

**RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:**

**Bid Receiving - PWGSC / Réception des
soumissions - TPSGC**
11 Laurier St. / 11, rue Laurier
Place du Portage , Phase III
Core 0B2 / Noyau 0B2
Gatineau
Québec
K1A 0S5
Bid Fax: (819) 997-9776

**REQUEST FOR PROPOSAL
DEMANDE DE PROPOSITION**

**Proposal To: Public Works and Government
Services Canada**

We hereby offer to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the goods, services, and construction listed herein and on any attached sheets at the price(s) set out therefor.

**Proposition aux: Travaux Publics et Services
Gouvernementaux Canada**

Nous offrons par la présente de vendre à Sa Majesté la Reine du chef du Canada, aux conditions énoncées ou incluses par référence dans la présente et aux annexes ci-jointes, les biens, services et construction énumérés ici sur toute feuille ci-annexée, au(x) prix indiqué(s).

Comments - Commentaires

Title - Sujet HELICOPTER PROJECT (DFO)	
Solicitation No. - N° de l'invitation F7013-120014/I	Date 2015-06-28
Client Reference No. - N° de référence du client F7013-120014	
GETS Reference No. - N° de référence de SEAG PW-\$CAG-003-25220	
File No. - N° de dossier 003cag.F7013-120014	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2015-08-31	Time Zone Fuseau horaire Eastern Daylight Saving Time EDT
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: MacNeil, Michael	Buyer Id - Id de l'acheteur 003cag
Telephone No. - N° de téléphone (819) 956-0078 ()	FAX No. - N° de FAX (819) 997-0437
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: DEPARTMENT OF FISHERIES AND OCEANS CCG/VESSEL PROCURE/HELICOPTER PROJ 200 ELGIN ST OTTAWA Ontario K2P1L5 Canada	

Instructions: See Herein

Instructions: Voir aux présentes

Vendor/Firm Name and Address

**Raison sociale et adresse du
fournisseur/de l'entrepreneur**

Issuing Office - Bureau de distribution

Civilian Aircraft Division/Division des Avions Civils
Portage III 8C1 - 50
11 Laurier St./11 rue Laurier
Gatineau
Québec
K1A 0S5

Delivery Required - Livraison exigée See Herein	Delivery Offered - Livraison proposée
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date

Solicitation No. - N° de l'invitation

F7013-120014/I

Amd. No. - N° de la modif.

File No. - N° du dossier

003cagF7013-120014

Buyer ID - Id de l'acheteur

003cag

CCC No./N° CCC - FMS No/ N° VME

F7013-120014

Attach the PDF copy of the RFP terms and conditions here.

CANADIAN COAST GUARD FULL FLIGHT SIMULATOR PROCUREMENT

The purpose of this requirement is to procure a Full Flight Simulator to support CCG functions and to support programs of the Department of Fisheries & Oceans and other government departments across the country.

Contract award is subject to Canada's internal approval process, which includes a requirement to approve funding in the amount of any proposed contract. Notwithstanding that a Bidder may have been recommended for contract award, issuance of any contract will be contingent upon internal approval in accordance with Canada's policies. If such approval is not given, no contract will be awarded. The Bidder will have no claim for damages, compensation, loss of profit, or allowance arising out of the preparation of its bid or the internal approval process conducted by Canada.

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PART 1 - GENERAL INFORMATION

1 Introduction

1.1 Organization of This Document

The bid solicitation is divided into seven parts plus attachments and annexes, as follows:

- Part 1 General Information: provides a general description of the requirement;
- Part 2 Bidder Instructions: provides the instructions, clauses and conditions applicable to the bid solicitation;
- Part 3 Bid Preparation Instructions: provides bidders with instructions on how to prepare their bid;
- Part 4 Evaluation Procedures and Basis of Selection: indicates how the evaluation will be conducted, the evaluation criteria that must be addressed in the bid, and the basis of selection;
- Part 5 Certifications: includes the certifications to be provided;
- Part 6 Security, Financial and Other Requirements: includes specific requirements that must be addressed by bidders; and
- Part 7 Resulting Contract Clauses: includes the clauses and conditions that will apply to any resulting contract.

1.2 Who Can Respond

Bidders must be the Original Equipment Manufacturer (OEM) for the Simulator to be proposed.

2. Summary

The purpose of the CCG Helicopter Project is to replace CCG's ageing fleet of helicopters. In addition, CCG will acquire a Full Flight Simulator to provide the primary platform for training pilots on the new light-lift and medium-lift helicopters.

2.1 Project Objectives

The objective of this program is to acquire a Full Flight Simulator (FFS) that is capable and configurable to conduct both initial and recurrent helicopter type training, proficiency checking, and mission based training in a realistic synthetic environment compatible with CCG helicopter operations. The FFS must provide a platform for training for the CCG Configuration A Bell 429 light-lift helicopter and the CCG Configuration A Bell 412 EPI medium-lift helicopter for the anticipated 30-year lifecycle of the new fleet.

The FFS must provide a platform that will accomplish the training objectives and mission specific training scenarios to meet all regulatory requirements described in the applicable Canadian Aviation

Regulations (CARs) governing type ratings and operations under Subparts 702, 703 and 704, as appropriate.

In addition, the FFS must act as a comprehensive training platform to prepare crews to safely and effectively accomplish the mission profiles described in the document *CCG Helicopter Mission Profile Document (Attachment 3 to Appendix C of Annex A – Statement of Work)*.

Given the diverse and challenging environments that CCG helicopters operate in, it will be of particular importance to simulate coastal and mountainous areas, arctic terrain, and offshore shipboard environments in which CCG typically operates with sufficient visual detail in order to prepare pilots for ongoing and future CCG operations.

The FFS will act as a comprehensive training platform that eliminates, to the greatest extent possible, the need for in-flight training. The FFS will also provide opportunities to advance the training program.

3. Debriefings

After contract award, respondents may request a debriefing on the results of the RFP. Respondents should make the request to the Contracting Authority within fifteen (15) calendar days of receipt of notification that their response was unsuccessful. The debriefing, at Canada's discretion, may be provided in writing, by telephone or in person.

PART 2 - BIDDER INSTRUCTIONS

1. Standard Instructions, Clauses and Conditions

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the *Standard Acquisition Clauses and Conditions Manual* (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

Bidders who submit a bid agree to be bound by the instructions, clauses and conditions of the bid solicitation and accept the clauses and conditions of the resulting contract.

The 2003 2014-09-25 Standard Instructions - Goods or Services - Competitive Requirements are incorporated by reference into and form part of the bid solicitation.

2. Submission of Bids

Bids must be submitted only to Public Works and Government Services Canada (PWGSC) Bid Receiving Unit by the date, time and place indicated on page 1 of the bid solicitation.

Due to the nature of the bid solicitation, bids transmitted by facsimile to PWGSC will not be accepted.

3. Inquiries - Bid Solicitation

All inquiries must be submitted in writing to the Contracting Authority no later than fifteen (15) calendar days before the bid closing date. Inquiries received after that time may not be answered.

Bidders should reference as accurately as possible the numbered item of the bid solicitation to which the inquiry relates. Care should be taken by bidders to explain each question in sufficient detail in order to enable Canada to provide an accurate answer. Technical inquiries that are of a proprietary nature must be clearly marked "proprietary" at each relevant item. Items identified as "proprietary" will be treated as such except where Canada determines that the inquiry is not of a proprietary nature. Canada may edit the questions or may request that the Bidder do so, so that the proprietary nature of the question is eliminated, and the inquiry can be answered with copies to all bidders. Inquiries not submitted in a form that can be distributed to all bidders may not be answered by Canada.

4. Applicable Laws

Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.

Bidders may, at their discretion, substitute the applicable laws of a Canadian province or territory of their choice without affecting the validity of their bid, by deleting the name of the Canadian province or territory specified and inserting the name of the Canadian province or territory of their choice. If no change is made, it acknowledges that the applicable laws specified are acceptable to the bidders.

5. Language

Any documents and supporting information submitted in response to this RFP shall be submitted in either English or French, Canada's two official languages. Should there be discrepancy between the wording of the English and French RFP documentation; the English documentation shall take precedence.

Bidders are requested to identify, in writing to the Contract Authority specified on Page 1 of this RFP, which of Canada's two official languages should be used for future communications from Canada. This is to be provided to Canada within fourteen (14) calendar days after the RFP is posted on buyandsell.gc.ca.

6. Flight Test Program

Bidders are advised that following award of a contract, if any, and should analysis of the aircraft performance data indicate the need for additional flight test data, the Contractor will not be responsible for the provision of aircraft, flight crews or other costs associated with conducting the flight test program(s) other than the costs of the Contractor's own staff which will be covered under a Task Authorization.

7. Canadian Content Definition (A3050T, 2014-11-27)

1. **Canadian good:** A good wholly manufactured or originating in Canada is considered a Canadian good. A product containing imported components may also be considered Canadian for the purpose of this policy when it has undergone sufficient change in Canada, in a manner that satisfies the definition specified under the [North American Free Trade Agreement](#) (NAFTA) Rules of Origin. For the purposes of this determination, the reference in the NAFTA Rules of Origin to "territory" is to be replaced with "Canada".(Consult [Annex 3.6](#) (9) of the *Supply Manual*.)
2. **Canadian service:** A service provided by an individual based in Canada is considered a Canadian service. Where a requirement consists of only one service, which is being provided by more than one individual, the service will be considered Canadian if a minimum of 80 percent of the total bid price for the service is provided by individuals based in Canada.
3. **Variety of goods:** When requirements consist of more than one good, one of the two methods below is applied:
 - a. aggregate evaluation: no less than 80 percent of the total bid price must consist of Canadian goods; or,
 - b. item by item evaluation: in some cases, the bid evaluation may be conducted on an item-by-item basis and contracts may be awarded to more than one supplier. In these cases, suppliers will be asked to identify separately each item that meets the definition of Canadian goods.
4. **Variety of services:** For requirements consisting of more than one service, a minimum of 80 percent of the total bid price must be provided by individuals based in Canada.
5. **Mix of goods and services:** When requirements consist of a mix of goods and services, no less than 80 percent of the total bid price must consist of Canadian goods and services (as defined above).

For more information on how to determine the Canadian content for a mix of goods, a mix of services or a mix of goods and services, consult [Annex 3.6](#) (9), Example 2, of the *Supply Manual*.

6. **Other Canadian goods and services:** Textiles: Textiles are considered to be Canadian goods according to a modified rule of origin, copies of which are available from the Clothing and Textiles Division, Commercial and Consumer Products Directorate.

8. **Canadian Content Certification (A3051T, (2010-01-11))**

This procurement is limited to Canadian goods.

The Bidder certifies that:

() the good(s) offered are Canadian goods as defined in paragraph 1 of clause [A3050T](#)

9. **Evaluation Procedures for Procurement Conditionally Limited to Canadian Content (A3070T, 2014-03-13)**

The evaluation team will determine first if there are two (2) or more bids with a valid Canadian content certification. In that event, the evaluation process will be limited to the bids with the certification; otherwise, all bids will be evaluated. If some of the bids with a valid certification are declared non-responsive, or are withdrawn, and less than two responsive bids with a valid certification remain, the evaluation will continue among those bids with a valid certification. If all bids with a valid certification are subsequently declared non-responsive, or are withdrawn, then all the other bids received will be evaluated.

PART 3 - BID PREPARATION INSTRUCTIONS

1. Bid Preparation Instructions

Canada requests that bidders provide their bid in separately bound sections as follows:

Section I: Technical Bid, one (1) master hard copy and six (6) hard copies, and two (2) soft copies on CD, DVD or USB key. Soft copies should be in Microsoft Office Word, Excel and/or searchable PDF formats.

Section II: Financial Bid, one (1) master hard copy and one (1) hard copy, and two (2) soft copies on CD, DVD or USB key. Soft copies should be in Microsoft Office Word, Excel and/or searchable PDF formats.

Section III: Certifications identified in Part 5, two (2) hard copies.

If there is a discrepancy between the wording of the soft and hard copies and the master hard copy, the wording of the master hard copy will have priority over the wording of the soft and hard copies.

Prices must appear in the financial bid only.

The bidders are requested to follow the format instructions described below in the preparation of their bid:

- (a) use 8.5 x 11 inch (216 mm x 279 mm) paper; and
- (b) use a numbering system that corresponds to the bid solicitation.

In April 2006, Canada issued a policy directing federal departments and agencies to take the necessary steps to incorporate environmental considerations into the procurement process [Policy on Green Procurement](#).

(<http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html>). To assist Canada in reaching its objectives, bidders are encouraged to:

- (a) use paper containing fibre certified as originating from a sustainably-managed forest and/or containing minimum 30% recycled content; and
- (b) use an environmentally-preferable format including black and white printing instead of colour printing, printing double sided/duplex, using staples or clips instead of cerlox, duotangs or binders.

Section I: Technical Bid

In their technical bid, bidders must demonstrate their understanding of the requirements contained in the bid solicitation and explain how they will meet these requirements. Bidders must demonstrate their capability and describe their approach to satisfy CCG's requirement for Full Flight Simulator in a thorough, concise and clear manner for carrying out the work.

Section II: Financial Bid

1.1 Bidders must submit their financial bid in accordance with the Financial Bid Proposal pricing tables found in Annex C - Financial Bid Proposal. The total amount of Goods and Services Tax or Harmonized Sales Tax must be shown separately, if applicable.

1.2 Exchange Rate Fluctuation Risk Mitigation (C3010T, 2014-11-27)

1. The Bidder may request Canada to assume the risks and benefits of exchange rate fluctuations. If the Bidder claims for an exchange rate adjustment, this request must be clearly indicated in the bid at time of bidding. The Bidder must submit form [PWGSC-TPSGC 450](#), Claim for Exchange Rate Adjustments with its bid, indicating the Foreign Currency Component (FCC) in Canadian dollars for each line item for which an exchange rate adjustment is required.
2. The FCC is defined as the portion of the price or rate that will be directly affected by exchange rate fluctuations. The FCC should include all related taxes, duties and other costs paid by the Bidder and which are to be included in the adjustment amount.
3. The total price paid by Canada on each invoice will be adjusted at the time of payment, based on the FCC and the exchange rate fluctuation provision in the contract. The exchange rate adjustment will only be applied where the exchange rate fluctuation is greater than 2% (increase or decrease).
4. At time of bidding, the Bidder must complete columns (1) to (4) on form [PWGSC-TPSGC 450](#), for each line item where they want to invoke the exchange rate fluctuation provision. Where bids are evaluated in Canadian dollars, the dollar values provided in column (3) should also be in Canadian dollars, so that the adjustment amount is in the same currency as the payment.
5. Alternate rates or calculations proposed by the Bidder will not be accepted for the purposes of this exchange rate fluctuation provision.

1.3 Exchange Rate Fluctuation Adjustment

1. The foreign currency component (FCC) is defined as the portion of the price or rate that will be directly affected by exchange rate fluctuation. The FCC should include all related taxes, duties and other costs paid by the Bidder and which are to be included in the adjustment amount.
2. For each line item where a FCC is identified, Canada assumes the risks and benefits for exchange rate fluctuation, as shown in the Basis of Payment. For such items, the exchange rate fluctuation amount is determined in accordance with the provision of this clause.
3. The total price paid by Canada on each invoice will be adjusted at the time of payment, based on the FCC and the exchange rate fluctuation provisions in the contract. The exchange rate adjustment amount will be calculated in accordance with the following formula:
Adjustment = $FCC \times Qty \times (i_1 - i_0) / i_0$ where formula variables correspond to:

FCC Foreign Currency Component (per unit)
 i_0 Initial exchange rate (CAN\$ per unit of foreign currency [e.g. US\$1])
 i_1 exchange rate for adjustments (CAN\$ per unit of foreign currency [e.g. US\$1])
Qty quantity of units

4. The initial exchange rate is typically set as the noon rate as published by the Bank of Canada on the solicitation closing date.
5. For goods, the exchange rate for adjustment will be the noon rate as published by the Bank of Canada on the date the goods were delivered. For services, the exchange rate for adjustment will be the noon rate on the last business day of the month for which the services were performed. For advance payments, the exchange rate for adjustment will be the noon rate on the date the payment was due. The most recent noon rate will be used for non-business days.
6. The Contractor must indicate the total exchange rate adjustment amount (either upward, downward or no change) as a separate item on each invoice or claim for payment submitted under the Contract. Where an adjustment applies, the Contractor must submit with their invoice form [PWGSC-TPSGC 450](#), Claim for Exchange Rate Adjustments.
7. The exchange rate adjustment will only be applied where the exchange rate fluctuation is greater than 2% (increase or decrease), calculated in accordance with column 8 of form [PWGSC-TPSGC 450](#) (i.e. $[i_1 - i_0] / i_0$).
8. Canada reserves the right to audit any revision to costs and prices under this clause.

Section III: Certifications - Detailed information in Part 5.

2. Facility Drawings and Aircraft Configurations

The facility drawings and aircraft configurations are available separately to this RFP. To obtain a copy of the documentation, suppliers are instructed to submit their request to the Contract Authority via email. Copies of the documentation will be provided solely to flight simulator manufacturers and only after a signed non-disclosure agreement (in a form to be prepared by Canada) is received by the Contract Authority.

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

1. Evaluation Procedures

- (a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical and financial evaluation criteria.
- (b) An evaluation team composed of representatives of Canada will evaluate the bids. Canada may hire any independent consultant or use any Government resources to evaluate any bid.
- (c) This solicitation contains mandatory requirements. Where a requirement of this RFP is mandatory, it will be identified specifically with the word "Mandatory", an "(M)", or with a statement covering a section of this document. The words "shall" and "must", in the RFP are also to be interpreted as mandatory requirements.
- (d) Proposals must comply with each and every mandatory requirement. Any proposal which fails to meet any of the Mandatory Requirements will be deemed non-responsive and will not be given further consideration. Each requirement must be addressed separately.
- (e) Bids will be evaluated solely on the information provided in each Bidder's submission.
- (f) It is the responsibility of the Bidder to obtain, from the Contracting Authority identified, any clarification of the requirement contained in the RFP prior to submitting its bid.

1.1 Technical Evaluation

1.1.1 Mandatory Technical Criteria

To facilitate bid preparation and bid evaluation, Bidders must prepare and submit evidence of compliance with Mandatory Requirements in accordance with ANNEX D - Bid Evaluation Plan.

1.1.2 Point Rated Technical Criteria

To facilitate bid preparation and bid evaluation, Bidders should prepare and submit evidence of compliance with Point Rated Requirements in accordance with ANNEX D,- Bid Evaluation Plan.

1.2 Financial Evaluation

Bidders must submit their financial bid in accordance with the requirements detailed within information of ANNEX C - Financial Bid Proposal.

2. Basis of Selection - Highest Combined Rating of Technical Merit and Price

1. To be declared responsive, a bid must:
 - (a) comply with all the requirements of the bid solicitation; and

(b) meet all mandatory criteria.

2. Bids not meeting "1(a) or 1(b)" will be declared non-responsive.
3. The selection will be based on the highest responsive combined rating of technical merit and price. The ratio will be **70%** for the technical merit and **30%** for the price.
4. For each responsive bid, the technical merit score and the pricing score will be calculated in accordance with ANNEX D - Bid Evaluation Plan to determine its combined rating.
5. Neither the responsive bid obtaining the highest technical score nor the one with the lowest evaluated price will necessarily be accepted. The responsive bid with the highest combined rating of technical merit and price will be recommended for award of a contract.
6. If two (2) bids are tied, preference will be given to the Bidder who is evaluated the highest technical score.

3. Evaluation of Price

The price of the bid will be evaluated in Canadian dollars, Applicable Taxes excluded, Delivery Duty Paid (DDP), Incoterms 2010., Canadian customs duties and excise taxes included,

PART 5 – CERTIFICATIONS

Bidders must provide the required certifications and documentation to be awarded a contract.

The certifications provided by bidders to Canada are subject to verification by Canada at all times. Canada will declare a bid non-responsive, or will declare a contractor in default, if any certification made by the Bidder is found to be untrue whether during the bid evaluation period or during the contract period.

The Contracting Authority will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply with this request will also render the bid non-responsive or will constitute a default under the Contract.

1. Mandatory Certifications Required Precedent to Contract Award

1.1 Integrity Provisions - Associated Information

By submitting a bid, the Bidder certifies that the Bidder and its Affiliates are in compliance with the provisions as stated in Section 01 Integrity Provisions - Bid of Standard Instructions [2003](#). The associated information required within the Integrity Provisions will assist Canada in confirming that the certifications are true.

1.2 Federal Contractors Program for Employment Equity - Bid Certification

By submitting a bid, the Bidder certifies that the Bidder, and any of the Bidder's members if the Bidder is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "[FCP Limited Eligibility to Bid](#)" list (http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml) available from [Human Resources and Skills Development Canada \(HRSDC\) - Labour's website](#)

Canada will have the right to declare a bid non-responsive if the Bidder, or any member of the Bidder if the Bidder is a Joint Venture, appears on the "[FCP Limited Eligibility to Bid](#)" list at the time of contract award.

Canada will also have the right to terminate the Contract for default if a Contractor, or any member of the Contractor if the Contractor is a Joint Venture, appears on the "[FCP Limited Eligibility to Bid](#)" list during the period of the Contract.

The Bidder must provide the Contracting Authority with a completed annex [Federal Contractors Program for Employment Equity - Certification](#), before contract award. If the Bidder is a Joint Venture, the Bidder must provide the Contracting Authority with a completed annex Federal Contractors Program for Employment Equity - Certification, for each member of the Joint Venture.

1.3 Quality Standards

By submitting a bid, the Bidder certifies that it has its ISO9001 certification. A copy of the ISO 9001 certification should be submitted with the bid but may be submitted afterwards. If the ISO 9001 certification is not submitted with the bid as requested, the Contracting Authority will inform the Bidder

of a time frame within which to provide the ISO 9001 certification. Failure to comply with the request of the Contracting Authority and to provide the ISO 9001 certification within the time frame specified will render the bid non-responsive.

1.4 Licensing agreement with Bell Helicopter

By submitting a bid, the Bidder certifies that the Bidder has entered into a license agreement with Bell Helicopter for the use of the level D flight data package for both the Bell 429 and 412EPI helicopters.

A copy of the fully executed licensing agreement between the Bidder and Bell Helicopter for the use of the level D flight data package data for both the 429 and the 412EPI helicopters should be submitted with the bid but may be submitted afterwards. If the license agreement is not submitted with the bid as requested, the Contracting Authority will inform the Bidder of a time frame within which to provide the license agreement. Failure to comply with the request of the Contracting Authority and to provide the license agreement within the time frame specified will render the bid non-responsive.

Under the contracts Canada has with Bell for the 429 and the 412EPI helicopters, aircraft performance data to meet Level D requirements will be provided to the FFS Contractor.

PART 6 - SECURITY, FINANCIAL AND OTHER REQUIREMENTS

1. Security Requirement

There is no security requirement associated with this procurement.

2. Financial Capability Requirement (A9033T, 2012-07-16)

2.1 The Bidder must have the financial capability to fulfill this requirement. To determine the Bidder's financial capability, the Contracting Authority may, by written notice to the Bidder, require the submission of some or all of the financial information detailed below during the evaluation of bids. The Bidder must provide the following information to the Contracting Authority within fifteen (15) working days of the request or as specified by the Contracting Authority in the notice:

- (a) Audited financial statements, if available, or the unaudited financial statements (prepared by the Bidder's outside accounting firm, if available, or prepared in-house if no external statements have been prepared) for the Bidder's last three fiscal years, or for the years that the Bidder has been in business if this is less than three years (including, as a minimum, the Balance Sheet, the Statement of Retained Earnings, the Income Statement and any notes to the statements).
- (b) If the date of the financial statements in (a) above is more than five months before the date of the request for information by the Contracting Authority, the Bidder must also provide, unless this is prohibited by legislation for public companies, the last quarterly financial statements (consisting of a Balance Sheet and a year-to-date Income Statement), as of two months before the date on which the Contracting Authority requests this information.
- (c) If the Bidder has not been in business for at least one full fiscal year, the following must be provided:
 - i. the opening Balance Sheet on commencement of business (in the case of a corporation, the date of incorporation); and
 - ii. the last quarterly financial statements (consisting of a Balance Sheet and a year-to-date Income Statement) as of two months before the date on which the Contracting Authority requests this information.
- (d) A certification from the Chief Financial Officer or an authorized signing officer of the Bidder that the financial information provided is complete and accurate.
- (e) A confirmation letter from all of the financial institution(s) that have provided short-term financing to the Bidder outlining the total of lines of credit granted to the Bidder and the amount of credit that remains available and not drawn upon as of one month prior to the date on which the Contracting Authority requests this information.

- (f) A detailed monthly Cash Flow Statement covering all the Bidder's activities (including the requirement) for the first two years of the requirement that is the subject of the bid solicitation, unless this is prohibited by legislation. This statement must detail the Bidder's major sources and amounts of cash and the major items of cash expenditures on a monthly basis, for all the Bidder's activities. All assumptions made should be explained as well as details of how cash shortfalls will be financed.
- (g) A detailed monthly Project Cash Flow Statement covering the first two years of the requirement that is the subject of the bid solicitation, unless this is prohibited by legislation. This statement must detail the Bidder's major sources and amounts of cash and the major items of cash expenditures, for the requirement, on a monthly basis. All assumptions made should be explained as well as details of how cash shortfalls will be financed.

2.2 If the Bidder is a joint venture, the financial information required by the Contracting Authority must be provided by each member of the joint venture.

2.3 If the Bidder is a subsidiary of another company, then any financial information in 2.1. (a) to (f) above required by the Contracting Authority must be provided by the ultimate parent company. Provision of parent company financial information does not by itself satisfy the requirement for the provision of the financial information of the Bidder, and the financial capability of a parent cannot be substituted for the financial capability of the Bidder itself unless an agreement by the parent company to sign a Parental Guarantee, as drawn up by Public Works and Government Services Canada (PWGSC), is provided with the required information.

2.4 **Financial Information Already Provided to PWGSC:** The Bidder is not required to resubmit any financial information requested by the Contracting Authority that is already on file at PWGSC with the Contract Cost Analysis, Audit and Policy Directorate of the Policy, Risk, Integrity and Strategic Management Sector, provided that within the above-noted time frame:

- (a) the Bidder identifies to the Contracting Authority in writing the specific information that is on file and the requirement for which this information was provided; and
- (b) the Bidder authorizes the use of the information for this requirement.

It is the Bidder's responsibility to confirm with the Contracting Authority that this information is still on file with PWGSC.

2.5 **Other Information:** Canada reserves the right to request from the Bidder any other information that Canada requires to conduct a complete financial capability assessment of the Bidder.

2.6 **Confidentiality:** If the Bidder provides the information required above to Canada in confidence while indicating that the disclosed information is confidential, then Canada will treat the information in a confidential manner as permitted by the Access to Information Act, R.S., 1985, c.c. A-1, Section 20(1) (b) and (c).

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003cag

Client Ref. No. – No de réf du client
F7013-120014

File No. – No. du dossier
003cagF7013-120014

CCC No./No CCC-FMS No/No VME

2.7 **Security:** In determining the Bidder's financial capability to fulfill this requirement, Canada may consider any security the Bidder is capable of providing, at the Bidder's sole expense (for example, an irrevocable letter of credit from a registered financial institution drawn in favour of Canada, a performance guarantee from a third party or some other form of security, as determined by Canada).

PART 7 - RESULTING CONTRACT CLAUSES

The following clauses and conditions apply to and form part of any contract resulting from the bid solicitation

1. Statement of Work (B4007C, 2014-06-26)

The Contractor must perform the Work in accordance with the Statement of Work at ANNEX "A".

2. Standard Clauses and Conditions

All clauses and conditions identified in the Contract by number, date and title are set out in the *[Standard Acquisition Clauses and Conditions Manual](https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual)* (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

2.1 General Conditions

2030, 2014-09-25, General Conditions - Higher Complexity - Goods, apply to and form part of the Contract.

4001, 2015-04-01, Supplemental General Conditions - Hardware Purchase, Lease and Maintenance

4002, 2010-08-16, Supplemental General Conditions - Software Development and Modification Services

4003, 2010-08-16, Supplemental General Conditions – Licensed Software

4006, 2010-08-16, Supplemental General Conditions, Contractor to Own Intellectual Property Rights in Foreground Information

1031-2, 2012-07-16, General Conditions - Contract Cost Principles (applicable if only one bidder is found compliant)

3. Period of the Contract

3.1 Period of the Contract (A9022C, 2007-05-25)

The period of the Contract is from date of Contract Award to (sixty months after contract award) inclusive.

3.2 Ready For Training

The full flight simulator shall be Ready For Training (RFT) on or before twenty four (24) months after contract award.

4. Authorities

4.1 Contracting Authority

Name: Michael MacNeil

Organization: Public Works and Government Services Canada
Acquisitions Branch
Civilian Aircraft Division

Address: Place du Portage, Phase 3, 8C1
11 Laurier Street
Gatineau, Quebec, K1A 0S5

Telephone: 819-956-0078
E-mail: michael.macneil@pwgsc.gc.ca

The Contracting Authority is responsible for the management of the Contract and any changes to the Contract must be authorized in writing by the Contracting Authority. The Contractor must not perform work in excess of or outside the scope of the Contract based on verbal or written requests or instructions from anybody other than the Contracting Authority.

4.2 Technical Authority

Name:
Title:
Organization:
Address:

Telephone:
E-mail:

The Technical Authority is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Technical Authority; however, the Technical Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

4.3 Contractor's Representative

Name:
Title:
Company:
Address:
Telephone:
E-mail address:

5. Payment

5.1 Basis of Payment

5.1.1 Basis of Payment - Limitation of Expenditure C0206C (2013-04-25)

The Contractor will be reimbursed for the costs reasonably and properly incurred in the performance of the Work, as determined in accordance with the Basis of Payment in Annex B, to a limitation of expenditure of \$_____ (insert the amount at contract award). Customs duties are included and Applicable Taxes are extra.

5.1.2 Limitation of Price (C6000C, 2011-05-16)

Canada will not pay the Contractor for any design changes, modifications or interpretations of the Work unless they have been approved, in writing, by the Contracting Authority before their incorporation into the Work.

5.1.3 Milestone Payments (H3009C, 2010-01-11)

Canada will make milestone payments in accordance with the Schedule of Milestones detailed in the Contract and the payment provisions of the Contract, up to 100 percent of the amount claimed and approved by Canada if:

- (a) an accurate and complete claim for payment using form PWGSC-TPSGC 1111, Claim for Milestone Payment, and any other document required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
- (b) the total amount for all milestone payments paid by Canada does not exceed 100 percent of the total amount to be paid under the Contract;
- (c) all the certificates appearing on form PWGSC-TPSGC 1111 have been signed by the respective authorized representatives; and
- (d) all work associated with the milestone and, as applicable, any deliverable required have been completed and accepted by Canada.

5.1.4 Task Authorization - Limitation of Expenditures (C0204C, 2013-04-25)

The Contractor will be reimbursed for the costs reasonably and properly incurred in the performance of the Work specified in the authorized Task Authorization (TA), detailed below, to the limitation of expenditure specified in the authorized TA.

Canada's liability to the Contractor under the authorized TA must not exceed the limitation of expenditure specified in the authorized TA. Customs duties are included and Applicable Taxes are extra.

No increase in the liability of Canada or in the price of the Work specified in the authorized TA resulting from any design changes, modifications or interpretations of the Work will be authorized or paid to the

Contractor unless these design changes, modifications or interpretations have been authorized, in writing, by the Contracting Authority before their incorporation into the Work.

5.1.5 Standard Pricing Spares Parts List

Material shall be quoted using Contractors most recent Catalogue list price discounted at Government Rate of _____%.

5.1.6 Travel and Living

The Contractor will be reimbursed its authorized travel and living expenses reasonably and properly incurred in the performance of the Work, at cost, without any allowance for profit and administrative overhead, in accordance with the Contractor's travel directives, for meal, private vehicle and incidental expenses not to exceed the costs provided in Appendices B, C and D of the *National Joint Council Travel Directive* and with the other provisions of the directive referring to "travelers", rather than those referring to "employees".

http://www.tbs-sct.gc.ca/pubs_pol/hrpubs/tbm_113/menu-travel-voyage-eng.asp

All travel must have the prior authorization of the Technical Authority.

All payments are subject to government audit.

5.2 Taxes - Foreign-based Contractor (C2000C, 2007-11-30)

Unless specified otherwise in the Contract, the price includes no amount for any federal excise tax, state or local sales or use tax, or any other tax of a similar nature, or any Canadian tax whatsoever. The price, however, includes all other taxes. If the Work is normally subject to federal excise tax, Canada will, upon request, provide the Contractor a certificate of exemption from such federal excise tax in the form prescribed by the federal regulations.

Canada will provide the Contractor evidence of export that may be requested by the tax authorities. If, as a result of Canada's failure to do so, the Contractor has to pay federal excise tax, Canada will reimburse the Contractor if the Contractor takes such steps as Canada may require to recover any payment made by the Contractor. The Contractor must refund to Canada any amount so recovered.

6. Invoicing Instructions

1. The Contractor must submit a claim for payment using form PWGSC-TPSGC 1111, Claim for Milestone Payment. Each claim must show:
 - (a) all information required on form PWGSC-TPSGC 1111;
 - (b) all applicable information detailed under the section entitled "Invoice Submission" of the general conditions; and
 - (c) the description and value of the milestone claimed as detailed in the Contract.
2. The Goods and Services Tax or Harmonized Sales Tax (GST/HST), as applicable, must be calculated on the total amount of the claim.

3. The Contractor must prepare and certify one original copy of the claim on form PWGSC-TPSGC 1111, and forward it to the Contract Authority identified under the section entitled "Authorities" of the Contract for appropriate certification after inspection and acceptance of the Work takes place.

4. The Contract Authority will then forward the original copy of the claim to the Technical Authority for certification and onward submission to the Payment Office for the remaining certification and payment action.

5. The Contractor must not submit claims prior to delivery of the materiel or until all work identified in the claim is completed. Payment will only be made on receipt of satisfactory invoices duly supported by specified release documents and/or other documents called for under the contract.

7. Certifications – Contract (A3015C, 2014-06-26)

Compliance with the certifications provided by the Contractor in its bid is a condition of the Contract and subject to verification by Canada during the term of the Contract. If the Contractor does not comply with any certification or it is determined that any certification made by the Contractor in its bid is untrue, whether made knowingly or unknowingly, Canada has the right, pursuant to the default provision of the Contract, to terminate the Contract for default.

8. Applicable Laws

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.

9. Priority of Documents

If there is a discrepancy between the wordings of any documents that appear on the list, the wording of the document that first appears on the list has priority over the wording of any document that subsequently appears on the list.

- (a) the Articles of Agreement
- (b) the General Conditions 2030, 2014-09-25
- (c) 4001, 2015-04-01, Supplemental General Conditions - Hardware Purchase, Lease and Maintenance
- (d) 4002, 2010-08-16, Supplemental General Conditions - Software Development and Modification Services
- (e) 4003, 2010-08-16, Supplemental General Conditions – Licensed Software
- (f) 4006, 2010-08-16, Supplemental General Conditions, Contractor to Own Intellectual Property Rights in Foreground Information
- (g) the Contract Cost Principles 1031-2, 2012-07-16 (applicable if only one bidder is found compliant)
- (h) Annex A, Statement of Work
- (i) Annex B, Basis of Payment

10. Insurance (G1005C, 2008-05-12)

The Contractor is responsible for deciding if insurance coverage is necessary to fulfill its obligation under the Contract and to ensure compliance with any applicable law. Any insurance acquired or maintained by the Contractor is at its own expense and for its own benefit and protection. It does not release the Contractor from or reduce its liability under the Contract.

11. Limitation of Liability (N0001C, 2008-05-12)

1. This section applies despite any other provision of the Contract and replaces the section of the general conditions entitled "Liability". Any reference in this section to damages caused by the Contractor also includes damages caused by its employees, as well as its subcontractors, agents, and representatives, and any of their employees.

2. Whether the claim is based in contract, tort, or another cause of action, the Contractor's liability for all damages suffered by Canada caused by the Contractor's performance of or failure to perform the Contract is limited to \$ contract value . This limitation of the Contractor's liability does not apply to:

- (a) any infringement of intellectual property rights; or
- (b) any breach of warranty obligations.

3. Each Party agrees that it is fully liable for any damages that it causes to any third party in connection with the Contract, regardless of whether the third party makes its claim against Canada or the Contractor. If Canada is required, as a result of joint and several liability, to pay a third party in respect of damages caused by the Contractor, the Contractor must reimburse Canada for that amount.

12. Simulator Acceptance

The Contractor shall provide notice to the Canadian Coast Guard in accordance with Annex A, Statement of Work

1. Inspection will be carried out by the Technical Authority at time of acceptance. All Work completed on the simulator shall be inspected in compliance with the regulatory requirements and is subject to final verification by the Technical Authority.

2. Acceptance procedures are described in Annex A Statement of Work.

3. The Contractor shall provide reasonable office space, equipment and access to clerical assistance to the inspection personnel to aid in the acceptance and delivery process.

4. Any items not accompanying the completed simulator shall be delivered in accordance with Incoterms 2010, DDP (Delivered Duty Paid) to Transport Canada, 20 Airbus Private, Ottawa, Ontario.

13. Simulator Delivery

Inspection and acceptance shall be carried out by and to the satisfaction of Canada at destination. The Contractor shall demonstrate to the satisfaction of the Technical Authority or his/her representative, that the equipment meets the specification as detailed under Annex A. Any defects or damages noted during delivery inspection shall be documented. The Contractor shall be responsible for and assume all costs to repair any such defects or damages. Should the work or any portion thereof not be in accordance with the requirements of any resultant contract, the Technical Authority, or his/her authorized representative, shall have the right to reject it or to require its correction.

Any formal communication with the Contractor regarding the quality of the work shall be undertaken by the Technical Authority through the Contracting Authority.

14. Notice of Labour Disputes

Whenever the Contractor has knowledge that any actual or potential labour dispute is delaying or threatens to delay the timely performance of this Contract, the Contractor shall immediately give notice thereof, including all relevant information with respect thereto, to the Contracting Authority

15. Liens - Section 427 of the Bank Act (H4500C, 2010-01-11)

1. If any lien under section 427 of the Bank Act exists in respect to any materials, parts, work-in-process, or finished work for which the Contractor intends to claim payment, the Contractor agrees to inform the Contracting Authority without delay and agrees, unless otherwise instructed by the Contracting Authority, either:

- (a) to cause the bank to remove such lien and to furnish the Contracting Authority, with written confirmation from the bank; or
- (b) to furnish or cause to be furnished to the Contracting Authority an undertaking from the bank to the Contracting Authority that the bank will not make any claim under section 427 of the Bank Act on materials, parts, work-in-process, or finished work in respect of which payment is made to the Contractor under this Contract.

2. Failure to inform the Contracting Authority of such lien or failure to implement paragraph 1(a) or (b) above shall constitute default under the clause entitled "Default by Contractor" in the General Conditions of the Contract and shall entitle Canada to terminate the Contract.

16. Shipping Instructions - Delivery at Destination (D4001C, 2008-12-12)

Goods must be consigned to the destination specified in the Contract and Delivered Duty Paid (DDP) to Transport Canada, 20 Airbus Private, Ottawa, Ontario, Canada, Incoterms 2010 for all shipments from a commercial contractor.

17. Warranty

The warranty period must be a minimum of 24 months from the date of final acceptance.

18. Task Authorization (B9054C, 2014-06-26)

A portion of Work to be performed under the Contract may be on an as and when requested basis using a Task Authorization (TA). The Work described in the TA must be in accordance with the scope of the Contract.

1. The Technical Authority will provide the Contractor with a description of the task using a Task Authorization form.
2. The Task Authorization (TA) will contain the details of the activities to be performed, a description of the deliverables, and a schedule indicating completion dates for the major activities or submission dates for the deliverables. The TA will also include the applicable basis and methods of payment as specified in the Contract.
3. The Contractor must provide the Technical Authority, within 14 calendar days of its receipt, the proposed total estimated cost for performing the task and a breakdown of that cost, established in accordance with the Basis of Payment specified in the Contract.
4. The Contractor must not commence work until a TA authorized by the Technical Authority has been received by the Contractor. The Contractor acknowledges that any work performed before a TA has been received will be done at the Contractor's own risk.

