight Manual Supplement

(e) **CARs:** *Canadian Aviation Regulations*

(f) **CASI**: Civil Aviation Safety Inspector

(g) **CASS**: *Commercial Air Service Standards*

(h) **CBAAC**: Commercial and Business Aviation Advisory Circular

(i) **CFS**: Commercial Flight Standards (TCCA)

(j) **CG**: Centre of Gravity

(k) **FSTD**: Flight Simulation Training Device

(l) **PF**: Pilot Flying

(m) **PIC**: Pilot-in-Command

(n) **PM**: Pilot Monitoring

(o) **PNF**: Pilot Not Flying

(p) **POI**: Principal Operations Inspector

(q) **PORD**: Private Operator Registration Document

(r) **NAC**: National Aircraft Certification (TCCA)

(s) **NSEP**: National Simulator Evaluation Programme (TCCA)

(t) **OEI**: One-Engine-Inoperative

(u) **RGR**: Reduced Ground Roll (20 Degree Flap Take-off)

(v) **TC**: Transport Canada

(w) **TCCA**: Transport Canada Civil Aviation

(x) **TTL**: Technical Team Lead

(y) **SA**: Special Authorization/Specific Approval

(z) **SIC**: Second-in-Command (Pilot)

(aa) **VAL**: Viking Aircraft Ltd

(bb) $\mathbf{V_{MCA}}$: Minimum Control Speed – Air

(cc) $\mathbf{V_S}$: Stalling Speed (or minimum steady flight speed); and

(dd) $\mathbf{V_1}$: Decision Speed.

3.0 Background

3.1 Application and structure of this Advisory Circular

(1) This Advisory Circular (AC) provides the conditions and associated guidance applicable to the SA for Reduced Ground Roll (RGR) take-off, as follows:

(a) **Appendix A**: Stipulates the conditions which operators must meet when issued the SA for RGR take-off. Compliance with these conditions is mandatory for air operators, private operators and pilots conducting RGR take-offs.

(b) **Appendix B**: Provides specific guidance respecting the conditions for the SA for RGR take-off (Appendix A). To facilitate cross-reference, the guidance in Appendix B utilizes the same numbering as the conditions in Appendix A.

(c) **Appendix C**: Features a compliance checklist for the conditions in Appendix A. This compliance checklist has been developed to assist air operators and private operators in the development of their RGR Take-off operations. It also serves as an aid to Transport Canada Civil Aviation (TCCA) personnel for certification and safety oversight purposes.

(d) **Appendix D**: Provides a list of the provisions in the *Canadian Aviation Regulations* (CARs) and *Commercial Air Service Standards* (CASS) that are applicable to air operators and private operators conducting RGR take-offs; and

(e) **Main Body**: Provides background information and general guidance.

4.0 Future disposition

(1) TCCA is committed to maintaining a viable civil aviation transportation system, while not compromising safety. This AC will remain in effect for information purposes until further notice.

5.0 Information management

(1) Not applicable.

6.0 Document history

(1) Advisory Circular (AC) 700-048, **Issue 02**, RDIMS 14261024 (E), 14506649 (F), dated 2019-04-15 — DHC-6 Twin Otter – Reduced Ground Roll Take-Off: Special Authorization and Guidance.

(2) Advisory Circular (AC) 700-048, **Issue 01**, RDIMS 12791412 (E), 13644418 (F), dated 2018-04-12 — DHC-6 Twin Otter – Reduced Ground Roll Take-Off: Special Authorization and Guidance.

7.0 Contact office

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Appendix A – Conditions: SA for reduced ground roll take - off

Authority

1. The **Special Authorization/Specific Approval (SA): DHC-6 Twin Otter – Reduced Ground Roll (RGR) Take-off** (hereafter, "SA for RGR Take-off") is issued pursuant to subparagraphs 604.74(1)(a)(ii), 702.08(g)(xii), 703.08(g)(x) and 704.08(g)(xi) of the *Canadian Aviation Regulations* (CARs). It authorizes the conduct of Reduced Ground Roll (RGR) take-offs as set out in the applicable Transport Canada (TC) approved Supplements to the DHC-6 Aircraft Flight Manual (AFM) as listed below:

(a) SUPPLEMENT 40 REDUCED GROUND ROLL – 20 DEG FLAP TAKE-OFF for DHC-6 Series 300 and Series 400 Aeroplanes; and

(b) SUPPLEMENT 19 REDUCED GROUND ROLL – 20 DEG FLAP TAKE-OFF for DHC-6 Series 100 and Series 200 Aeroplanes.

Conditions

2. This authority is granted subject to the following conditions:

(a) Company Operations Manual / Operations Manual

The Company Operations Manual (for air operators) or Operations Manual (for private operators), shall include guidance to operations personnel in the execution of this SA. This guidance shall include, but is not limited to:

(i) the contents of this SA; and

(ii) standard operating procedures (SOPs), respecting the conduct of RGR take-offs.

(b) Aircraft requirements

RGR Take-offs must be conducted in accordance with the limitations and procedures specified in the applicable TC approved Supplements to the DHC-6 Aircraft Flight Manual as listed below:

(i) SUPPLEMENT 40 REDUCED GROUND ROLL – 20 DEG FLAP TAKE-OFF for DHC-6 Series 300 and Series 400 Aeroplanes; and

(ii) SUPPLEMENT 19 REDUCED GROUND ROLL – 20 DEG FLAP TAKE-OFF for DHC-6 Series 100 and Series 200 Aeroplanes.

(c) Distance required for take-off

(i) Prior to conducting a Reduced Ground Roll – 20 degree flap take-off, the pilot-in-command must make an assessment of the distance available;

(ii) The take-off shall not be conducted unless the runway (take-off surface) distance available is sufficient; and

(iii) A suitable landing area is available in the case of a rejected take-off.

