National Defence / Défense nationale

Office of the Commanding Officer
Aerospace Engineering Test Establishment
PO Box 6550 Station Forces
Cold Lake AB, T9M 2C6

AETE 2014-006 (RW 3-3)

19 June 2014

Distribution List

PROJECT ESTIMATE – AETE 2014-006
CH147F NORTHERN
DOMESTIC AIRSPACE EVALUATION

References: A. 10081-1 (SO Tac Avn Sys) / 11500-82-2 / AETE 2014-006 (AFTEC 2-2) Request For Estimate Tasking, 23 May 2014
B. Email Maj. S.J Coté, 15:39 13 Jun 2014
C. Email N.A. Stanway, 12:52 11 Jun 2014
D. Email Col. N. Gagne, 06:24 19 Jun 2014
E. C-12-147-F00/MB-001(TR4) Aircraft Operating Instructions CH147F Medium-Heavy Lift Helicopter, 30 July 2013
F. Specific Purpose Flight Permit CH147F/2013/TAA FP- 479 Rev 7, 7 Apr 2014
G. C-05-020-007/AM-000 Flight Test Orders For The Canadian Forces, 1 Jun 2014

INTRODUCTION

1. This letter comprises the Aerospace Engineering Test Establishment (AETE) project estimate requested at reference A. This estimate describes AETE's resources and external support requirements needed to conduct an evaluation of the CH147F in the Northern Domestic Airspace (NDA).

2. AETE has estimated that the execution of project 2014-006 will require up to 135 flight hours and cost $133,281.26. A detailed cost estimate is provided at Annex A.

3. AETE concurs with the Priority, Aim, Objectives, Scope, and Deliverables as described in reference A with the addition of the following objectives recommended in references B and C:

a. Evaluate the performance of the Electro-Optical Sensor (EOS) with respect to alignment and integration with the Avionics Management System (AMS); and

b. Determine the in-flight barometric altitude error of the Air Data Computer (ADC) systems.

TEST CONCEPT

4. The test will consist of self-deploying two CH147F aircraft into the NDA. While the test may be accomplished using a single aircraft, having two aircraft deployed will enhance continuity of testing in case of aircraft unserviceability. Due to the remote location of the testing, unserviceability could have a major impact on the ability to complete the project in the narrow window provided by the Arctic climate. A second aircraft will also enhance safety through mutual support.

5. The project will be executed by a test team comprised of AETE and 450 Sqn personnel authorized by the Flight Test Authority (FTA) and operating under an Experimental Flight Permit (EFP).

6. This project's preparation and execution will consist of the following phases:

a. Phase 1: FTI Development. In preparation for Phases 3 and 4, a CH147F Flight Test Instrumentation (FTI) suite will be developed to allow for the recording of EGI and AMS information. Although not essential for the safe execution of this program, fitting one CH147F with FTI would provide invaluable information in the event the systems under test do not perform adequately. FTI development will take place at AETE during the months of June to July and installation will be performed in Petawawa during Phase 3. Additional FTI costs are presented in Annex A.

b. Phase 2: AETE Test Team Training. The AETE Qualified Test Pilots (QTPs) are not current on the CH147F. An AETE-approved Training Plan will be executed using resources from 450 Sqn to provide ground and flight training to support the issuance of an Aircraft Captain category on the CH147F category by the Commanding Officer (CO) AETE in support of Test and Evaluation. In addition, the training will include the intended test procedures in Boeing's Systems Integration Laboratory (SIL) to verify the procedures and establish the system's behaviour. Phase 2 will occur in Petawawa and Philadelphia during the months of June and July.

c. Phase 3: Flight Test – Petawawa. Ground and flight test will be conducted by AETE, with support from 450 Sqn, using a CH147F equipped with the FTI suite designed in Phase 1. Testing will be conducted to establish a baseline with regards to EGI alignment time, failure mode testing and procedure validation. The ADC barometric altitude error will also be determined. Phase 3 will occur in the Petawawa area and will require 5 days.