19. Task Authorization Limit (C9011C, 2014-06-26)

The Technical Authority may authorize individual task authorizations up to a limit of \$25,000.00, Applicable Taxes included, inclusive of any revisions.

Any task authorization to be issued in excess of that limit must be authorized by the Technical Authority and Contracting Authority before issuance.

20. Liquidated Damages (D0024C, 2008-05-12)

1. If the Contractor fails to deliver the goods as defined in 3.2, (Delivery Date) within the time specified in the Contract, the Contractor agrees to pay to Canada liquidated damages in the amount of \$133,500.00 for each full month of delay. The total amount of the liquidated damages must not exceed five (5) percent of the contract price.
2. Canada and the Contractor agree that the amount stated above is their best pre-estimate of the loss to Canada in the event of such a failure, and that it is not intended to be, nor is it to be interpreted as, a penalty.

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3. Canada will have the right to hold back, drawback, deduct or set off from and against the amounts of any monies owing at any time by Canada to the Contractor, any liquidated damages owing and unpaid under this section.

4. Nothing in this section must be interpreted as limiting the rights and remedies which Canada may otherwise have under the Contract.

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ANNEX A

STATEMENT OF WORK

(insert attached Annex A here)

ANNEX B

BASIS OF PAYMENT

Milestone Number	Milestone Description	Percentage of Contract Value	Milestone Amount (CAD)
001	Agreement by Canada that the Contractor has completed Project Initiation Meeting (PIM) (DID M-010, SOW 8.1) & System Requirements Review (SSR) meeting (SOW 8.2).	5%	TBD
002	Agreement by Canada that the Contractor has completed Preliminary Design (PD) (SOW 6.3).	5%	TBD
003	Agreement by Canada that the Contractor has completed Critical Design (CD) (SOW 6.4).	5%	TBD
004	Agreement by Canada that the Contractor has completed in-plant laboratory demonstration and testing of major systems and sub-systems (SOW 14).	10%	TBD
005	Agreement by Canada that the Contractor has completed In-Plant acceptance (IPAT) (SOW 14.1).	15%	TBD
006	Agreement by Canada that the Contractor has completed On-Site acceptance (OPAT) (SOW 14.2).	15%	TBD
007	Level D Qualification by Transport Canada for both the 429 and 412EPI simulated cockpits (SOW 3. & 4.)(DID ETA-003).	20%	TBD
008	Simulator Ready-for-Training (RFT) for both the 429 and 412EPI simulated cockpits (SOW 4.1).	15%	TBD
009	Final delivery of Technical Data Package (SOW 20, DID T-009), spares, tools and special equipment (DID ILS-004), and completion of pilot and technician training (DID ILS-003).	5%	TBD

010	Agreement by Canada that the Contractor has maintained 98% reliability for a period of 90 consecutive days (BSTR 3.1.0-13).	5%	TBD
	Total Amount Authorized for Claims:	100%	TBD
	Optional Items	Quantity	Amount
011	The Contractor shall be paid for reasonable Travel and Living expenses that have been pre-approved by the Technical Authority.	As and when required	
012	For the provision of spare parts listed in Table 2 of Annex D, Financial Bid Proposal, the contractor shall be paid the bid price, minus the discount percentage rate of _____ for each part purchased for the duration of the Contract.		
013	For the provision of spare parts not listed in Table 2 of Annex D, Financial Bid Proposal, the contractor shall be paid the latest catalogue price, minus the discount percentage rate of _____ for each part purchased for the duration of the Contract.		
014	For the provision of tooling and equipment listed in Table 3 of Annex D, Financial Bid Proposal, the contractor shall be paid the bid price for each purchased.		
015	For Technical Authority approved tasks the Contractor shall be paid the firm price or hourly rate negotiated at tasking approval.	As and when required	

ANNEX C

FINANCIAL BID PROPOSAL

1.1 General

1.1.1 This Annex provides instructions regarding the use of the Financial Bid Proposal by the Bidder. It provides a description of how the Financial Bid is to be completed and submitted separately by the Bidder as part of the Bidder's proposal.

1.1.2 All data required to complete the Financial Bid is contained within the Tables below.

1.1.3 It is important the Bidder inserts its data into the appropriate Part, as instructed within the Pricing Tables.

1.2 Financial Bid Proposal

1.2.1 Bidders shall submit their financial bid in accordance with the details in RFP.

Table 1

Contract Line Item No.	Description	QTY	Unit of Issue	Firm unit or Lot price

Table 2 - Spare Parts

CLIN #	Description	Manufacturer	Model #	Part #	Quantity	U o I	Firm Unit Price

Table 3 - Tooling and Equipment

CLIN #	Description	Manufacturer	Model #	Part #	Quantity	U o I	Firm Unit Price

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ANNEX D

BID EVALUATION PLAN

(insert attached Annex D here)

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ANNEX E

BID EVALUATION SCORE SHEET

(insert attached Annex E here)



Fisheries and Oceans
Canada

Pêches et Océans
Canada

Canadian
Coast Guard

Garde côtière
canadienne



Safety First, Service Always

**Helicopter Project
ANNEX A
Full Flight Simulator Statement of Work
Final RFP**

Published under the Authority of:

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Document Control

Record of Amendments

#	Date	Description	Initials
1	November 29, 2014	Initial draft	BM
1.1	December 13, 2014	Revised after internal review	PE
1.2	February 13, 2015	Amendments after industry consultation round 2	PE
1.3	May 7, 2015	Revised after industry consultation round 2	PE
1.4	June 5, 2015	Final version for RFP	SH

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List of Acronyms

ACRONYM	TERM
ACP	Approved Check Pilot
AMO	Approved Maintenance Organization
AO	Air Operator
AOC	Air Operator Certificate
ASD	Aircraft Services Directorate
ATP	Acceptance Test Plan
CARs	Canadian Aviation Regulations
CCG	Canadian Coast Guard
CDR	Critical Design Review
CDUs	Cockpit Control & Display Units
CGO	Computer Generated Object
CMP	Configuration and Change Management Plan
EDR	Engineering Design Review
FAR	United States, Federal Aviation Regulations
FFS	Full Flight Simulator
FSR	Field Service Representative
FTD	Flight Training Device
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ICD	Interface Control Documents
IPAT	In Plant Acceptance Testing
IP	Intellectual Property
MPPR	Monthly Project Progress Reports
MPS	Master Project Schedule
NAA	National Aviation Authority
NSP	National Simulator Program
OEM	Original Equipment Manufacturer
OTA	Operational Training Area
PDR	Preliminary Design Review
PMBOK	Project Management Book of Knowledge
PMP	Project Management Plan
PPC	Pilot Proficiency Check
PRM	Progress Review Meeting

ACRONYM	TERM
PWGSC	Public Works and Government Services Canada
QA	Quality Assurance
QMP	Quality Management Plan
QTG	Qualification Test Guide
RFT	Ready For Training
RMP	Risk Management Plan
SB	Service Bulletins
SOW	Statement of Work
STD	Synthetic Training Device
TA	Technical Authority
TC	Transport Canada
UM	Unscheduled Meetings
WBS	Work Breakdown Structure

1. Reference Documents

- 1) International Air Transport Association (IATA) document “Flight Simulation Training Device Design & Performance Data Requirements” Ref. No: 9019-07, latest revision
- 2) Federal Aviation Administration, FAA 14 CFR PART 60—Flight Simulation Training Device Initial and Continuing Qualification and Use Website - http://www.faa.gov/about/initiatives/nsp/media/consolidated_version.pdf
- 3) Federal Aviation Administration FAA AFS-205, National Simulator Program Flight Simulation Training Device Qualification Guidance.
- 4) ICAO Document 4444 Procedures for Air Traffic Navigation Services – Air Traffic Management.

2. Background

The Canadian Coast Guard (CCG) is in the process of renewing its helicopter fleet. This procurement will include 15 CCG configured Bell 429 helicopters, 7 CCG configured Bell 412EPI helicopters, and two polar helicopters suited to support the CCGS *John G. Diefenbaker* polar icebreaker.

The introduction of new aircraft brings with it the parallel need for a new training solution to ensure pilots are properly prepared with the right skills and experience to successfully deliver programs and services with the new aircraft.

Currently, regulatory and CCG mission training is predominantly delivered in aircraft at the CCG bases and Headquarters. All procedural, aircraft familiarization, and certification training for the light helicopters is accomplished in the airframe, while medium helicopter training and certification is accomplished through both aircraft and simulator operations. For the future fleet of CCG helicopters, CCG mission and regulatory training will be conducted in a Full Flight Simulator to the greatest extent possible.

3. Objective

The Helicopter Project Full Flight Simulator (FFS) Statement of Work defines the work to be performed to deliver Canada a qualified Level D FFS having separate cockpits for the CCG Bell 429 light helicopter and the CCG Bell 412EPI medium helicopter. The delivered FFS must be suitable for qualification to the level D standard by the Transport Canada National Simulator Program (NSP) and support both pilot proficiency training and CCG mission training.

4. Scope

The Statement of Work (SOW) consists of the following documents:

- a. Statement of Work
- b. SOW Appendices:
 - i. Appendix A – Contract Data Requirements List (CDRL)
 - ii. Appendix B – Data Item Descriptions (DIDs)
 - iii. Appendix C – FFS Baseline Statement of Technical Requirements
 - 1) Attachment 1 – Operation Training Areas (OTAs)
 - 2) Attachment 2 – FFS Concept of Operations
 - 3) Attachment 3 – CCG Helicopter Mission Profiles
 - 4) Attachment 4 – Mission Training Scenarios

The primary deliverable from this work is a Level D qualified FFS Ready for Training (RFT) and capable of supporting regulatory and CCG mission training on both the CCG Bell 429 and the CCG Bell 412EPI, and which meets all of the mandatory requirements defined in the FFS Baseline Statement of Technical Requirements. The Baseline

Statement of Technical Requirements describes the regulatory and certification requirements, performance requirements, and capability requirements for the FFS.

In addition, the Contractor must deliver the project management and technical deliverables as defined by the CDRL and the DIDs. The DIDs define the individual deliverables that the Contractor must provide to Canada at the times specified in the CDRL. DIDs describe the format, process, delivery schedule, and level of detail required to satisfy the requirements for each deliverable.

Where documents are required to be submitted to Canada as part of this project, the time period specified shall be understood to be calendar days.

4.1 Ready for Training (RFT)

RFT is the point at which the FFS has met all of the requirements in the FFS Baseline Statement of Technical Requirements, as determined by a series of final qualification tests conducted, and the FFS has been authorised for use by the Transport Canada Regulatory Authority as part of Transport Canada Aircraft Services Directorate's approved training program.

5. Compliance Matrix

The Contractor must demonstrate compliance with each technical requirement through a Compliance Matrix. Initially delivered as part of the Bid package, the Compliance Matrix must be developed and refined throughout the first two phases of the Work. The Compliance Matrix must also be firmly linked to the Evaluation, Test and Acceptance deliverables, clearly showing how compliance with each technical requirement will be demonstrated through the evaluation, testing and acceptance program. **DID T-001 Compliance Matrix** provides amplifying instructions.

6. Phases of Work

Canada anticipates that the FFS design and construction will be undertaken in three distinct phases, with each phase serving to generate progressive confidence that Canada's requirements will be met.

6.1 Progressive Acceptance

To facilitate the review and acceptance of deliverables by Canada within each phase, the Contractor is strongly encouraged to provide deliverables in a progressive fashion as they become available rather than delivering a single batch of deliverables at the end of each phase.

Throughout the Work, in situations where the Contractor solicits the direction of Canada on matters of technical design or cost, the Contractor must present all logical options, the attributes of each option, and the Contractor's recommendations. The Contractor must bear in mind that the criteria for assessing options must include compliance with technical requirements.

6.2 Review Period

All documents submitted to Canada should include adequate time for Canada to review and comment. Unless otherwise agreed to, Canada will require 14 days to review and provide comment on deliverables.

6.3 Phase I – PD – Preliminary Design

Following Contract Award, the Contractor must proceed with the refinement and consolidation of the main characteristics of the design. The resultant Preliminary Design Data Package, as defined in the CDRL, must address and meet all requirements as defined in the DIDs and the FFS Baseline Statement of Technical Requirements.

The purpose of the PD phase is to present the preliminary FFS design to Canada and to ascertain that it satisfies the contractual requirements before proceeding with Critical Design.

Some of the key objectives of the PD phase must include ascertaining that:

- a. The design is verifiable and risks have been identified, categorized, and mitigated, as appropriate.
- b. The proposed design satisfies the FFS Baseline Statement of Technical Requirements and all contractual requirements.

6.4 Phase II – CD – Critical Design

Following acceptance by Canada of the Preliminary Design Data Package, the Contractor must undertake work required to develop the deliverables defined by the DIDs.

The purpose of CD is for the Contractor to demonstrate to Canada that the proposed FFS design satisfies the contractual requirements and that the maturity of the proposed final design is sufficient to proceed to fabrication, assembly and integration. This phase will address the interfaces between configuration items.

During CD, the Contractor must demonstrate that the following objectives have been met:

- a. The production processes and controls confirm that the design can proceed to the fabrication stage.
- b. The planned Quality Assurance (QA) activities have established the requisite verification and screening processes to ensure design integrity.

- c. The proposed design satisfies the FFS Baseline Statement of Technical Requirements.
- d. The final design resolves all issues and action items identified during PD.

The CD phase will be defined as complete when Canada is satisfied that the proposed FFS design will fulfill the requirements of the Contract, is sufficiently mature to proceed with production, and that outstanding PD and CD action items are resolved to the satisfaction of Canada.

6.5 Phase III – Build and Integration

Following acceptance by Canada of the Final Design package, the Contractor must proceed with the build and integration of the FFS.

6.5.1 Lab Demonstration

Within this phase of the Work, the Contractor must demonstrate elements of the design as defined with the CDRL and DIDs in a lab environment prior to acceptance and design freeze of these elements. As a minimum, the contractor must demonstrate the following in the lab:

- a. The functionality, appearance, and user interface of the IOS, as well as the lesson plan builder and system malfunctions.
- b. The visual database and, to the extent possible, the visual system.

The Contractor is strongly encouraged to demonstrate additional elements of the design in the lab environment to de-risk acceptance of the FFS downstream.

6.5.2 Acceptance and Testing, Onsite Installation, and Qualification

Following completion of the build and integration of the FFS, the Contractor must proceed with the acceptance and testing by Canada, onsite installation, and qualification of the FFS to achieve RFT.

7. Project Management

Following Contract Award, the Contractor must assign a Project Manager for the duration of the project. The Project Manager must be given the authority and resources to successfully execute the contract and be the single point of contact for formal communication between the Contractor and Canada.

The Contractor must provide the necessary personnel, management systems and infrastructure to ensure effective and efficient administration, execution, monitoring, control, reporting and delivery of all aspects of the Work.

The Contractor must use a Project Management system that reflects industry best practices, such as the Project Management Body of Knowledge (PMBOK) or equivalent

The Contractor must prepare and deliver the Project Management Plan and associated documents describing the project management methodology to be used in the administration of this project. The following Project Management DIDs form the basis of the plan and sub-plans:

- a. **Project Management Plan (DID M-001)**
- b. **Master Project Schedule (DID M-002)**
- c. **Risk and Issue Management Plan (DID M-003)**
- d. **Communications Management Plan (DID M-004)**
- e. **Quality Plan (DID M-005)**
- f. **Technical Data Management Plan (DID M-006)**
- g. **Configuration and Change Management Plan (DID M-007)**
- h. **Infrastructure Plan (DID M-008)**
- i. **Human Resources Plan (DID M-009)**

8. Project Meetings

The Contractor must provide a suitable representative, typically the Project Manager, with decision-making authority at all project meetings and teleconferences.

The Contractor must arrange and provide conference facilities that are adequate to accommodate the attendees for all meetings.

The Contractor must provide clerical support for all meetings, taking minutes and recording action items. Unless otherwise stated, the Contractor must provide a draft of all meeting minutes for review and acceptance by Canada within a maximum of five (5) working days following the meeting. The final agreed upon minutes must be prepared by the Contractor and forwarded to Canada for acceptance and signature.

The Contractor must record any action items along with the assigned responsibilities and deadlines identified during all meetings. All action items must be consolidated after each meeting and provided to Canada with the meeting minutes.

Meetings may be cancelled through mutual agreement of Canada and the Contractor. Rescheduling of meetings must also be done through mutual agreement between the Contractor and Canada. Meeting requirements can be satisfied through teleconferences, face-to-face, video conferencing or any other method agreed upon between the Contractor and Canada.

8.1 Project Initiation Meeting

A Project Initiation Meeting (PIM) must be hosted by the Contractor at their facility within two (2) weeks following contract award.

The Project Initiation Meeting is the first official meeting between the Contractor and Canada. This meeting introduces the members of the Contractor's Project Team and Canada, and provides the opportunity to define working relationships and discuss the role of each team member. It also serves as an opportunity to review the contract and technical documents to ensure the Contractor understand the documents. Other ongoing priorities in the project that involve Canada may also be discussed at this meeting. The PIM must be conducted in accordance with **DID M-010 Project Initiation Meeting**.

8.2 System Requirements Review

A System Requirements Review meeting must be held to conduct a detailed review of the technical requirements. This meeting must be held early in the Preliminary Design phase and may be combined with other meetings.

8.3 Progress Meetings

Periodic progress meetings between Canada and the Contractor must be held to review progress and discuss issues and risks. As a minimum, the following periodic progress meetings must be held:

- a. Monthly Progress Review Meeting (PRM) – A monthly progress review meeting must be held normally at the Contractor's facility to discuss issues related to the contract and overall progress of the work. The Contractor must develop the agenda for each meeting, submitting it to Canada for approval no later than seven (7) days prior to the meeting and is responsible for drafting a Record of Discussion for each meeting. **DID M-011 Progress Review Meetings** describe the requirements for these meetings in detail.
- b. Technical Progress Review Meeting (TRM) – A bimonthly (every two months) technical review meeting must be held to discuss technical issues related to the FFS design, construction or any other technical matter. These meeting must normally be held at the Contractor's facility. The Contractor must be responsible for development of the agenda for each meeting, submitting it to Canada for approval no later than seven (7) days prior to the meeting and for drafting a Record of Discussion for each meeting. **DID M-012 Technical Review Meetings** provides amplifying details. The TRM will normally be held in conjunction with the PRM and may be held more frequently than bimonthly if both the Contractor and Canada agree.

- c. Ad-hoc or unscheduled meetings may be required during the course of the project to address issues such as schedule delay, or significant concerns of a technical or contractual nature, which warrant immediate discussion or action. An unscheduled meeting may be initiated by the Contractor or Canada.

9. Progress Reporting

To ensure a mutual understanding of progress of the Work along with issues or risks which may impact progress or achievement of objectives, the Contractor must deliver Monthly Progress Reports to Canada as defined by **DID M-013 Monthly Progress Reports**. The Monthly Progress Report must be delivered not later than seven (7) working days before each PRM and its content discussed during the PRM.

9.1 Photographs and Videos

The Contractor shall routinely provide Canada with high quality photographs and videos as appropriate to illustrate progress on the Work. Selected photographs may be included with the Monthly Progress Reports to visually indicate progress. Native file formats photographs and videos must also be provided to Canada. In general, Canada will leave it to the discretion of the Contractor to determine what to photograph although Canada may provide guidance on areas of particular interest.

The photographs and videos will be used primarily for internal communication purposes but may also be used periodically for external communication purposes. For external purposes, Canada will seek the Contractor's permission prior to posting photos and videos externally. As a rough indication, it is expected that in the order of fifty (50) photographs/videos would be provided on a monthly basis once the construction of the simulator has commenced.

10. Quality Management

The Contractor must implement and maintain a Quality Management System (QMS), certified compliant with the current version of ISO 9001. The Contractor shall assure that all Subcontractors and Suppliers comply with the appropriate Quality requirements.

The Contractor must conduct Quality Management activities in accordance with a Quality Plan (QP), which describes how the Contractor will implement the QMS throughout this work. The Quality Plan must be consistent with and subordinate to the Project Management Plan and prepared in accordance with the current version of ISO 10005 Quality Management - Guidelines for Quality Plans. The Quality Plan must describe how the Contractor will conform to the specified quality requirements of the Contract and specify how the required quality activities are to be carried out, including quality assurance of Subcontractors and Suppliers.

The Contractor shall deliver the QP in accordance with **DID M-005 Quality Plan**. Upon acceptance/approval of the QP by Canada, the Contractor must implement the Quality Plan. The Contractor must make appropriate amendments to the QP throughout the term of the contract to reflect current and planned quality activities. Amendments to the QP must be acceptable to Canada. The documents referenced in the QP must be made available when requested by Canada.

Canada reserves the right to perform Government Quality Assurance (GQA) and audits at Contractor's facilities and those of Subcontractors and Suppliers, and at any other installation site. Canada must have the right of access to any area of the Contractor's or Subcontractors' facilities where any part of the Work is being performed, with a minimum of two (2) weeks' notice. Canada shall be afforded unrestricted opportunity to evaluate and verify Contractor's or Subcontractors' conformity with the Quality Plan and to validate product conformity with contract requirements. This requirement does not relieve the Contractor of the Quality Management responsibilities for the Work of this SOW. The Contractor, Subcontractors and Suppliers shall make available all documents and records deemed necessary by Canada's audit team for the conduct of GQA.

11. Mission-Based Training Requirements

CCG has identified five (5) Operational Training Areas (OTAs) to be simulated in the FFS for Mission Training. The Contractor must acquire and provide the data to support the five (5) Operational Training Areas (OTAs) to meet the Transport Canada Regulator approval requirements for training credits (approved scenes). The FFS must provide a suitable environment for delivering pilot training under Transport Canada Aircraft Services Directorate's (TC ASD) approved pilot training plan for CCG operations.

As the design and build of the FFS progresses, ensuring the FFS will meet the mission training needs for TC ASD pilot trainers and their training program will be a key area of focus for Canada. Mission requirements are given particular attention in the Baseline Statement of Technical Requirements and form the key elements of the FFS design that are over and above Level D standards. To ensure that the FFS meets these training needs, key areas of focus have been highlighted via the following deliverables:

- a. **IOS Configuration and Software (DID T-003)**
- b. **Lesson Plan and Computer Generated Objects Scenario Builder (DID T-004)**
- c. **Malfunctions Definition (DID T-005)**
- d. **Simulator Configuration (DID T-007)**
- e. **Visual Database (DID T-008)**

f. **CCG Mission Training Requirements Report (DID T-016)**

12. Aircraft Performance Data

Under the contracts Canada has with Bell for the 429 and the 412EPI helicopters, aircraft performance data to meet Level D requirements will be provided to the FFS Contractor. After an assessment of the data provided, the Contractor will be responsible to validate the data and determine if there are any deltas between the data provided and the complete data necessary to provide a solution that meets all technical requirements of Canada. This analysis will form the basis for deliverable **DID T-011 Simulator Data Plans**. The final deliverable associated with T-011 is completed data packages containing all data necessary for accurate and comprehensive simulation in the FFS.

The Contractor will be solely responsible for simulator performance regardless of the source of aircraft performance data.

A Validation Data Roadmap demonstrating the Contractor's selected data and rationale for selecting said data must be provided in accordance with **DID T-010 Validation Data Roadmap**.

12.1 Flight Test Program(s)

Note: For the purposes of providing a cost proposal in response to the RFP, Bidders should assume there will be no cost associated with the potential need to collect additional data.

After contract award, should analysis of the aircraft performance data provided by the helicopter OEM indicate the need for additional flight test data, in accordance with **DID T-012 Flight Test Plans**, the Contractor must define the required flight test program(s) and designate a Test Director to oversee the execution of the flight test program(s).

The Contractor will not be responsible for the provision of aircraft, flight crews or other costs associated with conducting the flight test program(s) other than the costs of the Contractor's own staff. These costs will be covered under a Task Authorization after contract award.

13. Cockpit Components

Under the contracts with Bell for the 429 and for the 412EPI, Canada will provide the majority of cockpit components (real aircraft components) required for the FFS as Government Furnished Equipment (GFE). A list of list of recommended cockpit components to be provided as GFE will be delivered to Bidders through the Contracting Authority. As part of the bid proposal, Bidders may particularize and amend this list and

deliver, as part of the bid proposal, a revised list of Helicopter OEM parts, instruments and avionics. **DID T-014 Helicopter OEM Parts, Instruments and Avionics** provides amplifying details. Canada will be responsible only for the aircraft components identified in the lists. All other components for the FFS are the responsibility of the Contractor.

The Master Project Schedule produced in accordance with **DID M-002** must clearly indicate the date by which all cockpit components provided by Canada must be received to avoid delay.

14. Acceptance Testing and Qualification

The Contractor must conduct a comprehensive evaluation and testing program in plant and on-site at TC ASD's Training Centre to demonstrate that the FFS satisfactorily meets all of the requirements in the Baseline Statement of Technical Requirements. Canada will concurrently run the ATMs and QTGs during IPAT, OSAT, and prior to Qualification Testing as part of the validation and verification process.

In accordance with **DID ETA-001 Acceptance Test Plan**, the Contractor must provide an ATP that describes all activities required to ensure the FFS is ready to conduct all acceptance tests for both simulated cockpits at In-Plant Acceptance Testing (IPAT), On-Site Acceptance Testing (OSAT), and for Qualification testing.

In accordance with **DID ETA-002 Acceptance Test Manuals**, the Contractor must deliver Acceptance Test Manuals (ATMs). The ATMs must outline the tests to be carried out to demonstrate the FFS' compliance with the specifications as defined in the Baseline Statement of Technical Requirements. Separate ATMs must be generated for each simulated cockpit.

Prior to the conduct of any acceptance testing, the Contractor must ensure that the FFS is fully prepared in all respects to conduct testing before providing Canada notice to attend. In the case of IPAT, this notification will be in the form of a Test Readiness Review, which forms part of **DID ETA-002 Acceptance Test Manuals**.

The Contractor must provide the necessary tools and resources including engineering, technical and operational support to successfully conduct acceptance testing. The FFS acceptance tests must be conducted for both simulated cockpits and witnessed by Canada. The FFS acceptance tests must include a physical configuration audit and test flight. The tests must be carried out for each simulated cockpit in accordance with the ATP and ATMs.

14.1 In-Plant Acceptance Tests (IPAT)

The Acceptance Tests must include, but not be limited to:

- a. Operational checks and demonstrations: to confirm that all operational and mission specific requirements are met, and equipment is functioning for its intended purpose.
- b. Acceptance flight checks during flight of all aircraft systems (including cabin systems) and simulator behaviour.
- c. Physical rework or provision of solutions for all technical and quality snags.
- d. Production of a deficiencies report, corrective action plan, and status report.

Both aircraft types must be addressed separately to identify any deficiencies unique to either aircraft. The Contractor must demonstrate that corrective action plans have been implemented and the deficiencies and non-conformities of both simulated cockpits have been resolved to the satisfaction of Canada.

The In-Plant Acceptance Tests will be considered complete when Canada confirms in writing that the acceptance tests have been performed, deficiencies have been corrected, and the simulator is in compliance with the test plan, objectives, and applicable standards.

14.2 On-Site Acceptance Tests (OSAT)

OSAT must be conducted after the FFS is installed and commissioned at the TC ASD Training Centre. Testing will be carried out for each simulated cockpit as per the ATP, ATMs and QTGs. At this point, all discrepancies noted at IPAT must have been addressed. A report documenting the results of the OSAT must be generated. The Contractor and Canada must agree to timelines for resolving any new discrepancies discovered.

The OSAT will be considered complete when Canada confirms in writing that the acceptance tests have been performed, deficiencies have been corrected and the simulator configured for each simulated cockpits is in compliance with test plan, objectives and applicable standards.

14.3 Qualification

Upon successful completion of OSAT, the Qualification for the Bell 429 and 412EPI simulated cockpits will be conducted by the Transport Canada Regulatory Authority in accordance with FAA Part 60.

The Contractor must provide a Qualification Test Guide for each simulated cockpit in accordance with **DID ETA-003 Qualification Test Guides**. The Qualification Test Guides must contain the performance tests for the Bell 429 and 412EPI in accordance with the standards referenced the Baseline Statement of Technical Requirements.

14.3.1 Regulatory Review

To de-risk the qualification process, Canada will provide a number of deliverables to the Transport Canada regulatory authority for review well in advance of the Qualification process. This informal review is to occur as soon as the necessary data is available but no later than 30 days prior to commencement of IPAT. The CDRL and related DIDs provide amplifying details regarding what is to be provided as part of this informal Regulatory Review.

14.4 Final Acceptance of FFS

Final Acceptance of the FFS will occur once Canada has received the Transport Canada Qualification Certificate along with the Qualification Report. When Canada is satisfied that all Discrepancy Reports impacting achievement of RFT have been resolved, Canada will proceed with final acceptance of the FFS. Until that point, the Contractor must be solely responsible for care, custody and maintenance of the FFS.

15. Simulator Delivery and Commissioning

Subsequent to acceptance by Canada of the results of the IPAT, the Contractor must transport the simulator to Transport Canada, Aircraft Services Directorate (TC ASD), 20 Airbus Private, Ottawa, Canada.

The Contractor must be responsible for all aspects of transportation, installation, systems integration and integration with the building systems, commissioning and testing of the Full Flight Simulator at the TC ASD Training Centre.

16. Facility

Canada will conduct an expansion to the TC ASD Training Centre to accommodate the FFS. The scope of this expansion is defined in the Building Drawing package (GFI). Construction start for the facility expansion is anticipated in July 2015 with completion of the expansion expected in May 2016. Canada is responsible for all aspects of the work defined by the drawing package.

16.1 Site Survey

As part of the bid proposal, a virtual site survey based on the drawing package identifying interface requirements for the FFS or any other site requirements must be conducted with the resulting findings included. The results of this survey must be provided in a Site Survey Report. **DID FR-001 Site Survey** provides amplifying details. The Site Survey Report must include a certification within the bid proposal that the facility expansion can accommodate the proposed FFS without significant modification.

After contract award, the Contractor must conduct an initial physical site survey and update the Site Survey Report based on the results of this physical inspection. The final version of the Site Survey Report must include the final simulator site layout.

The Contractor is responsible for any modifications, adjustments, or work completion to the facility required to accommodate the FFS beyond that defined in the drawing package (GFI).

16.2 Installation Plan

The Contractor must provide a detailed installation plan reflecting the installation of the FFS in the TC ASD Training Centre. **DID FR-002 Installation Plan** provides amplifying details.

17. FFS Maintenance

The Contractor must develop and deliver a comprehensive maintenance program for the FFS to ensure availability and reliability of the FFS once in service. The maintenance program must be fully compatible with TC ASD's Maintenance, Analysis and Planning System. **DID ILS-001 Maintenance Program** provides amplifying details.

Once accepted by Canada, FFS maintenance will be the responsibility of simulator operations personnel at TC ASD. Until acceptance of the FFS by Canada, maintenance of the FFS and all related systems must be the responsibility of the Contractor.

18. Simulator Product Support

A Product and Customer Service Support Plan must be provided as part of the bid proposal. The plan must clearly convey the after sales support available for the FFS while in-service. **DID ILS-002 Product Support** provides requirements and amplifying details.

19. Spares, Tools & Special Equipment

As part of the bid proposal package, a list of recommended spare parts, tools and special equipment (with pricing) required to support the FFS Maintenance Program and corrective maintenance to the FFS must be provided. The list of recommended spares, tools and special equipment must be consistent with recommendations in third party Original Equipment Manufacturers (OEMs) Maintenance and Overhaul manuals.

After Contract award, the Contractor must work with Canada to refine and finalize the list of spares, tools and special equipment before CDR. Procurement of the spares, tools, and special equipment will be actioned through a contract amendment or a Task

Authorization. **DID ILS-004 Spares, Tools and Special Equipment List** provides requirements and amplifying details.

20. Technical Data Package

The Contractor must provide a comprehensive technical data package comprising all documentation (including drawings, manuals, schematics, etc.) required to operate, maintain and update the FFS throughout its in-service life. **DID T-009 FFS Technical Data Package** provides amplifying details.

As part of the Contractor's Technical Data Management Plan, the Contractor must maintain a technical data list reflecting all of the deliverables generated and delivered as part of this Work. **DID M-006 Technical Data Management Plan** provides amplifying details.

21. Training

The Contractor must develop and deliver a training program consisting of training curriculum, training materials, and training courses for pilot instructors and maintenance personnel. The objective of the training program is to fully prepare pilot instructors to successfully conduct training in the FFS and to provide maintenance personnel with the skills and knowledge they will require to implement the FFS Maintenance Program and conduct corrective maintenance. The schedule for the execution of the training program must ensure that all required pilot instructors and maintenance personnel are trained prior to Ready for Training (RFT). Information with respect to training for pilots and maintenance personnel is contained in **DID ILS-003 Training Plan**.



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Helicopter Project ANNEX D Full Flight Simulator Bid Evaluation Plan Final RFP

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Full Flight Simulator Evaluation Procedures and Selection Criteria

Evaluation and Selection Process

Following the bid solicitation closing for the Full Flight Simulator (FFS), a phased evaluation and selection process will be initiated. Subject to the requirements for clarification and proof and/or confirmation, bids will be required to meet the minimum requirements associated with a phase, or step in the process. There are several phases in the evaluation process, which are described below.

The Evaluation and Selection Process phases are as follows:

- Phase 1 – Confirmation of Compliance with all Mandatory Technical Requirements
- Phase 2 – Evaluation of Rated Technical Elements
- Phase 3 – Evaluation of Financial Proposals
- Phase 4 – Contractor Selection

The technical proposals will be evaluated and scored in accordance with the scoring criteria described in the Bid Evaluation Score Sheet attached as Annex E to this RFP.

Phase 1 – Confirmation of Compliance with Mandatory Technical Requirements

In Phase 1, Canada will review the bids for compliance with all Mandatory Technical Requirements as described in the CCG FFS Baseline Statement of Technical Requirements included as Appendix C to the Statement of Work (Annex A to this RFP) and the Mandatory Experience criterion.

Bids must meet all Mandatory Technical Requirements. Bids that do not meet all of the Mandatory Technical Requirements will be deemed non-compliant and will not be subject to further evaluation. Bidders must complete the Compliance Matrix in accordance with DID T-001 to demonstrate how they will meet all CCG FFS Baseline Statement of Technical Requirements.

Bids must also meet the Mandatory Experience criterion described in the Bid Evaluation Score Sheet. Information demonstrating compliance with the Mandatory Experience criterion must be provided in accordance with DID M-014 (Experience References).

It is required that proposals address, in writing, all of the Mandatory Technical Requirements. It is the bidder's responsibility to ensure that the proposal is complete in technical detail to allow for evaluation. The information provided must be complete, precise and clearly demonstrate that the bidder meets the stated Mandatory Technical Requirements. Responses consisting of a simple statement of compliance or lacking narrative must be avoided. If the evaluation team finds that a proposal does not provide sufficient detail to substantiate a Mandatory Technical Requirement, then that proposal may be declared non-compliant and will not be subject to further evaluation.

If it appears a requirement may be non-compliant, the evaluation team may nonetheless, at its discretion, proceed with the evaluation of any given bid while it further considers a final decision concerning any potential non-compliance of that bid.

Phase 2 – Evaluation of Rated Technical Elements

To ensure that Canada procures a Full Flight Simulator (FFS) that provides the capability to conduct mission training, Bidders are requested to provide information supporting their Technical Elements. The objective of the Technical Evaluation is to provide Canada a way to assess a paper/virtual version of the Bidder's proposed final solution for the CCG FFS to ensure it will meet the needs of Canada.

The total Rated Technical Qualifications score for each Bidder will be equal to the sum of the points scored for each Item (1-7) of the point-rated Rated Technical Qualifications. One hundred points are available for the Rated Technical Qualifications score, as shown in the table below.

Item #	Category	Maximum Potential Score
1	Experience	12
2	Simulator Systems	35
3	CCG Mission Training	30
4	Facility Compliance	5
5	Project Management	10
6	Technical Innovations	3
7	Presentation	5
Total		100

It is required that proposals address, in writing, all of the requirements. It is the Bidder's responsibility to ensure the information provided is complete, precise and clearly demonstrates the Bidder's qualifications in each category.

Responses should be guided by the scoring criteria information provided in the Bid Evaluation Score Sheet as well as the specific DIDs associated with each requirement.

The Bidder shall provide as part of its Technical Proposal all documents essential to demonstrate compliance with each requirement, including, without limitation, photographs, drawings, calculations, documents, and other such evidence.

The Bidder shall provide references that substantiate their experience claims for responses in the experience category in accordance with DID M-014. Canada reserves the right to contact one or all of the references. It is the responsibility of the Bidder to ensure that the references provided are current and relevant to this solicitation.

Phase 3 – Evaluation of Financial Proposals

The financial proposals of those Bidders who are technically compliant will be evaluated by PWGSC with respect to the requirements as described in this Solicitation.

The total assessed bid price for Bidder n is P_n as defined below:

$$P_n = P_1 + P_2 + P_3$$

Where,

ANNEX D - CCG Full Flight Simulator Bid Evaluation Plan To F7013-120014/I

P1 = Cost for all items defined in the RFP with the exception of P2 and P3 below.

P2 = Option - Cost of Vertical Reference Training Proposal

P3 = Option - Cost of Innovation Proposal

Note: the cost of P2 and P3 will be evaluated as part of the total assessed bid price but will be considered contract options that may be exercised after contract award. Because of the potential technical risk associated with these options, they will be executed in a phased approach with off-ramps which may be executed if Canada determines that they will not significantly contribute to the training value of the FFS. For this reason, the financial proposal for the Vertical Reference and Innovation Proposal shall be broken down as follows:

$P2 = P2P + P2C + P2T$

$P3 = P3P + P3C + P3T$

P2P – Cost of the Vertical Reference Training Proposal up to end of Preliminary Design Stage

P2C – Cost of the Vertical Reference Training Proposal up to end of Critical Design Stage

P2T – Cost of the Vertical Reference Training Proposal up to Ready for Training

P3P – Cost of the Innovation Proposal up to end Preliminary Design Stage

P3C – Cost of the Innovation Proposal up to end Critical Design Stage

P3T – Cost of the Innovation Proposal up to Ready for Training

Phase 4 – Contractor Selection

The Bidder who has met all the mandatory requirements and has obtained the highest Best Value Score will be recommended for contract award, subject to the provisions of this solicitation.

The Best Value Score will be determined by using the following formula subject to the following weighting factors:

- i. Technical Weighting Factor = 70
- ii. Price Weighting Factor = 30

$$\text{Best Value Score} = \frac{(TP_n \times P_{wf})}{TP} \times \frac{LPP}{P_n} + \frac{(TP_n \times T_{wf})}{TP}$$

Where:

TP_n = Total Technical Points Acquired by Bidder n

TP = Total Available Weighted Technical Points (100)

P_{wf} = Price Weighting Factor (30)

LPP = Lowest Total Assessed Bid Price of all Compliant Proposal

P_n = Total Assessed Bid Price for Bidder n

T_{wf} = Technical Weighting Factor (70)

Phase 1 - Technical Mandatory Requirements

Criteria #	Related DID	Description	PASS/FAIL
TM 1	M-014	Mandatory Experience.	P/F
TM 2	T-001	Mandatory Compliance Matrix.	P/F
Requires both criteria to PASS			

TM 1 - Previous Delivery of Level D FFS

The Bidder must demonstrate that they have delivered a Level D or equivalent Full Flight Simulator (FFS) in the past three years.

Criteria #	Related DID	Fail	Pass
TM 1	M-014	Bidder does not comply fully with Mandatory Experience.	Bidder complies fully with Mandatory Experience.

TM 2 - Mandatory Compliance Matrix

The Bidder must provide a completed compliance matrix. Bidders are requested to use the numbering and chronology of the Baseline Statement of Technical Requirements provided in Appendix A to Annex A.

Criteria #	Related DID	Fail	Pass
TM 2	T-001	Bidder does not comply fully with Mandatory Technical Requirements.	Bidder complies fully with Mandatory Technical Requirements.

EXAMPLE OF COMPLIANCE MATRIX FOR BID PURPOSES

Object Number	Mandatory Requirements	Proof of Compliance Required from Bidder	Bidder's Response (How requirement is met)	Comments
1.0-1	REGULATORY AND QUALIFICATION REQUIREMENTS The Full Flight Simulator (FFS) must be qualified to Level D for operation in Canada by the Transport Canada National Simulator Program (NSP), in accordance with standards described in the latest revision of the FAA 14 CFR Part 60 criteria.			
1.0-2	The FFS must have one motion platform and visual system with convertible cockpits for the CCG Bell 429 helicopter and the CCG Bell 412EPI helicopter, and must be qualified to Level D in accordance with 1.0-1.			