(d) Weather requirements

The PIC shall ensure that each RGR take-off:

(i) is conducted during day time and under visual meteorological conditions (VMC); and

(ii) that the meteorological conditions will allow the flight crew to establish and maintain visual contact with the ground and avoid obstacles, throughout the take-off.

(e) Maximum number of passengers

(i) For each RGR take-off, the maximum number of passengers will comply with any limitation specified in the applicable TC approved Supplement to the DHC-6 Aircraft Flight Manual.

(f) Minimum flight crew

The minimum flight crew for an RGR take-off shall consist of two pilots, subject to the following conditions:

(i) the PIC must be qualified in accordance with the air operator's approved training program or private operator's training program (as applicable), and shall have met the training and recency requirements specified in paragraphs (k) through (q).

(ii) the pilot manipulating the flight controls during an RGR take-off (pilot flying (PF)) must be qualified in accordance with the air operator's approved training program or private operator's training program (as applicable), and shall have met the applicable ground training, flight training, and recency requirements specified in paragraphs (k) through (q).

(iii) the pilot not flying (PNF) or pilot monitoring (PM) must be qualified in accordance with the air operator's approved training program or private operator's training program (as applicable) for DHC-6 pilots, and shall have met the ground training requirements specified in paragraphs (k) and (l).

(g) Pre-take-off briefing

Prior to each RGR take-off, the pilot who will be conducting the take-off (PF), shall conduct a take-off briefing which will include:

(i) the actions to be taken if an engine failure occurs or if any other aircraft malfunction or abnormality occurs;

(ii) the actions to be taken with all engines operating normally; and

(iii) any other pertinent factors, conditions or hazards.

(h) Training program

(i) RGR ground and flight training shall be conducted in accordance with the air operator's approved training program or private operator's training program (as applicable).

(ii) The air operator's approved training program or private operator's training program (as applicable) shall specify:

(A) the requirements established for an individual who will conduct the initial and recurrent ground training specified in paragraph (k);

(B) the requirements established for an individual who will conduct the initial and recurrent flight training specified in paragraph (m); and

(C) any requirements for initial operating experience (line indoctrination) or flight crew pairing restrictions which have been determined to be appropriate for particular routes, aerodromes or areas of operation.

(i) Requirement to demonstrate and record trainee proficiency

The initial and recurrent flight training requirements specified in paragraph (m) shall only be considered to have been met when:

(i) the pilot undergoing training is able to demonstrate proficiency in the conduct of each of the required RGR take-off normal and emergency procedures; and

(ii) the person who conducted the training has recorded that proficiency was demonstrated by the trainee.

(j) Retention of training and qualification records

The air operator or private operator (as applicable) shall retain the records of the ground training, flight training conducted, pilot proficiency, pilot recency and instructor qualifications, as required in paragraphs (k) through (p), (r) and (s) for at least 3 years.

(k) Initial and recurrent ground training

Subject to the validity requirements specified in paragraph (l), no air operator or private operator shall permit a person to conduct an RGR take-off and no person shall conduct an RGR take-off unless that person has completed initial or annual recurrent RGR ground training to include the following:

(i) The airspeeds applicable to RGR take-offs as well as the associated hazards. This shall include, but is not limited to the following:

(A) Minimum Control Speed - Air (V_{MCA});

(B) Stalling Speed; and

(C) Decision Speed (V_1), including an explanation of the "airborne V_1" concept;

(ii) The conditions contained in the SA for RGR Take-off as well as all of the limitations stipulated in the approved RGR Take-off AFMS;

(iii) The normal and emergency procedures specified in the approved RGR Take-off AFMS for each series of aircraft operated; this shall include, but is not limited to the:

(A) Normal Procedures, Take-off

(B) Emergency Procedures, Engine Failure During Take-off, Prior to Liftoff

(C) Emergency Procedures, Engine Failure Airborne, Prior to V1; and

(D) Emergency Procedures, Engine Failure Airborne, After V1.

(iv) The Performance Charts contained in the approved RGR Take-off AFMS for each series of aircraft operated; this shall include, but is not limited to, the performance information required for flight crews to ensure that there is sufficient distance available to allow the aircraft to safely conduct a take-off, as stipulated in paragraph (c).

(v) The successful completion of a written exam, with a minimum pass mark of 70%, which is based on the material specified in subparagraphs (i) through (iv) and is subject to the following:

(A) The exam will be corrected to 100%; and

(B) If the exam results demonstrate that the trainee has insufficient knowledge, additional training shall be provided, before the student re-writes the exam. This additional training shall be recorded.

(l) Validity period for initial and recurrent ground training

The validity period of initial and recurrent ground training specified in paragraph (k) expires on the first day of the thirteenth month following the month in which the training was completed, and is also subject to the following:

(i) Where the initial or recurrent ground training is renewed within the last 90 days of its validity period, its validity period is extended by 12 months (from the date when the pilot's validity period was to have expired);

(ii) The Minister may extend the validity period of initial or recurrent ground training by up to 60 days where the Minister is of the opinion that aviation safety is not likely to be affected; and

(iii) Where all of the elements of initial or recurrent ground training have been taught within the last 90 days of the ground training instructor's validity period, that instructor's

validity period (for initial or recurrent ground training) is extended by 12 months (from the date when the instructor's validity period was to have expired).

(m) Initial and recurrent flight training

Subject to the validity requirements specified in paragraph (n), no air operator or private operator shall permit a person to conduct an RGR take-off and no person shall conduct an RGR take-off unless that person has completed initial or recurrent flight training that includes the following procedures as specified in the approved RGR Take-off AFMS:

(i) **Normal procedures, take-off**: This training shall be:

(A) conducted in a flight simulation training device (FSTD) which has been specifically validated and approved for RGR flight training in accordance with paragraph (s); or

(B) conducted in an aeroplane

(ii) **Emergency procedures, engine failure during take-off, prior to liftoff**: This training shall be:

(A) conducted in an FSTD which has been specifically validated and approved for RGR flight training and/or RGR procedural training in accordance with paragraph (s);

(B) conducted in an aeroplane; or

(C) conducted during a ground briefing, where the pilot undergoing training is required to explain the procedure.