d. Phase 4: Flight Test – Northern Domestic Airspace. Commencing in Petawawa, the aircraft and test team will fly to test locations within the NDA to identify issues related to the Embedded Global Positioning System – Inertial Navigation Unit (EGI) that may affect the AMS, Digital Automatic Flight Control System (DAFCS) and Flight Director (FD). A progressive approach will be employed as the aircraft will continue farther north with each test location with the ultimate goal of reaching Canadian Forces Station Alert. Upon completion of testing in Alert, the aircraft will proceed to Iqaluit to support OP NANOOK. Phase 4 is scheduled for 10 days and will include the following locations within the NDA with a detailed itinerary provided at Annex B:

(1) Rankin Inlet;

(2) Cambridge Bay;

(3) Resolute Bay;

(4) Alert;

(5) Enroute legs including transit to and between the above airports; and

(6) Other off-airport locations as required in order to meet the test objectives including extreme latitude testing north of Alert.

7. Constraints. The following constraints apply to this project. As of this date, none of these items should prevent completion:

a. The evaluation should be conducted between 01 Aug 2014 and 30 Sep 2014 due to forecasted environmental conditions beyond this time period;

b. The evaluation should be completed prior to 24 Aug 2014 to allow the CH147F to support OP NANOOK 2014 in accordance with reference D;

c. The latitude at which the Original Equipment Manufacturer (OEM) considers the EGI airworthy may limit the scope of the test;

d. Testing should be planned to maintain the CH147F within communication range of supporting unit(s) including Beyond Line Of Sight (BLOS) means;

e. Ability to transit between airports due to the combination of Arctic weather, long distances and limited refuelling locations;

f. Limited timeline for development and installation of FTI equipment. FTI is desirable but not essential to this test;

g. Availability of ALSE equipment including but not limited to immersion suits and life rafts;

h. Availability of accommodations and logistic support;

i. Planned refuelling locations should be limited to locations with High Pressure Refuelling (HPR).

j. Availability of a valid Digital Aeronautical Flight Information File (DAFIF) will determine the ability to evaluate LNAV and LNAV/VNAV approach capability.

k. Availability of aircrew; and

l. Serviceability of CH147F aircraft.

8. Limitations. The following limitation applies to this project:

a. The aircraft shall not be flown beyond the limitations stated in references B and C unless stated otherwise in the Experimental Flight Permit (EFP).

SUPPORT REQUIREMENTS

INTERNAL SUPPORT

9. Rotary Wing Evaluation (RW Eval). RW Eval will provide:

a. All phases.

(1) 1 x Project Officer (PO);

b. Phase 2.

(1) 2 x QTPs for conversion training;

c. Phases 3 and 4.

(1) 2 x QTPs;

(2) A Flight Authorization Officer (FAO) to authorize all flights conducted by the test team on the CH147F in Phases 3 and 4; and

(3) 1 x Flight Test Engineer (FTE).

10. Fighter Evaluation (Ftr Eval). N/A.

11. Multi-Engine Evaluation (ME Eval). N/A.

12. Systems Evaluation (SYS Eval).

a. Electromagnetic Compatibility (EMC).

(1) Phase 1. Assess EMC for the FTI equipment.

b. Avionics (Avs).

(1) Test Planning Phase: Provide SME support.

c. Crew Systems (CS).

(1) Phases 3 and 4. Provide 1 x Qualified Systems Evaluator (QSE).

13. Operations (Ops).

a. Phases 3 and 4.

(1) Provide 2 x Satellite Telephones.

(2) Provide 2 x Handheld GPS receivers.

14. Experimental Aircraft Maintenance Engineering (XAMEO). Perform initial measurements of AETE personnel for Immersion Suits.

15. Data Acquisition and Processing Services (DAPS).

a. Provide personnel to develop the FTI;

b. Provide personnel for the installation of the FTI;

c. Provide FTI equipment capable of recording two MIL-STD-1553 data busses;

d. Provide the training and authorizations required to members of the test team for installation and removal of the FTI and FTI-specific checks (e.g., A, B, A/B, work orders).

16. Technical Support (TS).

a. Phases 3 and 4.

(1) Provide 1 x Imagery Data System (IDS) technician.

(2) Provide the following equipment:

(a) 4 x GoPro Cameras; and

(b) Still and video Cameras.