Phase 2 - Rated Technical Elements, Item 1 - Experience

Criteria #	Related DID	Description	Maximum Points Available
EX 1	M-014	Bidders must substantiate responses below by responding in accordance with DID M-014.	5
EX 2	M-014		5
EX 3	M-014		1
EX 4	M-014		1
Maximum Potential Score			/12

Criteria #	Rated Technical Qualifications	Score
EX 1	The Bidder can earn up to a total of 5 points for experience delivering a Level D or equivalent rotorcraft flight simulator as per the following criteria:	5
	The Bidder earns a total of 1 point out of 5 available points if it has delivered a Level D or equivalent rotorcraft flight simulator in the past 10 years.	
	The Bidder earns a total of 3 points out of 5 available points if it has delivered a Level D or equivalent rotorcraft flight simulator in the past 5 years.	
	The Bidder earns a total of 5 points out of 5 available points if it has delivered a Level D or equivalent rotorcraft flight simulator in the past 3 years.	
EX 2	The Bidder has delivered a Level 7 FTD or a Level B,C, or D FFS qualified by Transport Canada or FAA in the past 3 years.	5
EX 3	The Bidder has delivered 2 Level D or equivalent rotorcraft flight simulators in the past 3 years.	1
EX 4	The Bidder has delivered 3 Level D or equivalent rotorcraft flight simulators in the past 3 years.	1
Maximum Potential Score		/12

Phase 2 - Rated Technical Elements, Item 2 - Simulator Systems

Criteria #	Related DID	Description	Maximum Points Available
SS 1	T-006	Convertible Cockpit: The Bidder demonstrates their capability to deliver a convertible cockpit FFS by providing a report in accordance with the deliverables described in DID T-006.	5
SS 2	T-007	Simulator Configuration: The Bidder demonstrates their proposed FFS solution by submitting a report in accordance with deliverables described in DID T-007.	10
SS 3	T-011	Simulator Data Plan: The Bidder demonstrates their approach to developing the necessary flight and other engineering data required to meet CCG's training needs by providing a report in accordance with the deliverables described in DID T-011.	5
SS 4	T-003, T-004	IOS/Lesson Plan and Computer Generated Objects Scenario Builder: The Bidder demonstrates their proposed solution for the IOS, including their approach to the Lesson Plan and Computer Generated Objects Scenario Builder, by providing a report in accordance with the deliverables described in DIDs T-003 and T-004.	5
SS 5	T-008	Visual Database: The Bidder demonstrates their proposed solution for the Visual Database by providing a report in accordance with the deliverables described in T-008.	10
Maximum Potential Score			35

Category - Simulator Systems							
Criteria #	Related DID	0	1	2	3	4	5
SS 1	T-006	The report does not address the requirements of the DID.	The report indicates only notional development of the convertible cockpit. There is high risk that a solution that does not meet the training needs of CCG may be delivered.	The report provides little clarity or detail of the technical configuration of the bidder's proposed solution and contains only preliminary engineering design work for the configuration of the proposed solution.	The report provides little clarity or detail of the technical configuration of the bidder's proposed solution and contains only preliminary engineering design work for the configuration of the proposed solution.	Clear and well laid out report that describes and illustrates through drawings, pictures and narrative the configuration of the bidder's proposed solution. The report clearly indicates advanced production engineering design work for the proposed solution.	The report demonstrates a complete solution that is available and has been used on a previous project for a qualified level D Rotorcraft FFS. The report illustrates through drawings, pictures and narrative the configuration of the bidder's proposed solution. Note: The Bidder must provide proof that the convertible cockpit solution is in use and has been delivered on a previous project.
SS 2	T-007	The report does not address the requirements of the DID.	The report indicates only notional development of the proposed solution. There is high risk that a solution that does not meet the training needs of CCG may be delivered.	The report describes a proposed solution that is not well-developed and/or does not demonstrate that the integration of the various components of the simulator are such that they will meet the needs of the CCG. Significant risk still remains due to a significant number of uncertainties.	The report describes a proposed solution that is not well-developed and/or does not demonstrate that the integration of the various components of the simulator are such that they will meet the needs of the CCG. Significant risk still remains due to a significant number of uncertainties.	The report describes and illustrates through drawings, pictures and narrative of the configuration that the bidder's proposed solution is fairly well developed, state of the art, well defined, and will support the majority of CCG's training needs. Some risk remains due to some uncertainties.	The report describes and illustrates through drawings, pictures and narrative of the configuration that the bidder's proposed solution is state of the art, well defined, and will support CCG's training needs. There is minimal to no risk associated with the proposed solution.
Criteria #	Related DID	0	1	2	3	4	5

Phase 2 - Rated Technical Elements, Item 3 - Mission Training

Criteria #	Related DID	Description	Maximum Points Available
MT 1	T-002	Description and depiction of the synthetic environment.	6
MT 2	T-002	Static and Moving models, complexity and control.	6
MT 3	T-002	Modeling of airflow, aerodynamic and environmental effects.	6
MT 4	T-002	Complex weather and sea state modeling.	6
MT 5	T-002	Use of the IOS to achieve the training objectives.	6
Maximum Potential Score			30

Category - Mission Training							
To substantiate the Quality of the Solution , the Bidder provides a response to DID T-002 that fully describes how they will design and develop a proposed solution that delivers a synthetic training environment that will satisfy the requirements outlined in the associated mission training scenario. Responses should address criteria MT #1-5 throughout the report to indicate how each element contributes to the goal of generating high quality training value.							
To substantiate the Relevant Experience , for each criteria the Bidder illustrates their response with relevant experience gained through having delivered full flight simulators with similar mission training requirements. The experience must be related to a project referenced in the deliverable for DID M-014 and the narrative must clearly describe how that experience is relevant to the specific criteria defined above.							
Criteria #	Related DID	0	1	2	3	4	5
MT 1	T-002	The report does not clearly address the requirements of the DID. The report is poorly written and hard to understand.	Cursor description of the area of focus. Minimal detail that does not clearly indicate what the user will see, hear, feel in the simulator, or does not properly link how those features serve to support the training needs of the CCG. The report leaves uncertainty and high risk that the solution will not meet the training needs.	Good description of the operating environment that clearly indicates what the user will see, hear, feel. Bidder demonstrates sufficient knowledge and understanding of the requirement and how their proposed solution will meet the training needs of the CCG. The report leaves some uncertainty and risk that the solution may not fully meet the training needs.	Full description of how the criteria is met suggesting the solution is complete and high quality. Reader is left with a complete understanding of the element and how it interacts with the rest of the MT criterion. The narrative convinces the reader that there is little risk that the solution will not fully meet all training needs. Response is precise with respect to what the user will see, hear, feel and comprehend.		
		No Relevant Experience	Relevant Experience				
MT 2	T-002	The report does not clearly address the requirements of the DID. The report is poorly written and hard to understand.	Cursor description of the area of focus. Minimal detail that does not clearly indicate what the user will see, hear, feel in the simulator, or does not properly link how those features serve to support the training needs of the CCG. The report leaves uncertainty and high risk that the solution will not meet the training needs.	Good description of the operating environment that clearly indicates what the user will see, hear, feel. Bidder demonstrates sufficient knowledge and understanding of the requirement and how their proposed solution will meet the training needs of the CCG. The report leaves some uncertainty and risk that the solution may not fully meet the training needs.	Full description of how the criteria is met suggesting the solution is complete and high quality. Reader is left with a complete understanding of the element and how it interacts with the rest of the MT criterion. The narrative convinces the reader that there is little risk that the solution will not fully meet all training needs. Response is precise with respect to what the user will see, hear, feel and comprehend.		
		No Relevant Experience	Relevant Experience				
Criteria #	Related DID	0	1	2	3	4	5

Annex E – Full Flight Simulator Bid Evaluation Score Sheet to F7013-120014/1

MT 3	T-002	The report does not clearly address the requirements of the DID. The report is poorly written and hard to understand.	Cursor description of the area of focus. Minimal detail that does not clearly indicate what the user will see, hear, feel in the simulator, or does not properly link how those features serve to support the training needs of the CCG. The report leaves uncertainty and high risk that the solution will not meet the training needs.	Good description of the operating environment that clearly indicates what the user will see, hear, feel. Bidder demonstrates sufficient knowledge and understanding of the requirement and how their proposed solution will meet the training needs of the CCG. The report leaves some uncertainty and risk that the solution may not fully meet the training needs.	Full description of how the criteria is met suggesting the solution is complete and high quality. Reader is left with a complete understanding of the element and how it interacts with the rest of the MT criterion. The narrative convinces the reader that there is little risk that the solution will not fully meet all training needs. Response is precise with respect to what the user will see, hear, feel and comprehend.
		0	1		
		No Relevant Experience	Relevant Experience		
Criteria #	Related DID	0	1	3	5
MT 4	T-002	The report does not clearly address the requirements of the DID. The report is poorly written and hard to understand.	Cursor description of the area of focus. Minimal detail that does not clearly indicate what the user will see, hear, feel in the simulator, or does not properly link how those features serve to support the training needs of the CCG. The report leaves uncertainty and high risk that the solution will not meet the training needs.	Good description of the operating environment that clearly indicates what the user will see, hear, feel. Bidder demonstrates sufficient knowledge and understanding of the requirement and how their proposed solution will meet the training needs of the CCG. The report leaves some uncertainty and risk that the solution may not fully meet the training needs.	Full description of how the criteria is met suggesting the solution is complete and high quality. Reader is left with a complete understanding of the element and how it interacts with the rest of the MT criterion. The narrative convinces the reader that there is little risk that the solution will not fully meet all training needs. Response is precise with respect to what the user will see, hear, feel and comprehend.
		0	1		
		No Relevant Experience	Relevant Experience		
Criteria #	Related DID	0	1	3	5
MT 5	T-002	The report does not clearly address the requirements of the DID. The report is poorly written and hard to understand.	Cursor description of the area of focus. Minimal detail that does not clearly indicate what the user will see, hear, feel in the simulator, or does not properly link how those features serve to support the training needs of the CCG. The report leaves uncertainty and high risk that the solution will not meet the training needs.	Good description of the operating environment that clearly indicates what the user will see, hear, feel. Bidder demonstrates sufficient knowledge and understanding of the requirement and how their proposed solution will meet the training needs of the CCG. The report leaves some uncertainty and risk that the solution may not fully meet the training needs.	Full description of how the criteria is met suggesting the solution is complete and high quality. Reader is left with a complete understanding of the element and how it interacts with the rest of the MT criterion. The narrative convinces the reader that there is little risk that the solution will not fully meet all training needs. Response is precise with respect to what the user will see, hear, feel and comprehend.
		0	1		
		No Relevant Experience	Relevant Experience		
Criteria #	Related DID	0	1		

Phase 2 - Rated Technical Elements, Item 4 - Facility Compliance

Criteria #	Related DID	Description	Maximum Points Available
FC 1	FR-001	The Bidder must demonstrate that their proposed solution will fit into the training facility.	5
Maximum Potential Score			5

Category - Facility Compliance

The bidder shall demonstrate that the proposed solution will fit into the allotted space at TC ASD. The Bidder submits a technical report in accordance with DID FR-001 which verifies that the proposed solution will fit into the space at TC ASD.			
Criteria #	Related DID	Score	Description
FC 1	FR-001	0	Poor. Response is not clearly laid out, is confusing or difficult to read. Drawings may not have been provided or are unsatisfactory. Response does not clearly indicate that the proposed solution will fit into the allotted space at TC ASD.
		5	Clear and well laid out report and accompanying drawings that indicate the proposed solution will fit into the allotted space at TC ASD.

Phase 2 - Rated Technical Elements, Item 5 - Project Management

Criteria #	Related DID	Project Management Rating	Maximum Points Available
PM 1	M-001	The Bidder provides a Project Management Plan (PMP) that provides a clear understanding of the Bidder's approach to managing the project.	5
PM 2	M-002	The Bidder provides a Master Project Schedule (MPS) that provides a clear understanding of how the schedule is aligned with the 18-24 month timeline and indicates how and when deliverables will be provided.	2
PM 3	M-005	The Bidder provides a Quality Plan (QP) that provides a clear understanding of the Bidder's approach to Quality Management .	1
PM 4	M-008	The Bidder provides an Infrastructure Plan (IP) that demonstrates the Bidder has the capacity to support the project.	1
PM 5	M-009	The Bidder provides a Human Resources (HR) Plan that demonstrates the Bidder's approach to ensuring it has the Human Resources capacity to meet the demands of the project.	1
Maximum Potential Score			10
Category - Project Management Rated			
The Contractor demonstrates their approach to managing the CCG FFS procurement. Where possible, the approach should align with the Contractor's standard approach to project management for a project of this magnitude. Available scoring is listed below.			
Criteria #	Related DID	1	3
PM 1	M-001	Bidder substantiates how it will meet the requirement of the associated DID with some uncertainty.	5
Criteria #	Related DID	1	2
PM 2	M-002	Bidder substantiates how it will meet the requirement of the associated DID with some uncertainty.	
Criteria #	Related DID	1	1
PM 3	M-005	Bidder did not submit a Quality Plan that addresses the requirements of the DID.	
Criteria #	Related DID	1	1
PM 4	M-008	Bidder did not submit an Infrastructure Plan that addresses the requirements of the DID.	
Criteria #	Related DID	1	1
PM 5	M-009	Bidder did not submit a Human Resources Plan that addresses the requirements of the DID.	

Phase 2 - Rated Technical Elements, Item 6 - Technological Innovations

Criteria #	Related DID	Description				Maximum Points Available
T1 1	T-016	Vertical Reference: The Bidder demonstrates their capability to deliver an FFS with vertical reference training capability by providing a report in accordance with the deliverables described in DID T-016.				1.5
T1 2	T-017	Innovation Proposal: The Bidder demonstrates their proposed FFS solution offers technological innovations associated with the training objectives of CCG by submitting a report in accordance with deliverables described in DID T-017.				1.5
Maximum Potential Score						3
Category - Simulator Systems						
Criteria #	Related DID	0	0.5	1	1.5	
T1 1	T-016	The report does not address the requirements of the DID or there is high risk that the solution will not meet the requirement or may provide negative training.	The report indicates only notional development of the vertical reference solution but there is risk that the solution will not meet the training needs of CCG.	The report describes and illustrates through drawings, pictures and narrative the configuration of the proposed solution. There appears to be minimal risk that the solution will not meet the training needs of the CCG. The report clearly indicates engineering design work for the proposed solution.	The report describes and illustrates through drawings, pictures and narrative a complete solution that is available and has been used on a previous project, or provides evidence of advanced production engineering work through drawings, pictures and narrative. There appears to be minimal risk that the solution will not meet the training needs of the CCG. Note: If applicable, the Bidder must provide proof that the vertical reference solution is in use and has been delivered on a previous project.	
Criteria #	Related DID	0	0.5	1	1.5	
T1 2	T-017	The report does not address the requirements of the DID.	The proposal is not clearly linked to the training needs of CCG as defined in the FFS Concept of Operations. The proposal appears to provide limited enhancement of the training value provided by the FFS as defined by the Baseline Statement of Technical Requirements.	The report describes and illustrates through drawings, pictures and narrative a solution that appears to be aligned with the FFS Concept of Operations and provides some enhancement of the training value provided by the FFS.	The report describes and illustrates through drawings, pictures and narrative an innovative solution that is fully aligned with the FFS Concept of Operations and clearly enhances the training value provided by the FFS. There is minimal to no apparent risk associated with the proposed innovations as they are in use or have associated production engineering work to indicate they are capable of being implemented by the time of delivery.	

Phase 2 - Rated Technical Elements, Item 7 - Presentation

Criteria #	Related DID	Description	Maximum Points Available
PR 1	N/A	The Bidder provides a well-written bid.	5
Maximum Potential Score			5

Related DID	0	1	5
N/A	Poorly laid out, very confusing or challenging to read responses containing numerous spelling, grammar and punctuation errors throughout.	Poorly laid out, confusing or difficult to read responses with enough proper spelling, grammar and punctuation errors to be distracting to the reader.	Well laid out response where the reader is easily able to navigate the bid. Text is essentially free from spelling, grammar, and punctuation errors. Text is easy to read.

Phase 2 - Rated Technical Elements - Total Score

Rated Technical Elements		Maximum Potential Score
Criteria #	Item 1 - Experience	/12
EX 1	The Bidder has delivered a Level D or equivalent rotorcraft flight simulator.	5
EX 2	The Bidder has delivered a Level 7 FTD or a Level B,C, or D FFS qualified by Transport Canada or FAA in the past 3 years.	5
EX 3	The Bidder has delivered 2 Level D or equivalent rotorcraft flight simulators in the past 3 years.	1
EX 4	The Bidder has delivered 3 Level D or equivalent rotorcraft flight simulators in the past 3 years.	1
Criteria #	Item 2 - Simulator Systems	/35
SS 1	Convertible Cockpit	5
SS 2	Simulator Configuration	10
SS 3	Simulator Data Plan	5
SS 4	IOS Configuration and Software / Lesson Plan and Computer Generated Objects Scenario Builder	5
SS 5	Visual Database	10
Criteria #	Item 3 - CCG Mission Training	/30
MT 1	Plan to develop the synthetic environment	6
MT 2	Moving models, complexity, and control	6
MT 3	Modeling of airflow, aerodynamic and environmental	6
MT 4	Complex weather and sea state modeling	6
MT 5	Links to the IOS	6
Criteria #	Item 4 - Facility Compliance	/5
FC 1	The Bidder must demonstrate that their proposed FFS solution will fit in to the TC ASD Training Facility.	5
Criteria #	Item 5 - Project Management	/10
PM 1	PMP	5
PM 2	MPS	2
PM 3	QP	1
PM 4	IP	1
PM 5	HR	1
Criteria #	Item 6 - Technological Innovations	/3
TI 1	Vertical Reference	1.5
TI 2	Innovation Proposal	1.5
Criteria #	Item 7 - Presentation	/5
PR 1	The Bidder provides a well-written bid	5
Total Score		/100

Appendix A to Annex A – Contract Data Requirements List
To F7013-120014/I

Notes:

DIDs are specified as either requiring Canada to “Accept” (A), “Review” (R) or Evaluate (E). Those requiring acceptance, must be accepted by Canada before the Contractor can progress the work for that particular requirement. Those that need only be reviewed will still be reviewed and commented upon by Canada but work for the requirement can progress as Canada’s comments are being addressed. Deliverable items that will be evaluated as part of the bid submission are labelled with an “E”.

Unless otherwise specified, deliverables, issues, comments or questions must be provided in Microsoft Office Suite 2010 format.

DID Naming Convention: DIDs are divided into five separate categories:

- M series DIDs are those that address project management, experience and governance requirements.
- T series DIDs are those that address technical requirements.
- ETA series DIDs are those that address evaluation, testing, and acceptance requirements.
- ILS series DIDs are those that address integrated logistics support requirements.
- FR series DIDs are those that address facility review requirements.

Project Management, Experience and Governance (M) - DIDs

DID Number	Title	Version	Accept or Review	Initial Submission	Subsequent Submission(s)	Frequency
M-001	Project Management Plan	1.0	E, A	Bid	1-month after CA	As required
M-002	Master Project Schedule	1.0	E, R	Bid	1-month after CA	Monthly
M-003	Risk and Issue Management Plan	1.0	R	1-month after CA	Monthly	Monthly
M-004	Communications Management Plan	1.0	R	1-month after CA	As required	As required

Appendix A to Annex A – Contract Data Requirements List
To F7013-120014/I

DID Number	Title	Version	Accept or Review	Initial Submission	Subsequent Submission(s)	Frequency
M-005	Quality Plan	1.0	E, R	Bid	1-month after CA	As required
M-006	Technical Data Management Plan	1.0	R	1-month after CA	Monthly	Monthly
M-007	Configuration and Change Management Plan	1.0	R	1-month after CA	As required	As required
M-008	Infrastructure Plan	1.0	E, R	Bid	1-month after CA	As required
M-009	Human Resources Plan	1.1	E, R	Bid	1-month after CA	As required
M-010	Project Initiation Meeting	1.0	R	1-month after CA		Once
M-011	Progress Review Meetings	1.0	A	2-month after CA		Monthly
M-012	Technical Review Meetings	1.0	A	2-month after CA		Bi-monthly (once every two months)
M-013	Monthly Progress Report	1.0	R	1-month after CA		Monthly
M-014	Experience References	1.1	E	Bid		Once

Appendix A to Annex A – Contract Data Requirements List
To F7013-120014/I

DID Number	Title	Version	Date	Accept or Review	Bid	PD	CD	Lab	TRR	IPAT	OSAT	RR	QT
	Technical												
T-001	Compliance Matrix	1.1		E, A	X	X	X			X	X		
T-002	CCG Mission Training Requirements Report	1.3		E	X								
T-003	IOS Configuration and Software	1.1		E, A	X	X	X	X					
T-004	Lesson Plan and Computer Generated Objects Scenario Builder	1.1		E, A	X	X	X	X					
T-005	Malfunctions Definition	1.0		A	X	X	X	X					
T-006	Convertible Cockpit Report	1.2		E	X								
T-007	Simulator Configuration Report	1.1		E, A	X	X	X						
T-008	Visual Database	1.0		E, A	X	X	X	X					
T-009	FFS Technical Documentation Package	1.2		A	X		X						NLT 1 month after
T-010	Validation Data Road Map (VDR)	1.1		A			X			30days prior		X	
T-011	Simulator Data Plans	1.1		E, A	X	X							X
T-012	Flight Test Plans	1.0		A		X						X	
T-013	Non-Simulated Items	1.0		A		X	X						
T-014	Helicopter OEM Parts, Instruments and Avionics	1.1		A	X	X	X						
T-015	Satellite Imagery and Terrain Data	1.0		A									X
T-016	Vertical Reference Training Capability	1.0		E	X								
T-017	Innovation Proposal	1.1		E	X								

Appendix A to Annex A – Contract Data Requirements List
To F7013-120014/I

DID Number	Title	Version	Date	Accept or Review	Bid	PD	CD	Lab	TRR	IPAT	OSAT	RR	QT
	Evaluation, Test and Acceptance (ETA)												
ETA-001	Acceptance Test Plan (ATP)	1.0		A		X	X						
ETA-002	Acceptance Test Manuals	1.0		A		X	X		X	X	X		
ETA-003	Qualification Test Guides	1.1		A		X	X			30days prior	30days prior	X	X
	Integrated Logistics Support (ILS)												
	ILS-001												
	Maintenance Programs	1.1		A		X	X			X			
	ILS-002												
	Product Support Plan	1.1		A	X								
	ILS-003												
	Training Plan	1.1		A		X	X			X			
	ILS-004												
	Spares, Tools and Special Equipment List	1.1		A	X	X	X						
	Facility Review (FR)												
	FR-001												
	Site Survey	1.0		E, A	X	X	X						
	FR-002												
	Installation Plan	1.0		A		X	X			X			

DID M-001 Project Management Plan

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for the Contractor's Project Management Plan (PMP).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-002, M-003, M-004, M-005, M-006, M-007, M-008, M-009

3. PREPARATION INSTRUCTIONS:

Format:

The PMP shall be prepared in the Contractor's format and approved by Canada. The format must be reviewed and accepted by Canada.

The PMP must be provided in a searchable PDF format for all versions prior to the final version. The final version of the PMP must be provided in both Microsoft Word and PDF files.

Requirements:

The Contractor must use a Project Management system that reflects industry best practices, such as the Project Management Book of Knowledge (PMBOK) or equivalent.

The PMP shall be kept current during the course of the Work. Subsequent amendments to the PMP shall be forwarded to Canada for review and acceptance.

The PMP shall identify and describe all activities and processes necessary to conduct the project, and the resources that will be allocated to complete the activities as outlined. All activities for this project shall be managed in accordance with the accepted PMP. The PMP shall address the following topics as a minimum:

- a. Master Project Schedule (M-002)
- b. Risk and Issue Management Plan (M-003)

- c. Communications Management Plan (M-004)
- d. Quality Plan (M-005)
- e. Technical Data Management Plan (M-006)
- f. Configuration and Change Management Plan (M-007)
- g. Infrastructure Plan (M-008)
- h. Human Resources Plan (M-009)

The PMP itself must cover each of the topics above in sufficient detail to provide clarity on the Contractor's approach to managing each of these topics for this Work. Details are to be further elaborated upon in sub-plans (specific DIDs for the sub-plans are indicated above).

The Contractor may include all of the sub-plan detail within the PMP if that is their normal practice so long as all the required content of the applicable sub-plan is covered.

Bid Proposal

The Bid Proposal must contain a preliminary Project Management Plan (PMP) together with such subordinate plans as defined by the CDRL.

Within 1 month after Contract Award

The Contractor must deliver the final PMP to Canada for review and acceptance.

Deliverables:

Bid Proposal

PMP is to be provided to Canada as part of the bid in accordance with Part 3 of the RFP – Bid Preparation Instructions.

Within 1 month after Contract Award

One (1) electronic copy of the Contractor's PMP in PDF and one (1) electronic copy in Word are to be provided to Canada.

DID M-002 Master Project Schedule

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirement for a Master Project Schedule (MPS).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-001, DID M-013, ETA-001, ETA-002, ETA-003

3. PREPARATION INSTRUCTIONS:

Format:

The MPS shall be prepared in the Contractor's format and approved by Canada. The format must be reviewed and accepted by Canada.

The MPS must be provided in both MS Project and a searchable PDF format for all versions.

Requirements:

The MPS must outline the project milestones, associated activities and deliverables extending from Contract Award through to the delivery and acceptance of the simulator, and project close out activities. The MPS must provide details describing simulator production and, as a minimum, include the following:

- a. A detailed Work Breakdown Structure and the corresponding activity list to at least two levels, in sufficient detail to define and monitor the progress on the Work.
- b. The sequence of events and required timeframes associated with each milestone.
- c. The relationships and inter-dependencies between all activities.

- d. A corresponding Gantt chart, highlighting the Contractor's deliverables, significant events and all critical path activities.
- e. All timelines related to testing activities referred to in the Evaluation, Testing, and Acceptance DIDs (ETA-001, ETA-002, ETA-003).
- f. The Contractor's list of freeze dates.
- g. Activities requiring Canada's participation, such as meetings, labs, training, and site surveys.

Particular attention should be given in the schedule to how the collection of flight test data for the Bell 429 and Bell 412EPI will inform the MPS and how that timeline will fit into the 18-24 month schedule.

The MPS as submitted in the bid proposal shall establish the baseline for measuring the progress and performance of the Contractor.

The MPS shall clearly identify contractual commitments and milestones in the order of their planned occurrence, in accordance with the contract.

Following review by Canada of the final MPS, it shall be updated on an as-required basis to ensure that it is kept current. At minimum, the Contractor shall update the MPS for delivery as part of the Monthly Progress Report (DID M-013) each month.

The Contractor's MPS must be kept current and align with the overall Project Management Plan developed for DID M-001.

Deliverables:

Bid Proposal

The MPS is to be provided to Canada as part of the bid in accordance with Part 3 of the RFP – Bid Preparation Instructions.

Within 1 month after Contract Award

One (1) electronic copy of the Contractor's MPS in PDF and one (1) electronic copy in MS Project are to be provided to Canada.

DID M-003 Risk and Issue Management Plan

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for the Contractor's Risk and Issue Management Plan (RIMP) and to identify and record technical risks.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-001, M-011, M-013

3. PREPARATION INSTRUCTIONS:

Format:

The RIMP shall be prepared in the Contractor's format and approved by Canada. The format must be reviewed and accepted by Canada.

The RIMP must be provided in a searchable PDF format for all versions prior to the final version. The final version of the RIMP must be provided in both Microsoft Word and PDF files. The Risk and Issue Register must be provided in Microsoft Excel.

Requirements:

As part of the Project Management Plan, the Contractor must provide a Project Risk and Issue Management Plan (RIMP) consistent with PMBOK and industry best practices.

The RIMP shall describe the policies, procedures and management systems within the Contractor's organization to manage both foreseen and unforeseen project risks as well as project issues as they may arise.

Additionally, the RIMP must also include risk strategies that will be used to avoid, control, mitigate or transfer risks within this project. This must include strategies for dealing with technology or processes which may be new to the contractor.

The Contractor must maintain a Project Risk and Issue Register and include it as part of the Monthly Progress Report.

The RIMP must contain the following, as a minimum:

- a. Risk management planning, including the concept for management and ongoing review of risks.
- b. Risk identification methodology, including a description of the risk register.
- c. Qualitative and quantitative risk analysis methodology.
- d. Risk response planning methodology.
- e. Risk monitoring and control including reporting methodology to corporate management and Canada.
- f. Issue management methodology including issue identification, escalation process, resolution activities, and issue monitoring.

The Contractor must manage risk and issue in accordance with the RIMP.

The Contractor's Risk and Issue Register must be presented and discussed at the monthly Progress Review Meetings.

The Contractor's Risk and Issue Management Plan must be kept current and align with the overall Project Management Plan developed for DID M-001.

Deliverables:

Within 1 month after Contract Award

One (1) electronic copy of the Contractor's RIMP in PDF and one (1) electronic copy in Word are to be provided to Canada. One (1) electronic copy of the Contractor's Risk and Issue Register in PDF and one (1) electronic copy in MS Excel are to be provided to Canada.

Monthly

One (1) electronic copy of the Contractor's Risk and Issue Register in PDF is to be provided to Canada as part of the Monthly Progress Report.

DID M-004 Communications Management Plan

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for the Contractor's Communications Management Plan (CMP)

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-001

3. PREPARATION INSTRUCTIONS:

Format:

The CMP shall be prepared in the Contractor's format and approved by Canada. The format must be reviewed and accepted by Canada.

The CMP must be provided in a searchable PDF format for all versions prior to the final version. The final version of the CMP must be provided in both Microsoft Word and PDF files.

Requirements:

The Contractor must prepare a Communications Management Plan.

The CMP must describe the policies, procedures and management systems for communications with Canada.

The CMP must, as a minimum, define how responses to technical and scheduling issues will be managed and communicated within the Contractor's organization and to Canada.

The Contractor's CMP must be kept current and align with the overall Project Management Plan developed for DID M-001.

Deliverables:

Within 1 month after Contract Award

One (1) electronic copy of the Contractor's CMP in PDF and one (1) electronic copy in Word are to be provided to Canada.

DID M-005 Quality Plan

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for the Quality Plan (QP) to the Contractor.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-001

3. PREPARATION INSTRUCTIONS:

Format:

The QP must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The QP must be provided in a searchable PDF format for all versions prior to the final version. The final version of must be provided in both Microsoft Word and PDF files.

Requirements:

The QP must describe how the contractor will implement and maintain a Quality Management System compliant to the most current version of the ISO 9000 standards. It must specify how the required quality activities are to be carried out, including Quality Assurance of Subcontractors and Suppliers.

The QP must be prepared in accordance with the current version of ISO 10005 Quality Management – Guidelines for Quality Plans. The Quality Plan shall include and/or reference all the processes, procedures, standard practices, job/work instructions, etc, that are used in implementing the Quality Program.

The Contractor's Quality Plan must be kept current and aligned with the overall Project Management Plan developed for DID M-001.

Deliverables:

Bid Proposal

The Bid Proposal must contain one (1) electronic copy of the QP.

Within 1 month after Contract Award

The contractor must provide one (1) electronic copy of the Contractor's QP in PDF and one (1) electronic copy in Word.

DID M-006 Technical Data Management Plan

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Technical Data Management Plan (TDMP).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-001, M-013

3. PREPARATION INSTRUCTIONS:

Format:

The Technical Data Management Plan must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The TDMP must be provided in a searchable PDF format for all versions prior to the final version. The final version of must be provided in both Microsoft Word and PDF files.

The Technical Data List must be provided in Microsoft Excel format.

Remarks:

The TDMP shall define the system by which the Contractor identifies tracks and manages the configuration of technical and other data produced as part of this Work. Technical data shall include reports, drawings, books and booklets, design data and other documentation.

As a minimum, the TDMP must define the Contractor's system for:

- a. Managing and verifying the quality of technical documentation.
- b. Identifying and numbering technical data.
- c. Managing and controlling versions of data.

- d. Identifying the process through which technical data is delivered to Canada.
- e. Notifying Canada of version changes.
- f. A Technical Data List to act as the primary place to track all of the data developed. The list shall be maintained and updated by the Contractor throughout the duration of the work and regularly delivered to Canada to ensure an accurate, shared picture of the state of required technical data. The Technical Data List shall include the following information, as a minimum:
 - Revision level of document
 - Revision date of document
 - Revision description
 - Version and date of the list

The Contractor's TDMP must be kept current and align with the overall Project Management Plan developed for DID M-001.

Email communications from the Contractor to Canada regarding DIDs or Technical Requirements should use the identification number of the DID or Technical Requirement within the subject line of the email.

Deliverables:

Within 1 month after Contract Award

One (1) electronic copy of the Contractor's TDMP in PDF and one (1) electronic copy in Word are to be provided to Canada for review and acceptance.

Monthly and As Required

The Technical Data List is to be provided monthly as part of the Monthly Progress Report and more frequently if required to reflect revisions to the list.

DID M-007 Configuration and Change Management Plan

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for the Configuration and Change Management Plan (CCMP) to the Contractor.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-001

3. PREPARATION INSTRUCTIONS:

Format:

A Configuration and Change Management Plan must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The CCMP must be provided in a searchable PDF format for all versions prior to the final version. The final version of must be provided in both Microsoft Word and PDF files.

Requirements:

The Contractor must prepare a CCMP that is consistent with the latest ISO 10007 Standard Guidance Document, or equivalent.

The CCMP must describe the policies, procedures and management systems within the Contractor's organization used to define and manage deviations from the CCG FFS Baseline Statement of Technical Requirements throughout the duration of the project.

The Configuration and Change Management Plan must define the following, as a minimum:

- a. The Contractor's plan for monitoring that the FFS Baseline Statement of Technical Requirements are being met in order to ensure that the delivered FFS fulfills the requirements of the Contract.
- b. A process for seeking approval from Canada to amend the approved requirements (technical and non-technical),

including procedures for the initiation and approval of all design change requests, as well as the associated roles and responsibilities for the Contractor and Canada.

- c. The physical configuration audit process for confirming that the as-built simulator configurations reflect the contractual requirements and that all aircraft are identical.

The Contractor's CCMP must be kept current and align with the overall Project Management Plan developed for DID M-001.

Deliverables:

Within 1 month after Contract Award

One (1) electronic copy of the Contractor's initial CCMP in PDF and one (1) electronic copy in Microsoft Word are to be provided to Canada.

DID M-008 Infrastructure Plan

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for Infrastructure Plan (IP) to the Contractor.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-001

3. PREPARATION INSTRUCTIONS:

Format:

The Infrastructure Plan must be prepared in the Contractor's format.

The IP must be provided in a searchable PDF format for all versions prior to the final version. The final version of must be provided in both Microsoft Word and PDF files.

Requirements:

The Contractor must deliver an IP demonstrating that the contractor has the infrastructure, including the production and administrative infrastructure, common and unique IT tools necessary to complete the Work.

The Contractor's IP must be kept current and align with the overall Project Management Plan developed for DID M-001.

Deliverables:

Bid Proposal

The Infrastructure Plan is to be provided to Canada as part of the bid in accordance with Part 3 of the RFP – Bid Preparation Instructions.

Within 1 month after Contract Award

One (1) electronic copy of the IP in PDF and one (1) electronic copy in Word are to be provided to Canada (if revisions are required).

DID M-009 Human Resources Plan

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for Human Resources (HR) Plan.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-001

3. PREPARATION INSTRUCTIONS:

Format:

The HR Plan must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The HR Plan must be provided in a searchable PDF format for all versions prior to the final version. The final version of must be provided in both Microsoft Word and PDF files.

Requirements:

The Contractor shall provide a HR Plan to identify its strategy to ensure that it has the required human resource capacity with the right experience, education and qualifications to successfully manage and complete the work.

The Contractor's HR Plan should pay particular attention to areas where the Contractor may not have much if any experience in a given area.

The Contractor shall provide a list of key project and management personnel that will be involved in the FFS project, and their résumés, as part of the HR Plan.

The Contractor shall define the roles and responsibilities of its personnel identified in the HR Plan, as well as any reporting relationships.

The Contractor's HR Plan must be kept current and align with the overall Project Management Plan developed for DID M-001.

Deliverables:

Bid Proposal

The HR Plan is to be provided to Canada as part of the bid in accordance with Part 3 of the RFP – Bid Preparation Instructions.

Within 1 month after Contract Award

One (1) electronic copy of the HR Plan in PDF and one (1) electronic copy in Word are to be provided to Canada (if revisions are required).

DID M-010 Project Initiation Meeting

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for the Project Initiation Meeting (PIM) to the Contractor.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: M-002

3. PREPARATION INSTRUCTIONS:

Format:

Agendas, minutes and records of decision associated with the meeting must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The agendas, minutes and records of decision must be provided in a searchable PDF format.

Requirements:

The Contractor shall prepare and submit a draft agenda to Canada for review and consensus five (5) working days prior to the PIM.

The Contractor shall provide a draft of the PIM Minutes for review and acceptance by Canada a maximum of five (5) working days following the meeting. All action items shall be consolidated after the meeting in the action item register and provided to Canada with the meeting minutes.

Deliverables:

The Contractor shall prepare and submit a draft PIM agenda to Canada for review and consensus five (5) working days prior to the PIM.

The Contractor shall provide one (1) electronic copy of the signed minutes and action item register for the PIM to Canada a maximum of five (5) working days following the meeting.

DID M-011 Progress Review Meetings

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for the monthly Progress Review Meetings (PRM).

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-002, M-012, M-013

3. PREPARATION INSTRUCTIONS:

Format:

Agendas and minutes associated with the meeting must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The agendas and minutes must be provided in a searchable PDF format.

Requirements:

The PRM must be scheduled by the Contractor on a monthly basis. At least five (5) working days in advance of each PRM, the Contractor must prepare and submit a draft agenda to Canada for review and consensus.

The PRMs must normally be held at the Contractor's facility and will be chaired by Canada. The purpose of the PRMs is to discuss issues related to the contract and overall progress of the Work. Topics addressed in the Monthly Progress Report shall form the primary topics for discussion at the PRMs.

The status of the Master Project Schedule shall be a standing item on the agenda for the PRMs.

The Action Items register shall be reviewed during each PRM to provide the status of all items.

The Contractor shall provide a draft of the PRM minutes and record of decision capturing the key points of the discussion and the resulting action items for review and acceptance by Canada a maximum of five (5) working days following the PRM. New action items shall be incorporated in the Action Items register after the meeting and provided to Canada with the minutes.

Deliverables:

One (1) electronic copy of the agenda must be provided by the Contractor to Canada five (5) working days prior to the PRM. The Contractor shall prepare and distribute the final agenda at the PRMs.

One (1) electronic copy of the minutes must be provided by the Contractor to Canada a maximum of five (5) working days following the meeting along with a consolidated Action Items register.

DID M-012 Technical Review Meetings

1. PURPOSE of DID:

The purpose of this DID is to define the requirements for the Technical Review Meetings (TRM).

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-002, M-011, M-013

3. PREPARATION INSTRUCTIONS:

Format:

Agendas and minutes associated with the meeting must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The agendas and minutes must be provided in a searchable PDF format.

Requirements:

The TRM must normally be scheduled by the Contractor on a bimonthly (every two months) basis. TRMs shall normally be held in conjunction with the Progress Review Meetings. Meetings may be held more frequently if requested by the Contractor or Canada.

At least five (5) working days in advance of the TRM, the Contractor must prepare and submit a draft agenda to Canada for review and consensus prior to the TRM.

The TRMs shall normally be held at the Contractor's facility and will be chaired by Canada. The purpose of the TRMs is to review the technical progress of the project. Any deviations from the work plan as well as risks and risk mitigation strategies relating to technical work shall be discussed as well. TRMs action items shall be reviewed during each meeting to provide the status of all items.

The Contractor shall provide a draft of the TRM Minutes capturing the key points of the discussion and the resulting action items for review and acceptance by Canada a maximum of five (5) working days following the meeting. Action items shall be incorporated in the Action items register after the meeting and provided to Canada with the minutes.