(iii) **Emergency procedures, engine failure airborne, prior to V_1**: This training shall be:

(A) conducted in an FSTD which has been specifically validated and approved for RGR flight training and/or RGR procedural training in accordance with paragraph (s);

(B) conducted in an aeroplane; or

(C) conducted during a ground briefing, where the pilot undergoing training is required to explain the procedure.

(iv) **Emergency procedures, engine failure airborne, after V_1:** This training shall be:

(A) Conducted in an FSTD which has been specifically validated and approved for RGR flight training and/or RGR procedural training in accordance with paragraph (s); or

(B) conducted in an aeroplane.

Note: Training for the **Engine Failure Airborne, After V_1** must include a simulated failure of the critical (left) engine.

(n) Validity period for initial and recurrent RGR flight training

The validity period of initial and recurrent flight training specified in paragraph (m) expires on the first day of the thirteenth month following the month in which the training was completed, and is also subject to the following:

(i) Where the initial or recurrent flight training is renewed within the last 90 days of its validity period, its validity period is extended by 12 months (from the date when the pilot's validity period was to have expired); and

(ii) The Minister may extend the validity period of initial or recurrent flight training by up to 60 days where the Minister is of the opinion that aviation safety is not likely to be affected.

(o) Exception for the purposes of flight training

For the purpose of completing the applicable requirements for initial or recurrent flight training specified in paragraph (m), an air operator or private operator may permit a person to conduct an RGR take-off and a person may conduct an RGR take-off, providing:

(i) the person has met the ground training requirements specified in paragraphs (k) and (l);

(ii) the person conducting the take-off is receiving flight instruction (dual) from an individual who meets the requirements specified in paragraph (r); and

(iii) no passengers are carried.

(p) 90 Day recency requirement

Subject to paragraph (q), no air operator or private operator shall permit a person to conduct an RGR take-off and no person shall conduct an RGR take-off, unless that person has within the previous 90 days, conducted at least three RGR take-offs in:

(i) an aeroplane; or

(ii) a flight simulation training device (FSTD) which has been specifically validated and approved for RGR flight training.

(q) Exception for the purpose of regaining the 90 day recency requirement

For the purpose of regaining the recency requirement specified in paragraph (p), an air operator or private operator may permit a person to conduct an RGR take-off and a person may conduct an RGR take-off, providing:

(i) the person has met the ground training requirements specified in paragraphs (k) and (l); and

(ii) the person conducting the take-off:

(A) is receiving flight instruction (dual) from an individual who meets the requirements specified in paragraph (r), or

(B) satisfies the applicable initial or recurrent flight training requirements, as specified in paragraphs (m) and (n), and no passengers are carried.

(r) Flight training instructor requirements

The air operator's or private operator's Chief Pilot or his/her designate, shall ensure that the individuals who conduct flight training demonstrate the safety awareness, technical knowledge, flying skill, operational experience and instructional ability to enable them to safely and effectively instruct and assess the training requirements specified in paragraph (m). The minimum requirements to conduct RGR training include the following:

(i) Each individual who conducts initial or recurrent RGR flight training in an **aeroplane**, shall meet the:

(A) ground training requirements specified in paragraphs (k) and (l)

(B) applicable initial or recurrent flight training specified in paragraphs (m) and (n)

(C) recency requirements specified in paragraph (p); and

(D) any other knowledge, skill or experience requirements determined by the air operator or private operator.

(ii) Each individual who conducts initial or recurrent RGR flight training or procedural training in a **flight simulation training device (FSTD),** shall meet the following requirements:

(A) ground training, as specified in paragraphs (k) and (l)

(B) subject to clause D, the applicable flight training requirements specified in paragraphs (m) and (n)

(C) subject to note which follows clause D, the recency requirements specified in paragraph (p); and

(D) any other knowledge, skill or experience requirements determined by the air operator or private operator.

Note: An individual who only provides RGR flight training or procedural training in an **FSTD**, can fulfill the flight training requirement specified in subparagraph (m)(i), and the 90 recency requirement specified in paragraph (p), in either an aeroplane or in an FSTD which has been validated and approved for RGR flight training.

(s) Flight simulation training device (FSTD) requirements

In order to be utilized for the purpose of RGR flight training or RGR procedural training stipulated in paragraph (m), a flight simulation training device (FSTD) must be specifically validated and approved by Transport Canada Civil Aviation (TCCA) National Simulator Evaluation Program (NSEP).

Appendix B – Specific guidance respecting the SA for reduced ground roll take-off

B.1 Overview

(1) The matrix below provides specific guidance corresponding to the conditions specified for the SA: DHC-6 – Reduced Ground Roll – 20 Degree Flap Take-Off, which appears in Appendix A of this Advisory Circular (AC).

Condition of SA	Guidance information
(a) Company Operations Manual / Operations Manual	(1) Standard operating procedures (SOPs) respecting Reduced Ground Roll (RGR) take-offs must describe the duties of the pilot flying (PF) and pilot monitoring (PM) during normal and emergency RGR take-off procedures. (2) SOPs should reflect the information provided in Appendix B, (k) Initial and Recurrent Training – Normal and Emergency Procedures, subparagraphs (2) and (3).
(b) Aircraft requirements	(1) RGR Take-offs must be conducted in accordance with the procedures and limitations specified in the Transport Canada (TC) approved RGR Take-off Aircraft Flight Manual Supplement (AFMS). (2) The procedures and limitations specified in the approved RGR Take-off Aircraft Flight Manual (AFM) Supplement have been developed to mitigate the hazards associated with an aircraft being airborne at a speed less than V1 – including those associated with the aircraft becoming airborne at a speed less than V_{MCA}. (3) The limitations specified in the approved RGR Take-off AFMS include: o The aircraft shall have a fully functioning auto feather system installed and operating o Minimum Flight Crew of 2 pilots o Approved Flap Setting for RGR take-off is 20 o Required placards installed; and o RGR Take-offs restricted to DAY VMC only.