(3) Perform video editing at the completion of the test as requested by the PO to support data analysis.

EXTERNAL SUPPORT

17. The following agencies are required to support this project as described below:

a. 1 Canadian Air Division. The following items are required:

(1) Phase 2.

(a) Provide 35 CH147F flying hours and Aviation Petroleum, Oil, Lubricants (AVPOL) for QTP training; and

(b) Task 1 Wing/450 Sqn to support IAW paragraph 17.c.

(2) Phases 3 and 4.

(a) Provide 100 CH147F flying hours and AVPOL based upon estimated requirements in Annex B;

(b) Provide support to 450 Sqn in obtaining required paper and digital flight planning products;

(c) Coordinate a ground means of sending and receiving BLOS communications including Satellite Communication (SATCOM) and High Frequency (HF) for system testing and flight following; and

(d) Task 1 Wing/450 Sqn to support IAW paragraph 17.c.

b. Project Sponsor. The following items are required:

(1) All Phases. In consultation with the PO, staff the TD travel authorization forms with the names provided at Annex C. Please note the following:

(a) PO will confirm primary and alternate names prior to the form being staffed; and

(b) As timelines tend to shift, the number of days for each TD can be moved at the discretion of AETE but will not exceed the pre-approved duration and estimated cost.

(2) Provide Temporary Duty (TD) funding for:

(a) Conversion training for 2 x AETE QTPs;

(b) Travel to the Boeing System Integration Lab;

(c) FTI Installation; and

(d) Project Execution.

(3) Financial coding for all associated project costs;

(4) Coordination with DTAES for the issuance of a CH147F EFP authorizing:

(a) Essential: Flight into the NDA;

(b) Essential: Extended over-water operations;

(c) Desirable: Flight into Instrument Meteorological Conditions (IMC), once EGI, DAFCS and Flight Director (FD) performance has been declared adequate within an operating region. The decision to fly IMC will be made in accordance with reference G; and

(d) Desirable: Flight into light icing conditions.

c. 450 Sqn. The following items are required:

(1) Phase 2.

(a) Provide CH147F aircraft as required;

(b) Provide Class 2 ALSE (Helmets and Life Preserver / Survival Vest (LP/SV)) for 2 x AETE QTPs;

(c) Establish training priority of AETE QTPs over ongoing training activities in order to meet aggressive project schedule; and

(d) Provide personnel to support AETE QTP's ground and flight training.

(2) Phase 3.

(a) Provide 1 x CH147F aircraft;

(b) Provide Class 2 ALSE (Helmets and LP/SVs) for 5 x AETE Aircrew;

(c) Provide personnel:

1) 1 x Aircraft Captain;

2) 1 x Flight Engineer;

3) 1 x Load Master; and

4) 1 x AVS technician to support FTI installation;

(d) Provide routine maintenance support.

(3) Phase 4.

(a) Provide 2 x CH147F aircraft;

(b) Provide Class 2 ALSE (Helmets and LP/SVs) for 5 x AETE Aircrew;

(c) Provide Class 2 ALSE for up to 11 aircrew to include:

1) Constant wear immersion suits;

2) Emergency Breathing Systems (EBS); and

3) LP/SVs.

(d) Provide Class 2 ALSE for 450 Sqn technicians to include:

1) Headsets;

2) Quick Don immersion suits; and

3) Life Preservers.

(e) Provide Class 3 ALSE for each aircraft to include:

1) At least one Personal Locator Beacon (e.g. ProFIND SLB1000);

2) 10 Man Life Raft; and

3) Survival Kits.

(f) Provide personnel:

1) 2 x Aircraft Captains;

2) 2 x Flight Engineers;

3) 2 x Load Masters; and

4) Aircraft technicians as required to service and maintain 2 x CH147F.