Deliverables:

One (1) electronic copy of the agenda must be provided by the Contractor to Canada five (5) working days prior to the TRM. The Contractor shall prepare and distribute the final agenda at the TRMs.

One (1) electronic copy of the minutes must be provided by the Contractor to Canada a maximum of five (5) working days following the meeting along with a consolidated Action Register.

DID M-013 Monthly Progress Report

1. PURPOSE of DID:

The purpose of the DID is to define the requirements of the Monthly Progress Report (MPR) for the Contractor.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-001, M-002, M-003, M-011, M-012

3. PREPARATION INSTRUCTIONS:

Format:

The Monthly Progress Report (MPR) must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The MPR must be provided in a searchable PDF format.

Requirements:

The MPR shall present a high level overview of the status of the project. The Contractor shall submit MPRs to Canada no later than five (5) days prior to the Progress Review Meetings (PRMs).

The MPR shall indicate the progress of the project work, including accomplishments and areas of concern, which shall be supported with a written explanation for each item.

The MPR shall include the following items, as a minimum:

- a. A written assessment of the current status of the project as it relates to both aircraft types. An executive summary of status including work planned vs. actual work completed.
- b. A qualitative and quantitative explanation of the physical progress of the work for the current monthly reporting period.

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- c. Key accomplishments/milestones to date. Major tasks in progress during the reporting period and reasons for any deviation.
- d. A forecast of milestones to come.
- e. A summary of milestone/progress claim payments.
- f. An updated Master Project Schedule (DID M-002), including project activity and milestone accomplishments, as well as areas of concern for each item identified and an explanation of any plans around work as necessary to maintain project schedule.
- g. Identification and explanation of unresolved project, technical and material issues.
- h. Photos shall be included, as appropriate, to explain project progress or issues, expected project activities, and milestone accomplishments for each of the next three reporting periods.
- i. An updated Project Action Item Register, identifying the status of all action items arising from project meetings.
- j. A Risk and Issues Register (DID M-003) showing the updated statuses for any issues, and the risk status and mitigation plans. Any issues concerning cost, schedule and/or scope.

The first MPR is due within 1-month after Contract Award.

Deliverables:

The contractor must deliver one (1) electronic copy of the MPR, including attachments, to Canada no later than five (5) days prior to the monthly Progress Review Meeting (DID M-011).

DID M-014 Experience References

1. PURPOSE of DID:

The purpose of the DID is to define the deliverables for Experience References.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID T-002, Annex D and Annex E of this RFP

3. PREPARATION INSTRUCTIONS:

Format:

The Experience References must be prepared in the Bidder's format.

Requirements:

The Bidder must provide references supporting their experience information provided in various sections of the bid proposal.

To meet experience criteria for the Technical Mandatory Requirement (#TM 1) or the Rated Technical Qualifications (EX 1-4, MT 1-5), the Bidder must submit evidence that they were "Manufacturer of the FSTD" as named on the Certificate of Qualification for the FFS being submitted to meet the specific experience criteria.

Where the Technical Mandatory Requirement (TM 1) or the Rated Technical Qualifications (EX 1-4, MT 1-5) requires that the FFS be delivered in the past 'X' years, 'X' is measured between the date of bid closure for this RFP and the date indicated on the Certificate of Qualification for that FFS.

Phase 1 - Technical Mandatory Requirements Criterion # TM 1

The Bidder must submit one (1) reference project for the Technical Mandatory Requirement. The experience cited as proof of compliance in the reference project must clearly indicate that the Bidder was the Manufacturer of the FSTD for that particular project. The experience reference should be articulated in the

form of a short narrative describing the project, the client name, duration of the project, along with proof of qualification.

**Phase 2 - Rated Technical Qualifications, Item 1 - Experience
Criteria # EX 1 to 4**

For the Experience rated criteria, the experience cited must clearly indicate that the Bidder was the Manufacturer of the FSTD for each project referenced. The experience reference should be articulated in the form of a short narrative describing the project, the client name, duration of the project, along with proof of qualification.

For Criteria EX 1, 3 and 4, the Bidder may submit no more than three (3) reference projects. For Criterion EX 2, the Bidder may submit one (1) reference project.

**Phase 2 - Rated Technical Qualifications, Item 3 - Mission
Training, Criteria # MT 1 to 5**

For the references used in response to the Mission Training criteria, the references should be articulated in the form of a short narrative describing each project, including the client name, the Bidder's role (Prime contractor, sub-contractor, etc.), the outcomes, and how this experience is relevant to the requirements and/or objectives of this project.

No more than three (3) reference projects overall may be submitted in support of Criteria MT 1 to 5.

Deliverables:

The deliverable must be provided in accordance with Part 3 of the RFP – Bid Preparation Instructions.

DID T-001 Compliance Matrix

1. PURPOSE of DID:

The purpose of this DID is to identify for the Contractor the process for demonstrating to Canada compliance with each technical requirement.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-001, ETA-001, ETA-002, ETA-003

3. PREPARATION INSTRUCTIONS:

Format:

The Compliance Matrix shall be prepared in the Contractor's format and shall be provided in Microsoft Excel or a compatible file format. The format must be reviewed and accepted by Canada.

Requirements:

The Contractor must prepare a compliance matrix clearly demonstrating how each requirement in the Baseline Statement of Technical Requirements will be met by the Contractor's proposed solution. For each requirement, the compliance matrix must do more than simply indicate compliance, it must also provide explanatory details or a link to a related deliverable clearly demonstrating through words, illustrations, technical drawings, pictures, etc. how that requirement will be met by the proposed solution. Where specific design guidance has been offered for a technical requirement, the Contractor shall provide information to show that the design guidance has informed how the requirement is being met.

After contract award, the Compliance Matrix must be updated to reflect the Contractor's Evaluation, Test and Acceptance deliverables and clearly indicate with reference to the Acceptance Test Plan and applicable Acceptance Test Manual how compliance to the Baseline Statement of Technical Requirements will be demonstrated during IPAT and OSAT.

The Compliance Matrix shall be prepared and presented to Canada for review as follows:

Bid Proposal

The bid proposal must contain a Compliance Matrix clearly identifying compliance with all mandatory requirements and either providing an explanation within the compliance matrix regarding how the solution will meet each requirement, or providing a reference to another bid document which provides the detailed explanation. The proposed Compliance Matrix will be evaluated by Canada.

Preliminary Design

The Contractor must provide a preliminary Compliance Matrix during Preliminary Design which includes linkages to the Acceptance Test Plan and Acceptance Test Manuals.

Critical Design

The Contractor must provide an updated Compliance Matrix as necessary to remain firmly reflective of the solution and related deliverables.

In-plant Acceptance Testing (IPAT)

The Contractor must provide a final version of the Compliance Matrix during IPAT.

On-site Acceptance Testing (OSAT)

The Contractor must provide an updated Compliance Matrix if required.

Deliverables:

Bid Proposal

The bid proposal must contain a Compliance Matrix provided in accordance with Part 3 of the RFP – Bid Preparation Instructions.

Preliminary Design

The Contractor must provide one (1) electronic copy of the updated Compliance Matrix.

Critical Design

The Contractor must provide one (1) electronic copy of the updated Compliance Matrix.

IPAT

The Contractor must provide one (1) electronic copy of the final Compliance Matrix to Canada 30 days prior to IPAT.

OSAT

The Contractor must provide one (1) electronic copy of the final Compliance Matrix to Canada 30 days prior to OSAT, if necessary.

DID T-002 CCG Mission Training Requirements Report

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for a CCG Mission Training Requirements Report.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: DID T-003, T-007, T-008, M-014

3. PREPARATION INSTRUCTIONS:

Format:

CCG Mission Training Requirements Report must be in the Bidder's format.

Requirements:

A narrative report must be developed for the mission training scenario defined below describing in detail how the proposed simulator will realistically reproduce the scenario. The report should explain at an appropriate level of technical detail how the bidder's solution will be capable of accurately reproducing the scenario defined below. If available, drawings and/or pictures should be used to illustrate the narrative and provide the reader with a clearer understanding of the narrative.

Where applicable, recent and relevant experience with a similar project or projects should be used to substantiate the capability to provide the mission training requirements described in this RFP. The specifics of the experience must be integrated directly into the narrative response. Specific information supporting the context of the references used is requested in accordance with DID M-014 Project References.

The information provided in response to this DID should provide insight as to how the visual and motion systems (addressed in T-007), the visual database (T-008), and the IOS (T-003) will come together to provide the necessary visual, audio and motion realism necessary to develop the scenario described below. The report

should also detail how all of the various aircraft and navigations systems such as RADAR, HTAWS, Nav Aids, Rad Alt and GPS Moving Maps will be accurately integrated and correlated throughout the evolution of the scenario.

Where the report provided as part of the response to DID T-008 describes the general approach for collecting data to model the OTA environment and CGOs, the report in response to this DID should describe the specifics associated with collecting data for the elements in the scenario below.

Where the report provided as part of the response to DID T-003 describes the general characteristics of the IOS, the report in response to this DID should identify the specific control features the IOS will offer the instructor within the scenario.

Bidders are requested to address the event markers (a, b, c, d, e) for the scenario below in the order in which they are listed. For each of the five event markers, the five (5) criteria listed in the Bid Evaluation Score Sheet (Annex E) should be addressed and clearly identified such that it is readily apparent to the reader how the narrative supports and substantiates each criterion. Relevant experience should be included in the response for each of the five (5) event markers with the link to the applicable criterion (MT #1 to #5) clearly described.

The operating environment used for the scenario incorporates elements and information contained in the Coastal OTA section of the OTA document and the Baseline Statement of Technical Requirements.

The mission scenario

- a. The helicopter departs the CCG vessel Sir Wilfred Laurier with a combination of internal cargo and passengers. The ship will be operating in Sea State 4 with winds averaging 25 knots with a 10 knot gust spread between 20 and 30 knots. Aircraft will conduct a CAT-A departure and transit VFR to a light station over 10 miles of open water which is at the same sea state as the vessel.
- b. While enroute to the light station, the visibility is reduced to 2 nautical miles in rain and fog with a ceiling of 300 feet above sea level (ASL). There are other aircraft, vessels and both sea and shore birds moving independently in the vicinity, as well as ground personnel at a light house.

- c. The weather improves enroute to 600 feet broken with an alto cumulous ceiling and 5 miles visibility in rain with scattered low stratus cloud between 800 and 1500 feet ASL. The helicopter arrives at the light station. The landing pad is constructed in an opening in the bush along the shoreline and has a 3 degree slope. The wind is blowing directly on shore at 20 knots. The sea is affected by these winds. Passengers and cargo are dropped off. Fuel is available.
- d. The helicopter departs with an external load of cargo on a short line which brings the helicopter to its maximum certified takeoff weight. The helicopter transits to a mountain repeater site at 5000 feet ASL, which requires the application of mountain flying techniques. The conditions are winds at 25 gusting 30 knot and temperature is ISA for that altitude plus 20 degrees centigrade. Ceilings are broken at 5500 feet ASL with layer of cirrus clouds at 15,000 feet.
- e. For the return flight to base, the flight transitions into darkness while flying along the coast and the crew elects to use NVGs. The rain stops and fog dissipates along the coast so that the visibility increases to 10 nm with only scattered clouds at 5000 ASL. The moon phase is 30% and at 40 degrees of elevation, providing some illumination and shadows. The destination for this leg is the CCG base in Victoria BC.

Deliverables:

Bid Proposal

One (1) copy of the CCG Mission Training Requirements narrative report, is to be provided to Canada as part of the bid, in accordance with Part 3 of the RFP – Bid Preparation Instructions.

DID T- 003 Instructor Operator Station (IOS) Configuration and Software

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for IOS configuration and software.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: DID T-001, T-004 and T-005

3. PREPARATION INSTRUCTIONS:

Format:

IOS Configuration documentation and drawings shall be in a format decided by the Contractor. The format must be reviewed and approved by Canada.

The IOS Configuration documentation must be provided in a searchable PDF format for all versions prior to the final version. The final version of the IOS Configuration documentation must be provided in both Microsoft Word and PDF files.

Drawings must be provided as .dwf or .dwg files.

Requirements:

The Contractor must provide reports, drawings, pictures, screen captures and diagrams as appropriate to demonstrate the configuration, user interface and the functionality of the IOS. As the Work progresses, the level of detail contained in the reports must increase such that it is clear that all contract requirements will be met by the IOS.

As a minimum, the report should contain the following information:

- a. Hardware components
- b. Software components

- c. Physical layout
- d. Malfunctions
- e. Interactive Page Builder
- f. Instructor control and station functionality (access menu)
- g. Flight Data Tuning/updating
- h. Host Connection
- i. Laptop Compatibility (if applicable)
- j. Standardized Data Compatibility

Bid Proposal

The bid proposal deliverable must demonstrate that the proposed solution meets all CCG requirements. The report shall describe and illustrate to the extent possible the proposed approach to the IOS, and the functionality of the IOS. The report must be linked to the Compliance Matrix (DID T-001) clearly indicating how each requirement will be met.

Preliminary Design

The Contractor must provide a detailed design package and report, including the IOS software list. This should be an advanced design that has fully integrated the technical requirements into the design.

Critical Design

Final documents and drawings shall be presented to Canada showing the mature plan for the IOS configuration. This documentation must detail how the IOS solution will manage and control the training session (from Lesson Plan Initialization to candidate Debrief). This must include scenario and environment control as defined in the FFS Baseline Statement of Technical Requirements (Appendix C) and Malfunction selection as detailed in the deliverables in response to DID T-005 Malfunctions.

Labs

The Contractor must provide lab environment sessions throughout the development phase of the IOS to provide Canada with an opportunity for physical interaction with the station as configuration is being finalized. This will optimize the IOS functionality and ensure layout effectiveness and suitability. A report listing the discrepancies to be addressed for the IOS must be generated following each lab session. The reports must be updated for each subsequent lab session. The reports should identify the decisions and Action Items identified during lab sessions.

Deliverables:

Bid Proposal

The bid proposal must contain a preliminary IOS configuration report provided in accordance with Part 3 of the RFP – Bid Preparation Instructions.

Preliminary Design

The Contractor must provide one (1) electronic copy of a detailed IOS design package and report.

Critical Design

The Contractor must provide one (1) electronic copy of the report, including the final documents and drawings.

Labs

The Contractor must provide one (1) electronic copy of the lab report following each session.

DID T-004 Lesson Plan and Computer Generated Objects Scenario Builder

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for demonstrating the Lesson Plan and Computer Generated Objects Scenario Builder.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: DID T-003 and T-005

3. PREPARATION INSTRUCTIONS:

Format:

The Lesson Plan and Computer Generated Objects Scenario Builder must be in the Contractor's format. The format must be reviewed and accepted by Canada.

The Lesson Plan and Computer Generated Objects Scenario Builder documentation must be provided in a searchable PDF format for all versions prior to the final version. The final version of the Lesson Plan and Computer Generated Objects Scenario Builder documentation must be provided in both Microsoft Word and PDF files.

Requirements:

During the development of the Lesson Plan and Computer Generated Objects (CGO) Scenario Builder, Canada will provide the Contractor with four (4) lesson plans for the purposes of developing and demonstrating the Lesson Plan and CGO Scenario Builder. The four (4) lesson plans will be used for acceptance testing. A mock-up of the Lesson Plan and CGO Scenario Builder can be used for demonstration purposes during the demo phase of the design and build.

The four (4) lesson plans provided will consist of two (2) lesson plans relating to level D and regulatory requirements and two (2) lesson plans specific to the seven (7) scenarios from the CCG Mission Training Scenarios document.

Development and demonstration should be done in conjunction with the development of the IOS Configuration (DID T-003).

Bid Proposal

In conjunction with the report for DID T-003 IOS Configuration and Software, the bid proposal report must demonstrate that the proposed solution meets all CCG requirements. The report shall describe and illustrate to the extent possible the proposed approach to the Lesson Plan and CGO Scenario Builder, and its functionality. The report must be linked to the Compliance Matrix (DID T-001) clearly indicating how each requirement will be met.

Preliminary Design

The Contractor must consult with Canada to finalize the system design. The final system design must have fully integrated the technical requirements in the Baseline Statement of Technical Requirements (Annex A, Appendix C).

Critical Design

If necessary, the Contractor must propose solutions to rectify any discrepancies or deficiencies identified and with Canada's concurrence implement their solutions and then provide the updated final system design.

Labs

The Contractor must demonstrate the Lesson Plan and CGO Scenario Builder in conjunction with the IOS Configuration (DID T-003) as it advances prior to In-Plant Acceptance. A report listing the discrepancies to be addressed for the Lesson Plan and CGO Scenario Builder must be generated following each lab session. The reports must be updated for each subsequent lab session. The reports should identify the decisions and Action Items identified during lab sessions.

Deliverables:

Bid Proposal

The bid proposal must contain a preliminary system design for the Lesson Plan and CGO Scenario Builder provided in accordance with Part 3 of the RFP – Bid Preparation Instructions.

Preliminary Design

The Contractor must consult with Canada to finalize the system design for the Lesson Plan and CGO Scenario Builder and provide one (1) electronic copy of a final system design.

Critical Design

If necessary, the Contractor must provide one (1) electronic copy of the updated final system design for the Lesson Plan and CGO Scenario Builder.

Labs

The Contractor must provide one (1) electronic copy of the lab report following each lab session.

DID T-005 Malfunctions Definition

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for Malfunctions Definition.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: T-003, T-004

3. PREPARATION INSTRUCTIONS:

Format:

The Malfunctions Definition report shall be provided in the Contractor's format. The format must be reviewed and accepted by Canada.

The Malfunctions Definition documentation must be provided in a searchable PDF format for all versions prior to the final version. The final version of the Malfunctions Definition documentation must be provided in both Microsoft Word and PDF files.

Requirements:

The Contractor must work collaboratively with Canada to define the appropriate malfunctions for the CCG Bell 429 and the CCG Bell 412EPI Separate Malfunctions Definition Reports must be prepared for the CCG Bell 429 and CCG Bell 412EPI

The Contractor must provide lists of malfunctions and failures which can be managed through the IOS, including a complete description of the secondary and tertiary effects of the malfunctions on the systems and sub-systems. This list shall include malfunctions applicable to all abnormal and emergency procedures and those required to activate flight deck indication systems. Malfunctions shall be both from the Contractor's standard list for the simulator model for helicopter operations and for specific equipment of the CCG

aircraft as defined in the rotorcraft flight manuals and from CCG mission-specific training scenarios.

The Contractor must demonstrate the malfunctions control in conjunction with the IOS Configuration (DID T-003) and the Lesson Plan Builder (DID T-004) as they evolve.

Provisions for additional malfunctions shall also be defined.

Bid Proposal

The bid proposal must contain a preliminary list of proposed malfunctions for each aircraft type based on their standard Malfunctions List and on the systems for the CCG helicopters.

Preliminary Design

The Contractor and Canada will work together to review and evolve the lists to ensure that all requirements are being addressed. The Contractor must provide updated Malfunctions Lists including identification of secondary and tertiary effects for each malfunction.

Critical Design

The Contractor must provide a final Malfunctions List report for each aircraft type complete with a logical fault tree describing clearly the primary, secondary and tertiary effects of each malfunction on helicopter systems and sub-systems.

Labs

The Contractor must demonstrate malfunctions in conjunction with the Lesson Plan Builder (DID T-004) and the IOS Configuration (DID T-003) as it advances prior to In-Plant Acceptance. A report listing the discrepancies to be addressed or new malfunctions must be generated following each lab session. The reports must be updated for each subsequent lab session. The reports should identify the decisions and Action Items identified during lab sessions.

Deliverables:

Bid Proposal

The bid proposal must contain Malfunctions Lists provided in accordance with Part 3 of the RFP – Bid Preparation Instructions.

Preliminary Design

The Contractor shall supply one (1) electronic copy of the updated Malfunctions Lists for review by Canada.

Critical Design

The Contractor shall supply one (1) electronic copy of the updated Malfunctions List report for each aircraft type for approval by Canada.

Labs

The Contractor must provide one (1) electronic copy of the lab reports for each session.

DID T-006 Convertible Cockpit Report

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for the Convertible Cockpit Report to the Bidder.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: N/A

3. PREPARATION INSTRUCTIONS:

Format:

The Convertible Cockpit Report shall be prepared in the Bidder's format. The format must be reviewed and approved by Canada.

The Convertible Cockpit Report must be provided in a searchable PDF format for all versions prior to the final version. The final version must be provided in both Microsoft Word and PDF files.

All drawings must be provided as .dwf or .dwg files.

Requirements:

The Bidder must provide to Canada detailed information about the design, configuration and function of the Convertible Cockpit. The information provided must give Canada a clear understanding of the maturity of the engineering work for the design and build of the convertible cockpit for the proposed solution. Drawings and Engineering information must be provided to show the mechanics of the cockpits and the components necessary for conversion. The information provided within the bid proposal should give Canada a clear understanding of how the convertible cockpit fits within the overall design of the FFS. A narrative should be included describing the conversion process between cockpits. The report should also discuss the approach to ensuring that the cockpit not in the simulator is capable of functioning as a Level 5 FTD.

Following the bid submission process, work on the design of the convertible cockpit must be captured as part of the overall Simulator Configuration deliverables described in DID T-007 Simulator Configuration.

Deliverables:

Bid Proposal

The bid proposal must contain a Convertible Cockpit Report provided in accordance with Part 3 of the RFP – Bid Preparation Instructions.

DID T-007 Simulator Configuration Report

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for the Simulator Configuration Report to the Contractor.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: DID T-001, T-003, T-009

3. PREPARATION INSTRUCTIONS:

Format:

The Simulator Configuration Report shall be in a format decided by the Contractor.

The Simulator Configuration Report must be provided in a searchable PDF format for all versions prior to the final version. The final version of the Simulator Configuration Report must be provided in both Microsoft Word and PDF files.

Simulator Configuration drawings must be provided as .dwf or .dwg files.

Requirements:

The Contractor must provide to Canada reports and drawings of the Simulator Configuration throughout the development process.

Simulator Configuration refers to the integration of major systems and how those integrated systems will be used to create a high quality synthetic training environment. Major systems include hardware and software. Specific emphasis will be placed on monitoring the quality and development of the:

- a. Dome
- b. IOS configuration

- c. Visual system
- d. Vibration system
- e. Flight controls
- f. Sound system
- g. Computer system
- h. Motion platform
- i. CCG Bell 429 and CCG Bell 412EPI simulated cockpits
- j. Cockpit conversion system
- k. Layout drawings of components when stored (not in use in FFS) and readiness level for use as a Flight Training Device (FTD)
- l. Cockpit Procedures Trainer (CPT)

Although the IOS configuration forms a component of the overall simulator configuration, it will be specifically addressed in further detail in accordance with DID T-003 IOS Configuration and Software.

Information regarding the Visual System must describe how its characteristics and components will support the high resolution visual data to be collected in accordance with DID T-008 Visual Database.

The Contractor must provide Canada with the drawings for the simulator configuration. Drawings for each aircraft type should be provided as well as drawings for the motion platform.

As drawings are updated, text must be provided with each drawing highlighting the differences between the newest drawings and the preceding version.

The drawing package for the final simulator configuration as installed at TC ASD will be delivered as part of DID T-009 FFS Technical Documentation Package.

Bid Proposal

In conjunction with the report for DID T-003 IOS Configuration and Software, the Simulator Configuration Report must describe and illustrate, to the extent possible, the proposed solution. The report must demonstrate how the proposed solution meets all CCG requirements. The report must be linked to the Compliance Matrix (DID T-001), clearly indicating how each technical requirement will be met.

The response should address the components of the FFS that exceed level D requirements to provide a realistic mission training environment. The information regarding the visual system and its components should provide evidence that the final images as they appear in the FFS will maximize the capability of the high quality visual data collected in accordance with DID T-008 (Visual Database).

Information provided should give a clear picture of how the components of the FFS will come together to achieve the maximum possible realism required to achieve the mission training objectives described within the OTAs.

Preliminary Design

Should the configuration of any elements of the simulator configuration evolve during preliminary design, the Contractor must provide an updated report including the design package.

Critical Design

The Contractor must present to Canada the plan for the final simulator configuration in the final Simulator Configuration Report.

Deliverables:

Bid Proposal

The bid proposal must contain a preliminary Simulator Configuration Report provided in accordance with Part 3 of the RFP – Bid Preparation Instructions.

Preliminary Design

The Contractor must provide one (1) electronic copy of an updated Simulator Configuration Report.

Critical Design

The Contractor must provide one (1) electronic copy of the final Simulator Configuration Report.

DID T-008 Visual Database

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for the Visual Database.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-002, T-002

3. PREPARATION INSTRUCTIONS:

Format:

Visual Database documentation must be in the Contractor's format. Canada must review and accept the format.

The Visual Database documentation must be provided in a searchable PDF format for all versions prior to the final version. The final version must be provided in both Microsoft Word and PDF files.

Requirements:

The Contractor must provide a series of deliverables which progressively demonstrate how the visual database requirements will be met. The Contractor must supply the airport data to support the qualified airport scenes specified in the CCG FFS Baseline Technical Requirements.

A Visual Database Report must be generated to address the details for the development, maintenance and updates of the Visual Database for all the qualified Class 1 and 2 scenes described within the OTAs.

The Visual Database Report must describe the complete process to create final scenes in the FFS that maximize the realism of the synthetic training environment. Specific attention should be given to describing the process to provide sufficient detail to accurately simulate flight at altitudes of 200 feet or lower.

The Visual Database Report must detail the plan and resources used to collect the data for the geo-specific locations within the OTAs, as well as the corresponding CGOs.

The Visual Database Report must define the process to refine the raw data to then render the final scenes.

The Visual Database Report must indicate any databases or open architecture databases that may be used as a foundation for developing the OTAs. If fully rendered environments for any of the OTAs are partially or fully available via any such proprietary or open architecture databases, the Report must explain any additional work required to further adapt those environments for the specific needs of Canada.

The Report must provide insight as to what components of the OTAs and the CGOs will be modelled using physics based models versus those that will require data collection.

The development of the visual database will be a specific area of focus for Canada and will be a standing agenda item for the bi-monthly Technical Review Meetings.

The Contractor must execute Lab sessions with Canada to review the visual database as it develops. These Labs will provide an opportunity for Canada to view examples of the types of scenes found in the 5 OTAs. This will provide confidence throughout the project that the visual acuity of these scenes will meet Canada's requirements for the OTAs and the related Mission Training scenarios.

All discrepancies noted during the development of the visual database must be addressed by the time of In-Plant Acceptance Testing (IPAT).

Bid Proposal

As part of the bid proposal, a Visual Database Report containing plans to address the qualified airports and the OTAs must be provided, including the process used to refine the raw data and model it to render the imaging necessary to create a high quality synthetic training environment. The Report must demonstrate that the proposed solution meets all CCG requirements.

Information provided should give a clear picture of how the visual data will come together to achieve the maximum possible realism required to achieve the mission training objectives described within the OTAs.

Preliminary Design

The Contractor must provide an updated Visual Database Report, as required.

Within the Visual Database Report, the Contractor must provide a visual database review plan describing its schedule for the development of the visual database leading up to In-Plant Acceptance. The review plan should include a minimum of three (3) Labs to be used as review sessions for the visual database prior to In-Plant Acceptance. The lab review plan must then be integrated into the Contractor's Master Project Schedule to be provided in accordance with DID M-002 Master Project Schedule.

Critical Design

The Contractor must start to deliver clips of video or still photos to show the development of the visual scenes.

Labs

A report must be generated from each Lab with deficiencies being noted and given a number for tracking purposes. Deficiencies and their solutions must be noted in the subsequent database review and report.

Deliverables:

Bid proposal

The bid proposal must contain a Visual Database Report provided in accordance with Part 3 of the RFP – Bid Preparation Instructions.

Preliminary Design

The Contractor must provide one (1) electronic copy of an updated Visual Database plan plus a review plan describing its schedule leading up to In-Plant Acceptance.

Critical Design

The must provide one (1) electronic copy of an updated Visual Database plan, as required.

Labs

The Contractor must generate one (1) electronic copy of a discrepancy report for each Lab.

DID T-009 FFS Technical Data Package

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for the Simulator Technical Data Package to the Contractor.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: FR-001, FR-002, ILS-001.

3. PREPARATION INSTRUCTIONS:

Format:

The Technical Data Package must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Technical Data Package must be provided in a searchable PDF format for all versions prior to and including the final printed paper version. The final version of the Technical Data Package must also be provided in both a maintainable format, using typical commercial standard word processing (Microsoft Word), spreadsheet (Microsoft Excel), or drawing software, as well as PDF files.

All third party (non-Contractor) data must be provided in paper and electronic formats (where possible).

Requirements:

The Contractor must prepare all technical data necessary to operate and maintain the Full Flight Simulator (FFS) for both simulated cockpits. This includes third party data and manuals.

The Technical Data Package must contain the following, as a minimum:

Operational Data

- a. Instructor operating manual
- b. Maintenance operating manual

- c. Simulator start-up and shutdown procedures
- d. Simulator safety equipment and emergency procedures
- e. Lesson plan and computer generated objects scenario builder editor manuals

Simulator Maintenance and Support

- a. Complete technical drawings package
- b. Preventive maintenance manual
- c. Maintenance and repair manual (including fault isolation)
- d. Printed circuit board repair manual
- e. Instrument repair manual
- f. Mechanical assemblies repair manual
- g. Test equipment user guide
- h. Third-party vendor data
- i. Facilities and installation data
- j. Simulated/Modified Instruments specifications for procurement & test
- k. Parts list
- l. Parts catalogs

Software Data

- a. Software manuals
- b. Operating system and software integration overview
- c. Simulator executive program manual
- d. Software module design manual
- e. Interface control manual

- f. Loadable software parts list
- g. Utilities program document (user guide)
- h. Software styles and practices manuals
- i. Software control data
- j. Data and license of commercial off the shelf (COTS) equipment/software

Engineering Support Data

- a. Drawing family tree
- b. Engineering drawings (mechanical and electrical)
- c. Circuit and wiring diagrams
- d. Cable and mechanical assemblies
- e. Systems schematics
- f. Complete “as-is” drawing package

Deliverables:

Bid Proposal

The Contractor must provide one (1) electronic copy of the Technical Data Package breakdown listing the data item and a brief description for each.

Critical Design

The Contractor must provide one (1) electronic copy of a draft of each Technical Data Package item.

Qualification

The Contractor must provide one (1) electronic copy of the complete Technical Data Package including red-lined changes to remain on-site immediately following qualification.

The final edited version of the Technical Data Package (all formats) must be delivered to Canada no more than one (1) month after Qualification.

DID T-010 Validation Data Roadmap (VDR)

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for the Validation Data Roadmap to Contractor.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-001

3. PREPARATION INSTRUCTIONS:

Format:

The Validation Data Roadmap (VDR) must be prepared in the format stated in FAA Part 60 Qualification Performance Standard and Objective Data Requirements. The format must be reviewed and accepted by Canada.

The VDR must be provided in a searchable PDF format for all versions prior to the final version. The final version of the VDR must be provided in both Microsoft Word and PDF files.

Requirements:

Separate VDRs must be prepared for the CCG Bell 429 and CCG Bell 412 EPI simulated cockpits.

The Contractor must prepare the VDR guidance material and contents in accordance with FAA Part 60 Qualification Performance Standard and Objective Data Requirements and supporting IATA Flight Simulator Design and Performance Data Requirements 9019-7 document.

Critical Design

The Contractor must provide a copy of the VDR for each simulated cockpit during Critical Design.

30 days prior to In-Plant Acceptance Testing (IPAT)

The Contractor must provide the completed VDRs along with the completed QTG 30days before In-Plant Acceptance Testing.

Regulatory Review

The Contractor must provide the completed VDRs 30 days prior to In-Plant Acceptance Testing.

The VDRs will be provided for Regulatory Review to ensure the FFS is tracking well for final qualification.

Deliverables:

Critical Design

The Contractor must provide one (1) electronic copy of the preliminary VDRs.

30 days before IPAT

The Contractor must provide one (1) electronic copy of the completed VDRs.

Regulatory Review

The Contractor must provide one (1) electronic copy of VDRs.

DID T-011 Simulator Data Plans

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for the Simulator Data Plans to the Contractor.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: DID T-010, DID T-012

3. PREPARATION INSTRUCTIONS:

Format:

The Simulator Data Plans are to be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Simulator Data Plans must be provided in a searchable PDF format for all versions prior the final version. The final versions must be provided in both Microsoft Word and PDF files.

Requirements:

Separate Simulator Data Plans must be prepared for the CCG Bell 429 and CCG Bell 412EPI simulated cockpits.

The Simulator Data Plans must contain the methodology to ensure the FFS has all the necessary data to meet level D requirements and support CCG's mission training needs.

Bid Proposal

The Simulator Data Plans must contain the proposed methodology to analyze the data packages delivered by the helicopter original equipment manufacturer (OEM). Given that the flight data will not have been made available by the helicopter OEM until after contract award, the plans should provide Canada with a clear understanding of the overall approach to validate the data packages once received.

The Plans must include consideration of the exact CCG configurations of both aircraft. The analyses therein should reflect consideration of the data required for Level D qualification and any

additional data that may be required for modeling mission training flight operations described in the OTA document.

The Plans must identify the methodology to:

- Validate when a data package is complete vice incomplete
- Conduct a gap analysis
- Determine a course of action to address any identified gaps following a gap analysis

Preliminary Design

The Contractor must conduct in-depth analyses of the data packages following receipt of the completed data packages from the helicopter OEM. The Contractor must provide final Simulator Data Plans containing the results of the analyses of the complete data packages provided by the helicopter OEM.

The final Simulator Data Plans must identify any gaps in the data packages from the helicopter OEM to determine what data needs to be collected/re-collected to ensure simulation is comprehensive and accurate.

The gap analyses and the plans to address any gaps should clearly identify:

- a. Data delivered from the helicopter OEM that is complete and can be used for simulation.
- b. Data delivered from the helicopter OEM that is missing, incomplete or insufficient and will require additional flight testing. Additional data needed via flight testing shall form the basis of the Flight Test Plans (T-012).
- c. Data delivered from the helicopter OEM that is missing, incomplete or insufficient and will require additional data from means other than flight testing (ex. Simulation modelling).

Data from the helicopter OEM that is usable or will be captured via modelling should become directly integrated into the Validation Data Roadmap (VDR) generated in accordance with DID T-010.

Based on the results of the gap analyses, final plans must be prepared and provided to ensure that complete and comprehensive data packages are delivered.

The resulting work from this DID and DID T-012 must be clearly cross-referenced into the final Simulator Data Package to be delivered under this DID at Qualification Testing.

Qualification Testing

The Contractor must provide the completed Simulator Data Packages for acceptance by Canada.

Deliverables:

Bid Proposal

The bid proposal must contain preliminary Simulator Data Plans provided in accordance with Part 3 of the RFP – Bid Preparation Instructions.

Preliminary Design

One (1) electronic copy of each final Simulator Data Plan is to be provided to Canada.

Qualification Testing

One (1) electronic copy of each complete Simulator Data Package is to be provided to Canada in PDF and Word.

DID T-012 Flight Test Plans

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for the Flight Test Plan to Contractor.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: DID T-010, DID T-011, DID ETA-002,

3. PREPARATION INSTRUCTIONS:

Format:

The Flight Test Plans shall be prepared in the Contractor's format. The format must be reviewed and approved by Canada.

The Flight Test Plans must be provided in a searchable PDF format for all versions prior to the final version. The final version of the Flight Test Plans must be provided in both Microsoft Word and PDF files.

Requirements:

Separate Flight Test Plans must be prepared for the CCG Bell 429 and CCG Bell 412EPI helicopters.

The Flight Test Plans must contain all of the information necessary to conduct a flight test program. The plans must include, as a minimum the maneuvers and procedures required for aircraft certification, and simulation programming and validation. Each maneuver or procedure shall identify:

- a. The purpose of each test
- b. Data to be gathered
- c. Procedures and control input the flight test pilot and/or engineer used
- d. Atmospheric and environmental conditions

- e. Flight conditions
- f. Helicopter configuration, including weight and center of gravity
- g. All other information necessary to recreate the flight test conditions in the FFS.

The Final Test Package for each aircraft must indicate the complete results from all flight testing.

The above conditions should be clearly identified in the Acceptance Test Manuals (DID ETA-002) as the source conditions to be replicated for testing purposes.

The Flight Test Data collected in accordance with this deliverable must be reflected in the Validation Data Roadmap (T-010).

Preliminary Design

The Contractor must provide final Flight Test Plans for approval by Canada.

Regulatory Review

The Contractor must provide the completed Flight Test Package to be used by the Regulator for reference material during the review of the Validation Data Roadmap (DID T-010).

Deliverables:

Preliminary Design

One (1) electronic copy of each of the Flight Test Plans is to be provided to Canada in PDF.

Regulatory Review

One (1) electronic copy of the Flight Test Package is to be provided to Canada in PDF and Word.

DID T-013 Non-Simulated Items

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for the Non-Simulated items to the Contractor.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: N/A

3. PREPARATION INSTRUCTIONS:

Format:

The Non-Simulated Items list shall be prepared in the Contractor's format and approved by Canada. The format must be reviewed and accepted by Canada.

The Non-Simulated Items list must be provided in a searchable PDF format for all versions prior to the final version. The final version of the Non-Simulated Items list must be provided in both Microsoft Word and PDF files.

Requirements:

The Contractor must prepare a list of all FFS Non-Simulated Items.

The Non-Simulated Items list must include all functions, operational capabilities and equipment of both the CCG Bell 429 and CCG Bell 412EPI simulated cockpits that will not be replicated in the FFS.

Deliverables:

Preliminary Design

The Contractor must provide one (1) electronic copy of the draft Non-Simulated Items list.

Critical Design

The Contractor must provide one (1) electronic copy of the final Non-Simulated Items list.

DID T-014 Helicopter OEM Parts, Instruments and Avionics

1. PURPOSE of DID:

The purpose of this DID is to identify the requirement for a list of Aircraft Parts, Instruments and Avionics to be ordered from the Helicopter OEM.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: N/A

3. PREPARATION INSTRUCTIONS:

Format:

The required Aircraft Parts, Instruments and Avionics list may be prepared in the Bidder's format and provided in MS Excel.

Requirements:

The Bidder shall identify the Aircraft Parts, Instruments and Avionics to be ordered from the Helicopter OEM that are required for the development and the commissioning of the Full Flight Simulator (FFS) in the defined configuration of the 429 and 412 EPI cockpits.

The list must identify when the parts are required based on the FFS project schedule.

This list will be used by Canada prior to contract award for the Full Flight Simulator to support advance ordering of long lead items from the Helicopter OEM.

Deliverables:

Bid Proposal

The bid proposal must contain a detailed list of Aircraft Parts, Instruments and Avionics that must be ordered from the Helicopter OEM. The list shall be provided in accordance with Part 3 of the RFP – Bid Preparation Instructions.

Preliminary Design

One (1) electronic copy of the Aircraft Parts, Instruments and Avionics list is to be provided to Canada if the list has been revised from that submitted at bid.

Critical Design

One (1) electronic copy of the Helicopter OEM Parts, Instruments and Avionics list is to be provided to Canada if there are any revisions to the list from Preliminary Design.

DID T-015 Satellite Imagery and Terrain Data

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for the Satellite Imagery and Terrain Data deliverables to the Contractor.

2. ATTACHMENTS and APPLICABLE REFERENCES:

Attachments: N/A

References: T-008

3. PREPARATION INSTRUCTIONS:

Format:

The satellite imagery and terrain data shall be in a digital format recommended by the Contractor and agreed to by Canada.

Requirements:

The Contractor must provide the raw satellite imagery, terrain and elevation data, as well as any related photographs, collected as part of the Work.

Deliverables:

Qualification Testing

The Contractor must present to Canada all of the satellite imagery and terrain data, as well as any photographs developed as part of the Work.

DID T-016 Vertical Reference Training Capability

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for a report describing the Contractor's approach to providing a vertical reference training capability.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: N/A

3. PREPARATION INSTRUCTIONS:

Format:

The Vertical Reference Capability Report shall be prepared in the Bidder's format.

The Vertical Reference Report must be provided in a searchable PDF format for all versions prior to the final version. The final version must be provided in both Microsoft Word and PDF files.

All drawings must be provided as .dwf or .dwg files.