(c) Distance required for take-off	(1) When planning an RGR take-off, the suitability of the take-off surface as well as the area available for a landing in case of a rejected take-off must be assessed. (2) For the purpose of an RGR take-off, the length of the runway (take-off surface) required is not limited by accelerate-stop distance (ASD). The value for ASD published in the approved RGR Take-off AFMS is to be used as a guide to ensure that a suitable area for a forced landing is available if a rejected take-off is initiated while airborne prior to V_1. A suitable area for a forced landing can be understood to be an area that provides the flight crew with a reasonable capability to safely land the aircraft. (3) Similarly, for the purpose of an RGR take-off, the length of the runway (take-off surface) required is not limited by accelerate-go distance (take-off distance to 35 feet with an engine failure at V_1). It is recommended that the value for accelerate-go published in the approved RGR Take-off AFMS be used as a guide to ensure that a suitable area is available, clear of obstacles along the take-off path, to continue the take-off if an engine fails at V_1. (4) RGR take-offs are frequently conducted on surfaces that are not dry, hard, or level. Therefore, air operators, private operators and pilots must consider and allow for degradation in take-off performance arising from the unique characteristics of each runway (take-off surface) at which an RGR take-off is conducted. (5) Information respecting the factors which can negatively affect take-off performance may be found in the **Viking DHC-6 Twin Otter Reduced Ground Roll (RGR) Take-off – Pilot Procedures and Training Guide (PPTG).** (6) Subpart 704 pilots and air operators are reminded that when conducting operations from gravel runways, they must also comply with the regulatory requirements to add an extra factor, when such operations are not specifically addressed in the Aeroplane Flight Manual, a Supplement to the Aeroplane Flight Manual, or in data from another source that is acceptable to the Minister.
(d) Weather requirements	(1) In determining whether the meteorological conditions are adequate, the flight crew must assess that they will be able to maintain visual contact with the ground and avoid obstacles.
(e) Maximum number of passengers	(1) Reserved

(f) Minimum flight crew	(1) The approved RGR take-off normal and emergency procedures require increased skill and alertness and also feature an elevated workload relative to a conventional take-off, for this reason, the minimum flight crew for an RGR take-off consists of two pilots. This is a limitation specified in the approved RGR Take-off AFMS. (2) If an engine failure or other emergency affecting the safety of flight occurs prior to V_1, the associated hazards - including those associated with being airborne at a speed less than V_{MCA} - can be effectively minimized by reducing power on the operative engine and conducting a rejected take-off. Having two pilots facilitates the immediate recognition and announcement of an engine failure by the PM as well as the prompt reaction by the PF. (3) A Second-In-Command (SIC), who meets the applicable ground training, flight training, and recency requirements specified in paragraphs (h) through (q), can serve as the PF during an RGR take-off. (4) The PNF/PM must be qualified in accordance with the air operator's approved training program or private operator's training program (as applicable) for DHC-6 pilots, and must also meet the RGR ground training requirements.
(g) Pre-take-off briefing	(1) Take-off briefings serve an important role in preparing flight crews to make the reject/continue (stop/go) decision. (2) Further to the minimum briefing requirements specified in the SA, the pre-take-off briefing should include: (a) the actions to be taken if an engine failure occurs or if any other aircraft malfunction or abnormality occurs : • during the take-off run, prior to liftoff (becoming airborne); • after the aircraft becomes airborne, prior to V_1; and • airborne, after V_1 (b) The actions to be taken with all engines operating normally, including: • the altitude at which obstacles will be cleared prior to the commencement of flap retraction. (c) Any other pertinent factors, conditions or hazards (3) If a series of RGR take-offs is conducted from the same location for the purpose of flight training, the PIC may elect to only conduct this briefing prior to the first RGR take-off. (4) Pilots must constantly guard against complacency and must always be ready to make the appropriate decisions and take the correct actions. They must always be prepared to take timely action – especially when addressing an engine failure during an RGR take-off.

(h) Training program	(1) The objective of RGR take-off ground and flight training is to provide pilots with the necessary background knowledge required to safely conduct RGR take-offs during line operations. (2) These training requirements have been developed to address the unique characteristics of RGR take-offs and include the recommendations of the aircraft manufacturer. (3) Air operators, private operators and pilots should consult the manufacturer's guidance for additional information. (4) Air operators and private operators are also encouraged to enhance their individual training programs by including additional training events, requirements and/or information which they have determined to be appropriate for particular routes, aerodromes or areas of operation. These include, but are not limited to: (a) Any requirements for initial operating experience (line indoctrination); and (b) Flight crew pairing restrictions (such as requiring newly qualified RGR pilot-in-command to only fly with experienced second-in-command pilots). (5) Sources of information include, but are not limited to: (a) Feedback from the training and checking pilots, as well as line pilots (b) Analysis of past incidents; and (c) Analysis of information received from other air operators, private operators and associations.

(i) Requirement to demonstrate and record trainee proficiency	(1) The aim of RGR flight training is to ensure that trainees are able to demonstrate the required proficiency. Therefore, RGR flight instructors must perform three vitally important functions: (a) Instructing (facilitating the candidate's learning and conveying information); (b) Evaluating trainee performance (confirming that the trainee is able to successfully conduct the required manoeuvres); (c) Documenting that the required training was completed and that the trainee demonstrated proficiency. (2) Instructors should reference the manufacturer's guidance for specific criteria to be used in the assessment of RGR normal and emergency procedures.
(j) Retention of training and qualification records	(1) Accurate and complete records serve as important tools to help air operators and private operators facilitate safe flight operations. (2) The retention period of 3 years is consistent with the requirements specified in sections 702.77, 703.99 and 704.117 of the CARs.
(k) Initial and recurrent ground training	**Overview** (1) The objective of initial and recurrent RGR ground training is to provide pilot trainees with the necessary background knowledge required to: (a) prepare for RGR flight training; and (b) safely conduct RGR take-offs during line operations. (2) Pilots are not authorized to conduct RGR take-offs – either as PF or PM – unless than have met the applicable initial or recurrent ground training requirements specified in Paragraph (k) of the SA for RGR take-off. (3) To increase the effectiveness and benefits received from RGR ground training, it should be conducted as closely as possible prior to the associated flight training. (4) Air operators and private operators should establish appropriate prerequisites for an individual who will conduct the ground training. The requirements specified for RGR take-off flight instructors, which are described below, would also be suitable criteria for ground instructors.