(g) Support:

1) Flight planning including provision of required publications and maps;

2) Provision of DAFIF and Digital Map files;

3) Coordination for Prior Permission Required (PPR) airfields;

4) Booking of commercial accommodations;

5) Provision of Between Meal Supplements (BMS) or Box Lunches where available;

6) Booking of Rations and Quarters (R&Q) where applicable (e.g. Resolute Bay, Alert);

7) Advanced coordination for commercial AVPOL and other aviation support services;

8) Coordination with Joint Task Force North (JTF(N)) as required;

9) Provision of deployed Aircraft Maintenance Support Equipment (AMSE);

10) Provision of spare parts;

11) Provision of aircraft records set support as required for flight operations; and

12) Deployment of Mobile Repair Party (MRP) if required.

PROJECT MANAGEMENT

18. Estimated Cost. Project costs are estimated to be $133,281 as detailed in Annex A

19. Risk. The estimated project risk levels are presented in Figure 1. The overall project risk level is HIGH due to schedule.

Risk	Risk Level	Details
Safety	Medium	The final safety risk level will be assigned during the AETE Safety Review Board. The risk level is considered to be MEDIUM at this stage based on the following considerations: • The test program will use an incremental approach with increasing northern latitude. • The CH147F remains controllable in Visual Meteorological Conditions (VMC) in a degraded mode when the Navigation and Flight Control Systems have failed. • If required, SAR response time may be delayed due to remote location of testing. • All testing will be conducted during daylight conditions. • The EGI under test has been used in the Arctic previously by other RCAF aircraft.
Technical	Low	• All testing will be completed using normal and approved operational procedures or basic test procedures. • All degraded modes to be tested have existing emergency procedures which will be validated before leaving Petawawa. • FTI does not involve aircraft modifications. • CH147F is not cleared for Instrument Meteorological Conditions (IMC) or Icing Conditions.
Environmental	Low	• No environmental concerns outside of those associated with normal RCAF helicopter operations in the Arctic are foreseen.
Schedule	High	• The testing will be conducted in remote locations with unpredictable weather and limited logistical support. • Testing shall be completed NLT 30 September due to potential of inclement weather. • The evaluation should be completed prior to 24 Aug 2014 to support OP NANOOK 2014.
Financial	Medium	• Due to the remote location of testing, costs related to unforeseen contingencies (e.g. MRP, weather delays) could escalate rapidly. • Lack of contract fuel in the Arctic will result in unpredictable costs.

Figure 1. Risk Description

20. MILESTONES. Annex D provides a Gantt chart indicating the project phases, task inter-dependencies and milestones. The final test report is estimated to be released on 27 October 2014 based on a start date of 1 September 2014.

21. If this estimate is acceptable, please respond to Air Force Test and Evaluation Coordination (AFTEC), who will coordinate a tasking to AETE. This estimate will remain valid for 30 working days provided no higher priority/precedence, conflicting projects arrive in the interim. Should you have any questions regarding this proposal, please contact the AETE Project Officer, Capt. B. Banadyga, at CSN 690-6634 or commercial (780) 840-8000 extension 6634 or the Officer in Charge of Rotary Wing Evaluation, Maj. M. Bergeron, at CSN 690-8759 or commercial (780) 840-8000 extension 8759.

Experto Crede

M.R. Barker
Colonel
Commanding Officer

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OIC TS
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NON-CONTROLLED GOODS / MARCHANDISES NON-CONTRÔLÉES

Annex A to Estimate
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ANNEX A – COST ESTIMATE