Requirements:

The Bidder should provide a report detailing their approach to providing a vertical reference training capability within the FFS for both the Bell 429 and 412EPI cockpits to meet the desirable requirement for the provision of vertical reference training.

The report should explain the Bidder's solution at an appropriate level of technical detail clearly demonstrating how the solution will meet CCG's training requirements. The report should also clearly describe the maturity of the design and engineering work related to the solution. If available, drawings and/or pictures should be used to illustrate the narrative and provide the reader with a clearer understanding of the solution.

If applicable, recent and relevant experience providing a similar solution should be used to substantiate the Bidder's ability to provide an effective training capability that meets CCG

requirements. The specifics of the experience must be integrated directly into the narrative response.

Following the bid submission process, work on the design of the vertical reference solution - should the contract option be selected - will be captured as part of the overall Simulator Configuration deliverables described in DID T-007 Simulator Configuration.

Deliverables:

Bid Proposal

The Vertical Reference Training Capability Report should be provided in accordance with Part 3 of the RFP – Bid Preparation Instructions.

DID T-017 Innovation Proposal

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for an Innovation Proposal.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: CCG Mission Profiles, CCG Mission Training Scenarios.

3. PREPARATION INSTRUCTIONS:

Format: The CCG Innovation Proposal must be in the Bidder's format.

The final version of the Innovation Proposal must be provided in both Microsoft Word and PDF files.

Applicable drawings must be provided as .dwf or .dwg files.

Requirements:

Bidders may propose an innovative solution. This provides bidders with the opportunity to suggest something based on their understanding of CCG's training needs. This could be in the form of technology or training innovations not requested that could be beneficial to the current training program, either in the present or in the near future. The proposed innovations should further the goals and objectives of providing effective regulatory and mission based training to CCG personnel in support of the operation of the CCG Bell 429 and CCG Bell 412EPI aircraft. The proposal should be consistent with and fully support the Full Flight Simulator Concept of Operations.

Emphasis should be placed on current training needs as described in the CCG Mission Profiles and Mission Training Scenarios and related documents as well as an understanding that this is a long term project with an expected lifespan of 30 years. The report should explain at an appropriate level of technical detail how the Bidder's proposed submission will provide innovation appropriate to the above goals. If available, drawings and/or pictures should be used to illustrate the narrative and provide the reader with a clearer understanding of the narrative.

If applicable, recent and relevant experience providing this type of innovation in a similar project or projects should be used to substantiate the capability to provide the capability described in this DID. The specifics of the experience must be integrated directly into the narrative response.

The information provided in response to this DID should provide insight as to how the proposed technological innovation will be integrated into the existing training programs. If the technology described is either new or still being developed, the response should provide supporting information validating that the innovation will be ready to be integrated into the solution, and with minimal risk, by the time of delivery.

Bidders should be cognizant of the requirements of the new building construction which forms part of the in the development of this report.

Deliverables:

Bid Proposal

The CCG Technology Innovation Proposal should be provided in accordance with Part 3 of the RFP – Bid Preparation Instructions.

DID ETA-001 Acceptance Test Plan (ATP)

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for the Acceptance Test Plan (ATP) to the Contractor.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: ETA-002, ETA-003, M-002

3. PREPARATION INSTRUCTIONS:

Format:

The ATP must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The ATP must be provided in a searchable PDF format for all versions prior to the final version. The final version of the ATP must be provided in both Microsoft Word and PDF files.

Requirements:

The ATP must present the Contractor's plans to perform all Acceptance Tests so that the FFS is ready for In-Plant Acceptance Testing (IPAT), On-Site Acceptance Testing (OSAT), and Qualification testing.

The ATP must cover both the CCG Bell 429 and CCG Bell 412EPI simulated cockpits.

The ATP must demonstrate how the Contractor will meet both regulatory requirements and CCG FFS Baseline Statement of Technical Requirements.

The Simulator ATP must address the following, as a minimum:

- a. Introduction and Objectives
- b. Acceptance Schedule

- c. Acceptance Methodology
- d. Acceptance Team Roles and Responsibilities

The Contractor's deliverables for the ATP should be clearly linked to the deliverables for the Acceptance Test Manuals (DID ETA-002).

The ATP must include plan for Test Readiness Review(s) prior to In-Plant Acceptance Testing (IPAT). The Test Readiness Review is addressed further in DID ETA-002.

Specific milestones in the Acceptance Schedule within the ATP must be noted for:

- a. Test Readiness Review
- b. IPAT
- c. OSAT
- d. Qualification

The Acceptance Schedule must be reflected in the Master Project Schedule (DID M-002).

Deliverables:

Preliminary Design

The Contractor must provide one (1) electronic copy of the draft ATP.

Critical Design

The Contractor must provide one (1) electronic copy of the final ATP.

DID ETA-002 Acceptance Test Manuals

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for the Acceptance Test Manuals (ATMs) to the Contractor.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: ETA-001, T-001

3. PREPARATION INSTRUCTIONS:

Format:

The ATMs must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The ATMs must be provided in a searchable PDF format for all versions prior to the final version. The final version of the ATMs must be provided in both Microsoft Suite format and PDF files.

The Test Readiness Review report must be provided in both Microsoft Suite format and PDF files.

The In-plant and On-site Acceptance Test Reports must be provided in both Microsoft Suite format and PDF files.

Requirements:

Separate ATMs must be prepared for each simulated cockpit. The ATMs must contain the performance, handling, functional and operational tests for both the CCG Bell 429 and the CCG Bell 412EPI simulated cockpits.

The ATMs must include the tests necessary to ensure compliance with the FAA Part 60 regulatory requirements for qualification to FFS Level D.

The ATMs must include the tests to be carried out in order to demonstrate compliance with the specifications as defined in

the CCG FFS Baseline Statement of Technical Requirements.

The cross reference between the technical requirements and the ATM(s) must be clearly presented within the Compliance Matrix (T-001).

The results from performing the acceptance tests must be captured as Acceptance Test Reports to be provided as a final deliverable under this DID. The Contractor must provide separate Acceptance Test Reports for each simulated cockpit.

Preliminary Design

The Contractor must provide an outline for each ATM.

Critical Design

The Contractor must provide draft ATMs.

Test Readiness Review (TRR)

The Contractor must perform a Test Readiness Review (TRR) prior to IPAT using the ATMs. The Contractor must provide a TRR report indicating the results of the tests for both simulated cockpits. The TRR report must indicate deficiencies as well as proposed timelines to rectify them.

The Contractor must provide the final ATMs and the TRR report no later than 14 days prior to IPAT.

The Contractor should provide evidence in the TRR report that sufficient spares are available and on hand to complete the IPAT without undue interruption due to faults with equipment.

In-plant Acceptance Testing (IPAT)

The Contractor must provide support to Canada to run the ATM for each simulated cockpit.

The Contractor must supply the completed In-plant Acceptance Test Reports within 7 days following completion of IPAT.

On-site Acceptance (OSAT)

The Contractor must provide support to Canada to run the ATM for each simulated cockpit.

The Contractor must supply the completed On-site Acceptance Test Reports within 7 days following completion of OSAT.

Deliverables:

Preliminary Design

The Contractor must provide one (1) electronic copy of an outline for each ATM.

Critical Design

The Contractor must provide one (1) electronic copy of the draft for each ATM.

Test Readiness Review

The Contractor must provide one (1) electronic copy of the Test Readiness Report. The Contractor must provide one (1) electronic copy of the final ATMs.

IPAT

The Contractor must provide one (1) electronic copy of the In-plant Acceptance Test Report.

OSAT

The Contractor must provide one (1) electronic copy of the On-site Acceptance Test Report.

DID ETA-003 Qualification Test Guides

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for the Qualification Test Guides (QTGs) to the Contractor.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: ETA-001, ILS-004

3. PREPARATION INSTRUCTIONS:

Format:

The QTGs shall be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

All versions of the QTGs must be provided in a searchable PDF format.

Requirements:

QTGs shall be prepared for the Bell 429 and CCG Bell 412EPI simulated cockpits.

The QTGs must be developed in accordance with the FAA part 60 requirements for rotorcraft and must include at a minimum the elements described in 11. Initial (and Upgrade) Qualification Requirements (§ 60.15).

The QTGs must demonstrate the FFS is compliant with FAA Part 60 regulatory requirements for TC Level D qualification and specifications as defined in the CCG FFS Baseline Statement of Technical Requirements.

Preliminary Design

The Contractor must provide an outline for each QTG.

Critical Design

The Contractor must provide draft QTGs.

In-Plant Acceptance Testing (IPAT)

The Contractor must supply the final QTGs with test results for approval 30 days prior to IPAT.

The Contractor must perform the entire QTGs during IPAT.

On-site Acceptance (OSAT)

The Contractor must perform the entire QTGs during OSAT.

Regulatory Review

The Contractor must provide the final QTGs 30 days prior to OSAT.

On-Site Qualification Evaluation

The Contractor must support the performance of the QTGs during the Regulatory Qualification, as required by the regulator.

The Contractor must provide Master QTGs, including Transport Canada National Simulator Program review changes seven (7) days following the Qualification Evaluation.

Deliverables:

Preliminary Design

The Contractor must provide one (1) electronic copy of an outline of the QTGs for each simulated cockpit.

Critical Design

The Contractor must provide one (1) electronic copy of the draft QTGs for each simulated cockpit.

30 days prior to IPAT

The Contractor must provide one (1) electronic copy and a searchable PDF file of the QTGs for each simulated cockpit.

30 days prior to OSAT

The Contractor must provide one (1) electronic copy and a searchable PDF file of the updated QTGs for each simulated cockpit, including the results from IPAT.

Qualification Evaluation

The Contractor must provide one (1) electronic copy of the Master QTGs, for each simulated cockpit, in PDF seven (7) days following the Qualification Evaluation.

DID ILS-001 Maintenance Programs

1. PURPOSE of DID:

The purpose of this DID is to define for the Contractor the requirements for the Maintenance Programs.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: N/A

3. PREPARATION INSTRUCTIONS:

Format:

The Maintenance Program shall be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Maintenance Program documentation must be provided in a searchable PDF format for all versions prior to the final version. The final version must be provided in both Microsoft Word and PDF files.

Requirements:

Separate Maintenance Programs must be prepared for the CCG Bell 429 and CCG Bell 412EPI simulated cockpits.

Canada's Maintenance Analysis and Planning System manages simulator configuration control, discrepancy reports, maintenance tasks and parts inventory and provides a common process for tracking pilot and technician log book entries. The Contractor's Maintenance Program must take into account the above information. Specific attention must be given in the Maintenance Program to the update and maintenance of the visual content of the Operational Training Areas (OTAs).

Deliverables:

Preliminary Design

The Contractor must provide one (1) electronic copy of the preliminary Maintenance Program.

Critical Design

The Contractor must provide one (1) electronic copy of the revised Maintenance Programs.

In-Plant Acceptance Testing (IPAT)

The Contractor must provide one (1) electronic copy of the final Maintenance Programs ten (10) days prior to IPAT.

DID ILS-002 Product Support Plan

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for the Product Support Plan to the Contractor.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: N/A

3. PREPARATION INSTRUCTIONS:

Format:

The Product Support Plan must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Product Support Plan must be provided in a searchable PDF format for all versions prior to the final version. The final version of must be provided in both Microsoft Word and PDF files.

Requirements:

The Product Support Plan must describe the structure of technical and onsite support available to Canada during the warranty period and once the simulator is in-service. For additional clarity, post warranty support is outside the scope of this contract. The Product Support Plan is intent to define to Contractor's approach to product support that Canada could contract for in the future. The plan must address the following items, as a minimum:

- a. Routine and emergency parts procurement
- b. Customer Service Representation and Structure
- c. Technical Support (AOG, 24/7, warranty, discrepancy reporting and tracking, customer query response, knowledge database, etc.)

- d. On-site Technical Support (Mobile Repair Party, Field Service Representative, data-link, etc.)
- e. FFS improvements (updates, services bulletins, service letters, advisories, etc.)
- f. Repair status updates (turn round times for repair or overhaul, etc.)

Deliverables:

Bid Proposal

The bid proposal must contain the proposed Product Support Plan provided in accordance with Part 3 of the RFP – Bid Preparation Instructions.

DID ILS-003 Training Plan

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for the Training Plan to the Contractor.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: DID M-001, ILS-001, ILS-002, ILS-004

3. PREPARATION INSTRUCTIONS:

Format:

The Training Plan shall be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Training Plan and associated training materials must be provided in a searchable PDF format for all versions prior to the final version. The final version must be provided in both MS Word and PDF files. Where applicable, slides must be provided in MS PowerPoint.

Requirements:

The Training Plan must include training programs for the operation and maintenance of the FFS and must include, where applicable, differences between the Bell 429 and Bell 412EPI simulated cockpits.

The Training Plan must include training programs for:

- a. Pilot and aircraft maintenance instructors
- b. Simulator technicians
- c. Simulator technical leads

Pilot and Aircraft Maintenance Instructors Training

The Contractor must provide courses for pilot and aircraft maintenance instructors. A maximum of ten (10) pilot and

aircraft maintenance instructors will be required to be trained. The instructors will possess an Airline Transport or Commercial Pilot License (ATPL) or an Aircraft Maintenance Engineer (AME) License.

The Contractor must provide one (1) pilot and aircraft maintenance instructor training course in plant prior to IPAT and two (2) pilot and maintenance instructor courses at the TC ASD Training Center, after the CCG FFS has been qualified by the TC NSP and is RFT.

A combination of theory and practical training must be provided to ensure the candidate has a thorough knowledge of the instructional functionality and installed equipment, including how to select and utilize various aircraft systems, simulator operation and all other aspects of training.

The pilot and maintenance instructor training must include the following as a minimum:

- a. Theory of operation of simulator functions
- b. IOS including, but not limited to the Lesson Plan Builder (LPB) and Brief/Debrief stations
- c. Basic motion and control loading system operations
- d. Visual system, aircraft configuration, malfunctions and environment (weather, moving models,...) set-up and control
- e. Emergency and safety procedures

The instructor training program must include a training and syllabus package for the FFS components, IOS, Visual system, LPB and all other associated instructional tools and functionalities.

Simulator Technician Training

The Contractor must provide courses for simulator technicians. A maximum of eight (8) simulator technicians will be required to be trained.

The Contractor must provide one (1) simulator technician course in plant prior to IPAT and one (1) simulator technician

courses at the TC ASD Training Center after the CCG FFS has been qualified by the TC NSP and is RFT.

A combination of theory and practical training must be provided to ensure the candidate has a thorough knowledge of the simulator and its installed equipment, to be able to perform daily simulator maintenance and repair simulator systems.

The simulator technician training will include the following subjects, as a minimum:

- a. Introduction to FFS equipment
- b. Computer and equipment hardware
- c. Instructor facilities
- d. Interfaces
- e. Motion & control loading hardware
- f. Power distribution & control
- g. Simulator operating procedures
- h. Visual system
- i. Software support

Advanced Simulator Technician Training

The Contractor must provide an advanced engineering and maintenance technician training courses for lead simulator technicians. A maximum of four (4) lead simulator technicians will be required to be trained.

The Contractor must provide one (1) advanced simulator technician training course in plant prior to IPAT and one (1) advanced simulator technician courses at the TC ASD Training Center, after the FFS has been qualified by the TC NSP and is RFT.

A combination of theory and practical training must be provided to ensure the candidate has a thorough knowledge of the simulator and its installed equipment, to be able to maintain, modify, update and repair simulator systems.

The advanced simulator technician training will include the following subjects, as a minimum:

- a. Enhanced simulator maintenance and technical support
- b. Simulation program development and modification
- c. Host and visual interfaces
- d. Enhanced software support training: computer operating software – executive software – maintenance utilities – data development utilities – authority approval tests
- e. Aircraft cockpits to be simulated
- f. Engineering Maintenance and technical support training on simulated training device (STD) and manufactured systems (Brief and debrief system, FFS interactive systems and CPT)

Documentation

The Contractor must include the following documentation for pilot and aircraft maintenance instructor, and simulator technician and advanced technician training:

- a. Complete training programs in hard copy and electronic format that is editable
- b. A complete training program in hard copy for all students attending training
- c. A complete training syllabus for all training programs

The Contractor must provide Canada with a written release and any other license or authorization necessary to permit Canada to update, refine, translate, reproduce and use the Contractor provided training material so that Canada may conduct its own initial and recurrent instructor training.

Deliverables:

Preliminary Design

One (1) electronic copy of the Contractor's Preliminary Training Plan including training syllabus and materials' in PDF and one (1) electronic copy in Word are to be provided to Canada.

Critical Design

One (1) electronic copy of the Contractor's Final Training Plan including training syllabus and materials in PDF and one (1) editable electronic copy in Word, one (1) editable electronic copy in MS PowerPoint, are to be provided to Canada.

One (1) electronic copy of the written release in PDF is to be provided to Canada.

IPAT

One (1) hard copy of the Contractor's Final Pilot and Maintenance Instructor, and Technician and Advanced Technician training materials for each student are to be provided prior to the start of the training.

DID ILS-004 Spares, Tools, and Special Equipment List

1. PURPOSE of DID:

The purpose of this DID is to identify the requirements for the Spares, Tools, and Special Equipment List to the Contractor.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: ILS-001, ILS-002, ILS-003, ETA-002, ETA-003

3. PREPARATION INSTRUCTIONS:

Format:

The recommended Spares, Tools, and Special Equipment list must be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Spares, Tools, and Special Equipment list must be provided in MS Excel.

Requirements:

The recommended Spares, Tools, and Special Equipment lists must be developed based on achieving CCG's availability and reliability requirements. Special Equipment is defined as non-standard equipment unique to the FFS based on the specification and configuration.

The recommended Spares, Tools and Special Equipment lists must include those items required to minimize the time from an Aircraft on Ground (AOG) condition to resume a Ready for Training (RFT) state.

The lists must include pricing, delivery and vendor/manufacturer details. The lists must indicate which spares, tools and equipment are common to both cockpits.

The proposed sparing list must address the following elements as part of the rationale for the proposed items:

- a. Mean Time Between Failures (MTBF)

- b. Mean Time to Repair (MTTR)
- c. Turn Around Time (TAT) for repairs and or calibration

The Spares list must also identify multiple supply sources for any recommended spares, if available.

For special equipment, the lists must cover the Contractor's own list and equipment originating from third party Original Equipment Manufacturer (OEMs). This includes the following, as a minimum:

- a. Test equipment used for testing hardware and/or software devices
- b. Tools required for the repair and overhaul of the critical components for each simulator system.

Documentation of third party special tool and test equipment should be provided in accordance with DID T-009 Technical Documentation Package.

Calibration of any spares or tools must be validated by current certificates, etc. before test equipment is used to verify device performance. Current and valid Calibration certificates must accompany all applicable Tools and Test Equipment provided in the contract.

Bid Proposal

The bid proposal must contain separate recommended Spares, Tools, and Special Equipment lists for the CCG Bell 429 and Bell 412EPI simulated cockpits.

Preliminary Design

The Contractor must work with Canada to provide updated Spares, Tools, and Special Equipment lists for each CCG Bell 429 and Bell 412EPI simulated cockpits.

Critical Design

The Contractor must deliver the final Spares, Tools, and Special Equipment lists.

Deliverables:

Bid Proposal

The bid proposal must contain recommended Spares, Tools, and Special Equipment lists for each CCG Bell 429 and Bell 412EPI simulated cockpits to be provided in accordance with Part 3 of the RFP – Bid Preparation Instructions.

Preliminary Design

The Contractor must provide one (1) revised electronic copy of the updated Spares, Tools, and Special Equipment lists.

Critical Design

The Contractor must deliver one (1) final electronic copy of the Spares, Tools, and Special Equipment lists.

DID FR-001 Site Survey

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Site Surveys.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: DID FR-002

3. PREPARATION INSTRUCTIONS:

Format:

The Site Survey documentation shall be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

Site Survey Report must be provided in a searchable PDF format for all versions prior to the final version. The final version of the Site Survey Report must be provided in both Microsoft Word and PDF files.

Drawings must be provided as .dwf or .dwg files.

Requirements:

The Contractor must provide a Site Survey Report to demonstrate that the proposed Full Flight Simulator (FFS) as described in the CCG FFS Baseline Statement of Technical Requirements can be housed in Transport Canada Aircraft Services Directorate (TC ASD) training facility.

The Site Survey Report must contain a completed checklist validating that the training facility has all provisions necessary to install and operate the equipment.

The Site Survey Report must include the following, as a minimum:

- a. Space Envelope Assessment
- b. Mezzanine location, height, and load bearing requirements
- c. Computer Room Requirements
- d. Mechanical Considerations
- e. Electrical Considerations
- f. HVAC, water supply, air supply Considerations
- g. Fire Protection Considerations
- h. Environmental Requirements
- i. Detailed Infrastructure Requirements
- j. An overlay of the Contractor's FFS drawings on to the site drawings

Any limitations must be identified in the Site Survey Report.

The Contractor must update the Site Survey Report following every site survey. The updates must identify resolved issues and any new or ongoing discrepancies.

The Final Site Survey Report must contain a complete Site Layout that identifies the final configuration of the FFS in the allocated space.

The Site Layout must identify at a minimum:

- k. Equipment layout, computer room layout
 - a. Weight distribution
 - b. Power distribution
 - c. HVAC distribution

The Contractor must ensure that the final Site Survey Report is fully integrated with the final Installation Plan generated in accordance with DID FR-002 Installation Plan.

Bid Proposal

The bid proposal must contain a preliminary Site Survey Report based on the information and design drawings provided as part of the RFP package.

The bid proposal must contain a Site Survey Report to demonstrate that the proposed Full Flight Simulator (FFS) as described in the CCG FFS Baseline Statement of Technical Requirements can be housed in Transport Canada Aircraft Services Directorate (TC ASD) training facility.

In addition, the Site Survey Report must provide a preliminary assessment of any mechanical or electrical limitations that would need to be addressed with Canada.

Preliminary Design

Based on the site visit to take place 1-2 months following Contract Award, the Contractor must provide a complete and comprehensive updated Site Survey Report.

Critical Design

Following Preliminary Design, the Contractor must provide a complete and comprehensive Site Survey Report that includes the Site Layout.

Following delivery of the Site Survey Report during Critical Design, the work under this DID transitions into the Installation Plan (DID FR-002). The Contractor must ensure that there are no outstanding issues with the site that will delay installation.

Deliverables:

Bid Proposal

One (1) electronic copy of the preliminary Site Survey Report along with all relevant drawings must be provided at bid in accordance with Part 3 of the RFP – Bid Preparation Instructions.

Preliminary Design

The Contractor must provide one (1) electronic copy of the Site Survey Report in PDF along with all relevant drawings.

Critical Design

The Contractor must provide one (1) electronic copy of the Final Site Survey Report in PDF along with all relevant drawings.

DID FR-002 Installation Plan

1. PURPOSE of DID:

The purpose of this DID is to identify to the Contractor the requirements for the Installation Plan.

2. ATTACHMENT and APPLICABLE REFERENCES:

Attachments: N/A

References: DID FR-001, DID ILS-004

3. PREPARATION INSTRUCTIONS:

Format:

The Installation Plan and any related drawings shall be prepared in the Contractor's format. The format must be reviewed and accepted by Canada.

The Installation Plan must be provided in a searchable PDF format for all versions prior to the final version. The final version of the Installation Plan must be provided in PDF files.

Drawings must be provided as .dwf or .dwg files.

Requirements:

The Contractor must prepare an Installation Plan indicating to Canada the plan and personnel to be used for the tear down, pack, and ship of the Full Flight Simulator (FFS) as it is relocated from plant to the site and installed at Transport Canada Aircraft Services Directorate (TC ASD).

The Installation Plan must reflect the Site Layout as per the Site Survey Report (DID FR-001).

All activities related to the installation of the FFS at TC ASD to be fully operational to perform OSAT are the responsibility of the Contractor.

The Installation Plan must identify all required site installation work, including at a minimum:

- a. Installation Schedule: a day-by-day break down of the installation events.
- b. Safety Plan: That meets all the local and national requirements of Canada.
- c. Installation Equipment: a complete list of equipment required by the Contractor.
- d. Interface requirements: all mechanical, electrical, water supply, HVAC.
- e. Special Arrangements: As a result of the final Site Survey.
- f. Required Specialists/Tradesmen: Names and field of work of licensed personnel.
- g. Permits/Inspections: All work permits and associated inspections must clearly be identified. These will be witnessed by Canada but are under the sole responsibility of the Contractor.
- h. Liabilities/Insurance: The Contractor must provide the required documentation as stated in the terms and conditions of the contract. All liabilities in the move and installation must be identified in advance.
- i. Disposal of waste.
- j. Security Clearances: The names and security clearance information of any personnel supporting the install and delivery of the FFS to TC ASD.

This list must be in accordance with the requirements described in the final Site Survey Report provided as part of DID FR-001 Site Survey.

The Contractor must ensure to be equipped with the sufficient quantities of spares, tooling and equipment to perform the installation in a timely manner (DID ILS-004).

Preliminary Design

The Contractor must provide a preliminary Installation Plan.

Critical Design

The Contractor must provide an updated Installation Plan.

In-Plant Acceptance Testing (IPAT)

Following the final Site Survey and formal confirmation that TC ASD is ready for the FFS, the Contractor must provide the final Installation Plan.

Deliverables:

Preliminary Design

The Bid Proposal must provide one (1) electronic copy of the preliminary Installation Plan.

Critical Design

The Contractor must provide one (1) electronic copy of the updated Installation Plan.

IPAT

The Contractor must provide one (1) electronic copy of final Installation Plan for the FFS.

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Object Number	Requirements	Desirable Requirements	Design Guidance
1	1 REGULATORY AND QUALIFICATION REQUIREMENTS		
1.0-1	The Full Flight Simulator (FFS) must be qualified to Level D for operation in Canada by the Transport Canada National Simulator Program (NSP), in accordance with standards described in the latest revision of the FAA 14 CFR Part 60 criteria.		CCG will request the NSP office to use FAA 14 CFR Part 60 criteria as an alternate means of compliance for the qualification of the CCG FFS.
1.0-2	The FFS must have one motion platform and visual system with convertible cockpits for the CCG Bell 429 helicopter and the CCG Bell 412EPI helicopter, and must be qualified to Level D for both cockpits in accordance with 1.0-1.		The FFS will be used to support training on both cockpits.
1.0-3	The (5) Operational Training Areas (OTAs) described in Attachment 1 and mandatory airports must be qualified in accordance with the standards described in 1.0-1.		The OTAs are defined in section 2 and the mandatory airports are described in section 7.3.
1.0-4	The FFS performance and handling qualities of both simulated aircraft must meet the requirements described in 1.0-1 in the course of objective and subjective evaluation training and testing for CCG Mission Training Scenarios.		Non-unique elements in the functions and subjective testing need only be demonstrated once. For instance, APU/GPU/engine start and run-up does not need to be retested for each OTA.
1.0-5	The FFS must be qualified to provide approved training for Night Vision Imaging System (NVIS) flight operations utilizing Transport Canada approved NVG (Night Vision Goggles) for all scenes, in accordance with the latest version of FAA AFS-205 National Simulator Program Flight Simulator Training Device Qualification Guidance entitled Night Vision Goggle Evaluation for Helicopter Flight Simulation Training Device (latest revision of Guidance number 10-01).		

Object Number	Requirements	Desirable Requirements	Design Guidance
2	2 MISSION REQUIREMENTS		
2.0-1	The Operational Training Areas (OTAs) described in Attachment 1 must be used to define and amplify the visual system requirements standards described in the latest revision of the FAA 14 CFR Part 60 criteria.		Attachment 1 (OTAs) describes in detail the way pilots in training should experience the synthetic training environment, characteristic manoeuvres that are demanded by the environment, and describes interdependencies.
2.0-2	The FFS OTAs must be created using the specified geographical locations to the specified dimensions and with corresponding environmental features, as per the maps and descriptions provided in Attachment 1.		The FFS Coastal, Offshore, Mountain, Onshore, Arctic OTAs should all be in accordance with the description provided in Attachment 1.
2.0-3	Removed		
2.0-4	Removed		
2.0-5	Removed		
2.0-6	Removed		
2.0-7	Removed		
2.0-8	Not Used		
2.0-9	Removed		
2.0-10	The FFS must provide high resolution imagery for flight in the OTAs that captures resolution to within 50 cm at surface level, as a minimum, for the entire geographical area within each OTA.		This does not include areas covered by water.
2.0-10.0-1		The FFS visual database should cover the entire contiguous land mass of Canada for all areas outside of the OTA boundaries.	This will provide for the ability to transition between OTA environments. Satellite imagery and terrain and elevation data will be provided, where available, by Canada following Contract Award, if required by the Contractor.

Object Number	Requirements	Desirable Requirements	Design Guidance
2.0-11	The FFS must provide 3D imagery for the entire geographical surface area within each OTA.		3D vegetation (trees, forestation) and 3D man-made features should be "representative" of the geographical area.
2.0-12	The FFS must provide accurate representation of terrain and elevation data for the entire geographical surface area within each OTA.		
2.0-13	The FFS must provide the capability for the helicopter to interact with natural and manmade hard surfaces and react accordingly.		<p>It is important for training purposes that the interaction caused by the helicopter making contact with a hard object simulates the impact of such an effect were it to occur in the real world (trees, buildings, hangar deck, wooden pads, etc.).</p> <p>It should not be possible for the helicopter to move through objects. It should not be possible for the helicopter to fall through ground when landing because scene content has not been developed.</p>

Object Number	Requirements	Desirable Requirements	Design Guidance
2.0-14	The FFS must provide high resolution imagery for flight in the OTAs that captures resolution to within 10 cm at surface level at a radius of 2km for six (6) geographical points within each OTA.		<p>CCG helicopters frequently operate at altitudes below 200 feet during mission work.</p> <p>The full list of geographical points will be developed after contract award. In the interim, a preliminary list has been provided as part of the current OTAs document.</p> <p>High resolution areas should be built with smooth terrain transitions, with no repetitive patterns. Where high resolution geo-representative textures are used to cover large areas, these should be used without compromising on the texture resolution.</p> <p>Geo-typical full-colour photo-texture should be used to replicate topographical and cultural features</p>
2.0-14.0-1	The six (6) geographical scenes must be in accordance with the visual requirements for Class 1 scenes as defined Table C3B of the current version of FAA Part 60 for a Level D FSTD.		

Object Number	Requirements	Desirable Requirements	Design Guidance
2.0-15	The FFS must include the following airports: Victoria, British Columbia (including Victoria Harbour); Prince Rupert, British Columbia; Halifax, Nova Scotia; Vancouver, British Columbia; Ottawa, Ontario; Montreal, Quebec; Trois-Rivières, Quebec; Iqaluit, Nunavut; Bella Bella, British Columbia; St. John's, Newfoundland; Sandspit, British Columbia; Quebec City, Quebec; and Resolute Bay, Nunavut.		These airports provide all standard instrument approaches as well as GPS, LPV, and RADAR assisted approaches. Five of the airports listed are incorporated into the 5 OTAs as follows: <ul style="list-style-type: none"> • Coastal - Bella Bella, BC (CBBC) • Offshore - St. John's, NL (CYJT) • Mountain - Sandspit, BC (CZFP) • Onshore - Quebec City, QC (CYQB) • Arctic - Resolute Bay, NU (CYUT)
2.0-15.0-1	The FFS must have level D qualified scenes that meet the requirements for Class 1 scenes as defined in Table C3B of the current version of FAA Part 60 for Level D FSTDs for the mandatory airports.		
2.0-16	The FFS must provide the capability to conduct reconnaissance, approach, and manoeuvre to land and take off anywhere in the synthetic training environment where it would be possible to do so in the real-world geo-specific OTA environments.		
2.0-16.0-1	The fidelity of the visual scenes must be sufficient for the aircrew to visually identify the helicopter landing area; determine the position of the simulated helicopter within the visual scene; and manoeuvre on or near the ground, or hover taxi, as necessary.		Maintaining effective situational and spatial awareness when operating close to the ground or obstructions is critical.
2.0-16.0-2	The fidelity of the visual scenes must also provide the visual cues necessary to allow the pilot(s) to discern detail and rate of change representative of the helicopter movement (drift) and attitude, and altitudes being flown for all OTAs.		The scenes should be capable of portraying the physical relationships known to cause landing illusions to pilots. These illusions can be caused by apparent rate of closure, rate of descent, and relative altitude of selected landing sites. These illusions can be more prevalent in mountainous terrain and in offshore operations.

Object Number	Requirements	Desirable Requirements	Design Guidance
2.0-17	The FFS must provide representations of water in the OTAs that behave appropriately to the specified wind direction, speed and sea states up to Sea State 6 of Beaufort Scale. The following features must be depicted, as a minimum:		Pilots will be trained in the FFS to recognize when limits to flight operations have been reached and/or exceeded. This is important as CCG helicopters normally only land on CCG vessels in conditions up to Sea State 4.
2.0-17.0-1	-Whitecaps, wind lines, and possibly spindrift (or blowing spray) must be visible in moderate to high wind conditions.		
2.0-17.0-2	-Waves must be seen crashing against shorelines and must be appropriate for the corresponding wind speed and sea state.		
2.0-17.0-3	-Spray associated with the helicopter downwash when the helicopter is in a low hover over or manoeuvring over the water.		This includes cases where floatation gear is deployed.
2.0-17.0-4	-Glassy water conditions generated as a result of 0 wind conditions and flat seas.		This will result in a reflective condition on the water where it is extremely difficult for the pilot to determine their height above the surface.
2.0-18	The FFS must recreate sea ice and ice movement appropriate to the geographical area, including dynamic interaction between ice and the applicable sea state.		CCG ice breakers routinely operate in areas of varying ice coverage
2.0-18.0-1	There must be representative interaction between the ice and a moving CCG icebreaker.		
2.0-19	The FFS must provide representations of water in the OTAs that behave appropriately to the effect of rotor downwash, which must in turn be affected by the prevailing wind.		
2.0-20	The FFS must be capable of depicting variable sun angles appropriate to the time of day, seasonal variation, and geographic location within the OTAs.		

Object Number	Requirements	Desirable Requirements	Design Guidance
2.0-21	The FFS must provide representations of land environments in the OTAs that behave appropriately to the effect of rotor downwash, which must in turn be affected by the prevailing wind.		
2.0-21.0-1	-Meadows, trees, branches, leaves, and blades of grass should be discernable in appropriate detail for the proximity of the aircraft, including for confined areas.		This is of key importance for the six (6) geographical points within each OTA, which are addressed in requirement 2.0-14. The correlation between the movement of such environmental features and the corresponding environmental conditions provide important cues for pilots.
2.0-22	The FFS visual database must contain Computer Generated (CG) models for 3 CCG vessels consisting of the Wilfrid Laurier, the Pierre Radisson, and the Louis St.Laurent icebreakers. The following features, at a minimum, must be depicted:		Corresponding IOS capability for controlling these vessels is defined in requirement 8.1.0-33.
2.0-22.0-1	-Accurately modelled landing pad, hangar, portholes, stairs, railings, antennas, rotating radar antennas, flags, lines denoting ship plating joints, cranes, anchors and anchor chains, navigation lights, life boats, etc.		
2.0-22.0-2	-Wind and airflow around the ship structure must be accurately modelled.		Airflow around the ship, particularly at high wind speeds, plays an important role in safe shipboard operations and therefore must be accurately depicted as it affects the operation of the helicopter.
2.0-22.0-3	-Vessel movement in three directions - pitch, heave, and roll - must appropriately respond to the sea state.		CCG flight operations normally cease in sea conditions that exceed Beaufort Scale 5 with winds over 45 knots. The FFS must be capable of simulating sea state 6 conditions so that pilots will be able to recognize when this limit is reached.
2.0-22.0-4	-Smoke from the engine exhaust of the ship must be visible and respond to the direction of the ship and the prevailing wind.		
2.0-22.0-5	-The bow wave and wake of the ship must be accurately depicted.		

Object Number	Requirements	Desirable Requirements	Design Guidance
2.0-23	The FFS visual database must contain CG models for one CCG Bell 429 and one CCG Bell 412EPI helicopter which can be set in motion and controlled via the IOS and Lesson Plan Builder to reflect realistic environments. The quality of the rendering of these objects must be equivalent to that of the scene in which they are found and must reflect the actual configuration of the CCG helicopters. Models must be rendered accurately in day and night conditions.		These CG models can be set in motion and controlled via the IOS and Lesson Plan Builder as per requirement 8.1.0-33.
2.0-24	The FFS visual database must produce multiple Computer Generated Objects (CGOs) to reflect realistic environments as outlined in the OTAs in Attachment 1. The quality of the rendering of these objects must be equivalent to that of the scene in which they are found. Objects must be rendered accurately in day and night conditions. As a minimum, these objects must include the following:		It is anticipated there would be a maximum of 50 moving objects. These objects can be set in motion from either the IOS or through the Lesson Plan Builder as per requirement 8.1.0-34.
2.0-24.0-1	-Generic ships appropriate to the OTA such as the following, either individually or in combination: cargo ships, tugboats, tugboats towing log booms, tugboats towing barges on a long cable, commercial fishing vessels, and small cruise ships.		
2.0-24.0-2	-Generic aircraft appropriate to the OTA such as the following, either individually or in combination: commercial aircraft, multi-engine commuter aircraft, float planes, and helicopters.		
2.0-24.0-3	-Generic vehicles appropriate to the OTA such as the following, either individually or in combination and with people appropriately visible in the vehicle: cars, trucks, buses, ambulances, and all-terrain vehicles (ATV).		For emergency vehicles, should be controllable to on/off via the IOS.
2.0-24.0-4	-Wildlife appropriate to the OTA such as the following either individually or in combination: deer, moose or other animals, and birds in flight such as Canada Geese and seagulls.		
2.0-25	The FFS must provide representations of man-made features in the OTAs that accurately reflect the visible features that would be seen dependent on the altitude of the aircraft. The quality of the rendering of these features must be equivalent to that of the scene in which they are found.		This should include features such as flags, windsocks at airports, smoke, and debris in the landing area. This should include rooftops, which will be of particular importance for training in the

Object Number	Requirements	Desirable Requirements	Design Guidance
2.0-25	Features must be rendered accurately in day and night conditions. These features must be affected as appropriate by both the prevailing wind and rotor downwash. As a minimum, the following features must be depicted:		urban OTA. For large urban and industrial areas, these man-made features can be represented using geo-representative or geo-typical textures, unless otherwise specified.
2.0-25.0-1	-A hospital helipad, appropriately marked and lit for night operations and surrounding buildings must include obstruction lights. The helipad must have security fencing for urban areas, a lighted windsock that corresponds to the prevailing wind and reacts accurately to wind strength.		
2.0-25.0-2	-Cultural lighting from towns and cities must appear reflected from cloud bases during night operations.		
2.0-25.0-3	-The FFS must have CGO 16 x 16 foot wooden helipads representing the kind used in CCG operations at the geo-specific locations these pads are found in the actual OTAs.		CCG utilizes 16 x 16 foot wooden landing pads in many sites across Canada. This is the standard pad size and construction in use by CCG. The size and construction of this pad must be accurately depicted in order to ensure realism. It must be possible to place one of these pads at various locations selectable from the IOS. The pads should be depicted at between 24" and 36" above the surrounding terrain. The pads may be constructed on uneven or sloped surfaces in order to create a level landing surface for the helicopter. Individual planks in the landing pad must be visible.
2.0-25.0-4	-The FFS must have CGO 16 x 16 foot wooden helipads representing the kind used in CCG operations that can be placed into a scene on either level or off-level surfaces as generic GCOs. This must include the following capabilities for modifications of the pads:		Requirement 8.1.0-34 addresses the associated IOS functionality required for these GCOs.