(k) Initial and recurrent ground training **Continued**	**Airspeeds** (1) Ground training respecting airspeeds is intended to ensure that flight crews are aware of the aerodynamic factors associated with RGR take-offs. (2) Ground training regarding **V_{MCA}** should include the factors which affect V_{MCA}, the hazards associated with engine failure at a speed less than V_{MCA}, and how these hazards are mitigated. (3) Ground training regarding **stalling speed** should include the factors which affect stalling speed, the associated hazards, and how these hazards are mitigated. (4) Ground training respecting **Decision Speed (V_1)**, is particularly important. Flight crews must have a thorough understanding of the reasons to conduct a rejected take-off: (a) Prior to the aircraft becoming airborne, a take-off will be rejected because of an engine failure and can also be rejected because of other malfunctions or abnormalities; and (b) Once the aircraft is airborne and at a speed less than V_1, there are limited reasons for conducting a rejected take-off; these include an engine failure or other emergencies affecting the safety of flight.
	Conditions and limitations (1) The conditions of the SA for RGR take-off and the limitations stipulated in the approved RGR Take-off AFMS have been specifically developed to ensure that RGR take-offs are conducted in a safe manner. (2) Ground training respecting conditions and limitations is intended to ensure that flight crews are aware of these important safety mitigations.

(k) Initial and recurrent ground training **Continued**	**Normal and emergency procedures** (1) The purpose of this element of ground training is to ensure the pilots have sufficient background knowledge to safely conduct the **normal and emergency procedures** specified in the approved RGR Take-off AFMS. (2) Items to be covered include, but are not necessarily limited to: (a) all elements of the published procedure; (b) the pre-take-off briefing stipulated in Paragraph (g) of the SA for RGR take-off; (c) the "airborne V_1" concept, and the actions that must be taken should an engine failure occur during an RGR take-off: (i) duties of the pilot monitoring, including, but not limited to: monitoring the engine instruments and promptly calling out any abnormalities, and (ii) duties of the pilot flying (PF). (d) The potential hazards associated with each of these procedures and how these potential hazards are mitigated. (3) The duties of each flight crew member must be clearly understood: (a) During an RGR take-off, the PF needs to focus on flying the aircraft; the pilot must accurately control the aircraft's flight path as he/she accelerates the aircraft at 5 feet or less above the take-off surface (while ensuring that the aircraft does not re-contact the surface). (b) While the PF focuses on flying the aircraft, the PM must closely monitor the engine instruments, immediately call out any abnormalities and also call out V_1. (In so doing, the PM serves an important role in off-loading the engine monitoring function from the PF, increasing the PF's situation awareness and facilitating the PF's quick response to an engine failure.) (c) It must also be understood that prior to V_1, a *timely* announcement of an engine failure from the PM and *prompt* action by the PF, will help to reduce the distance required to stop the aircraft during a rejected take-off. This is particularly important when conducting the procedure for **Engine Failure Airborne, Prior to V_1.** (d) Additionally, it must be emphasized that the PM must call out V_1 in a **timely** manner, thereby facilitating the correct reject/continue (go/no go) decision on the part of the PF.

(k) Initial and recurrent ground training **Continued**	**Performance charts** (1) The purpose of this element of ground training is to ensure the pilots are able to determine that there is sufficient distance available to safety conduct a take-off and account for an engine failure or other abnormal or emergency, as stipulated in paragraph (c) for the SA for RGR take-off. (2) Pilots need to understand that for an RGR take-off, the length of the runway (take-off surface) is not limited by accelerate-stop distance (ASD). The value for ASD published in the approved RGR Take-off Supplement to the DHC-6 AFM is to be used as a guide to ensure that a suitable area for a forced landing is available if a rejected take-off is initiated while airborne prior to V_1. (3) RGR take-offs are frequently conducted on surfaces that are not dry, hard, or level. Therefore, pilots must understand the need to allow for degradation in take-off performance arising from the unique characteristics of each runway (take-off surface) at which an RGR take-off is conducted. (4) It is recommended that air operators and private operators address training respecting performance charts by providing trainees with practical examples from aerodromes within their own area of operations. (5) This training element can also be utilized to provide an opportunity to exercise pilot decision-making skills.
	Written examination (1) The written examination can be either open-book or closed-book, as determined by the air operator or private operator.
(l) Validity period for initial and recurrent ground training	(1) The requirements respecting the validity periods for initial or recurrent ground training mirror the validity period requirements for initial or recurrent flight training. (2) A proven effective way for an individual to learn something – or to review something – is by teaching it. For this reason, ground training instructors have been given the flexibility to have their own personal validity period – for initial or recurrent ground training – renewed through the action of providing instruction, within the constraints specified.

(l) Validity period for initial and recurrent ground training **Continued**	(1) In order to qualify an individual to serve as an **instructor for RGR ground instruction**, the ground training requirements specified in paragraphs (k) and (l), can be deemed to have been met if an individual: (a) thoroughly reviews all of the elements of the initial or recurrent RGR ground training, as specified in paragraph (k); (b) has been assessed to be qualified to conduct the RGR ground training by the air operator's or private operator's Chief Pilot or a person designated by the Chief Pilot; and (c) has had this assessment documented and retained on the instructor's file for a period of three years as per paragraph (j) (2) If authorized in their approved training program, an air operator or private operator may engage a third party training organization to conduct RGR ground training, and may delegate the qualifying and assessment of RGR ground instructors – as specified in paragraphs (1) and (2) above – to the management of this training organization. In this case, the instructor and third party training organization must fulfill the requirements specified in paragraph (2), above – and the assessment of the instructor's qualifications will be assessed and documented by a person designated by the senior management of the third party training organization.