Phase 1: FTI Development					
Estimated Temporary Duty Costs (Recce, 450 Sqn, Petawawa)					
Description	Unit Cost	Number of People	Number of Days	Subtotal	Remarks
Meals (Petawawa)	$73.65	2	3	$441.90	2 x DAPS Personnel (AETE Civilians)
Meals (in Transit)	$73.65	2	2	$294.60	3 days at Petawawa
Accommodations (Petawawa)	$110.00	2	3	$660.00	
Rental Car	$50.00	1	5	$250.00	
Incidentals	$17.30	2	5	$173.00	
Accommodations (In Transit)	$150.00	2	1	$300.00	
Airfare	$1,000.00	2	-	$2,000.00	
Miscellaneous (e.g. Fuel, Parking, Taxi)	$300.00		-	$300.00	
			Total Temporary Duty Costs (Recce)	**$4,419.50**	
Estimated Temporary Duty Costs (Installation, 450 Sqn, Petawawa)					
Description	Unit Cost	Number of People	Number of Days	Subtotal	Remarks
Meals (Petawawa)	$73.65	4	3	$883.80	3 x DAPS Personnel (AETE Civilians)
Meals (in Transit)	$73.65	4	2	$589.20	1 x EMC Personnel (AETE Civilians)
Accommodations (Petawawa)	$110.00	4	3	$1,320.00	3 days at Petawawa
Rental Car	$50.00	2	5	$500.00	
Incidentals	$17.30	4	5	$346.00	
Accommodations (In Transit)	$150.00	4	1	$600.00	
Airfare	$1,000.00	4	-	$4,000.00	
Miscellaneous (e.g. Fuel, Parking, Taxi)	$300.00		-	$300.00	
			Total Temporary Duty Costs (Installation)	**$8,539.00**	
Estimated Equipment and Design Costs (AETE)					
Description	Unit Cost	Number of Units		Subtotal	Remarks
Parts	$1,000.00	1		$1,000.00	
Civilian Overtime	$2,373.85	1		$2,373.85	
Miscellaneous	$1,000.00	1		$1,000.00	
			Total Equipment and Design Costs (AETE)	**$4,373.85**	
			Total Phase 1 Costs	**$17,332.35**	

Annex A to Estimate
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Phase 2: AETE Test Team Training					
Estimated Temporary Duty Costs (Ground School, 450 Sqn, Petawawa)					
Description	Unit Cost	Number of People	Number of Days	Subtotal	Remarks
Meals (Petawawa)	$23.82	2	12	$571.68	2 x AETE QTPs 2 weeks Ground School 26 May - 6 Jun
Meals (in Transit)	$73.65	2	2	$294.60	
Accommodations (Petawawa)	$75.00	2	13	$1,950.00	
Rental Car	$50.00	1	13	$650.00	
Incidentals	$17.30	2	14	$484.40	
Accommodations (In Transit)	$150.00	2	1	$300.00	
Airfare	$1,000.00	2	-	$2,000.00	
Miscellaneous (e.g. Fuel, Parking, Taxi)	$300.00		-	$300.00	
Total Temporary Duty Costs (Ground School)				**$6,550.68**	
Estimated Temporary Duty Costs (Flight Training, 450 Sqn, Petawawa)					
Description	Unit Cost	Number of People	Number of Days	Subtotal	Remarks
Meals (Petawawa)	$23.82	2	12	$571.68	2 x AETE QTPs 2 weeks Flight Training Proposed Dates: 7-18 Jul 2014
Meals (in Transit)	$73.65	2	2	$294.60	
Accommodations (Petawawa)	$75.00	2	12	$1,800.00	
Rental Car	$50.00	1	12	$600.00	
Incidentals	$17.30	2	14	$484.40	
Accommodations (In Transit)	$150.00	2	1	$300.00	
Airfare	$1,000.00	2	-	$2,000.00	
Miscellaneous (e.g. Fuel, Parking, Taxi)	$300.00	-	-	$300.00	
Total Temporary Duty Costs (Flight Training)				**$6,350.68**	
Estimated Temporary Duty Costs (Systems Integration Lab, Boeing, Philadelphia)					
Description	Unit Cost	Number of People	Number of Days	Subtotal	Remarks
Meals (Philadelphia)	$100.00	2	3	$600.00	2x AETE QTP/QSE/FTE 3 days Dates End-Jun TBD
Meals (in Transit)	$73.65	2	2	$294.60	
Accommodations (Philadelphia)	$96.00	2	4	$768.00	
Rental Car	$50.00	1	4	$200.00	
Incidentals	$17.30	2	5	$173.00	
Accommodations (In Transit)	$150.00	2	1	$300.00	
Airfare	$1,000.00	2	-	$2,000.00	
Miscellaneous (e.g. Fuel, Parking, Taxi)	$200.00	-	-	$200.00	
Total Temporary Duty Costs (SIL)				**$4,535.60**	
Total Phase 2 TD Costs				**$17,436.96**	

