ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 1

EO C470.01 – DISCUSS AIRCRAFT MANUFACTURERS

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Prepare the list of international partnerships located at Attachment A by photocopying the list and cutting the sections apart to distribute to the cadets.

Photocopy the International Partnership Summary Sheet located at Attachment B for each cadet.

Photocopy the Unmanned Aerial Vehicle (UAV) Manufacturers Worksheet located at Attachment C for each cadet.

UAVs are continuously changing. The information presented in Reference C3-324 may be used as a starting point in researching current UAVs and UAV manufacturers. Research current UAVs and UAV manufacturers and collect information on two or three UAVs from newspapers, magazines, journals or websites to present in TP 2. The *Aircraft* page on the Air Force website (http://www.airforce.gc.ca) may include information on UAVs used by the Canadian Forces.

PRE-LESSON ASSIGNMENT

At least one week before the lesson, assign each cadet (or have each cadet select) an international partnership from the list of international partnerships located at Attachment A. Distribute an International Partnership Summary Sheet located at Attachment B to each cadet. Have the cadets review and research the international partnership details and prepare a short oral presentation (approximately 2–5 minutes) using the International Partnership Summary Sheet located at Attachment B.

APPROACH

An in-class activity was chosen for TP 1 as it is an interactive way to provoke thought and stimulate interest among cadets.

An interactive lecture was chosen for TP 2 to identify UAV manufacturers.

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INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have discussed international partnerships between aircraft manufacturers and identified UAV manufacturers.

IMPORTANCE

It is important for cadets to discuss international partnerships between aircraft manufacturers as Canada is a leading exporter of advanced technology and is the fourth largest producer of civil aircraft in the world. It is important for cadets to identify UAV manufacturers as UAVs are a relatively new technology and are rapidly becoming more important in aviation, especially military aviation.

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Teaching point 1 **Conduct an activity where the cadets will review a summary of an international partnership between aircraft manufacturers and make a short oral presentation on the international partnership.**

Time: 20 min Method: In-Class Activity

ACTIVITY

OBJECTIVE

The objective of this activity is have the cadets review a summary of an international partnership between aircraft manufacturers and make a short oral presentation on the international partnership.

RESOURCES

- Pen / pencil,
- List of international partnerships located at Attachment A, and
- International Partnership Summary Sheet located at Attachment B.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

Have each cadet make a short oral presentation (approximately 2–5 minutes) to the group on their selected / assigned international partnership using the information they have recorded on the International Partnership Summary Sheet.



If there is not enough time for all the cadets to make their presentations, the cadets can be divided into two or more groups.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 1

The cadets' participation in the activity will serve as the confirmation of this TP.

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Teaching point 2 **Identify UAV manufacturers.**

Time: 5 min Method: Interactive Lecture



Distribute an Unmanned Aerial Vehicles (UAV) Manufacturers Worksheet located at Attachment C to each cadet.



Present the information collected on the UAVs to the cadets and have the cadets make notes using the Unmanned Aerial Vehicles (UAV) Manufacturers Worksheet.

CONFIRMATION OF TEACHING POINT 2

The cadets' completion of the Unmanned Aerial Vehicles (UAV) Manufacturers Worksheet will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets' participation in presenting the information on an international manufacturing partnership will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Canada is one of the world's leading suppliers of aviation technology. International partnerships between Canadian aviation manufacturers and those in other countries results in 85 percent of the aviation production being sold internationally. The use of UAVs, especially in military aviation, is growing rapidly and the manufacturing of UAVs is becoming an important sector in aviation manufacturing.

INSTRUCTOR NOTES / REMARKS

Cadets who are qualified Advanced Aviation Technology – Aircraft Manufacturing and Maintenance may be able to assist with this lesson.

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REFERENCES

C3-321 ISBN 978-2-921393-91-1 Bombardier Inc. (2009). *Canada's Bombardier*. Canada: Bombardier Inc.