(m) Initial and recurrent flight training

Overview

(1) The aim of the flight training is to ensure that trainees are able to demonstrate the required proficiency. Towards this end, instructors should reference the manufacturer's guidance for specific criteria to be used in the assessment of RGR normal and emergency procedures.

(2) In attaining the required proficiency, pilot trainees must have sufficient opportunity to practice each of the required procedures. For guidance in achieving the required proficiency, the matrix below provides recommendations for the minimum number of each manoeuvre which should be conducted in an aeroplane or flight simulation training device (FSTD):

Training element	Initial	Recurrent
Normal Procedures (RGR), Take-off	**5**	**2**
Engine Failure During Take-off, Prior to Liftoff	**1**	**1**
Engine Failure Airborne, Prior to V_1	**2**	**1**
Engine Failure Airborne, After V_1	**2**	**1**

(3) Trainees may need to conduct additional manoeuvres, as required, in order to achieve the objective of having the flight instructor assess them as proficient.

Flight training conducted in an aeroplane

(1) **Warning:** Air operators, private operators and flight instructors must utilize conservative judgement to ensure that adequate safety margins are provided during RGR take-off flight training conducted in an aeroplane. In particular, all personnel:

(a) must comply with the direction and guidance stipulated in this Annex; and

(b) should adhere to the recommendations respecting safe training practices provided in the **Viking DHC-6 Twin Otter Reduced Ground Roll (RGR) Take-off – Pilot Procedures and Training Guide (PPTG)**. These include, but are not limited to recommendations respecting:

- Minimum runway requirements (width and length);
- Environmental requirements (including crosswind);
- Altitude and airspeed requirements; and
- Restrictions on the use of asymmetric power.

(m) Initial and recurrent flight training **Continued**	**Flight training conducted in an aeroplane – continued** (2) Air operators, private operators and flight instructors must be aware of the potential hazards and risks which exist during RGR flight training. These risks include, but are not necessarily limited to: (a) **runway over-run –** especially during a rejected take-off (and landing) which is initiated while the aircraft is airborne at a speed less than V_1; (b) **lateral excursion from the runway** – which may lead to contact with other aircraft or an obstacle – particularly if adequate directional control is not established and maintained throughout the take-off and/or rejected take-off; (c) **rough landing –** if the controls are mishandled during a rejected take-off which is initiated while the aircraft is airborne at a speed less than V_1; and/or (d) **poor aircraft control** resulting in a potential stall and/or loss of altitude – if the controls are mishandled during simulated engine failure which is initiated while the aircraft is airborne at a speed greater than V_1. (3) The training requirements for **rejected take-offs** can be satisfied by having the pilot undergoing training verbally explain these procedures during a briefing. **Note:** Training for "rejected take-offs" refers to both the **Emergency Procedures, Engine Failure During Take-off, Prior to Liftoff** and **Emergency Procedures, Engine Failure Airborne, Prior to V_1**) as detailed in Appendix A, subparagraphs (m)(ii) and (m)(iii) of this AC. (4) Air operators and private operators also have the option of conducting training for **rejected take-offs** in an aeroplane. The decision to conduct training for rejected take-offs in an aeroplane is at the discretion of the air operator or private air operator, and must be made in consideration of the factors listed above, and must also consider the experience level of the pilot conducting training and the pilot being trained. (5) When training for **rejected take-offs** in an aeroplane, the pilot conducting training must not create an asymmetric power situation by reducing power on one engine. Instead, the pilot conducting training should verbally prompt the pilot trainee to conduct the rejected take-off by calling "reject" (or whatever equivalent term has been adopted).

(m) Initial and recurrent flight training **Continued**	**Flight training conducted in an aeroplane – continued** (6) Training conducted in an aeroplane**,** respecting the approved RGR Take-off AFMS, **Emergency Procedures, Engine Failure Airborne, After V_1**, is subject to the following limitations: (a) simulated engine failures shall be conducted at a safe altitude, not less than **4000 ft AGL**; and (b) simulated engine failures shall not be initiated at a speed less than **V_1 + 5 kts**. (7) The safe training practices provided in this AC and the **Viking DHC-6 Twin Otter Reduced Ground Roll (RGR) Take-off – Pilot Procedures and Training Guide (PPTG)** are intended to reflect the conservatism provided in numerous sources including, but not limited to, the following: (a) *Commercial Air Service Standard* (CASS) 722 Schedule I - Pilot Proficiency Check (PPC) – Aeroplane; (b) CASS 723 (Aeroplane) Schedule I – PPC; (c) CASS 724 (Aeroplane) Schedule II – PPC - Aeroplane; (d) TP 6533: Approved Check Pilot Manual, Appendix A – Safe Checking Practices; and (e) TP 14727E, Second Edition, (11/2007) – Pilot Proficiency Check and Aircraft Type Rating, Flight Test Guide (Aeroplanes) (8) Where practicable, the pilot trainee should demonstrate the ability to conduct RGR take-offs during crosswind conditions.