Phase 3: Flight Test - Petawawa					
Estimated Temporary Duty Costs (450 Sqn, Petawawa)					
Description	Unit Cost	Number of People	Number of Days	Subtotal	Remarks
Meals (Petawawa)	$23.82	5	4	$476.40	2 x QTPs 2 x FTE/QSE 1 x IDS Tech Proposed Date: 4-7 Aug 2014 (4 days in Pet, 5th day Phase 4) -assumes round trip tickets, with the return leg covering YOW-YEG at the end of Phase 4. -assumes 2x cars are cheaper than 1 mini-van, maintain flexibility to support team members with lots of equipment -assumes FTI needs to be ground shipped -expects 1-way rental charge
Meals (in Transit)	$73.65	5	2	$736.50	
Accommodations (Petawawa)	$75.00	5	5	$1,875.00	
Rental Car	$50.00	2	6	$600.00	
Incidentals	$17.30	5	6	$519.00	
Accommodations (In Transit)	$150.00	5	1	$750.00	
Airfare	$1,000.00	5	-	$5,000.00	
FTI Shipping	$2,000.00	-	-	$2,000.00	
Miscellaneous (e.g. Fuel, Parking, Taxi)	$500.00	-	-	$500.00	
Total Temporary Duty Costs (Petawawa)				**$12,456.90**	

Annex A to Estimate
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Phase 4: Flight Test - Transit to Alert					
Estimated Temporary Duty Costs (Arctic)					
Description	Unit Cost	Number of People	Number of Days	Subtotal	Remarks
Meals	$73.65	19	1	$1,399.35	2 x QTPs 2 x ACs 2 x FTE/QSEs 4 x FE/LM 1 x IDS Tech 8 x Maint Tech Dates: 4-20 Aug 2014
Meals (Northern Rate)	$123.70	19	13	$30,553.90	
Incidentals	$17.30	19	14	$4,601.80	
Accommodations (Quarters)	$50.00	19	2	$1,900.00	
Accommodations (Commercial)	$175.00	19	12	$39,900.00	
Airfare	$1,500.00	5	-	$7,500.00	
Miscellaneous (e.g. Fuel, Parking, Taxi)	$200.00	-	-	$200.00	- assumes Quarters in Alert, and possibly Resolute Bay - assumes CAL from Iqualuit to Ottawa for 5 x AETE. Return tickets
			Total Temporary Duty Costs (Arctic)	**$86,055.05**	

Annex B to Estimate
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ANNEX B – ITINERARY AND FLYING RATE

Airport	ID	Activity	D+X	Date
Petawawa	CYWA	Depart/Transit	0	11-Aug
Timmins	CYTS	Refuel/Transit	0	11-Aug
Pickle Lake	CYPL	Refuel/Transit	0	11-Aug
Churchill	CYYQ	Remain Overnight (RON)	1	11-Aug
Rankin Inlet	CYRT	Transit/Testing/RON	2	12-Aug
Cambridge Bay	CYCB	Transit/Testing/RON	3	13-Aug
Resolute	CYRB	Transit/Testing/RON	3	14-Aug
Resolute	CYRB	IFR Approach Testing/RON	4	15-Aug
Alert	CYLT	Transit/Testing/RON	6	16-Aug
Alert	87°N	Transit/Max. Latitude Testing/RON	7	17-Aug
Resolute	CYRB	Transit/RON	8	18-Aug
Hall Beach	CYUX	Refuel/Transit	8	19-Aug
Iqaluit	CYFB	Transit/RON	9	19-Aug
Iqaluit	CYFB	Handover/AETE departs via CAL	10	20-Aug
Contingency	A/R	Wx Delay / Maintenance (5 days)	A/R	25-Aug

Italics denote proposed locations and are not mandatory

Annex B to Estimate
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Airport	ID	Dist(nm)	Time (hrs)	Fuel Burned (lbs)
Petawawa	CYWA	Testing	5.0	13000
Timmins	CYTS	228.4	1.8	4568
Pickle Lake	CYPL	382.9	2.9	7658
Churchill	CYYQ	457.8	3.5	9156
Rankin Inlet	CYRT	251.6	1.9	5032
Cambridge Bay	CYCB	494	3.8	9880
Resolute	CYRB	386.7	3.0	7734
Resolute	CYRB	Testing	3.0	7800
Alert	CYLT	592.8	4.6	11856
Alert	87°	590	4.5	11800
Resolute	CYRB	592.8	4.6	11856
Hall Beach	CYUX	439.7	3.4	8794
Iqaluit	CYFB	429.8	3.3	8596
TOTAL		**4846.5**	**45.3**	**104730.0**
	STTO/Cont. (10%)		49.8	125676.0