Object Number	Requirements	Desirable Requirements	Design Guidance
2.0-25.0-4.0-1	-Foliage must be visible in some areas where pads are placed. It must be possible to select and add foliage that exceeds the height of the pad in order to indicate that the pad is temporarily unsuitable for use		
2.0-25.0-4.0-2	-In mountainous areas, these pads must be capable of being placed on hillsides where only rocky surfaces are surrounding the pad. For onshore OTAs, Pads must be placed within confined areas that are surrounded by trees.		
2.0-25.0-4.0-3	-It must be possible to depict these pads with snow and ice cover, and the cover must affect the surface friction on the pad.		
2.0-25.0-5	-Mountaintop sites must include buildings, towers with related and visible guide wires, and a raised wooden landing pad.		
2.0-25.0-6	-A light station with rotating flashing lights, as well as associated features such as wind socks, flag poles, generic buildings.		<p>In addition to the light stations found in geo-specific locations within the OTAs, Instructors would like to be able to re-create a CCG light station anywhere in the OTA at their discretion. The features described are those found at most CCG light houses. The generic light station should have CCG colours.</p> <p>Requirement 8.1.0-34 addresses the associated IOS functionality required for these CGOs. The Instructor should be capable of turning lights on/off.</p>

Object Number	Requirements	Desirable Requirements	Design Guidance
2.0-25.0-7	-Smaller boats, including representative CCG small vessels, life rafts, and personnel with life jackets		<p>This will be used for training for search and rescue scenarios. The representative CCG vessels only need have the proper red colouring of CCG vessels and do not need to be modelled on specific vessels.</p> <p>These objects can be set in motion from either the IOS or through the Lesson Plan Builder as per requirement 8.1.0-34.</p>
2.0-25.0-8	-For the Arctic OTA, a group of persons on the ice conducting scientific operations with one person displaying a light intended to alert the helicopter to the presence of the group.		<p>These people can be generic and their equipment need not be specific science equipment.</p> <p>The light shining can be a white strobe light or something similar and should emit light to a distance of 2 miles.</p>
2.0-26	The FFS must have generic high tension power lines available that replicate 500KVA structures and thinner static lines present between the tops of the towers.		<p>In addition to the actual 500KVA towers found at the geo-specific locations within the OTAs, Instructors would like to be able to re-create these structures anywhere in the OTA at their discretion.</p> <p>Requirement 8.1.0-34 addresses the associated IOS functionality required for these CGOs.</p>
2.0-27	The FFS must be capable of permitting the helicopter to interact with wires and other obstructions in the complete range of atmospheric conditions available. CCG helicopters are equipped with Wire Strike Protection Systems (WSPS), which affords some protection in the event of an inadvertent wire strike. The WSPS must be factored into any simulated collision with wires in flight.		<p>The ability to see wires must be affected by the prevailing visibility as determined by selected atmospheric conditions such as rain, snow, or fog. This provides enhanced opportunities to accomplish low visibility training.</p>

Object Number	Requirements	Desirable Requirements	Design Guidance
3	3 HELICOPTER SIMULATION		
3.1	3.1 Extent of Simulation		
3.1.0-1	The FFS must simulate slopes of greater than 5 degrees fore and aft, and 5 degrees side to side, and/or a combination of fore and aft and side to side, up to and in excess of the capability of the helicopters.		This provides the ability to test the limits of the helicopter and to recognize when limits may be exceeded. This should include the capability to experience dynamic roll over as a result of excessive slope (requirement 3.1.1.5).
3.1.0-2	The FFS must be capable of modifying the surface friction of takeoff and landing areas to accurately reproduce actual conditions.		Slippery landing surfaces can generate unanticipated movement of the helicopter during start up and shut down, and during take-off and landing. Soft landing areas can create suction under the skid(s), which can lead to dynamic rollover. Use of a sliding scale at the IOS would be ideal in providing this capability.
3.1.0-3	The FFS must accurately model the effect of emergency float deployment over water in accordance with the Rotorcraft Flight Manual (RFM).		
3.1.0-4	The FFS must accurately recreate the effects on the helicopter of having emergency floats deployed while having landed the on the water.		This motion should be correlated to the Instructor-selected sea state. This allows for emergency float deployment in a variety of training scenarios. If the sea state exceeds the sea state for which it was certified, the helicopter should roll over.
3.1.0-5	The FFS must be capable of simulating a dynamic rollover event.		This can occur during off level landings or when one skid is stuck or obstructed during takeoff.
3.1.0-6	Removed		
3.1.0-7	The FFS must be capable of Point in Space (PINSAs), Localizer Precision with Vertical Guidance (LPV) and GPS/RNAV Instrument Approach Procedures.		

Object Number	Requirements	Desirable Requirements	Design Guidance
3.1.0-8	The FFS must be capable of Non Directional Beacon Airborne Radar (NDB/ARA) Instrument Approach Procedures.		
3.1.0-9	The FFS must provide malfunctions to cover all aircraft systems and installed equipment including any and all corresponding effects on related equipment, systems, and sub-systems.		
3.1.0-10	The FFS must simulate the center of gravity shift while passengers are embarking and disembarking from the hover.		
3.1.0-11	Not Used		
3.1.0-12	The FFS must be available for training for 20 hours a day, 7 days a week, 365 days a year.		<p>The training schedule usually does not exceed more than 16 hours a day for 5 days a week over a 4 week period. These numbers should be considered when determining sparing needs.</p> <p>Availability is defined as the time that a particular training device is available for training use.</p> <p>% availability = $((T - D) / T) \times 100$</p> <p>Training time (T) = available time in hours as determined by FFS operational readiness and availability during training days.</p> <p>Down time (D) = actual unscheduled down time or unavailability of the FFS. D time is from the moment the FFS becomes unavailable for training to the moment it becomes available for training.</p>
3.1.0-13	The FFS must have a reliability rate of 98%.		<p>Reliability is defined as ability of the FFS to perform consistently with full functionality and without interruption over a specified period of time. 90 consecutive days will be used as a demonstration period for contracting purposes.</p>

Object Number	Requirements	Desirable Requirements	Design Guidance
3.1.0-13			<p>% reliability = ((T - Device Failure Time)/ T x100</p> <p>Training time (T) = available time in hours Total available time should be measured, as determined by FFS operational readiness during training sessions.</p> <p>Device failure time = the time the FFS is unavailable for training due to unscheduled maintenance, as defined by simulator technical support (i.e. time required to return the device to a status of available for training as recorded by simulator technical support).</p>
3.1.0-14		<p>It is desirable that the FFS provides the ability to conduct vertical reference training.</p>	<p>Vertical reference is flight with reference to the ground and objects directly below the helicopter. In order for the pilot to be able to see and accurately place loads in this condition he/she must look directly below the helicopter and slightly aft of the pilot station. In almost all cases, the pilot is the sole occupant of the helicopter. Control and orientation of the helicopter during vertical reference flight is maintained using peripheral vision while the pilot uses direct vision to judge depth perception and to accurately place and manoeuvre the load. Loads are typically suspended 120 feet below the helicopter.</p> <p>This technique came from the requirement to accurately place and remove external loads in an obstacle-rich environment where the distance to the load made it impractical to use a short sling.</p>

Object Number	Requirements	Desirable Requirements	Design Guidance
3.1.0-15	The FFS aircraft aerodynamic performance modeling for the CCG Bell 429 and CCG Bell 412EPI must be based on an aerodynamically-accurate blade element model for each aircraft.		This is to ensure correct aerodynamic response to situations such as, but not limited to, in-flight performance, blade flap back, vortex ring state, touch down autorotation, retreating blade tip stall, and rotor system recirculation due to proximity to buildings and ship structures.
3.1.0-16	The FFS must provide the capability to simulate external loads carried 120 feet below the helicopter in all five OTAs.		The 120 foot condition simulates typical long line external load activity common to CCG operations
3.1.0-17	The FFS must provide the capability to simulate external loads carried 20 feet below the helicopter in all five OTAs		The 20 foot condition simulates typical short line sling activity utilizing a lanyard attached to a cargo net.
3.1.0-18	The FFS must simulate the aerodynamic effects of external loads carried below the helicopter while in flight and during load placement.		The view below the helicopter includes the helicopter being positioned at angle, causing the load to be below the helicopter but not necessarily perpendicular to the helicopter.

Object Number	Requirements	Desirable Requirements	Design Guidance
3.1.0-19	The FFS must be capable of viewing the helicopter skids and external load on a short line through a simulated cargo mirror in the pilot's chin bubble.		When external loads are carried on a short line, the pilot can view the load through a mirror mounted outside the chin bubble. This gives the pilot a view of the cargo hook and load directly below the machine, and also the landing area directly below the aircraft. This view from the pilot position must be accurately depicted as it allows the pilot to place the load precisely, release it from the aircraft, and then land nearby or fly away to get another load. When the load is placed, the pilot will need to compensate for the change in overall weight of the aircraft by reducing power in order to remain in the hover over the load. If the load is inadvertently released in flight, the pilot will feel a vertical jerk as the weight of the load would suddenly be removed from the airframe. External loads may be placed on a helipad, the aft deck of a ship, or any other location described in this document.
3.1.0-20	The FFS must simulate the effects of placing and releasing the load during external load operations, including simulating the excess thrust associated with the sudden decrease in weight from having placed or released the load.		During training, upon placement or release of the load, the pilot would still be using the power required to carry the weight of the helicopter plus the load. A key element of training would then be for the pilot to reduce power to compensate for the reduction in weight.
3.1.0-21	The FFS must be capable of simulating the conditions found in the Canadian Arctic. The following features, at a minimum, must be depicted: -Sea conditions with a mixture of ice and open water -Complete ice coverage -Whiteout conditions caused by flat light with or without any precipitation		CCG operations are routinely carried out throughout the Canadian Arctic in a wide variety of environmental and seasonal conditions. Whiteout conditions can occur when there is cloud cover that prevents any shadows associated with surface features. This can occur over water or ground when the ground is relatively flat and without discernable surface features. This effect prevents the pilot from

Object Number	Requirements	Desirable Requirements	Design Guidance
3.1.0-21			discerning the aircraft's height above ground or its orientation with respect to the horizon. Obscuring phenomena need not be present for this condition to occur.
3.1.0-22	The FFS must provide representative terrain airflow modelling around terrain, mountains, and buildings, including up flowing and down flowing air, subsidence and demarcation lines, for the entire area of the OTAs, as described in 2.0-10.		A full CFD analysis is not envisioned or intended for these areas. Airflow modeling can be an estimate based on the prevailing wind direction and can perhaps be based on a physics based model.
3.1.0-23	The FFS must provide accurate terrain airflow modelling around terrain, mountains, and buildings, including up flowing and down flowing air, subsidence and demarcation lines, for the six (6) geographical points within each OTA as described in 2.0-13.		
3.2	3.2 Environmental Control System		
3.2.0-1	The FFS must provide accurate simulation of environmental conditions of varying intensity with the ability to change progressively from light to heavy. The following are to be included as a minimum:		
3.2.0-1.0-1	-Wind effects including turbulence.		This includes accurate airflow around mountainous areas, other terrain features, buildings, and ships
3.2.0-1.0-2	-Standard storm fronts (including warm frontal weather and passage and fast moving cold fronts and squall lines).		
3.2.0-1.0-3	-Thunderstorms and lightning, which must be displayed on related onboard equipment.		

Object Number	Requirements	Desirable Requirements	Design Guidance
3.2.0-1.0-4	-Rain of varying intensities (blowing rain, rain-covered landing surfaces and runways etc.). Virga or rain columns must be available and selectable from the IOS.		Rain of varying intensities (light, moderate, heavy, violent) and the resulting accumulation on the surface of the helicopter and the environment can impact the pilot's ability to fly safely. This includes rain that when combined with relative humidity results in fog.
3.2.0-1.0-5	-Cloud, haze and hazing in-cloud effects. Clouds must be depicted by type and occur as layers of varying height, thickness, and opacity representing few, scattered, broken, and overcast conditions giving partial or complete obstruction of the ground scene. Low clouds such as stratocumulus must occur with ragged bottoms of irregular heights.		
3.2.0-1.0-6	-Fog, including fog present in low lying areas of valleys and rivers represented as advection fog, radiation fog, and fog caused by orographic lift. Patchy fog must give the effect of variable runway visual range (RVR).		
3.2.0-1.0-7	-Falling and blowing snow of varying intensities (snow-covered landing surfaces and runways, etc.) Snow on the surface must be affected by rotor downwash up to and including whiteout conditions.		
3.2.0-1.0-8	-Blowing dust.		
3.2.0-1.0-9	-Recirculating dust and snow resulting from rotor downwash.		
3.2.0-1.0-10	-Whiteouts and brownouts caused by re-circulation below the helicopter during approach, landing, and departure. Dust ball or snowball development must be progressive and have realistic lasting/dissipating and light scattering effects based on the simulated atmospheric conditions, aircraft configuration, and flying technique.		
3.2.0-1.0-11	-Representative effects of in-flight airframe and rotor icing and asymmetric shedding of rotor ice.		

Object Number	Requirements	Desirable Requirements	Design Guidance
3.2.0-1.0-12	-The FFS must provide the capability to combine the various weather conditions listed above.		One of the key elements in operational training is the ability to simulate flight in various conditions of low visibility. For this reason, the FFS needs to be able to combine various weather elements as they would be experienced in the real-world environment.
3.2.0-1.0-13	-Accumulation must be depicted in proportion to the intensity of the associated precipitation (light, moderate, heavy, violent) in the location affected.		
3.2-1	The FFS must employ wind shear models that provide training for recognition of wind shear and microburst phenomena appropriate to rotorcraft operations.		Guidance Document AC 120-41 Criteria for Operational Approval of Airborne Wind Shear Alerting and Flight Guidance Systems.
3.3	3.3 Automatic Flight Control System (AFCS)		
3.3.0-1	The AFCS must be accurately model all autopilot modes and provide any transient effects at system engagement or disengagement.		
3.4	3.4 Flight Deck Equipment		
3.4.0-1	The FFS must provide uniform lighting throughout the interior.		
3.4.0-2	The FFS must have cockpit enclosures suitable for Night Vision Goggle training.		To ensure accurate representation, there cannot be any light bleed from the main platform or any other external source. Even without goggles, colours should be accurate.
3.4.0-3	The FFS must have adequate lighting around the observer seats to permit note taking.		
3.4.0-4	The FFS must be equipped with a non-aircraft type instructor seat.		
3.4.0-5	The FFS instructor seat must have rest points, seatbelts, and back rest to minimize the likelihood of bodily injury in the event of extreme jostling of the instructor.		

Object Number	Requirements	Desirable Requirements	Design Guidance
3.4.0-6	The FFS must be equipped with two non-aircraft-type observer seats.		The two seats will be for an observer and an inspector.
3.4.0-7	The FFS must have the necessary adjustment controls so that the observer seats are ergonomically suitable for a two-hour training period.		
3.4.0-8	The FFS must have audio jacks installed and positioned near or at the observer seat for easy access by the observer.		
3.4.0-9	The FFS must have cockpit windows and chin bubbles that accurately represent those found in the CCG helicopters.		Distortions in windows (ex. bends), and optical distortion that exist in the helicopter should also exist for the simulator. If applicable, helicopter window operation equipment will be installed.
3.4.0-10	The FFS must have all window accessories and other helicopter parts visible from the cockpit and in the out the window (OTW) field of view installed.		Examples include hinges, wipers, etc. These are not expected to be functional.
3.4.0-11	The FFS access way must automatically swing into position against the exit platform, at the rear of the flight compartment, once the FFS flight compartment is in the rest position.		
3.4.0-12	The FFS must be equipped with an air conditioning unit that is capable of maintaining a controlled space temperature range in the non-simulated and cockpit area of 20 degrees Celsius +/- 5 degrees.		
3.4.0-13	The FFS must have an instructor controlled thermostat located in the aft section of the flight compartment.		
3.4.0-14	The FFS interior space temperature reading must be available at the Instructor Operator Station.		
3.4.0-15	The FFS air distribution system must supply air to the following areas: -Outlets in the aft-occupied section of the simulator -Outlets to supply air to critical electrical simulator equipment -Outlets to simulate aircraft supplied airflow		

Object Number	Requirements	Desirable Requirements	Design Guidance
3.4.0-16	The FFS air flow noise must not interfere with the simulated sound system and not be heard in the cockpit.		
3.4.0-17	The FFS ventilation system must have extra airflow capacity to allow rapid exhaust of the simulated smoke after a smoke/fire malfunction has been cleared.		
3.4.0-18	The FFS must enable cooling and ventilation of all FFS equipment enclosures, electronic racks, and airborne avionics in compliance with OEM operation requirements.		
3.5	3.5 Smoke Generation		
3.5.0-1	The FFS must have smoke generation capability to support simulation of electrical, cabin, and engine fires.		
3.5.0-2	The FFS must include a smoke generator system that produces non-toxic, non-residue type smoke.		
3.5.0-3	The FFS must incorporate a method of quick evacuation of the residual smoke upon termination of a simulated smoke event.		
3.5.0-4	Not used		
3.6	3.6 Built-In Test Equipment		
3.6.0-1	The FFS must replicate the Diagnostics Maintenance Information Transfer System (DMITS) with identical operation and functionality of the CCG Helicopters.		This will be used for maintenance purposes, primarily to download fault records.
3.6.0-2	The FFS must be able to connect, operate and interface with the airborne DMITS Ground Support Equipment (GSE) Box.		
3.6.0-3	The FFS must be able to execute DMITS tasks using a laptop containing current DMITS software.		

Object Number	Requirements	Desirable Requirements	Design Guidance
3.6.0-4	The FFS must have the correct content, format, and refresh rate as the CCG Helicopters and perform all DMITS in accordance with the CCG Helicopters Maintenance Manuals.		
3.6.0-5	The FFS must process incremental historical Flight Simulator Aircraft values in the DMITS Aircraft Data log files.		
3.7	3.7 Flight Controls		
3.7.0-1	The FFS must have replicated Flight Controls that are driven by electric-actuators.		
3.7.0-2	The FFS must accurately model the capability to manually release an external load from the main cargo hook.		
3.7.0-3	The FFS must accurately model the capability to manually deploy the emergency float system.		
3.7.0-4	The FFS Flight Control System must be equipped with operation and maintenance utilities for the following, as a minimum: -test utilities -system monitoring -diagnostics -error reporting -safeties -tuning and calibration		
3.7.0-5	Not used		
3.8	3.8 Navigation Systems		
3.8.0-1	The FFS NAV system performance must simulate real-world disturbances.		This will include standard service volume, degraded ground NAV-AIDS, over-station passage, magnetic variation, satellite coverage and usability, etc.

Object Number	Requirements	Desirable Requirements	Design Guidance
3.8.0-2	The FFS SkyTrac system must have the ability to display bearing and distance from a selectable vessel.		This is the only functionality required of this satellite based flight following system.
3.8.0-3	The FFS onboard weather RADAR must accurately display shorelines and be capable of identifying CCG vessels.		

Object Number	Requirements	Desirable Requirements	Design Guidance
4	4 COCKPIT AND ENCLOSURE		
4.1	4.1 Configuration and Design		
4.1.0-1	The FFS must be capable of repetitive and frequent conversion cycles from the Bell 429 cockpit to the Bell 412EPI helicopter cockpit while maintaining the same reliability and performance levels.		It is expected that cockpit conversions will be conducted two (2) times per month.
4.1.0-2	The FFS must be capable of being safely converted from one cockpit to the other by four (4) personnel and be ready for training within an eight-hour timeframe.		
4.1.0-3	The FFS cockpit that is not on the motion platform must function as a Cockpit Procedures Trainer (CPT) that is built to a level 5 equivalent Flight Training Device (FTD) as per the standards described in FFA Part 60.		CCG will use the cockpit not in use on the motion and visual platform for additional training. Canada does not plan to qualify the CPT at this time.
4.1.0-4	Not used		
4.1.0-5	The FFS must use a scissor-lift as the mechanism to move the cockpits from the simulator main platform to the docking area at the mezzanine level.		
4.1.0-6	The FFS cockpit must provide the same mounting for an iPad as in the CCG light and medium helicopters and must include a USB port for power only.		There is no other requirement for integration with helicopter systems.
4.1.0-7	The FFS exterior must be painted white with small design markings in red to identify it with the Canadian Coast Guard (CCG), Bell Helicopter, the 412EPI, and the 429.		This will be discussed with the Contractor post-contract award.
4.2	4.2 Cockpit Instruments - Panels - Equipment		
4.2.0-1	The FFS cockpit instruments, panels, and equipment must be stimulated to the maximum extent possible.		Cockpit instruments, panels, and equipment that are provided as GFE will be stimulated throughout unless a technological and operational restriction would impede Level D functions and subjective testing.

Object Number	Requirements	Desirable Requirements	Design Guidance
4.3	4.3 Cockpit Interface System		
4.3.0-1	The FFS must have an interface rack with spare capacity of fifty percent (50%) over what is required to run the FFS.		This is to account for future growth.
4.3.0-2	The FFS cockpit interface system must have a graphical interface for programming, diagnostics, and troubleshooting.		
4.4	4.4 Simulator Updates		
4.4.0-1	The FFS must have the same electronic subscription system as the aircraft to allow for the FFS to accept related updates in the same manner as the aircraft.		Updates for the simulator should align with updates to the aircraft. For example, map and chart updates are done on 14-28 day cycles. These updates will include things such as navigational database updates.
4.4.0-2	The FFS navigation data and communication data must be ARINC-424 compliant.		ARINC 424 Navigation System Data Base Standard is an international standard for aircraft navigation data maintained by Airlines Electronic Engineering Committee and published by Aeronautical Radio, Inc.
4.4.0-3	The FFS must have an interface that provides a method to perform automatic and manual changes to the navigation database(s).		This should provide for a simplified and quick method for both automatic and manual changes. Canada will provide the subscriptions.
4.4.0-4	Not used		
4.4.0-5	Not used		

Object Number	Requirements	Desirable Requirements	Design Guidance
5	5 MOTION AND VIBRATION SYSTEM		
5.1	5.1 System Performance		
5.1.0-1	The FFS must have a fully electric motion system.		
5.1.0-2	The FFS Motion System must be equipped with Operation and maintenance utilities for the following: -test utilities -system monitoring -diagnostics -tuning -error reporting		
5.1.0-3	Not used		

Object Number	Requirements	Desirable Requirements	Design Guidance
6	6 SOUND/NOISE - AUDIO AND COMMUNICATION SYSTEM		
6.1	6.1 Sound System		
6.1.0-1	The FFS must have host utilities that provide for rapid diagnostics of the system and for validation of the sound simulation against the actual aircraft data.		
6.1.0-2	The FFS must be equipped with a sound data utility to view, tune, and integrate all simulated sound with a graphical user interface.		
6.1.0-3	The FFS must have a Sound Measurement Utility (SMU) next to the IOS that is used to produce octave plots of the simulator sound.		
6.1.0-4	The FFS SMU must be capable of comparing simulator sounds with the actual aircraft data during simulator qualification.		
6.1.0-5	The FFS Sound System must be equipped with Operation and maintenance utilities for the following: -testing -system monitoring -diagnostics -error reporting		
6.2	6.2 Communication System and Audio Equipment		
6.2.0-1	Not used		
6.2.0-2	The FFS must be equipped with headsets including a boom microphone for the instructors.		

Object Number	Requirements	Desirable Requirements	Design Guidance
7	7 VISUAL SYSTEM		
7.1	7.1 Visual Display		
7.1.0-1	The FFS must have a visual display system with a minimum continuous field of view (FOV) of at least 220 degrees horizontal x 80 degrees vertical with a cross-cockpit viewable image presentation for pilot and co-pilot.		<p>This means that the FOV must extend back behind the 3 or 9 o'clock position in order for the pilot to be able to see over his/her shoulder in order to know when to start turning to complete the Visual assessment of the area. Vertical FOV must be sufficient to allow the pilot to see downwards in front of the aircraft while completing the reconnaissance of the area, as well as upwards during approach and departure to confined areas. When the helicopter is transitioning for an approach and landing, the aircraft will flare with a nose up attitude to reduce speed. During this transition, the pilot must be able to keep the landing pad in sight through the windows available, including chin bubbles, without the loss of correlation in the visual scene. While positioning the helicopter on the landing pad, the pilot must be able to see the pad directly in front of the machine. During the landing phase, the pilot must also be able to see back behind the 3 or 9 o'clock position in order to assist with positioning of the aircraft and to ensure adequate obstacle clearance.</p> <p>When arriving at a light station, the field of view (FOV) of the simulator should allow the pilot to be able to circle the area to look for hazards in the landing area and to assess the wind speed and direction.</p> <p>This should include the ability to process high rates of yaw without the image suffering.</p>
7.1.0-2	FFS visual system must have a constant refresh rate of a minimum of 60hz, day and night.		

Object Number	Requirements	Desirable Requirements	Design Guidance
7.1.0-3	The FFS must have a main FOV with a minimum brightness of 6 foot lamberts, in accordance with Level D requirements.		
7.1.0-4	The FFS must have a main FOV with a minimum surface contrast ratio of 5:1, in accordance with Level D requirements.		
7.1.0-5	The FFS must have a total FOV that includes the chin window areas of both CCG helicopters.		
7.1.0-6	Moved to 2.0.-10		
7.1.0-7	The FFS must have a visual system that is capable of accurately reproducing the effects of cultural and celestial lighting, including the use of landing and position lights, on the NVG devices.		This should include the use of both white and IR lights during aided (NVG) and unaided scenarios.
7.1.0-7.0-1	The FFS visual system must display the effects of own-ship lighting in reduced visibility, such as reflected glare, including landing, strobes, position lights, and rotating beacons must be present.		
7.1.0-8	The FFS visual system must include effects of obscuration to vision associated with various weather phenomena.		
7.1.0-9	The Visual Display must be equipped with operation and maintenance utilities for the following: -test utilities -system monitoring -diagnostics -error reporting -tuning and calibration		
7.1.0-10	Not Used		
7.2	7.2 Image Generation		

Object Number	Requirements	Desirable Requirements	Design Guidance
7.2.0-1	The FFS must have an Image Generator (IG) that provides for volumetric particles with physics-based models for special effects that are particular in nature in the real world.		This will be imperative to conduct the high-performance mission training described in section 2.
7.2.0-2	The FFS must have an image system that is Night Vision Goggle (NVG) compatible.		Simultaneously visible during aided and unaided flight.
7.2.0-3	The FFS must have the ability to project NVG and non-NVG images simultaneously.		
7.2.0-4	The FFS must have an IG output capability of 40 million pixels as a minimum with each projector capable of a minimum of 4 megapixel resolution.		This will be imperative to conduct the high performance mission training described in section 2.
7.2.0-5	The FFS IG projectors must be digital.		
7.2.0-6	The FFS visual system celestial illumination must include light generated by the moon in various phases and starlight, and must include the effects of terrain masking and shadowing.		This includes, as an example, the effect of celestial illumination reflecting on water.
7.2.0-7	The IG must be equipped with Operation and maintenance utilities for the following: -test utilities -system monitoring -diagnostics -error reporting -real-time system (RTS) control		
7.3	7.3 Visual Databases		
7.3.0-1	Moved to 2.0.14		
7.3.0-2	Moved to 2.0-23		
7.3.0-3	Not used		

Object Number	Requirements	Desirable Requirements	Design Guidance
7.3.0-4	Moved to 2.0-10		
7.4	7.4 Visual Database Management		
7.4.0-1	Not Used		

Object Number	Requirements	Desirable Requirements	Design Guidance
8	8 INSTRUCTOR OPERATOR STATION (IOS)		
8.1	8.1 Instructor Station		
8.1.0-1	The FFS IOS must have a minimum of 3 screens, including the repeater station display.		The IOS screens should be large enough to provide ease of manipulation and interpretation without impeding the line of sight of the crew.
8.1.0-2	The FFS IOS must have high-resolution LED touch screens with quick and easy access menu(s).		
8.1.0-3	The FFS IOS screens and lighting must not create glare or any way compromise the quality of the visuals in the cockpit for day, night or NVG scenes.		
8.1.0-4	The FFS IOS must have a desk area for taking notes and holding publications such as checklists, training scenario events/emergencies lists, etc.		
8.1.0-5	The FFS IOS seat must be a forward facing swivel chair and allow for adjustments of height and position for comfort and safety while the instructor remains seated.		
8.1.0-6	The FFS IOS seat must be adjustable to accommodate a left or right positioned instructor operator station.		The Instructor seat will have to be able to be moved laterally to be able to operate on either side or areas in between to accommodate training for a two person crew.
8.1.0-7	The FFS IOS must have lighting that is dimmable to allow the instructor to read/take notes.		

Object Number	Requirements	Desirable Requirements	Design Guidance
8.1.0-8	The FFS IOS must provide Instructor control of environmental parameters as individual or combined quick-sets or pre-sets for features including wind speed and direction, temperature, icing, barometric reference pressure, runway conditions, activation/positioning of storm fronts and microbursts, as a minimum.		Wind speed and direction should be selectable to one knot and one degree increments, respectively. Variable wind conditions should be optional with speed varying +/- 5 knots and /or with gusts of up to +10-15 knots must also be selectable.
8.1.0-9	The FFS IOS must provide the capability to ensure smooth transition into a varying intensity of the same weather phenomena or to transition smoothly into completely new weather phenomena.		A smooth transition includes the ability to define the amount of accumulation, intensity as well as the lasting dissipation of obscuring phenomena (reducing visibility of the pilot). This should include environment, atmosphere and weather effects for the following: Clouds (single/layered, modifiable properties), Visibility-RVR-Fog, variable precipitation (rain-hail-snow) and other obscuring phenomena, wind speed and direction (surface & altitude), turbulence (varied types), thunder storms, wind shear, and microbursts.
8.1.0-10	The FFS IOS must have instructor menus that allow for rapid adjustment of parameters within IOS pages.		All pages should be organized into functional groups, such as control pages or malfunction pages for which they can be easily be accessed into view. More frequently used pages should have direct touch select areas. The most common settings should be available as pre-set buttons for specific values, which can be determined by the Instructor as need be.
8.1.0-11	The FFS IOS must enable the instructor to control the simulator, information, and performance readouts through the IOS pages.		Simulator control refers to things such as resets, flight freeze, etc.
8.1.0-12	The FFS IOS must have the capability to use data from external sources to recreate incident and accident occurrences at the brief/debrief station.		External sources would include items such FDR, CVR, QAR, HUMS, or quick access recorders for the purposes of recreating accident data for the purposes of offering enhanced training.

Object Number	Requirements	Desirable Requirements	Design Guidance
8.1.0-13	The FFS IOS must have the capability to download a training session in a format that can be used by the instructor for briefing, debriefing, and classroom activities.		Event recordings will be used for debriefing, producing training videos, training programs (ex. single engine drills).
8.1.0-14	The FFS IOS must be capable of enabling the Instructor to capture, record, and restore up to a minimum of twenty (20) different profiles of twenty (20) pre-defined parameters at any time during the training session (event markers).		
8.1.0-15	The FFS IOS must provide the capability to capture snapshots of position of each flight situation with a unique capture identifier and/or number displayed.		
8.1.0-16	The FFS IOS must have the capability for quick configuration changes and repositioning of the helicopter for in-air or on-ground locations using either quick-set/pre-set or Instructor real-time selections.		Reposition to instructor cursor selected positions, geo-specific areas, taxiways, hold position. The Instructor should be able to control the reposition of the helicopter to any one of several predefined positions such as gate-tarmac-helipad, takeoff, cruise or final approach, or random points selected on-the-fly (event marker).
8.1.0-17	Removed		
8.1.0-18	The FFS IOS must have controls that enable the instructor to easily and quickly insert any abnormal or emergency conditions.		The instructor should be able to select any malfunction to be immediately or automatically activated under pre-set conditions.
8.1.0-19	The FFS IOS must have a page that is automatically displayed if the position is indicating that flight controls, not artificially driven, are in conflict with the predefined settings after reposition or reset.		
8.1.0-20	The FFS IOS must have Air Traffic Control (ATC) Environment & Control.		The ATC should have on/off audio chatter simulating air traffic within the terminal area. Two-way radio frequency should reflect other traffic taking off and landing at airports.
8.1.0-21	The FFS must have the capability to create Radio Transmission Chatter (RTC) to be heard over ATC frequencies.		ATC frequencies should include clearances, ground, tower, departure etc.

Object Number	Requirements	Desirable Requirements	Design Guidance
8.1.0-22	The FFS IOS must have multiple station ATIS weather reporting capability/recording.		
8.1.0-23	The FFS IOS must provide for automated and instructor controlled background chatter.		Background chatter heard in the cockpit (e.g., aircraft-to-aircraft, aircraft-to-ground, or ground-to-ground communications other than ownship) should be location-specific and content-specific messages that are fully correlated to the visually simulated traffic. Only messages relevant to the purpose of a given frequency should be heard, and should not diminish the audibility of other communications.
8.1.0-24	The FFS Environmental Control Systems must accept and quickly respond to Instructor settings and resets.		
8.1.0-25	The FFS IOS must be capable of recording traffic routes for use as custom scenarios.		Pre-record moving model behaviour and flight path scenarios such as runway incursions and traffic avoidance.
8.1.0-26	The FFS IOS must provide the Instructor with the capability of seeing radio frequency selection by the pilot or crew as well as radio selected for monitoring and transmitting.		The IOS operator needs to have the capability of transmitting to simulate communications with other agencies.
8.1.0-27	The FFS IOS must have a communications system to allow selective and private voice transmission between stations.		
8.1.0-28	The FFS IOS must have a Press-To-Talk (PTT) three position switch (on/off, hot mic).		
8.1.0-29	The FFS IOS must have an audio jack panel to plug-in a headset, boom-set and hand-microphone.		
8.1.0-30	The FFS IOS must have the capability of setting up, pausing, resuming, or resetting training sessions with a single button push.		

Object Number	Requirements	Desirable Requirements	Design Guidance
8.1.0-31	The FFS IOS must have the capability to interchange display of screen content at the IOS operator's discretion or during screen failure.		The ability to flip the content/functionality of one screen with another. During screen failure allows training to continue after one screen fails.
8.1.0-32	The FFS IOS must have the ability to display ground and airborne traffic moving models.		For example, the ability to have selectable behaviour such as Traffic avoidance system.
8.1.0-33	The FFS IOS must provide the ability to select, set in motion and control one or a combination of the moving models defined in 2.0-21 (3 CCG icebreakers) and 2.0-22 (2 CCG helicopters).		Moving models should move independently of each other (i.e. If more than one ship in a scene, they must not all turn together at the same time in the same direction).
8.1.0-33-0-1	-For CCG icebreakers, the IOS must allow control of ship's heading and speed.		
8.1.0-33-0-2	-For CCG helicopters, the IOS must provide to the ability to take-off, land, and control speed, heading and altitude, including climbs and descents.		
8.1.0-34	The FFS IOS must provide the ability to select and/or set in motion one or a combination of the moving objects defined in 2.0-23, the wooden pads described in 2.0-24.0-4, the light station described in 2.0-25.6, the small vessels described in 2.0-25.0-7, and the electrical structures described in 2.0.26.		The Instructor will require no direct control of these objects other than to start and stop their transit through the scene.
8.1.0-35	The FFS must provide a wireless remote control for the IOS to allow for the instructor to occupy one of the pilot seats while still providing the capability to introduce helicopter system malfunctions.		The remote control will allow IOS operator to conduct training even though only one pilot is available.
8.1.0-36	The FFS IOS must automatically display a crash page when a crash condition has occurred.		
8.1.0-37	The FFS IOS displays and indicators must be NVG compatible.		
8.1.0-38	The FFS IOS must provide the Instructor with quick-sets or pre-sets to control aircraft parameters, be it individually or in combination with other parameters.		

Object Number	Requirements	Desirable Requirements	Design Guidance
8.1.0-39	The FFS IOS must have a 'Help' mode that provides real-time information on all Instructor functions and selections.		
8.1.0-40	THE FFS IOS must have an off-simulator printer with full colour capacity, and capable of reproducing the total contents of the instructor display terminals as currently in view, including graphic information.		
8.1.0-41	The FFS IOS must have manual map scaling modes that are under Instructor control, in addition to the automatic map scaling modes.		
8.1.0-42	The FFS IOS must provide the Instructor with controls for crash reset for clearing post-crash conditions.		
8.1.0-43	The FFS IOS must provide the Instructor with controls for crash inhibit to allow flight simulation to continue when crash conditions are met.		
8.1.0-44	The FFS IOS must have map plots that are under Instructor display and control for en-route and terminal areas.		
8.1.0-45	The FFS IOS must have map plots that include a status header, providing aircraft condition monitoring, as well as time display.		Aircraft Condition will include but no be limited to altitude, airspeed, heading and other flight parameters.
8.1.0-46	The FFS IOS must provide the instructor with the capability to select the map center by using an active reference runway, latitude-longitude, coordinated map cursor, or the aircraft position.		
8.1.0-47	The FFS IOS must have normal navigation station identifiers that are correctly positioned with associated identification symbols, and failed stations that can be easily recognized.		
8.1.0-48	The FFS IOS must have helicopter symbol movement on the map and show the aircraft track with range and bearing markers, plus track erase and track suppress features.		
8.1.0-49	The FFS IOS must be capable of enabling the instructor to select weather cells and see them displayed on the map.		

Object Number	Requirements	Desirable Requirements	Design Guidance
8.1.0-50	The FFS IOS must have the capability to show approach performance plots and erase tracks for all plot types.		Graphical representation should be present for approach performance to display glide path and approach angle deviation, localizer and track deviation, and airspeed. Ideal and actual touchdown paths should both be plotted. Also, there should be a separate plot for the display of the aircraft track on the runway or any landing site.
8.1.0-51	The FFS must provide malfunctions to support all normal and alternate operational procedures, as well as abnormal and emergency procedures in accordance with the latest revision of the IATA Flight Simulator Design and Performance Data Requirements Manual.		Malfunctions will be associated with the applicable Approved Flight Manual abnormal procedures, TC ASD Approved Training Program and Aircraft/Aircraft System OEM documentation.
8.1.0-52	The FFS IOS must have the functionality to easily and quickly add generic vegetation and rocks anywhere in the OTAs.		In the OTA this would provide the added visual cues and depth perception normally available when operating from unprepared landing sites and could be used to compensate resolution shortfalls for landing in areas where the resolution is only to 50cm.
8.1.0-53	The FFS must be supported by a furnishings consisting of two (2) display screens of a minimum of forty (40) inches each, and two (2) brief/debrief workstations for the classroom at TC.		Dedicated data communications network shall be provided for classrooms and work stations. The BDS workstation shall interface to existing classroom audio visual equipment.
8.1.0-54	The FFS IOS must be able to display the moving map with the clutter and declutter capability.		This should include IFR Nav Aids/IFR Airways, VFR reporting points, etc.
8.1.0-55	The FFS IOS must have the ability to select and adjust the alternate view on the IOS screen, including the following views, as a minimum: cockpit view, chase, overtop, from behind and above, from the ground or ship.		This allows the instructor to select the view most appropriate for monitoring performance and optimum situational awareness (flight profile, obstacle clearance, etc.).

Object Number	Requirements	Desirable Requirements	Design Guidance
8.1.0-56	The FFS IOS must have a minimum of eight electrical service outlets available.		The outlets will be used to plug in diagnostic equipment, laptops, service lamps etc. Outlets are required to be positioned on 4 on either side of the IOS.
8.2	8.2 Lesson Plan System		
8.2.0-1	The FFS lesson plan system must enable the instructor to partially or fully automate a training environment by pre-programming specific IOS functions.		
8.2.0-2	The FFS lesson plan system must enable the instructor to pre-set the configuration of the simulated aircraft and environmental conditions for use in pre-programmed lessons.		
8.2.0-3	The FFS lesson plan system must enable the Instructor to clear a malfunction and then reposition the simulated aircraft before or during a pre-programmed lesson.		
8.2.0-4	Not used		
8.2.0-5	The FFS lesson plan system must have correlation with visual ground, landing and departing traffic, including terminal area simulation of airports or heliports, appropriate to the training program.		
8.2.0-6	The FFS lesson plan format shall be instructor selectable for display in either graphic profile or text format.		
8.2.0-7	The FFS lesson plan system must provide the Instructor with the ability to create mission scenarios with pre-programmed computer generated objects/personnel for the required synthetic environment.		
8.2.0-8	The FFS lesson plan system must provide the capability to display instructor notes via cues, comments, and narrative to assist instructor actions.		
8.2.0-9	The FFS lesson plan system must provide fully automatic lesson plans which require no instructor intervention once the lesson has been started.		