(m) Initial and recurrent flight training **Continued**	**Flight training conducted in a flight simulation training device (FSTD)** (1) For training in an FSTD respecting a ground rejected take-off in accordance with the **Engine Failure, Prior to Liftoff** procedure, the engine failure should be simulated after nose wheel lift-off, while the main landing gear is still in contact with the runway (take-off surface). (2) For training in an FSTD respecting an airborne rejected take-off in accordance with the **Engine Failure Airborne, Prior to V_1** procedure, the engine failure should be simulated when the aircraft is airborne at a speed less than V_1. (3) For training in an FSTD respecting an airborne continued take-off in accordance with the **Engine Failure Airborne, After V_1** procedure, the engine failure should be simulated when the aircraft is airborne, after V_1. This training should include a simulated failure of the critical (left) engine.
(n) Validity period for initial and recurrent RGR flight training	(1) Reserved
(o) Exception for the purposes of flight training	(1) Paragraphs (m) and (n) are intended to restrict the conduct of RGR take-offs – for **operational** purposes – to those who have completed initial or recurrent RGR flight training. The imperative language used in these provisions therefore requires an exception (relief provision), to enable a pilot to conduct an RGR take-off – for the purpose of completing their required flight training. (Without such an exception, an unresolvable situation would be created, whereby a pilot could not conduct an RGR take-off for flight training – because they had not already completed their flight training.) (2) Paragraph (o) requires that "no passengers are carried" during RGR take-off flight training. In this context, other individuals who are required to be on board, for flight training and/or checking purposes, are not considered to be passengers. These may include: (a) the air operator's/private operator's: (i) pilot trainees, and (ii) flight instructors and/or check pilots; and (b) TC personnel.
(p) 90-Day recency requirement	(1) The 90-day recency requirement is intended to mitigate the elevated workload, as well as the increased skill and alertness that are required when conducting an RGR take-off. (2) The RGR take-offs required for initial and recurrent flight training can be utilized to fulfill the requirements for 90-day recency.

(p) 90-Day recency requirement **Continued…**	(3) The RGR take-offs may be conducted from any runway or surface in order to fulfill the requirements for 90-day recency. They may, for example, be conducted on a hard surface runway during a positioning flight, since there is no requirement for these take-offs to be conducted from an unprepared surface.
(q) Exception for the purpose of regaining the 90-day recency requirement	(1) The goals of this condition are to ensure safety by ensuring that RGR take-offs are only conducted by those individuals who have completed the required RGR ground and flight training – and at the same time provide flexibility to air operators and private operators as to how the 90-day recency is regained. (2) An air operator or private operator may permit a person to conduct RGR take-off, providing: (i) the person has met the ground training requirements specified in paragraphs (k) and (l); and (ii) the person conducting the take-off: (A) is receiving flight instruction (dual) from an individual who meets the requirements specified in paragraph (r); or (B) satisfies the applicable validity requirements for initial or recurrent flight training, as specified in paragraphs (m) and (n), and no passengers are carried.
(r) Flight training instructor requirements	**Overview** (1) Flight instructors have a vitally important role in helping air operators and private operators to establish and maintain safe and effective RGR operations. (2) As a minimum, RGR flight instructors must meet the ground training, flight training and recency requirements that have been established for pilots to conduct RGR take-offs. (3) Air operators and private operators are also strongly encouraged to consider the important role that flight instructors perform – and the unique circumstances of their operations – in determining whatever additional knowledge, skill or experience requirements would be appropriate. (4) Examples of additional requirements include, but are not limited to: (a) operational experience conducting RGR take-offs; (b) experience as a training pilot; and/or (c) experience as an approved check pilot (ACP).

(r) Flight training instructor requirements **Continued**	**Instructors for flight simulation training device (FSTD) only** (1) It should be noted that individuals who conduct RGR flight instruction in an approved FSTD – and do not conduct RGR flight instruction in an aeroplane – can utilize an approved FSTD to: (a) complete the flight training requirements for **Normal Procedures, Take-off** specified subparagraph (m) and (i); and (b) complete the 3 take-offs mandated by the 90-day recency requirement specified in paragraph (p).
	(1) In order to qualify an individual to serve as an **instructor for RGR flight instruction**, the ground training requirements specified in paragraphs (k) and (l), can be deemed to have been met if an individual: (a) thoroughly reviews all of the elements of the initial or recurrent RGR ground training, as specified in paragraph (k); (b) has been assessed to be qualified to conduct the RGR ground training by the air operator's or private operator's Chief Pilot or a person designated by the Chief Pilot; and (c) has had the above assessment documented and retained on the instructor's file for a period of three years as per paragraph (j).

(r) Flight training instructor requirements **Continued**	(2) In order to qualify an individual to serve as an **instructor for RGR flight training in an aeroplane or in an FSTD**, the flight training requirements specified in paragraphs (m) and (n), can be deemed to have been met if an individual: (a) is employed by an air operator or private operator that has been issued and conducts operations in accordance with the SA, DHC-6 Twin Otter – Reduced Ground Roll (RGR) Take-off; (b) has within the last year conducted take-offs utilizing the approved RGR take-off procedures; (c) has been assessed to be qualified to conduct the approved RGR flight training in an aeroplane or in an FSTD by the air operator's or private operator's Chief Pilot or a person designated by the Chief Pilot; and (d) has had the above assessment documented and retained on the instructor's file for a period of three years as per paragraph (j). (3) During the implementation and transition period for the RGR procedures, for the purpose of qualifying an individual to serve as an **instructor for RGR flight training in an FSTD only**, the flight training requirements specified in paragraphs (m) and (n), can be deemed to have been met if an individual: (a) has received flight instruction as stipulated in condition (m), in an aeroplane or an FSTD which has been approved for RGR flight training, from a training pilot designated by the type certificate holder for the DHC-6, Viking Aircraft Ltd. (VAL); (b) has, on the basis of their performance during the aforementioned training, been recommended to serve as a flight instructor by the type certificate holder's designated training pilot; (c) has been assessed to be qualified to conduct the approved RGR flight training by the air operator's or private operator's Chief Pilot or a person designated by the Chief Pilot; and (d) has had the above assessment documented and retained on the instructor's file for a period of three years as per paragraph (j). (4) If authorized in their approved training program, an air operator or private operator may delegate a third party training organization to conduct RGR flight training, and may delegate the qualifying and assessment of RGR flight instructors – as specified in paragraphs (1) to (4) above – to the management of this third party training organization. In this case, the instructor and third party training organization must fulfill the applicable requirements specified in paragraphs (1) to (4), above – and the assessment of the instructor's qualifications will be assessed and documented by a person designated by the senior management of the third party training organization.