C3-322 Government of Canada. (2008). *Canada's aerospace advantages*. Retrieved February 10, 2009 from http://investincanada.gc.ca/eng/industry-sectors/advanced-manufacturing/aerospace/aerospace-advantages.aspx

C3-323 Industry Canada. (2009). *Aerospace in Canada*. Retrieved February 10, 2009 from http://www.ic.gc.ca/eic/site/ad-ad.nsf/eng/ad03909.html

C3-324 Thirty Thousand Feet Aviation Directory. (2009). *Unmanned aerial vehicles*. Retrieved February 10, 2009, from http://www.thirtythousandfeet.com/uav.htm

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INTERNATIONAL PARTNERSHIPS

After photocopying, cut the list apart on the dotted lines and distribute as required to the cadets.

Pratt & Whitney Canada

- Pratt & Whitney Canada is an aerospace leader committed to shaping the future of business, general aviation, and regional aircraft and helicopters with high-performing, dependable engines.
- A new 10 000-pound thrust class engine family was selected by Cessna Aircraft for the Citation Columbus business jet and will exceed International Civil Aviation Organization (ICAO) emissions standards by up to 50 percent.

Bombardier Aerospace

- Bombardier's regional airliner product family includes the CRJ series regional jets and the Q series turboprop.
- Bombardier is the world's third largest civil aircraft manufacturer with locations in 22 countries and customers in more than 100 countries.

Goodrich and Messier-Dowty

- The landing gear market is the undisputed domain of Canadian industry.
- Goodrich is the chosen supplier of components for the Airbus A380 landing gear. Messier-Dowty supplies landing gear for the Boeing 787.

ExelTech Aerospace

- ExelTech Aerospace is the largest regional aircraft maintenance, repair, and overhaul (MRO) in North America and services such types as the Bombardier CRJ, Embraer ERJ, ATR-42, ATR-72, Boeing 737, and Saab 340.

Magellan, Honeywell, and Avcorp

- The Joint Strike Fighter (JSF) program has nine different nations as partners: the United States, the United Kingdom, Italy, the Netherlands, Turkey, Canada, Denmark, Norway, and Australia.
- Several Canadian companies supply components and systems to the JSF including Magellan (primary flight and propulsion structures), Honeywell (power management system), and Avcorp (outboard wings).

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CAE

- CAE is a world leader in simulation and training services for civil and military aviation.
- Through its global network of 27 civil and military aviation training centres, CAE trains more than 75 000 crew members annually.

Thales

- Thales is a world leader in mission-critical information systems for aviation, defence, and security markets with operations in 50 countries.
- Their headquarters is in Montreal and it is the worldwide centre of excellence for flight control systems.

CMC Electronics

- CMC Electronics provides innovative cockpit systems integration and avionics to customers worldwide.
- CMC is the prime contractor for the avionics systems integration of the Beechcraft T-6B military trainer aircraft.

Magellan Aerospace Corporation

- Magellan Aerospace Corporation has locations in Canada, the United States, the United Kingdom, and India.
- Magellan designs, manufactures, and repairs aeroengine and aerostructure components and assemblies.

Avcorp

- Avcorp produces high-strength interior panels, fuel tanks, structural wing components, and fully integrated vertical and horizontal stabilizers.
- Avcorp is providing primary flight structures for the Cessna Sovereign and Citation CJ3 business jets.

Standard Aero

- Standard Aero is among the largest small-turbine engine maintenance and repair companies in the world, providing MRO services for General Electric, Rolls-Royce, Honeywell and P&WC engines.

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INTERNATIONAL PARTNERSHIP SUMMARY SHEET

Companies and Countries Involved
Aircraft Types and / or Components Involved
Additional Information

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UNMANNED AERIAL VEHICLE (UAV) MANUFACTURERS WORKSHEET

UAV Name	Manufacturer Name and Country of Manufacture	Purpose(s)

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