ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL THREE

INSTRUCTIONAL GUIDE

SECTION 4

EO C360.04 – IDENTIFY HOW EQUIPMENT IS USED AT AN AERODROME

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-803/PG-001, 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.

Create slides of figures located at Annex E.

Photocopy the activity sheet located at Annex F for each cadet.

PRE-LESSON ASSIGNMENT

N/A.

APPROACH

An interactive lecture was chosen for this lesson to clarify, emphasize and summarize the equipment used at an aerodrome.

INTRODUCTION

REVIEW

N/A.

OBJECTIVES

By the end of this lesson the cadet shall have identified how equipment is used at an aerodrome.

IMPORTANCE

It is important for the cadets to be able to identify the equipment at an aerodrome and how it is used to understand aerodrome operations. At most aerodromes each vehicle has a specific purpose and, to carry out specialized tasks, certain vehicles have additional equipment added to them.

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Teaching point 1 **Explain How Trucks Are Used at an Aerodrome**

Time: 15 min Method: Interactive Lecture

One of the most common vehicles found at an aerodrome is a truck. The trucks found at an aerodrome can be broken down into three general categories:

- pickup truck,
- dump truck, and
- specialty truck.



Show the cadets Figures 16E-1, 16E-2 and 16E-3.

INSPECTIONS

Throughout the course of the day, aerodrome operations staff must conduct inspections of the following areas:

- runways,
- taxiways,
- aprons, and
- roads.

Most of the time, the only equipment required to conduct these inspections is a vehicle with a rotating amber beacon and a two-way radio. A car is usually the most economical vehicle for this kind of task.

While most of the regular inspections at an aerodrome can be conducted using a car, pickup trucks are required for some specific inspections. Specifically, the guidelines for conducting runway friction testing require the use of a pickup truck when using a portable decelerometer (a device that measures deceleration).

A pickup truck transports tools and equipment required to correct deficiencies more easily than a car.

There may also be areas of the aerodrome that need inspections, but that do not have proper roads. In these cases, a four-wheel drive pickup truck may be required to safely reach these areas.

MAINTENANCE

Pickup trucks are used extensively for ongoing maintenance tasks around an aerodrome. They are well-suited to carry the tools and equipment necessary to perform maintenance. Typical maintenance tasks that might be carried out include:

- replacement and repair of lights,
- fence repairs,
- sign repairs, and
- minor pavement and turf repairs.

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CONSTRUCTION

During construction at an aerodrome, trucks of all shapes and sizes will be used. Flatbed trucks deliver materials and equipment to the site, as well as move them around the facilities. Dump trucks will be used wherever excavations or earth moving occurs. Pickup trucks will be used to move people, smaller tools and equipment around.

While most of these vehicles will not be owned by the aerodrome, the aerodrome operator will be responsible for ensuring that drivers are properly trained, that the vehicles are properly equipped (eg, two-way radio, rotating amber beacon/strobe light), and that the vehicles move about the aerodrome in a safe and efficient manner.

SNOW REMOVAL

At most Canadian aerodromes, winter is a busy time of year for trucks. All of the snow that falls on the movement areas and the road system has to be cleared in a timely manner to allow operations to continue with minimal disruption.



Show the cadets Figure 16E-4.

Snowplows are often attached to large trucks. Even pickup trucks can have a plow blade attached for clearing small areas. Piles of snow that accumulate can be moved using dump trucks. Dump trucks or pickup trucks may have hoppers in the back that can be used for spreading chemicals for melting ice or grit to increase traction.

PLATFORMS FOR SPECIALTY EQUIPMENT

Many specialized vehicles at an aerodrome are basic truck frames with the addition of special equipment. Examples of these include:



Show the cadets Figure 16E-5.

- de-icing trucks,
- fuel delivery,
- air stairs,
- rapid response emergency vehicles, and
- ground servicing equipment (eg, catering truck).



Show the cadets Figure 16E-6.

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ACTIVITY

Time: 5 min

OBJECTIVE

The objective of this activity is to have the cadets match the vehicle pictures with the correct name and purpose.

RESOURCES

- Aerodrome vehicle handout located at Annex F, and
- Pen/pencil.

ACTIVITY LAYOUT

N/A.

ACTIVITY INSTRUCTIONS

1. Distribute the handout located at Annex F.
2. Have the cadets complete the handout.
3. Provide assistance and guidance as required.
4. Correct the answers as a group using Annex G.

SAFETY

N/A.

CONFIRMATION OF TEACHING POINT 1

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

Teaching point 2 **Describe Runway Maintenance Equipment and How it is Used at an Aerodrome**

Time: 5 min Method: Interactive Lecture

There are several important pieces of equipment that are used extensively at aerodromes: sweepers, snowplows and snow blowers.