Notes: 13442 lbs total fuel capacity, 2600 lbs/hr fuel burn
Usable Fuel: 11800 lbs incl 1000lbs reserve + 30 min VFR reserve
Time based on 130kts groundspeed
10% STTO/Cont includes Start, Taxi, Takeoff and Weather Diversions

Annex C to Estimate
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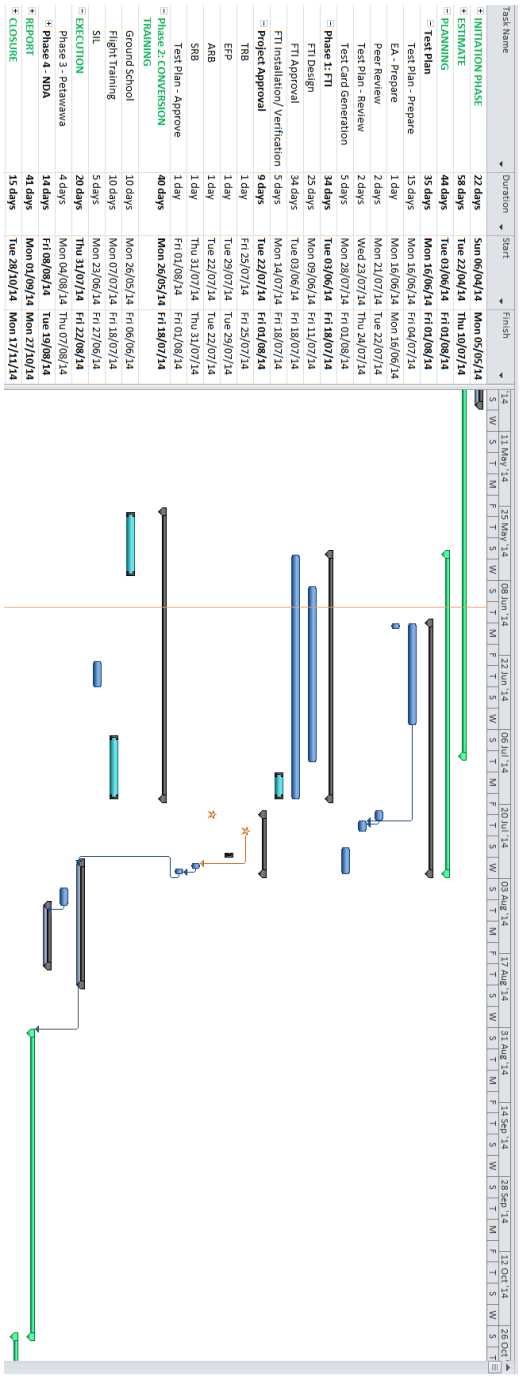
ANNEX C – CREWING

Position	**Primary**	**Alternates**
QTPs (2)	Maj M .Bergeron Capt B. Banadyga	LCol. B. Carrothers Maj M. Parsons Maj D. Duval Capt M. Jordan Capt C. Blais
FTE/QSE (2)	Capt A. Gushaty Capt C. Kublik	Capt C. Presley Capt D. Rochon Capt M. Desrochers
AC (2)	Maj C. Bowes-Lyon Maj J. Knaul	450 Pilot 450 Pilot
FE/LM (4)	450 FE 450 FE 450 LM 450 LM	450 FE 450 FE 450 LM 450 LM
IDS Tech (1)	Cpl A. Ark	Cpl A. Stuparyk MCpl K. Scott
Techs (8)	450 Tech 450 Tech 450 Tech 450 Tech 450 Tech 450 Tech 450 Tech 450 Tech	450 Tech 450 Tech 450 Tech 450 Tech 450 Tech 450 Tech 450 Tech 450 Tech