(s) Flight simulation and training device requirements	**Validation and approval of a flight simulation training device (FSTD)** (1) For the purpose of initial and recurrent RGR flight training, paragraph (m) authorizes the use of an FSTD – which has been specifically validated and approved for RGR take-offs. (2) Applications for the validation and approval of an FSTD are submitted to the Technical Team Lead (TTL) of the TC National Simulator Evaluation Program (NSEP) (3) An overview of the process for having a FSDT validated and approved for RGR take-offs appears below: (a) The "sponsor" (FSTD owner/operator) provides TCCA NSEP with a letter of intent (LoI) to add RGR take-off qualification to the device. (b) The sponsor submits a letter of compliance (LoC) that the FSTD has been validated by a suitably qualified person for RGR take-off. (c) TC NSEP either accepts the statement of compliance – and/or conducts an evaluation/validation. (This is typically done within a month of receipt of the LoC.) (d) Because the RGR take-off involves a flight regime which is outside of the normal flight envelop and for which there is no data (airborne in ground effect at a speed less than V_{MCA}), a subjective validation would be conducted. (e) The subjective validation would typically involve two pilots (one from industry and one from TC) who would subjectively validate the simulator for RGR take-offs.

Appendix C — Compliance checklist

C.1 Overview

(1) The matrix below has been developed to assist air operators and private operators in ensuring that their RGR take-off operations comply with the conditions specified in the SA**: DHC-6 – Reduced Ground Roll (RGR) – 20 Degree Flap Take-off** (Appendix A). This matrix also serves as an aid for Transport Canada Civil Aviation (TCCA) personnel for the purposes of certification and safety oversight.

(2) This matrix provides:

(a) A reference to the specific condition in the SA;

(b) The assessment of compliance (to be made by the air operator/private operator/TCCA personnel); and

(c) An area to record the details of the air operator's/private operator's means of compliance. (This can include, such things as the applicable references in the company operations manual, etc.).

(3) This matrix can be reproduced locally.

Requirement	Compliance (Y/N)	Means of compliance (references / documentation)
(a) Company Operations Manual / Operations Manual		
(b) Aircraft requirements		
(c) Distance required for take-off		
(d) Weather requirements		
(e) Maximum number of passengers		

Requirement	Compliance (Y/N)	Means of compliance (references / documentation)
(f) Minimum flight crew		
(g) Pre-take-off briefing		
(h) Training program		
(i) Requirement to demonstrate and record trainee proficiency		
(j) Retention of training and qualification records		
(k) Initial and recurrent ground training		
(l) Valdity period for initial or recurrent ground training		
(m) Initial and recurrent flight training		

Requirement	Compliance (Y/N)	Means of compliance (references / documentation)
(n) Validity period for initial and recurrent RGR flight training		
(o) Exception for the purposes of flight training		
(p) 90-Day recency requirement		
(q) Exception for the purpose of regaining the 90-day recency requirement		
(r) Flight training instructor requirements		
(S) Flight simulation training device requirements		

Appendix D — Applicable regulations

D.1 Overview

(1) Some of *Canadian Aviation Regulations* (CARs) and *Commercial Air Service Standards* (CASS) that are applicable to **air operators** and **private operators** conducting Reduced Ground Roll (RGR) take-offs are specified below.

Caution: This list is provided for convenience only and is not exhaustive. Air operators, private operators, pilots and flight dispatchers are responsible for compliance with all relevant provisions.

D.2 Part VII, Subparts 2, 3 and 4

Subject	Provisions in the CARs	Provisions in the CASS
Contents of an Air Operator Certificate	Subparagraphs 702.08(g)(xii), 703.08(g)(x), and 704.08(g)(xi)	N/A
Company Operations Manual	Subsections 702.82(1), 703.105(1) and 704.121(1)	Sections 722.82, 723.105 and 724.121
Standard operating procedures (SOPs)	Subsections 702.84(1), 703.107(1), 704.124(1) and 705.138(1)	Sections 722.84, 723.107, 724.124 and 725.138
Flight crew member qualifications	Subsection 702.65 and paragraphs 703.88(1)(d) and 704.108(1)(d)	
Training program	Sections 702.76, 703.98 and 704.115	Subsections 722.76(1), 723.98(1) and 724.115(1)
Flight crew training on a contract basis	Sections 702.76, 703.98 and 704.115	Subsections 722.76(2), 723.98(2) and 724.115(2)
Technical ground training - initial and recurrent	Sections 702.76, 703.98 and 704.115	Subsections 722.76(7), 723.98(6) and 724.115(7)

Aircraft flight training program – initial and annual recurrent (subpart 702)	Section 702.76	Subsection 722.76(10)
Aeroplane only training programs (subparts 703 and 704)	Sections 703.98 and 704.115	Subsections 723.98 (10) and 724.115(11)
Level B training programs (subparts 703 and 704)	Sections 703.98 and 704.115	Subsections 723.98 (9) and 724.115(10)
Training and qualification records	Sections 702.77, 703.99 and 704.117	

D.3 Part VI, Subpart 4

Subject	Provisions in the CARs
Other activities approved by the minister	Subparagraph 604.74(1)(a)(ii)
Operations Manual	Subsection 604.197(1)
Standard operating procedures (SOPs)	Paragraphs 604.197(1)(i) and (j)
Flight crew member qualifications	Paragraphs 604.143(1)(b) and (c)
Training program	Section 604.166
Acquiring and maintaining competency	Section 604.167
Training program content and training facilities	Section 604.168
Instructor qualifications and training	Section 604.144

Flight crew members ground instruction	Subsection 604.169(1)
Flight crew members — Aircraft operation training	Section 604.170
Flight crew members — Level B, C or D flight simulator	Section 604.171
Training and qualification records	Subsection 604.149 (1)