Object Number	Requirements	Desirable Requirements	Design Guidance
8.2.0-10	The FFS lesson plan system must allow the Instructor to take control of the lesson plans manually or at scheduled intervals and then return to the lesson plan at any time.		There should be straightforward lesson plan controls to allow for activation of the lesson plan action item of interest, step forward and backward, and select new lesson action items.
8.2.0-11	The FFS lesson plan system must automatically track and display the active step of the lesson plan via an elapsed time indicator.		The time indicator should be included and conveniently displayed on the appropriate Instructor page.
8.2.0-12	The FFS must have a lesson plan editor capability to facilitate the creation and updating of the lesson plans.		The editor should be designed such that no programming knowledge is required for its use.
8.2.0-13	The FFS lesson plan system must have an easy to operate graphic user interface for an on-line editor with the capability of being edited on a PC.		
8.2.0-14	The FFS lesson plan system must have quick action functionality for features such as cut-copy-paste to allow the Instructor to move one portion of a lesson to another.		
8.2.0-15	The FFS lesson plan system must provide a page layout that can be visible in one of the editor windows while simultaneously viewing the lesson as it is being updated.		

Object Number	Requirements	Desirable Requirements	Design Guidance
9	9 COMPUTER COMPLEX AND INTERFACE		
9.1	9.1 Computer Complex		
9.1.0-1	Not used		
9.1.0-2	Not used		
9.1.0-3	The FFS Computer Complex must be equipped with Operation and maintenance utilities for the following: -back up and retrieval -system monitoring -diagnostics -error reporting		

Object Number	Requirements	Desirable Requirements	Design Guidance
10	10 MAINTENANCE AND UTILITIES		
10.1	10.1 Maintenance and Utilities		
10.1.0-1	The FFS must have a maintenance interphone system to enable communication between areas that include but are not limited to the following: -Visual display area -Computer room -Instructor area of the flight compartment -Interface cabinets -Motion platform		
10.1.0-2	The FFS must have maintenance lighting under the flight compartment area.		
10.1.0-3	The FFS must have a non-slip surface maintenance walkway that provides working access around the exterior of the flight compartment.		
10.1.0-4	The entire maintenance walkway must be installed with a safety rail and toe rail to prevent tools and equipment from falling off the platform.		
10.1.0-5	The FFS must have stowage facilities in the aft section of the flight compartment to accommodate up to three flight bags.		
10.1.0-6	The FFS must have an area to accommodate the secure stowage of documentation and manuals that are required for the flight deck during operation of the FFS while in motion.		
10.1.0-7	The FFS must have a coat storage area in the aft section of the flight compartment.		
10.1.0-8	The FFS must have the capability to conduct maintenance training for		The maintenance training capability should encompass the ability to download diagnostic information on to a USB stick.

Object Number	Requirements	Desirable Requirements	Design Guidance
11	11 SAFETY		
11.1	11.1 Safety Features		
11.1.0-1	The FFS must have an 'off' button for the flight controls located at the IOS with the on/off status being clearly displayed at all times.		
11.1.0-2	The FFS must have a second 'off' button for the flight controls located in an area other than the IOS, with the display of on/off systems status for maintenance operations purposes.		
11.1.0-3	The FFS must have an emergency off button clearly marked as 'emergency off' located at the IOS station.		
11.1.0-4	The FFS must have emergency controls that generate appropriate aural and visual alarm warning cues.		
11.1.0-5	The FFS must have a second 'emergency off' button located in the cockpit that is readily accessible but does not interfere with simulation of the cockpit.		
11.1.0-6	The FFS must have one or more 'emergency off' buttons located in a maintenance service area.		A maintenance service area should be areas such as the motion control cabinet, motion base frame, flight controls station, etc.
11.1.0-7	The FFS must have a 'motion off' button and accompanying on/off status display at the IOS.		
11.1.0-8	The FFS must have a 'motion off' button and accompanying on/off status display in an area other than the IOS suitable for maintenance operations.		
11.1.0-9	The FFS must have an 'emergency motion off' button and accompanying on/off status display in an area other than the IOS suitable for maintenance operations.		A maintenance service area should be areas such as the motion control cabinet, motion base frame, flight controls station, etc.

Object Number	Requirements	Desirable Requirements	Design Guidance
11.1.0-10	The FFS must have a second emergency motion off button located in the cockpit that is readily accessible but does not interfere with simulation of the cockpit.		
11.1.0-11	The FFS must have emergency motion controls that generate appropriate aural and visual alarm warning cues.		
11.1.0-12	The FFS must have motion system interlock controls that interact with flight simulator systems and facility equipment.		Flight Simulator Systems and Facility Equipment refers to access-ways, computer complex, doors, pads, rear gate, motion detector, fence, overhead crane, and Facility Fire Panel.
11.1.0-13	The FFS must have motion system inhibit controls in various FFS operational and maintenance stations.		Flight Simulator operational and maintenance stations refer to areas such as, but not limited to, the cockpit, visual maintenance deck, base frame, and motion control cabinet.
11.1.0-14	The FFS must have a Maintenance Override button or capability to allow maintenance crews to go on motion with cabinet doors open.		
11.1.0-15	The FFS motion Interlock and inhibit points must be centrally monitored with the capability to address and monitor each element, and to add and program new interlock and inhibit functions.		
11.1.0-16	The FFS Emergency Power Off (EPO) must have distinctive, direct-access, clearly marked button-controls located at but not limited to: IOS, Flight Simulator Power Distribution Panel, Visual System Maintenance Deck, Motion Control Cabinet and base frame.		EMERGENCY POWER OFF (EPO): The EPO is an Electrical Power Stop of the Flight Simulator systems.
11.1.0-17	The FFS EPO status must be centrally monitored and generate appropriate aural and visual alarm warning cues.		The EPO function will be conducted in a way as to not cause damage to the Flight Simulator and equipment.
11.1.0-18	The FFS must have the capability for quick restart post-EPO activation.		
11.1.0-19	The FFS must have smoke and overheat sensing at all electrical/electronic enclosures and crew positions with early detection and aural/visual alerting indicating the smoke and overheat source.		Smoke & Overheat activation will invoke associated Flight System control and shutdown.

Object Number	Requirements	Desirable Requirements	Design Guidance
11.1.0-20	The FFS smoke and overheat sensor status must be centrally monitored.		
11.1.0-21	The FFS smoke and overheat sensors must have the capability to be temporarily disabled in the affected areas until the simulated smoke is completely exhausted.		
11.1.0-22	The FFS must have the following Flight Simulator functions and features for the Transport Canada Training Centre Fire Panel alarm:		
11.1.0-22.0-1	-The Motion System (Fire Panel) Interlock must direct a Motion Off sequence and lower the crew access-way.		
11.1.0-22.0-2	-A non-simulated area mounted horn/strobe alarm unit must be activated alerting Flight Simulator crew to emergency egress.		
11.1.0-23	The FFS must have an escape ladder system integrated on the base frame that is easily and quickly deployable.		Doors and simulator egress should be taken into consideration when planning escape ladder location.
11.1.0-24	The FFS must have access-way controls in the FFS and on the mezzanine with battery power back-up.		
11.1.0-25	The FFS power distribution system must monitor and control facility power under-voltage, over-voltage and phase shift conditions.		
11.1.0-26	The FFS facility power voltage and current values must be centrally monitored.		Power fault conditions must also be indicated.

Object Number	Requirements	Desirable Requirements	Design Guidance
12	12 ATTACHMENT 1 - OPERATIONAL TRAINING AREAS (OTAs)		

Object Number	Requirements	Desirable Requirements	Design Guidance
13	13 ATTACHMENT 2 - CONCEPT OF OPERATIONS		

Object Number	Requirements	Desirable Requirements	Design Guidance
14	14 ATTACHMENT 3 - HELICOPTER MISSION PROFILES		

Object Number	Requirements	Desirable Requirements	Design Guidance
15	15 ATTACHMENT 4 - MISSION TRAINING SCENARIOS		

FFS Operational Training Areas

Background

Canadian Aviation Regulations (CARs) requires that all Canadian Commercial Flight Operators provide training to flight crews for any specialty flight operations that they may be expected to conduct. These specific references can be found in CARs 702.76 (a),(d) and CARs 703.98(a),(d).

In order to meet these regulatory training requirements, the following Operational Training Areas (OTAs) will be essential to support the CCG Mission Profiles and Training Scenarios. In the context of this training, it is important to note that most flying conducted in support of CCG program delivery at this time is “single pilot”.

Operational Training Areas (OTAs)

In accordance with technical requirements 2.0-1 and 2.0-2, the five (5) OTAs are:

- **Coastal (OTA# 1)**
- **Offshore (OTA# 2)**
- **Mountain (OTA# 3)**
- **Onshore (OTA# 4)**
- **Arctic (OTA# 5)**

These OTAs are centered on specific geographical locations, such as coastal light stations, mountain communications sites, and arctic areas that are currently in use by the CCG. High resolution visual scenes and wide fields of view will be integral to replicating the actual environments being simulated.

The following sections describe the types of operational activities undertaken in the 5 OTAs as part of CCG program delivery. A single training session may be conducted in one or more OTAs to prepare for effective CCG program delivery. Geographic locations of each OTA, along with relevant maps, are found at the end of this attachment.

1. Coastal

- **Bella Bella (Campbell Island) Airport (CBBC)**
- **N52 11 06 W128 09 24**
- **50 x 50 NM square**

Aircraft are tasked to move personnel, equipment, and cargo to and from CCG bases, CCG vessels, light stations, and airports. During the course of these operations, a variety of weather typical to coastal marine areas is routinely encountered.

Coastlines include islands and inlets, and can be rocky and/or heavily treed, which can present navigation challenges in adverse weather conditions. For this reason, the onboard weather radar will be used to depict areas of rain as well as to be able to accurately map the shorelines of the area of operation. In addition, the Helicopter Terrain Awareness Systems (HTAWS) will also be used to depict the terrain in the area of operation. This is important because the HTAWS will provide navigation options to the pilot with respect to areas of safe passage such as low terrain and valleys en route. Lastly, the pilot must be able to conduct an IFR recovery as a result of deteriorating weather conditions, or upon inadvertent entry into Instrument Meteorological Conditions (IMC), using the onboard GPS systems, or via conventional navigation aids available in the area.

Moving Objects

In this OTA, vessels are frequently seen underway along the coastlines, including any of the following individually or in combination thereof: tugboats, tugboats towing log booms or barges on a long cable, commercial fishing vessels, and small cruise ships. Aircraft in flight in the coastal areas will include multi-engine commuter aircraft, float planes, and helicopters or combinations thereof. Light stations are present and will include either a flag or windsock that responds to the prevailing wind. Moving persons and ATVs are found in these areas. Wildlife such as deer, moose, or other animals are seen and may be seen moving onto the helipad. At light stations, ATVs are sometimes seen moving around the light station site, as well as on and off the landing pad. Birds such as Canada Geese and seagulls are seen in flight and identifiable as to their species. Smaller boats, including CCG small vessels, life rafts, and personnel with floating devices can be present as well.

Moving Models

The CCG helicopter-capable vessels such as the Sir Wilfrid Laurier, the Pierre Radisson, and the Louis S. St-Laurent can be seen in these areas. A CCG Bell 429 and/or Bell 412EPI helicopter may be seen as well.

Fuel Caches

A remote fuel cache is available in this OTA. This feature is found at or near sea level where multiple fuel drums will be located. There may or may not be buildings co-located

with these sites. In the field, these caches may be resupplied by vessel, road, or the helicopter itself. External load operations simulating resupply are conducted to these locations. The location of these sites needs to be selectable as a user waypoint from the navigation database found in onboard navigation equipment, and navigation to these locations will be capable of being linked to the auto flight systems.

Operations in this OTA may occur at night and with use of Night Vision Goggle (NVGs).

Instrument Flight

It is important to be able to teach the hazards associated with inadvertent flight into Instrument Meteorological Conditions (IMC). In this case, the pilot must be able to avoid this condition utilizing appropriate onboard equipment such as auto flight systems, weather radar, GPS navigation aids, moving map presentations, and HTAWS. If encountered, the pilot must either exit the area and return to Visual Meteorological Conditions (VMC), or be able to recover under IMC utilizing Instrument Flight Rules (IFR) procedures to the nearest airport that has an IFR Approach Procedure, a light station, or other location that has a GPS based Point in Space (PINSAs)/LPV Instrument Approach Procedure.

2. Offshore

- **St. John's Airport (CYYT)**
- **N47 37 07 W52 45 09**
- **30 NM radius**

CCG helicopters routinely operate from CCG vessels and can be based on CCG icebreakers for extended periods in both offshore, near shore, and Arctic environments.

During offshore operations, helicopters will be transiting to and from CCG vessels to shore-based locations or, in some cases, to other CCG vessels. For this reason, multiple vessels will be seen in this OTA at varying locations from each other and from shore.

During shipboard operations, as for all OTAs, the entire range of wind and weather phenomena can be encountered, including high winds, snow, rain, and fog. For winter offshore operations, this will also include snow, blowing snow, and icing conditions. Ice can form on the helideck and ship structures during conditions of high wind and the associated sea states, thus it is important to be able to see and feel these effects.

When approaching a ship, the pilot must be able to fly around the ship at low altitude and keep the ship in sight in order to be able to conduct this reconnaissance. The pilot must keep the flight deck in sight when approaching the ship in a flared, nose high

attitude. During departures, the pilot will keep the ship, related shipboard obstructions, and the flight deck in sight as he/she transitions into forward flight. Approach and departure procedures are flown from ship deck and helipads in a manner that can assure the safety of the aircraft in the event of a single engine failure during critical phases of flight. This will necessitate a vertical profile in the departure phase and the ship and/or helideck must remain in the visual field of view of the pilot at all times during this procedure in order to complete a landing after engine failure and before the Critical Decision Point (CDP) during takeoff is reached.

When operating to and from CCG vessels, CCG helicopters utilize satellite based Flight Following Systems (FFS). This system incorporates a function called Rendezvous which provides the helicopter with a satellite-derived bearing and distance from a selectable CCG vessel. The Rendezvous functionality will be used in this OTA. Shipboard operations may occur at night while utilizing Night Vision Goggles (NVGs). Operations to and from CCG vessels may also be conducted under IFR utilizing standard Instrument approach procedures, GPS and LPV procedures and Non Directional Beacon Airborne Radar (NDB/ARA) Approach Procedures.

Inadvertent entry into IMC conditions will be taught in this OTA.

Moving Models and Objects

This OTA features moving aircraft, vessels, life rafts, and birds. Small shore based communities are found in this OTA where vessels and vehicles such as trucks and ATVs can be seen.

3. Mountain

- **Sandspit Airport Area (CYZP)**
- **N53 15 15 W131 48 50**
- **50 NM wide x 70 NM long centered on Mt Moresby (Lat/Lon: 53.0192 / 132.0856)**

CCG helicopters operate routinely to mountainous locations in order to ferry personnel, equipment, and cargo. The transfer of cargo is often accomplished utilizing external loads carried on a short or long line.

In addition to the weather phenomena described in the Coastal and Offshore OTAs, the effects of terrain airflow at various wind speeds around mountainous areas is a key factor to operations in this OTA. This includes the effects of turbulence, up flowing and down flowing air, subsidence and demarcation lines. Aircraft performance at various

weights, altitudes, and temperatures needs to be considered in order to conduct safe operations in mountainous areas.

Missions to and from Marine Telecommunications sites at elevations up to 7000 feet ASL will be conducted in this OTA. These sites feature one or more buildings, a transmission tower with associated guide wires, and a landing pad. The standard landing pad found here (as in many locations where CCG operates) is a 16 x 16 foot wooden structure raised above the ground. Training pilots will approach these landing pads from various directions in order to facilitate an “into wind” approach and landing. As for all OTAs, the ability of the aircraft to make contact with natural or manmade features is essential.

Prior to landing at these sites, pilots will conduct a low level reconnaissance to confirm wind speed and direction and to check for obstructions or loose items in the landing area. High resolution out-the-window view and wide fields of view will allow for the site to be kept in view and clearly assessed during low level flight. The introduction of obscurants to vision such as rain, snow, or fog, plus the effects of blowing snow or dust during landings and take offs will provide important training in this and all OTAs.

Emergency procedures training in this OTA will include the effects of an engine failure during critical phases of approach and departure that are consistent with the effects of weight, altitude, and temperature found at attitude. The effects of the acquisition and loss of effective translational lift during approach and departure phases of flight to during these flight conditions at these altitudes, particularly in the event of an engine failure during critical phases of flight, will play a crucial part in training within this OTA.

Moving Models/Objects

Wildlife including deer and birds will be present. Persons will be seen moving around the landing site.

4. Onshore

- **Quebec City Airport (CYQB)**
- **N46 47 28 W71 23 36**
- **30 x 30 NM square**

Onshore A - Rural

CCG helicopters operate to and from onshore locations, often to and from confined areas, in both rural and urban areas. Terrain in these areas will be rolling and may be treed or open and will include both manmade and natural obstacles such as cliffs, hills,

and electrical transmission lines and related towers. Roads, rail lines, rivers, hills, and lakes, including towns and cities, will be seen.

Confined areas in the rural areas of this OTA are bordered by tall trees and/or low hills and include obstructions such as wires and transmission towers. The simulation of sloping ground at angles up to and in excess of the capabilities of the CCG light and medium helicopters will be available within or near these confined areas.

An operational technique known as “hover exit” will be taught in this OTA. This will entail a simulation where the pilot holds the aircraft in a low hover and experiences the shift in the center of gravity due to a person, or several persons, sequentially entering the aircraft by climbing on the right skid and entering the aircraft. The simulation will continue, at the pilot’s direction, with the person moving from the right side of the aircraft to the left side and then exiting the aircraft from the left side and stepping off the skid onto the ground.

Low visibility training will be taught in this OTA (and others). A typical scenario will include gently rising terrain where the visibility is deteriorating due to obscurants such as rain, snow, or fog. Terrain will pass under the helicopter at a rate consistent with the forward speed of the aircraft, which will be affected by the prevailing wind. Pilots must be able to determine forward visibility based on how long an object in the forward field of view takes to disappear under the aircraft. Flight operations in low visibilities must be conducted at reduced speeds, and flight operations are suspended when forward visibility decreases below one mile. If poor visibilities are encountered inadvertently, pilots must recognize when conditions may require track change or landing. During flight in low visibility, the effect of wind can have a significant effect. The effects on the aircraft of headwind, tailwind, and crosswinds of varying intensities during low altitude flight must be accurately experienced in order for training to be effective.

Obstacles such as hills and electrical transmission towers will appear in the correct scale for the altitude being flown and at the correct rate of closure. To demonstrate extreme cases, the helicopter may be flown at 100 feet above ground or less with visibilities of less than ¼ mile. In these cases, only the legs of the transmission tower may be visible to the pilot as he/she approaches. If this were combined with extreme fog, as is common, the pilot may find that due to low visibility, they are suddenly confronted by the realization of the close proximity of the tower legs.

During these scenarios, inadvertent entry into IMC will be taught utilizing either a track reversal or an IFR recovery to a nearby airport or helipad.

Flight in this OTA will include flights with simulated underslung loads.

Flight in this OTA will be conducted during day, night, NVG, and IFR/IMC conditions.

Moving Models/Objects

ATVs, vehicles, wildlife, and aircraft may be present. Persons on ATVs may be seen entering the open area of a confined area as selected from the IOS. CCG 429 and 412EPI helicopters may be visible in this OTA.

Onshore B - Urban

All of the features described for the rural component of the Onshore OTA also apply to the urban component.

CCG helicopters land in confined areas in urban areas. Confined areas in urban areas will consist of a hospital helipad with buildings, fencing, and other manmade structures in the vicinity. It is important to be able to conduct GPS/LPV approach procedures to hospital helipads. The hospital helipad will be marked and lit for night operations and surrounding buildings will include obstruction lights. The helipad will have a lighted windsock that corresponds to the prevailing wind and reacts accurately to wind strength.

Moving Models/Objects

A moving ambulance may be seen in this area with emergency lights either on or off. Persons will be seen moving around the helipad. Vehicles such as cars and trucks will be seen on roadways in the vicinity of the helipad.

5. Arctic

- **Resolute Bay Airport (CYUT)**
- **N74 43 01 W94 58 10**
- **Standard Pressure Region**
- **25 NM radius**

Flights in arctic regions are a common part of CCG Program Delivery. CCG helicopters are assigned to CCG icebreakers for extended periods of time in the arctic, normally during the summer months. In order to provide effective training in this environment, the Arctic OTA will be routinely combined with offshore operations during a training session.

Arctic operations can also be conducted during the winter months and training in this OTA will be conducted in conditions of day, night, NVG, and IFR/IMC. Shore based communities are present and display appropriate lighting for night operations.

Environmental conditions in arctic regions pose significant challenges to flight operations and need to be accurately rendered in order to provide safe and effective training.

Surface conditions in this OTA can be a combination of flat rolling tundra, mountains, water, and ice coverage of varying percentages. This can make navigation difficult, particularly in cases of reduced visibility.

Flight in flat light conditions where an overcast ceiling meets with the surface of the ocean, ice, or tundra in the distance is common in this area. These conditions can generate conditions known as “whiteout” and are very dangerous in flight because up to and past the point where the visible horizon is lost, there may be no other obscuration to visibility such as rain, snow, or fog to indicate a problem. The actual flight visibility may be 10 miles or more, but because of featureless terrain and no shadowing provided by the sun or the moon, there are insufficient visual cues to know if the aircraft is level, climbing or descending, without reference to flight instruments. These conditions can also be present in flight over open water where, due to an absence of wind, the surface of the water is smooth. This is known as “glassy water” and when combined with whiteout, is one of the most dangerous conditions of flight in visual meteorological conditions (VMC), particularly at low altitudes. Flat light, whiteout, and glassy water conditions are critical to training in this OTA.

Low sun angles can be found in the spring, fall, and winter in the Arctic. Low sun angles have a greater operational impact when combined with the visual effects of snow, ice fog, and ice crystals.

Sea ice will be present in this OTA and sea state will impact the movement of the ice.

Low visibility training will be conducted in this OTA in keeping with the weather phenomena and terrain found in this area.

Day, night, NVG, and IFR flight will be conducted in this OTA.

IFR procedures will be included in this OTA. A typical flight will entail a departure from a CCG vessel, entry into IMC, and an IMC transition to a shore based airport or GPS based location for an instrument approach. An IFR return to the ship will be conducted utilizing NDB/ARA instrument approach procedures.

Moving Models/Objects

CCG vessels, primarily icebreakers, will be seen in this OTA along with CCG 429 and 412EPI aircraft. Other large vessels such as tankers and cargo vessels will be seen as

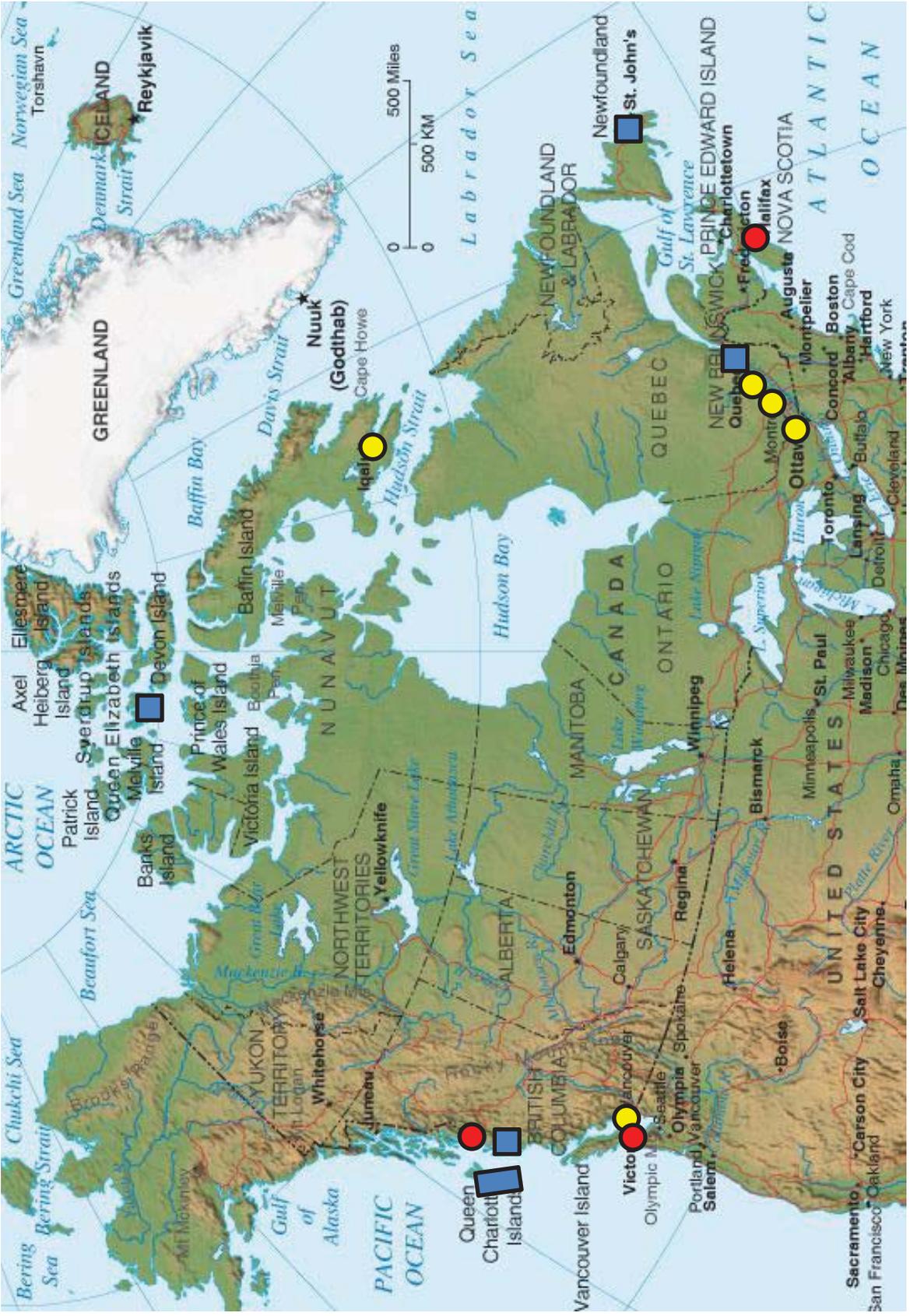
well. Trucks and ATVs are present in shore-based communities. Birds in flight will be seen. In this OTA, a group of persons on the ice with equipment may be present conducting a scientific operation. One of the persons in this group may display a signal light intended to alert the helicopter to the presence of the group up to 2 miles away.

Qualified Airports and OTAs

Overall View

LEGEND:

- Certified Airports (3): ●
- Desired Airports (5): ●
- OTAs (5): ■



CERTIFIED AIRPORTS

Mandatory:

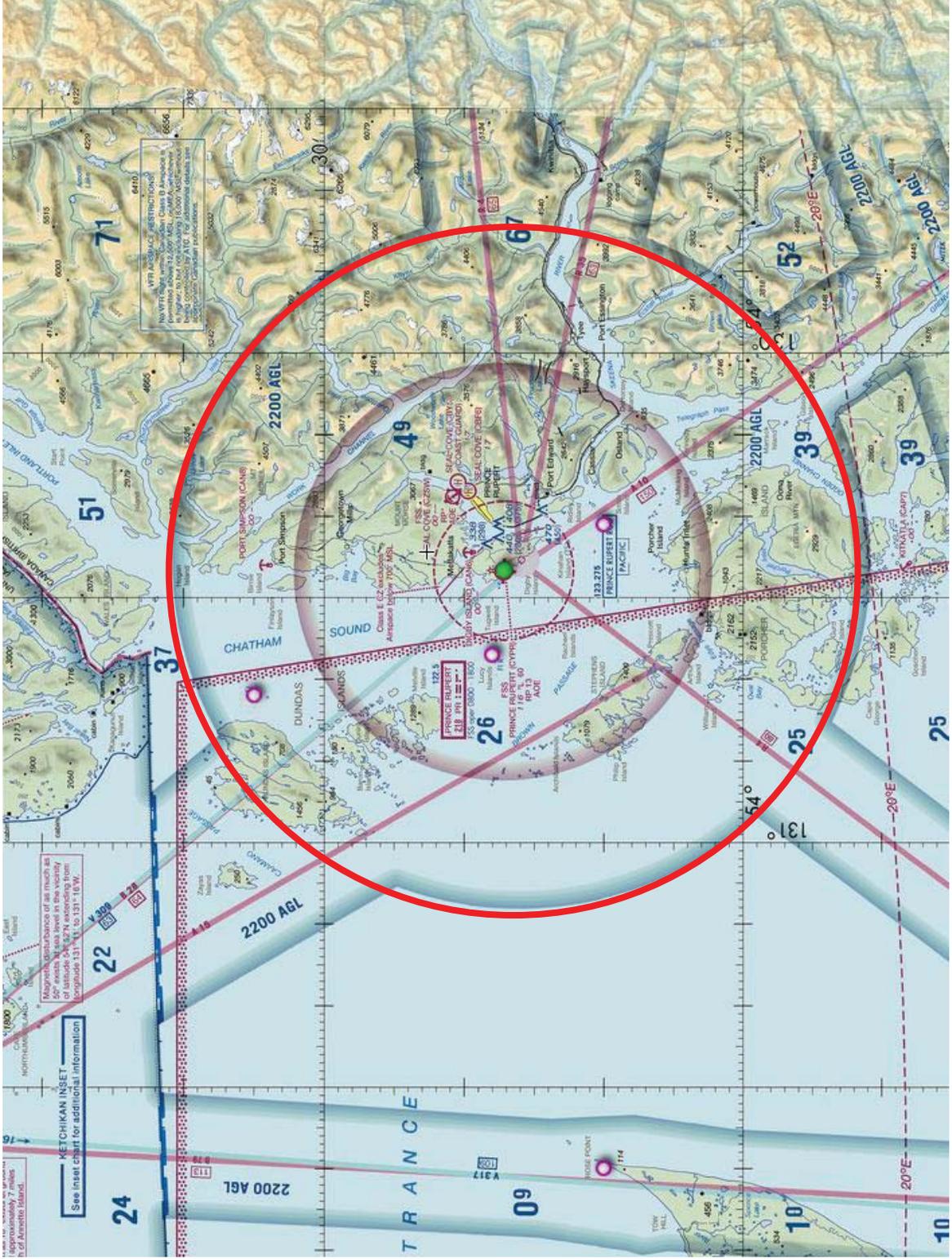
- Victoria (to include Victoria Harbour)
- Prince Rupert (to include surrounding lighthouses)
- Halifax

Highly Desired:

- Vancouver
- Ottawa
- Montreal
- Trois-Rivières
- Iqaluit

Note: All approaches, including copter only approaches, shall be included for all landing sites within the 25 NM radius

Prince Rupert BC (CYPR) – 25 NM



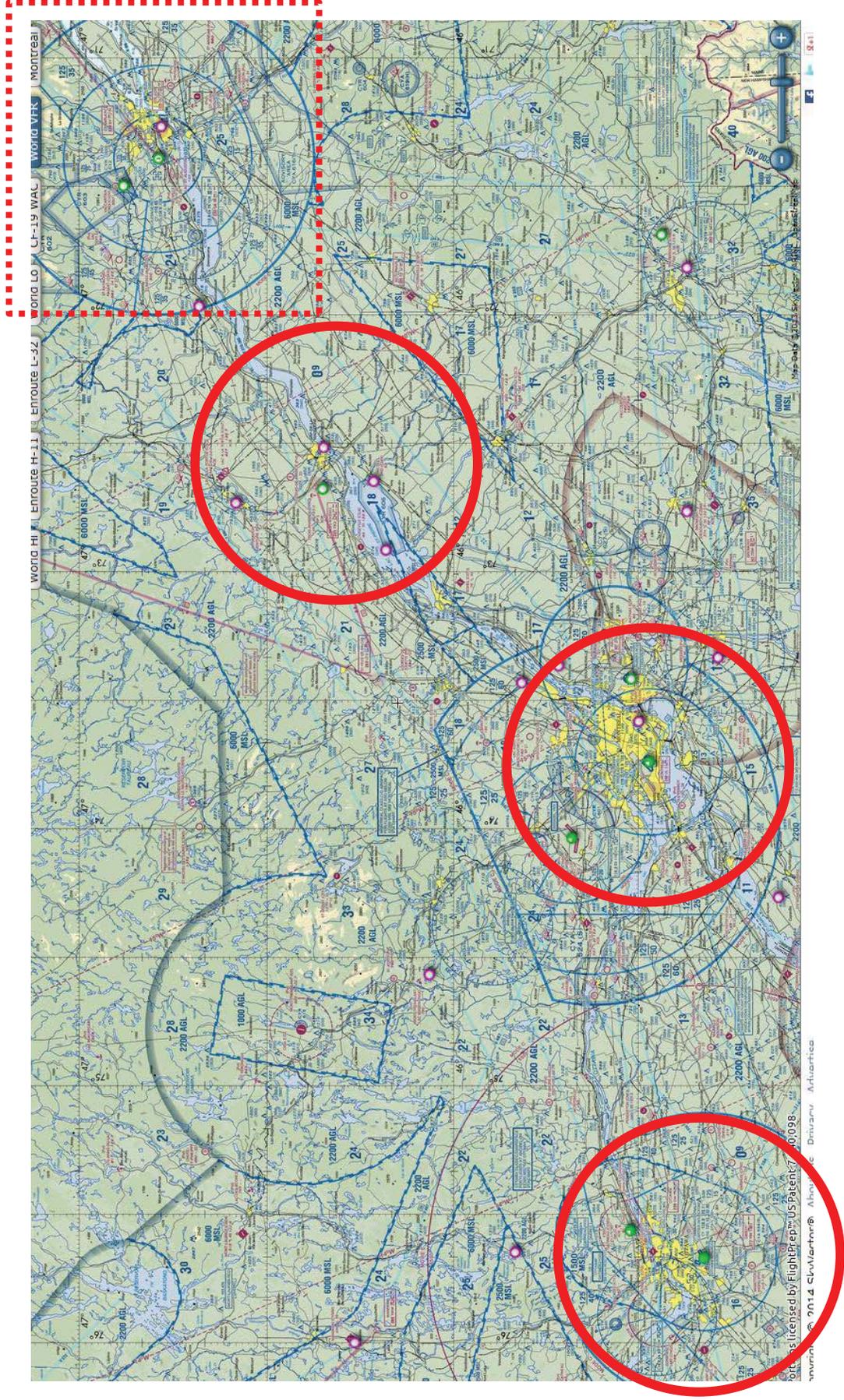
CYPR

- ***Green Island Light Station-Concrete pad, 10' ASL.***
N 54 34.091 W 130 42.333
- ***Triple Island Light Station-Concrete pad, 45' ASL.***
N 54 17.682 W 130 52.810
- ***Seal Cove Coast Guard Base-concrete pad, 17' ASL.*** N 54 19 54 W 130 16 36
- ***Dundas Repeater Site- gravel pad, 1500' ASL.*** N 54 31 16 N 130 54 55

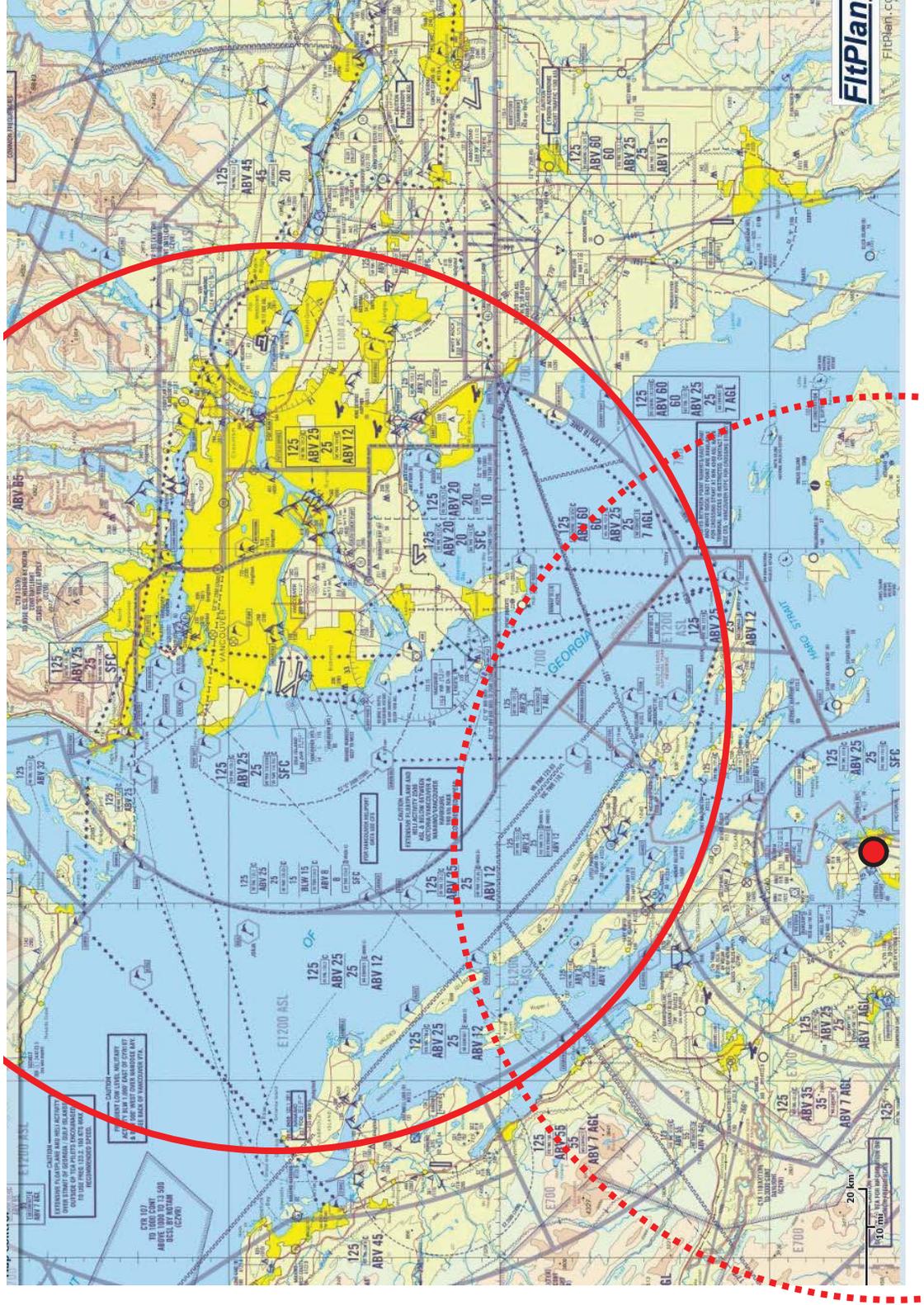
CYHZ

- CCG Base Shearwater: 44 37 56.15N 63 30 16.56N
Concrete Ramp at CFB Shearwater.
- Dover: 44 29 24N 63 51 43W
Ground based landing area, no pad or prepared surface.
- Betty Isl.: 44 26 19.7N 63 46 00.4W - Ground based landing area, no pad or prepared surface.
- Sambro: 44 26 12N 63 33 46W - Ground based landing area, no pad or prepared surface.
- Maugher Beach: 44 36 08.2N 63 32 00.9W - Wooden pad on narrow peninsula.
- Georges Isl. – Radar: 44 28 27.87N 63 33 34.17W - Open area, no prepared surface but grass is mowed during summer.
- Georges Isl. – Lighthouse: 44 38 26.2N 63 33 37.2W - Elevated wooden pad next to lighthouse.
- Devil’s Isl.: 44 34 49.53N 63 27 35.36W - Ground based landing area, no pad or prepared surface.
- Jeddore Rock: 44 39 46.8N 63 00 39.6W - Elevated wooden pad next to lighthouse.