Annex D to Estimate
AETE 2014-006 (RW 3-3)
17 Jun 2014

ANNEX D – PROJECT MILESTONES



Task Name	Duration	Start	Finish
INITIATION PHASE	22 days	Sun 06/04/14	Mon 05/05/14
ESTIMATE	58 days	Tue 22/04/14	Thu 10/07/14
PLANNING	44 days	Tue 03/06/14	Fri 01/08/14
Test Plan	35 days	Mon 16/06/14	Fri 01/08/14
Test Plan - Prepare	15 days	Mon 16/06/14	Fri 04/07/14
EA - Prepare	1 day	Mon 16/06/14	Mon 16/06/14
Peer Review	2 days	Mon 21/07/14	Tue 22/07/14
Test Plan - Review	2 days	Wed 23/07/14	Thu 24/07/14
Test Card Generation	5 days	Mon 28/07/14	Fri 01/08/14
Phase 1: FTI	34 days	Tue 03/06/14	Fri 18/07/14
FTI Design	25 days	Mon 09/06/14	Fri 11/07/14
FTI Approval	34 days	Tue 03/06/14	Fri 18/07/14
FTI Installation/ Verification	5 days	Mon 14/07/14	Fri 18/07/14
Project Approval	9 days	Tue 22/07/14	Fri 01/08/14
TRB	1 day	Fri 25/07/14	Fri 25/07/14
EFP	1 day	Tue 29/07/14	Tue 29/07/14
ARB	1 day	Tue 22/07/14	Tue 22/07/14
SRB	1 day	Thu 31/07/14	Thu 31/07/14
Test Plan - Approve	1 day	Fri 01/08/14	Fri 01/08/14
Phase 2: CONVERSION TRAINING	40 days	Mon 26/05/14	Fri 18/07/14
Ground School	10 days	Mon 26/05/14	Fri 06/06/14
Flight Training	10 days	Mon 07/07/14	Fri 18/07/14
SIL	5 days	Mon 23/06/14	Fri 27/06/14
EXECUTION	20 days	Thu 31/07/14	Fri 22/08/14
Phase 3 - Petawawa	4 days	Mon 04/08/14	Thu 07/08/14
Phase 4 - NDA	14 days	Fri 08/08/14	Tue 19/08/14
REPORT	41 days	Mon 01/09/14	Mon 27/10/14
CLOSURE	15 days	Tue 28/10/14	Mon 17/11/14

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ANNEX E – DATA REQUIREMENTS

Prepared by: Capt. B.J. Banadyga, RW 3-3

1. This annex details the data to be acquired during AETE 2014-006 CH147F Northern Domestic Airspace Evaluation and the deliverables to be provided to the AETE Project Officer. It will be updated as required during the AETE test planning process by the AETE Project Officer in consultation with the DAPS Project Engineer.

GENERAL

2. The aim of this project is to support the TAC of the CH147F for flight in the Northern Domestic Airspace.

3. Data must be acquired in order to meet the following specific project objectives:

   a. Confirm the EGI, AMS, DAFCS and FD behaviour during the conduct of EGI ground and in-flight failure mode testing; and

   b. Measure the navigation performance of the Inertial Navigation System (INS) portion of the EGI.

DATA TO BE ACQUIRED

4. All messages on the two MIL-STD-1553 data busses will be recorded.

DATA ACQUISITION SYSTEM FUNCTIONAL REQUIREMENTS

5. Development and installation of a data bus recorder which can be installed and operated by the flight test crew with minimal in-flight interaction.

6. There is no requirement for in-flight display of data.

7. Data can be transferred to a laptop or hard-drive post-flight if data storage becomes a limitation.

DATA DELIVERABLES

8. There are no data deliverables required for the final report. AETE does not currently possess an Interface Control Document (ICD) and therefore cannot extract information from the recorded data. Further analysis will be undertaken if test results deem it necessary and upon receipt of the ICD.

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MILESTONES

9. The milestones and duration for this project associated with FTI are identified in the project schedule in Annex D. Overall, 30 working days are required to design, develop and install the data acquisition system.