Equipment designed for aerodrome use is usually designed to be mounted on a special chassis. The chassis has a standardized mounting bracket and common hydraulic connections which allow different types of equipment to be mounted, depending on the task to be done.

SWEEPERS

Sweepers come in three main configurations:

- self-propelled,
- front mounted, and
- towed.

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Show the cadets Figure 16E-7.

When there has been a light accumulation of snow or slush but not enough to require a snowplow, a sweeper can be used. Sweepers remove debris such as dirt or sand, to prevent foreign object damage (FOD) to propellers or turbine engines.

The rotating brush has bristles made of stainless steel or synthetic materials (usually nylon or polypropylene). Steel bristles cut through ice and snow effectively and synthetic bristles move wet snow or slush well.

Some sweepers have hot air blowers, which direct a steady stream of hot air onto the surface being swept. In addition to blowing away any small particles left behind by the brush, the hot air can melt small ice deposits.

SNOWPLOWS

Any aerodrome that expects snow will have a snowplow, either owned by the aerodrome, or contracted by a third party. A snowplow is the most effective way to remove snow from aircraft movement areas.



Show the cadets Figures 16E-8 and 16E-9.

SNOW BLOWERS

When a snowplow pushes snow to the side of a runway, it creates a pile of snow known as a windrow. The preferred method of removing the windrow is with a snow blower. The snow blower can move along the edge of the runway blowing the snow in the windrow over the runway edge lights and away from the runway.



Show the cadets Figures 16E-10 and 16E-11.

Similar to sweepers, snow blowers can be front mounted, rear mounted or self-propelled. The large self-propelled versions have two engines: one for driving, and the other for powering the snow blower. Rear mounted blowers are commonly attached to tractors.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS

Q1. What configurations do sweepers come in?

Q2. What are the differences between a highway snowplow and an aerodrome snowplow?

Q3. What is the primary purpose of a snow blower at an aerodrome?

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ANTICIPATED ANSWERS

A1. Self-propelled, front mounted or towed.

A2. An aerodrome snowplow has a wider blade that is reversible (two-way).

A3. Removing windrows left behind by snowplows.

Teaching point 3 **Describe Refuelling Equipment at an Aerodrome**

Time: 5 min Method: Interactive Lecture

STATIONARY REFUELLING EQUIPMENT

At most public aerodromes, aviation fuel is available for purchase from the aerodrome operator, or from a third party (or parties at a large aerodrome). Fuel is dispensed in two main ways: from a stationary location or from a mobile refueller. A stationary refuelling system is made up of three main components: tanks, pumps and hoses.



Show the cadets Figures 16E-12 and 16E-13.

MOBILE REFUELLING EQUIPMENT

At a large aerodrome, or at an aerodrome with large aircraft, a stationary refuelling system is not a viable option. In these cases, refuelling is carried out by mobile refuelling equipment that brings fuel to the aircraft.



Show the cadets Figure 16E-14.

Commonly, the fuel is stored in large tanks in a remote location (known as a fuel farm) at the aerodrome. The mobile tanker is filled from the bulk tanks, driven to the aircraft and refuelling is carried out. The tanker can then move on to the next aircraft and repeat the process. When the tanker no longer carries enough fuel to service the next aircraft, it returns to the bulk tank and is refilled.

CONFIRMATION OF TEACHING POINT 3

QUESTIONS

Q1. What are the two main ways that fuel is dispensed to aircraft?

Q2. What is the name of the remote location where fuel is stored for mobile refuelling?

Q3. What are the three main components of a refuelling system?

ANTICIPATED ANSWERS

A1. From a stationary location or from a mobile refueller.

A2. A fuel farm.

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A3. Tanks, pumps and hoses.

END OF LESSON CONFIRMATION

QUESTIONS

Q1. What are three types of equipment used at an aerodrome?

Q2. Where is fuel stored at an aerodrome?

Q3. For inspection of which aerodrome facilities is a car usually the most economical vehicle?

ANTICIPATED ANSWERS

A1. Sweepers, snowplows and snow blowers.

A2. At a fuel farm.

A3. Runways, taxiways, aprons, and roads.

CONCLUSION

HOMEWORK/READING/PRACTICE

N/A.

METHOD OF EVALUATION

N/A.

CLOSING STATEMENT

It is important for the cadets to be able to identify the equipment at an aerodrome and how it is used. Each piece of equipment has a specific purpose, and is outfitted with specialized equipment to help it perform the required tasks.

INSTRUCTOR NOTES/REMARKS

N/A.

REFERENCES

C3-148 (ISBN 0-9739866-0-3) Syme, E. R., & Wells, A. T. (2005). *Airport Development, Management and Operations in Canada: Second Edition*. Barrie, ON: Aviation Education Services.

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