Additional Airports (IFR YOW – YUL – YRQ – YQB)



Additional Airports (IFR Vancouver - Victoria: 34 NM)



5 OTAs

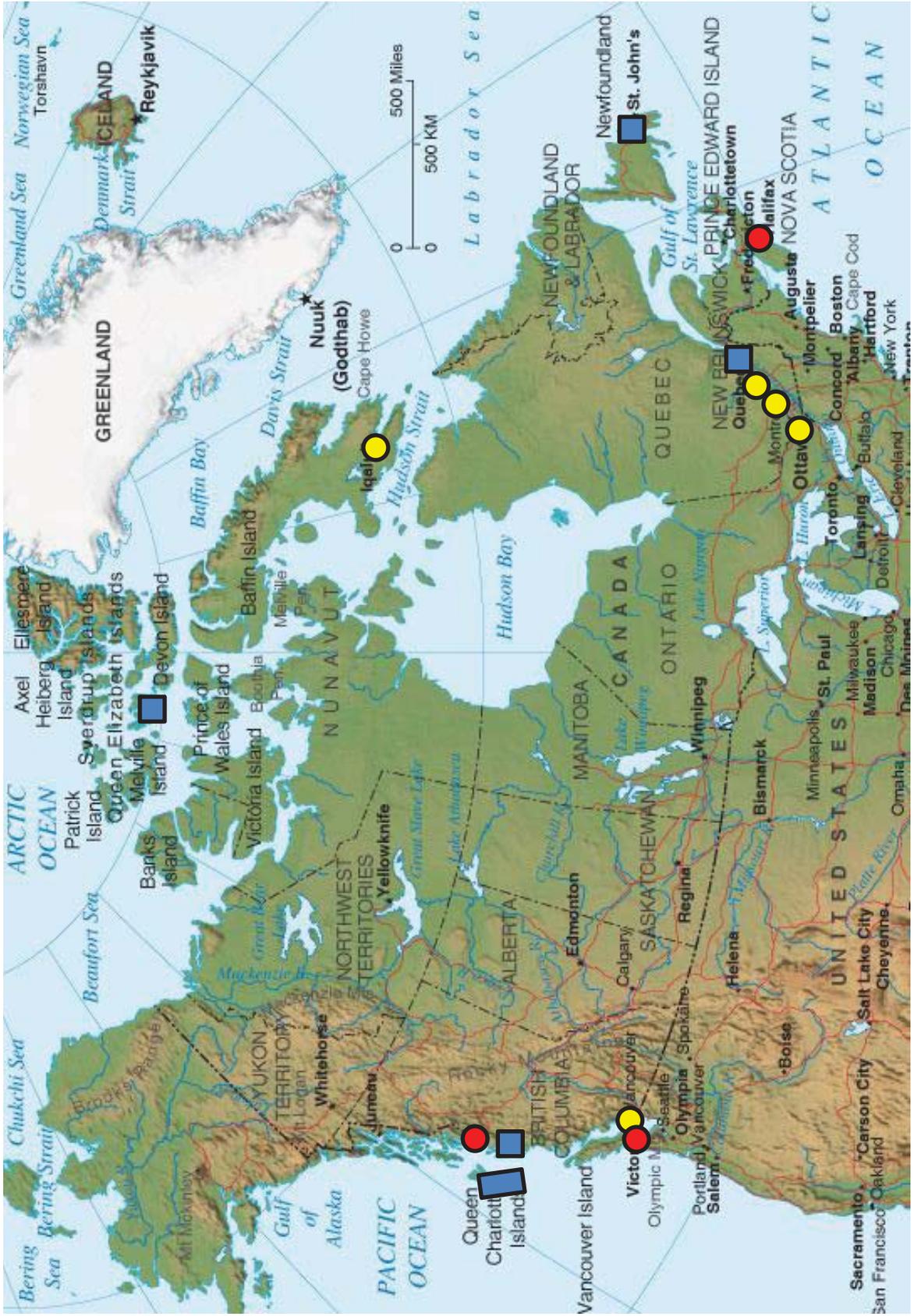
- **Coastal**
 - Bella Bella (Campbell Island) Airport (CBBC)
 - N52 11 06 W128 09 24
 - 50 x 50 NM square
- **Offshore**
 - St. John's Airport (CYJT)
 - N47 37 07 W52 45 09
 - 50 x 50 NM square
- **Mountain**
 - Sandspit Airport Area (CZP)
 - N53 15 15 W131 48 50
 - 50 NM wide X 70 NM long centered on Mt Moresby (Lat/Lon: 53.0192 / 132.0856)

- **Onshore**
 - Quebec City Airport (CYQB)
 - N46 47 28 W71 23 36
 - 60 x 60 NM square
- **Arctic**
 - Resolute Bay Airport (CYUT)
 - N74 43 01 W94 58 10
 - Standard Pressure Region
 - 50 x 50 NM square

5 OTAs Overview

LEGEND:

- Certified Airports (3): ●
- Desired Airports (5): ●
- OTAs (5): ■



Bella Bella BC (CBBC) COASTAL



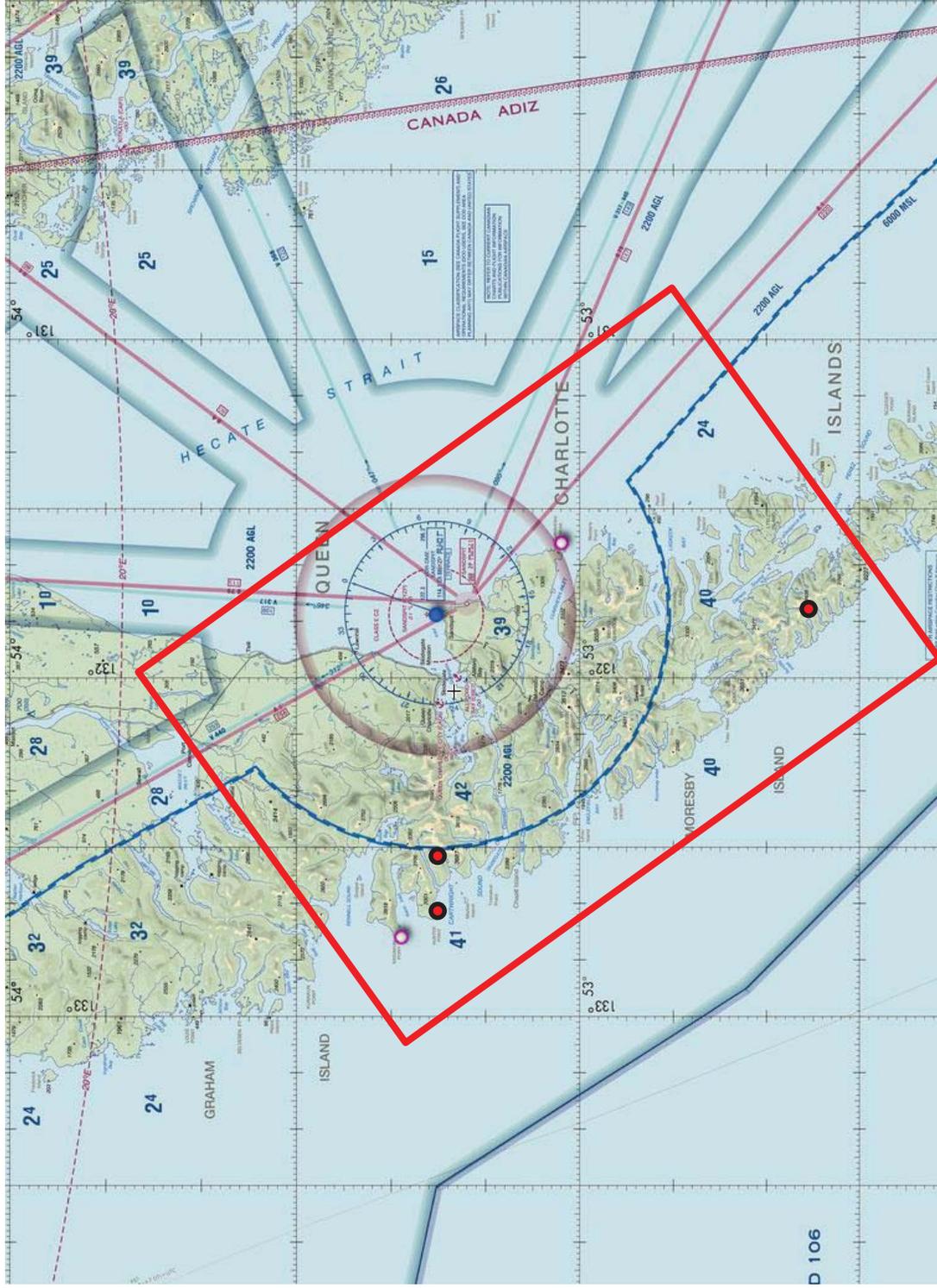
CBBC

- **Dryad Point Light Station**-concrete pad, 20' ASL.
N 52 11.037 W 128 06.826
- **Shear Water(CAW8)**-gravel pad, 5' ASL.
N 52 09 W 128 05
- **Ivory Island Light Station**-concrete pad, 10'ASL.
N 52 16.290 W 128 24.300
- **McInnis Island Light Station**-concrete pad, 95' ASL.
N 52 15.720 W 128 43.350
- **Boat Bluff Light Station**-concrete pad, 150'ASL.
N 52 38.620 W 128 31.450
- **Klemtu Repeater Site**- elevated timber pad, 2644' ASL.
N 52 34.737 W 128 33.832

CYYT

- Cape St. Francis, N47 48.5 W052 47.2
concrete pad approx 30 x 30 ft
- Bally Hack Point, N47 26.75 W053 11.5
unprepared landing site.
- Brigus, N47 32.9 W053 10.9
unprepared landing site.
- Green Point, N47 36.7 W053 10.6
unprepared landing site.
- Hr. Grace Island, N47 42.7 W053 08.5
unprepared landing site.
- Carbonear Island, N47 44.36 W053 09.85
unprepared landing site.
- Bull Head, N47 18.64 W052 44.9
unprepared landing site.

Sandspit BC (CYZP) MOUNTAIN



CYZP

- **Queen Charlotte City Public Heli Pad**-concrete pad, 55' ASL.
N 53 14.500 W 132 04.600
- **Cumshewa Repeater Site** - gravel and dirt, 2049' ASL.
N 53 09.480 W 131 59.946
- **Van Inlet Repeater Site** - gravel pad, 3350' ASL.
N 53 15 08 W 132 32 31
- **Hunter Point Repeater Site** - elevated timber pad, 10' ASL.
N 53 15.400 W 132 42.900
- **Barry Inlet Repeater Site** - elevated timber pad, 2600' ASL.
N 52 34 45 W 131 45 13

CYZP - Barry Inlet Repeater Site

elevated timber pad: 2600' ASL.

N 52 34 45 W 131 45 13



Lighthouses

Western
47° 05' 50.1"
70° 42' 12.6"

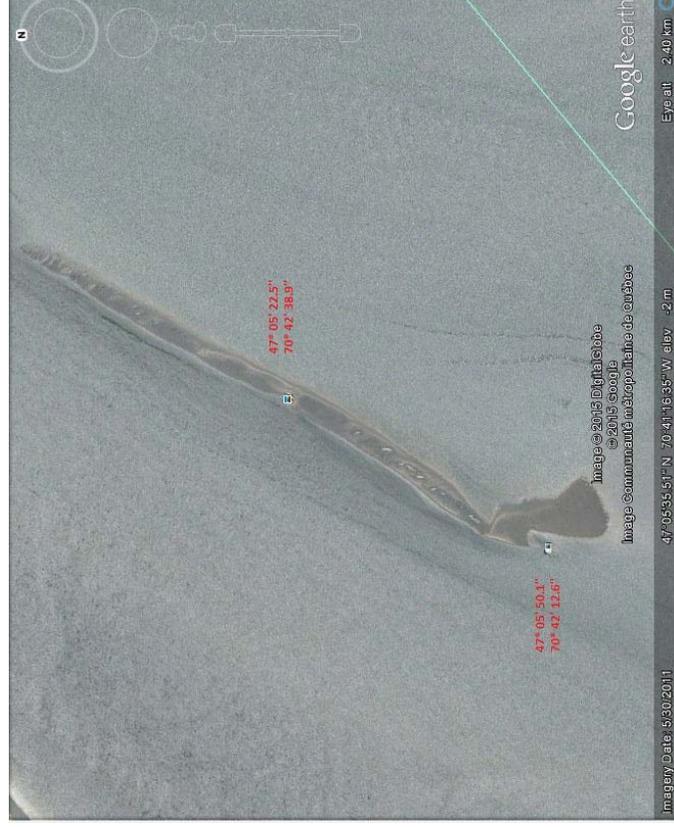


Google Earth
location of 2
lighthouses

Eastern
47° 05' 22.5"
70° 42' 38.9"



Zoom-in on sandbar



CCG Main base - Ident: CTJ2 (3 x pads)

Altitude: 20' MSL

- A: 86'x86' with a safety area of 105'x94' WITH lights (46° 48' 22.8" N, 71° 12' 14" W)
- B: 60'x60' with a safety area of 86'x86' WITHOUT lights (46° 48' 22" N, 71° 12' 15.7" W)
- C: 60'x60' with a safety area of 86'x86' WITHOUT lights (46° 48' 21" N, 71° 12' 16.6" W)



Hôpital de l'Enfant-Jésus - Ident: CTJ5

1 x pad

Coord. : 46° 50' 15"N, 71° 13' 30.6"W

Altitude: 110' MSL

85'x85' concrete rooftop, with lights (ARCAL 123,05, type K)
 Radio Frequency: 118.65 (Quebec tower)

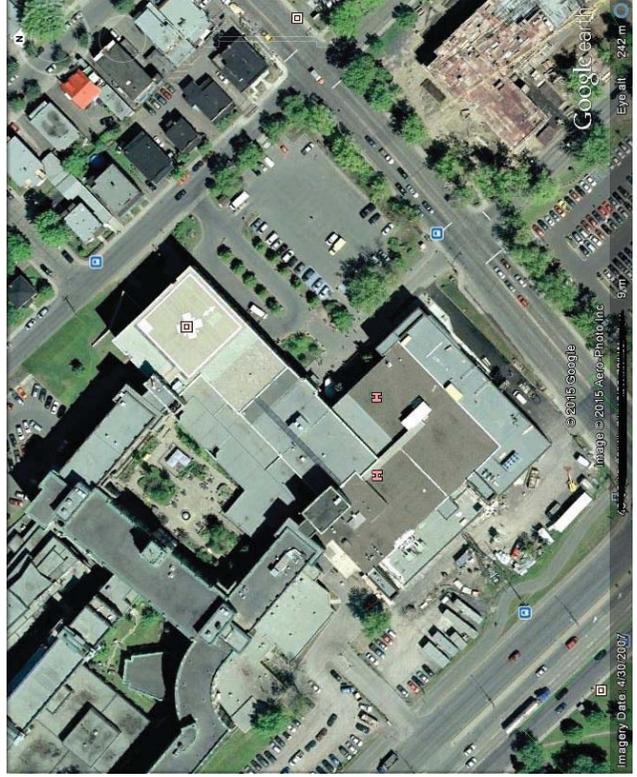


QUÉBEC / HÔPITAL DE L'ENFANT-JÉSUS OC (Heli)

ELEV 110 APPX

CTJ5

REF	N46 50 15 W71 13 31 Adj 177°W UTC-5(4) Elev 110' aprx. A5002
OPR	Hôpital de l'Enfant-Jésus 418-649-5891 Fax 418-649-5594 Cert PN PPR
FLT PLN	NOTAM FILE CYOB
FIC	Québec 866-GOMÉTEO or 866-WXBRIEF (Toll free within Canada) or 866-541-4105 (Toll free within Canada & USA)
HELI DATA	FATO/TLOF 85' x 85' concrete rooftop 12,000 lbs. Max heli overall length 57'
LIGHTING	RY(ME) RF(FL) ARCAL-123.05 type K
COMM	Québec 118.65
TWR	Arridep 025° to 235° fr heli (H1)
PRO	Unmarked P-line aprx 800' SW of pad. Guard rail and access ramp inside safety area.
CAUTION	



Resolute Bay NU (CYUT)

ARCTIC



Resolute Bay NU (CYUT)

ARCTIC



Full Flight Simulator Concept of Operations

1. Background

The purpose of the CCG Helicopter Project is to replace CCG's ageing fleet of helicopters. In addition, CCG will acquire a Full Flight Simulator to provide the primary platform for training pilots on the new light-lift and medium-lift helicopters.

2. Project Objectives

The objective of this program is to acquire a Full Flight Simulator (FFS) that is sufficiently capable and configurable to conduct both initial and recurrent helicopter type training and proficiency checking, as well as scenario based operational training in a realistic synthetic environment compatible with CCG helicopter operations. The FFS should provide a platform for training for the CCG Bell 429 light-lift helicopter and the CCG Bell 412EPI medium lift helicopter for the anticipated 30-year lifecycle of the new fleet.

In keeping with the anticipated 30 year lifecycle for the FFS, CCG requires that the FFS technologies and capabilities be 'state of the art' at time of delivery. 'State of the art' in this context refers to technologies that are advanced, but commercially in use, and considered reliable. This should exclude technologies that have not been fielded for use in the commercial simulator industry and thus present a risk of being unreliable and unsupported.

The FFS must provide a platform that is capable of supporting the training objectives and mission specific training scenarios to meet all regulatory requirements described in the applicable Canadian Aviation Regulations (CARs) governing type ratings and operations under Subparts 702, 703 and 704, as appropriate.

In addition, the FFS must act as a comprehensive training platform to prepare crews to safely and effectively accomplish the mission profiles described in the document *CCG Helicopter Mission Profile Document*.

Given the diverse and challenging environments in which CCG helicopters operate, it will be of particular importance to simulate coastal and mountainous areas, arctic terrain, and offshore shipboard environments in which CCG typically operates with sufficient visual detail in order to prepare pilots for ongoing and future CCG operations. These areas are described in the document entitled Operational Training Areas (OTAs) which forms an attachment to the Baseline Statement of Technical Requirements document.

The FFS will act as a comprehensive training platform that eliminates the need for most in-flight training. The FFS will also provide opportunities to advance the training program.

3. Purpose of Simulator Acquisition

At present, training and certification requirements are met through ground school and flight operations training. The FFS should eliminate the need for in-flight training so that Pilot Proficiency Checks (PPCs), Instrument Flight Rules (IFR) certification, and CCG mission-based training can be done solely on the full flight simulator.

Currently, flight operations training is predominantly delivered in aircraft at the CCG bases and consumes approximately 490 hours per year. CCG aims that the acquisition of the simulator will remove the need to take an aircraft out of service for pilot training. This will benefit the operational life of the helicopters and enhance the mission readiness of the fleet in a number of ways. The use of an FFS should:

- a. Reduce the additional hours added to the helicopter and the associated maintenance events associated with hours of flight time for training.
- b. Reduce risks to pilots and aircraft by providing a safe training environment.
- c. Increase the availability of aircraft to perform operational tasks.
- d. Increase the capability and quality of training for various malfunctions or flight scenarios that would be too dangerous to perform or impossible to reproduce in an actual aircraft.

Lower on-going costs, decreased aircraft wear and maintenance related to training, and the increased capabilities of pilots and maintenance engineers are all benefits of using the simulator as the primary platform for training.

4. Centralized Training

As with the current training program, initial and recurrent training will continue to be managed and conducted by Transport Canada Aircraft Services Directorate (TC ASD) personnel.

The helicopter FFS will be centrally located in the National Capital Region, in effect creating a centre of expertise for helicopter training. The FFS will be housed at the TC ASD Training Center. The CCG helicopter fleet is operated and maintained by Transport Canada under an existing Memorandum of Understanding (MOU). Co-location will take advantage of the current support system in place at TC ASD and will make use of existing resources and facilities, including technicians, classrooms, and maintenance facilities already in place for the 2 full flight simulators TC ASD currently owns.

To accommodate simulation capacity for both the light and medium-lift helicopters at TC ASD within the available space allotment, a single FFS with the ability to simulate both the CCG Bell 429 and the CCG Bell 412EPI aircraft is considered essential.

As with other simulators housed at TC ASD Training Center, there is potential that FFS will be leased out when not in use by personnel if there is a commercial need identified and there is no other avenue for meeting that need readily available.

5. Training Objectives

The FFS must provide a comprehensive training solution that closely reflects the day-to-day use of the CCG fleet of Bell 429 light-lift helicopters and the CCG Bell 412EPI medium-lift helicopters for safe flight operations and support of CCG program delivery. CCG presently has

approximately fifty pilots and it is intended that their currency training and PPCs will be conducted in the FFS.

The FFS should provide a safe environment for pilots and maintenance personnel to become familiar with the updated technologies found on the new fleet of helicopters. It is anticipated that the FFS, as a new training solution, should present Canada with an opportunity to analyze the cost and benefits of implementing more advancements to flight operations and related training programs for future growth.

5.1. Enhanced Safety Training

The CCG intends to use the FFS to prepare pilots for malfunctions and training scenarios that are tailored to the CCG fleet and operating environments, including instrument and mechanical failures specific to the CCG Bell 429 and the CCG Bell 412EPI. The FFS should have the capability to simulate realistic malfunction scenarios that reflect actual incidences that may have occurred in the helicopter fleet. The FFS should have the capability to integrate data from external sources, to recreate incident and accident scenarios during training.

Additionally, it is envisioned that the FFS will have data capturing capability to play back training scenarios to help analyze pilot responses in various situations. In this way the FFS will be configured to support an ongoing Flight Data Monitoring program (FDM).

5.2. Enhancements in Training

In preparation for future growth, CCG is planning to expand its current training program to include things such as E-learning (including on-line training prior to using the FFS) and distance learning. The FFS should offer the capability to capture data from training sessions in the FFS for the purposes of classroom instruction modules to be carried out at a later date and for crew training briefing/de-briefing sessions. The capability to offer these types of training sessions will better prepare pilots for using the new aircraft in the fleet and will be used for subsequent refresher courses.

As with the current training program, it is envisioned these additions to the training program will be managed and conducted by TC ASD personnel.

5.3. Simulator Availability

The FFS should be available 365 days a year and available for most of the training day, minus the time for daily inspection and maintenance activities.

The FFS should have the option of having the cockpit not on the motion platform act as a Cockpit Procedures Trainer to give pilots and maintainers an additional platform to familiarize themselves with the equipment and perform parallel training exercises.

5.4. Maintenance Training

The FFS will be used to train maintenance personnel for built-in tests and diagnostics.

6. Simulation Capacity

The ability to practice and simulate all normal, abnormal and emergency procedures must be available in all training scenarios and mission profiles. All weather phenomena such as wind, rain, snow and fog must be available in all scenes and areas within the simulator database.

6.1. Replicating CCG Operations and Operating Environments

The FFS should prepare pilots for the specific work CCG pilots do on a daily basis. CCG has created seven mission profiles to provide insight into the activities that the CCG fleet undertakes to fulfill its mandate and the environmental conditions within which the helicopters operate.

- Mission Profile 1 – Personnel and cargo transfer, ship to shore and land-based sites
- Mission Profile 2 – Icebreaking and Ice Reconnaissance
- Mission Profile 3 – Support for Aids to Navigation and MCTS Sites
- Mission Profile 4 – Environmental Response
- Mission Profile 5 – Support for Department of Fisheries and Oceans Programs
- Mission Profile 6 – Support for Other Government Departments and Agencies
- Mission Profile 7 – Secondary Search and Rescue

The *CCG Helicopter Mission Profiles Document* included as attachment (x) to the Technical Requirements document addresses the seven mission-specific task scenarios in detail.

7. Concept of Support

Transport Canada's existing support system for managing the simulators presently housed at TC ASD Training Center will be utilized to manage the helicopter FFS on a day-to-day basis.

Most activities related to upkeep of aircraft systems and the cockpits for the FFS will be done by TC ASD personnel. The FFS should offer the capability for aircraft data to be updated and modified by TC ASD once the FFS is ready for training so that it is synced up with the aircraft as any modifications occur. The Original Equipment Manufacturer (OEM) for the FFS should be available to provide any additional support over the life span of the FFS. The FFS must be capable of both software and hardware updates and modifications to ensure that they remain current with the helicopters.

The FFS should also be capable of receiving software updates to reflect the evolving training needs of a 30-year program.

While it is inevitable that obsolescence issues will arise during the anticipated 30-year life of the fleet, managing obsolescence should be a key factor in the design and integration of the FFS.

CCG Helicopter Mission Profiles

1 Purpose

This Helicopter Mission Profile document provides a description of how the Canadian Coast Guard (CCG) helicopters are employed in support of CCG's mandate.

2 Background

CCG provides maritime services supporting government priorities, contributing to the safety, accessibility, sustainability and security of Canadian waters. In doing so, CCG serves clients in all sectors of the Canadian economy. CCG programs deliver services to Canadians that include:

- a. Aids to navigation, icebreaking, search and rescue, pollution response, and marine communications and traffic services to commercial fishers, commercial shippers, ports and recreational boaters;
- b. A response to federal maritime priorities and natural or man-made emergencies. The provision of support for various activities mandated under the Federal Emergency Response Plan and involvement, both nationally and internationally, in planning and exercises related to environmental response and search and rescue; and,
- c. Support to Department of Fisheries and Oceans (DFO) programs by providing vessels, helicopters, and maritime professionals to support science activities and to help manage and protect fisheries resources. Internal clients include DFO Fisheries Management, DFO Oceans Management, DFO Science, and DFO Small Craft Harbors.

In addition, CCG supports the non-military activities of other government departments and agencies by providing vessels, aircraft, marine expertise, and other maritime services, including support to maritime security activities. Clients for these services include the following:

- a. Department of National Defense;
- b. Environment Canada;
- c. Natural Resources Canada;
- d. Public Safety Canada;
- e. Royal Canadian Mounted Police;
- f. Canada Border Services Agency; and
- g. Transport Canada.

3 Scope

This document outlines the current mission profiles for the entire CCG helicopter fleet. These profiles provide insight to the activities that the CCG fleet undertakes to fulfill its mandate and outline the nature of the environmental conditions in which the helicopters operate, referring to factors such as weather, temperature, implications regarding coastal and high altitude areas, etc.

4 Profiles for CCG Programs

4.1 CCG Mission Overview

The Canadian Coast Guard light and medium helicopters will support a number of CCG programs such as Aids to Navigation, Icebreaking services, Marine Communication Traffic Services, Search and Rescue and Environmental Response, as well as the programs of the Department of Fisheries and Oceans and other government departments. These helicopters support activities such as:

- a. Personnel and cargo transfer, ship to shore and land based sites;
- b. Icebreaking and ice reconnaissance;
- c. Support for Aids to Navigation and MCTS sites;
- d. Environmental Response;
- e. Support for Department of Fisheries and Oceans programs;
- f. Support for other government departments and agencies; and,
- g. Secondary Search and Rescue.

The helicopters operate in all areas of Canada, including the East and West Coasts, the Arctic, Great Lakes and St. Lawrence Seaway as well as inland waters and Canada's north.

Currently, both light and medium helicopters are used to conduct CCG missions, however limitations regarding helicopter size, range and lift capacity may determine which helicopter is assigned to a specific task.

Based on operational requirements, CCG envisions replacing the current fleet, possibly using up to three helicopter types, as follows:

- a. Light helicopter capable of:
 - Seating at least four passengers plus crew;
 - Being hangared aboard existing CCG vessels;

- A useful load capacity of at least 453.5 kg (1000lbs) plus the necessary fuel to achieve a minimum endurance of at least two hours.
- b. Medium helicopters capable of:
- Seating at least nine passengers plus crew;
 - Landing aboard existing CCG vessels;
 - Lift capacity of at least 3800lbs (including pilot, full fuel and payload); and,
 - Minimum endurance of approximately two hours.

However, CCG's preference is to minimize the number of helicopter types in an effort to achieve economies of scale and reduced life cycle costs (maintenance and fuel costs), while ensuring that the requirements for each helicopter type mentioned above can be satisfied.

This document addresses the mission profiles for the light and medium helicopters.

4.2 Specific Mission Profiles

4.2.1 Mission Profile 1 - Personnel and cargo transfer, ship to shore and land based sites

The new CCG light and medium helicopters will be used for personnel and cargo transfer between ship and shore and for crew changes, transporting injured persons or resupplying light stations or other remote sites with various items including mail, household goods, groceries, equipment etc.

In this capacity, the helicopter must be capable of over-water flight and operating from land and shipboard facilities in the harsh operating environment, often in reduced visibility conditions, associated with Canada's northern and maritime and coastal areas. The helicopter may be required to travel long distances from ship to shore (at least 240 nm / 444 km) or to reach light stations or other sites in remote locations such as the Queen Charlotte Islands, Sable Island or Canada's arctic, sometimes landing at unprepared sites.

The nature of CCG missions require that the interior of the helicopter be easily reconfigurable to accommodate passengers and crew together with cargo, and on occasion, it may be necessary to alter the aircraft interior to carry only crew and cargo. Rear facing cargo doors are used by crew to easily access cargo on the aircraft or easily retrieve a litter kit with a minimum of discomfort to the injured party.

4.2.2 Mission Profile 2 - Icebreaking and ice reconnaissance

CCG regions that provide icebreaking services use icebreakers with onboard helicopter facilities (hangar, etc.). During the winter, icebreakers and shipboard helicopters

operate as a team, to facilitate the movement of ships through ice infested waters. Typical operations include ice reconnaissance as well as ice breaking.

Using the CCG light helicopter for ice reconnaissance operations often involves low level flying (under 500ft.) for at least 2 hours in cold weather temperatures extending to minus 30 degrees Celsius, over water, ice or land. The helicopters are used to conduct spring ice surveys to determine how fast ice is clearing and when CCG operations to commission aids to navigation can begin or to assess harbors for CCG vessels in advance of doing harbor breakouts.

At CCG, ice reconnaissance missions are conducted via a partnership agreement with the Canadian Ice Service branch at Environment Canada to provide an Ice Service Specialist to conduct ice surveys using a CCG helicopter. While aboard the helicopter the ice service specialist uses a laptop computer tablet connected to a GPS mechanism to record ice conditions and digitizes the information to generate an Ice Chart. The helicopter is often used to assess ice conditions approximately 50 miles from the vessel, greatly enhancing the visibility provided by shipboard radar. These missions are undertaken from both ship-borne and shore-based facilities and the helicopters may be required to land on snow and ice to retrieve ice samples.

4.2.3 Mission Profile 3 – Support for Aids to Navigation and MCTS Sites

The CCG new light and medium helicopters will be capable of providing the necessary support to maintain CCG Aids to Navigation and Marine Communications Traffic System (MCTS) sites, which may be remotely located at altitudes up to 1981m (6500ft.). Major Aids to navigation and MCTS sites require periodic preventive maintenance visits and refurbishment during their life cycle. Helicopters provide the necessary means of transport for the technicians, electronics components, construction materials and equipment to execute these tasks.

During such missions rear facing cargo doors would habitually be used to readily access equipment and materials, some of which may be irregularly shaped. Likewise, the capacity to sling sizeable loads would often be utilized to relocate materials and equipment from land or ship locations to mountaintop or otherwise inaccessible sites, in order to complete construction activities. For this reason, the light helicopters must be capable of transporting a useful load of at least 453.5 kg (1000 lbs) plus the necessary fuel to achieve a minimum endurance of at least two hours, internally and/or externally, while medium helicopters, which are often used in tower construction, must be able to transport useful loads of at least 1723kg (3800lbs).

All helicopters in the coast Guard are required to sling loads and the long line vertical reference capability allows the cargo to be delivered to otherwise inaccessible areas, with reduced environmental impact, as the size of drop zone requirement can be

minimized. Lines can extend to up to 46 m (150ft) in length, in order to safely clear ship superstructure and other obstacles and allow optimal maneuverability of the helicopter.

Items slung by helicopter can include cement, sand, gravel and structural tower units. Incorporating a remote hook capability will permit the deposit of the load with minimal environmental footprint and risk, without the need for ground personnel to assist.

In this work scenario, the operating environment for the pilot and CCG personnel is highly demanding and intense, compounded by the challenges associated with performing repetitive tasks at high altitudes, in variable coastal environmental conditions, such as fog and cold temperatures. The pilot must be capable of viewing the sling equipment, the load, the drop zone and the ground crew at all times to facilitate safe delivery of the load and must be able to continually assess aircraft performance indicators while conducting the external lift so that the aircraft integrity and safety is not compromised.

4.2.4 Mission Profile 4 - Environmental Response

CCG Helicopters are used to identify suspected polluters. Generally, the light helicopters are used as platforms to collect pollutants (samples), acquire photographs or video from remote areas which are not accessible by any other means. On such missions, they often operate from ship borne facilities, flying at low altitudes for extended periods of time, in potentially reduced visibility conditions in a cold weather maritime environment.

4.2.5 Mission Profile 5 - Support for Department of Fisheries and Oceans Programs

CCG provides support for various DFO programs including those of the Ecosystems and Oceans Science (EOS) and Ecosystems and Fisheries Management (EFM).

Missions supporting EOS may involve low altitude flying over large areas, in a maritime environment, to conduct ice reconnaissance using the DFO produced ice thickness probe, which is attached to the forward external aircraft fuselage. This exercise is carried out in order to study climate change and assess the situation pertaining to the thickness of the ice in a specific geographic area. For this activity, the ice service specialist generally brings a laptop computer and GPS equipment aboard the helicopter for use during the flight.

CCG deploys ice breakers and helicopters to support activities such as the annual seal hunt in the Gulf of St. Lawrence and the Front at the North East Coast of Newfoundland and Labrador. During these missions, a light helicopter is used primarily to identify both seal herd concentrations, and enforcement for EFM, with the fisheries observer positioned in the front seat while using a laptop, possibly the helicopter GPS and video camera equipment that is mounted aboard the aircraft for the duration of the flight.

Again, the nature of these missions indicates a harsh, possibly low visibility operating environment, where the helicopter may be operating from a ship borne base.

4.2.6 Mission Profile 6 - Support for other government departments and agencies

Given that CCG provides the on water support for Maritime Security activities, the mission operating environment requires both light and medium CCG helicopters to be in continuous communication during the exercise with parent vessels and partner agencies and departments. To that end, CCG helicopters will be required to have radio communication compatibility with the Department of National Defense (DND), the Royal Canadian Mounted Police (RCMP) and other government departments (OGD) and agencies as necessary. These activities may take place in coastal areas, requiring operations based aboard vessels or landing on unprepared surfaces (on snow, ice or rough terrain).

In this situation, a helicopter having Instrument Flight Rule (IFR) capability would provide the pilot the capacity for enhanced situational awareness to address navigation and emergency situations.

4.2.7 Mission Profile 7 – Secondary Search and Rescue

At times, the light helicopters accompanying CCG vessels may be used for air surveillance to augment CCG's surface Search and Rescue capability. While working onboard CCG vessels, they can and have assisted in SAR missions for missing or stranded fishers.

In this capacity the helicopter may be required to travel at low altitudes, over large areas, for at least two hours. It may be necessary to conduct these search activities in reduced visibility conditions in a harsh maritime environment, requiring IFR capability and the use of Night Vision Goggles.

Mission Training Scenarios for CCG Helicopters

1. Overview

The eight training scenarios addressed in this document are all directly linked to the seven helicopter mission profiles in the *CCG Helicopter Mission Profiles Document*.

Each training scenario listed is linked to both the mission training objectives, and crew currency and qualifications.

2. Mission Training Objectives

The eight scenarios listed below will be carried out on the Full Flight Simulator (FFS) to prepare crews to safely and effectively accomplish the Mission Scenarios described in the *CCG Helicopter Mission Profiles Document*. The training scenarios are intended to train and test crews in the use of the aircraft systems, malfunctions recognition and handling, as well as pilot decision making and situational awareness capabilities during realistic CCG operations.

Further information about the training objectives of the CCG can be found in the *CCG Full Flight Simulator: Concept of Operations* and *CCG Full Flight Simulator: Statement of Operational Requirements*.

3. Training Scenario Features

The following features apply to the eight training scenarios described below in section 4:

- a. The ability to practice and simulate all normal, abnormal, and emergency procedures must be available in all training scenarios.
- b. The ability to incorporate day, night unaided, and Night Vision Imaging Systems (NVIS) operations.
- c. The ability to encounter inadvertent entry to inadvertent instrument meteorological (IMC) conditions with a Visual Flight Rules (VFR) recovery and an Instrument Flight Rules (IFR) recovery to a suitable aerodrome or light station equipped with a GPS/Localizer performance with vertical guidance (LPV) approach procedure.
- d. All weather phenomena such as wind, rain, snow, and fog must be available in all scenes as well as in areas within the simulator database, including onshore, offshore coastal and shipboard operations.

- e. All scenarios must incorporate various wind and weather conditions, including in-flight icing and also be capable of IMC encounters and night vision goggle (NVG) operations.
- f. Restrictions to visibility must be accomplished through simulations of various obscurants such as rain, snow, fog, smoke or dust. This must also include obscuring phenomena such as dust and snow balls and water spray caused by the rotor wash when operating at close proximity to the ground/water.

4. Training Scenarios

The environmental, equipment, operations and manoeuvre elements listed for each scenario are the integral capabilities the FFS must have in order to provide a comprehensive training scenario.

Training Scenario 1 - Shipboard and Offshore Training

- a. Realistic representation of a CCG vessel at sea (static and dynamic).
- b. Recreate pitch, heave and roll of the vessel up to (up to 5° roll, 5° pitch and 5m heave) during flight operations, landings and take-offs. The helicopter will have to be flown in sympathy with the movement of the ship.
- c. Sea states up to sea state 6. Note: This is for emergency procedures training as CCG helicopters do not land in conditions of sea state 6.
- d. Shipboard operations must be able to be conducted in various conditions of wind, rain, and snow at temperatures specified in the Statement of Requirements as appropriate.
- e. Simulate airflow around the superstructure as it affects the area around the landing pad and helicopter hangar. Day, night, IFR, and NVIS operations including navigation to and from the ship to other ships, platforms or shore based facilities.
- f. Non Directional Beacon / Airborne Radar Approach (NDB/ARA) operations.

- g. Sling operations to the aft deck and to the foredeck, including long line of 120 feet.

Training Scenario 2 - Operations in Mountainous Areas

- a. Ability to control density altitudes to simulate aircraft performance
 - i. A/C must react in accordance with the performance parameters described in the approved Rotorcraft Flight Manual
- b. Recreation and aircraft reaction to mountainous terrain airflow characteristics utilizing computational fluid dynamics (CFD) modeling techniques
- c. Mountain top structure simulations, including pads and communication towers with and without guide wires
- d. Mountain flying technique for take-off, en-route, and landing operations to and from elevated landing pads and other unprepared areas (pinnacles, cirques, ridges, shoulders, ledges, etc.)
- e. Sling operations

Training Scenario 3 - Operations in Coastal Areas

- a. Accurate representation of coastlines for navigation
- b. Light station(s) take offs and landings
- c. NVG operations
- d. Use of weather radar with surface mapping features.
- e. Use of Helicopter Terrain Awareness and Warning System (HTAWS) to determine terrain features ahead of and around the aircraft

Training Scenario 4 – Operations in Arctic, Tundra and Treed Areas

- a. Fuel caches

- b. Sloping ground
- c. Dynamic roll over scenarios
- d. Confined areas
- e. High Tension power lines and power transmission towers
- f. Capable of contact with obstacles
- g. Rising terrain incorporating obstacles to be used in reduced visibility scenarios.

Training Scenario 5 - External Load Operations

- a. Operations scenario A: Simulating a load underneath the helicopter using a short lanyard (within 20 feet) and load.
- b. Operations scenario B: Simulating a long line of 120 feet. This scenario should incorporate the re-creation of the vertical reference technique commonly used in CCG operations.
 - i. This will require the addition of a display from the side designated as the VREF seat, which will enable the pilot to look directly below the aircraft at the load and the surface. The surface should be what would be experienced in any of the scenarios listed above.
 - ii. While in the VREF mode, the aircraft must be capable of being manoeuvred while the pilot looks directly below the aircraft. The load should be visible and be subject to the oscillations normally encountered during this regime of flight. Loads will move independently of, but also as a result of movement of the aircraft by the pilot.

Training Scenario 6 - Secondary Search and Rescue

- a. SAR conducted in all weather conditions and over a variety of terrain such as forest, tundra, over water, coastal areas, shipboard for the purpose of initiating and conducting searches for personnel, vehicles or vessels.
 - i. These scenarios will be conducted using all appropriate onboard equipment such as weather radar, auto flight systems, HTAWS, and navigation equipment.
 - ii. These scenarios must be capable of including training related to inadvertent entry to IMC, as well as the use of IFR procedures for positioning and de-positioning from the search area.

Training Scenario 7 - Low Visibility Training

- a. Selected areas of the simulator terrain database must be of sufficiently high resolution to conduct confined area landings and detailed navigational procedures in conditions of low visibility while flying below 200 feet above ground level (AGL).
- b. These high resolution areas must include both onshore, Arctic, and coastal regions.

Training Scenario 8 - IFR Operations

- a. Standard approach, arrival and departure procedures to selected airports, including some in Arctic and remote locations, in accordance with the requirements of the TC simulator approval program.
- b. Conduct operations in instrument meteorological conditions with and without degraded aircraft systems.
- c. The ability to conduct cloud breaking procedures.