



# Maintenance Personnel PROGRAM

## MAINTENANCE PROGRAM

TrainingPort provides **customized and comprehensive programs** that meet your needs. A Training Needs Assessment assists in determining requirements that, until recently, have been seen as optional in business aviation.

## TOPICS OFFERED (TOPICS AND NUMBER OF LESSONS SUBJECT TO CHANGE)

The TrainingPort.net model is to find the premier expert in a particular subject and arrange for them to be our Content Expert. If a Subject Matter Expert cannot be identified, we create lessons using research and information known to be superior.

*\*Indicates the topic applies to maintenance personnel involved in flight operations and/or taxiing*

## OPERATIONAL TOPICS

### **Aircraft Critical Surface Contamination – 4 lessons**

Our lessons on aircraft critical surface contamination discuss the problems caused by ground icing, when you are likely to encounter ground icing, the basics of aircraft de/anti-icing fluids, and how to de-ice and anti-ice to ensure a clean aircraft. Background is provided through a discussion of the aerodynamic effects of surface contamination on critical surfaces, types of surface contamination, and how to identify weather conditions conducive to surface contamination. We also consider real-life accident and incident case studies that involved surface contamination.

#### Topic Outline

- Weather conducive to ice, frost and snow contamination
- Types of contamination
- Inspection before flight and removal of contamination
- Hazards related to critical surface contamination
- The effects of contamination
- Aircraft de-icing/anti-icing procedures
- Aircraft inspection and reporting procedures
- The use of holdover timetables

### **Crew Resource Management (CRM) – 8 lessons**

Our CRM topic explores the effective use of all resources available to individual flight department roles to improve safety and efficiency. An emphasis is placed on case studies, communication, operational risk, and crew coordination. Threat and error management and human factors are also key components of this topic.

#### Topic Outline

- Threat and error management
- Communication
- Situational awareness
- Pressure and stress
- Fatigue
- Workload management
- Decision making
- Leadership and team building
- Automation and technology management
- “Surprise and Startle” effect and its mitigation strategies
- Resilience development

### **Crew Resource Management (CRM) [FOR CANADIAN COMMERCIAL OPERATORS] – 8 lessons**

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Delivery of the topic may be adjusted to meet specific requirements, e.g., it may be delivered as a “Standalone Initial Topic” per TC AC 700-042, which applies to Canadian commercial clients. Additional synchronous learning modules have been added to meet operator/trainee-specific requirements.

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- “Surprise and Startle” effect and its mitigation strategies
- Resilience development
- Relevant case study template (TC AC 700-042 only)
- Current safety trends template (TC AC 700-042 only)
- Evacuation drills template (TC AC 700-042 only)

#### **CVR/FDR Maintenance – 1 lesson**

This topic reviews maintenance and troubleshooting procedures for CVR/FDRs. As well as reviewing historical and technical information, the topic emphasizes the importance of the CVR/FDR in contributing to the overall safety of the industry.

#### Topic Outline

- Definition and role of CVR/FDRs
- Legislation for their operation/modification
- CVR/FDR troubleshooting
- Other types of flight recorders
- Importance and advantages of preserving information held on a CVR and/or FDR
- National and international provisions requiring data preservation
- Consequences of incorrectly disabling a CVR and/or FDR following an incident or accident

#### **Emergency Procedures Training\* – 3 lessons**

This topic provides trainees with a comprehensive review of general emergency procedures, including fire safety, emergency evacuation and pilot incapacitation. It provides a practical training checklist that prompts a review of aircraft-specific emergency procedures and equipment. The different components and classes of a fire are explained, as well as the operations and procedures crew members must follow when an emergency or accident occurs.

#### Topic Outline

- Use of fire extinguishers
- Operation and use of emergency exits
- Emergency evacuation procedures and preparations
- Storage and use of life preservers and rafts
- Proper use of crew and passenger oxygen
- Procedures in case of pilot incapacitation

#### **Fatigue Management – 3 lessons**

Fatigue is an important safety issue for aviation. Numerous incident and accident investigations have cited fatigue as a contributing factor. It is important for all personnel to learn how to recognize the signs of fatigue, understand reporting procedures, and learn preventative and mitigation strategies.

#### Topic Outline

- Physiology
- Operational issues
- Causal and contributing factors
- Sleep requirements
- Circadian rhythms
- Strategic caffeine use
- Effective napping
- Environments conducive to sleep
- Sedatives
- Diet and exercise
- Light exposure and jet lag
- Controlled rest on the flight deck
- Fatigue Risk Management Systems (FRMS)

#### **High Altitude Physiology and Effects\* – 1 lesson**

This topic reviews the associated risks and effects of high altitude flight operations. It covers subjects like respiration and hypoxia. Rapid decompression is discussed, as well as the physiological effects that occur at high altitudes without supplemental oxygen. This topic also highlights the importance of supplemental oxygen requirements, and informing passengers of the location of oxygen supply equipment.

#### Topic Outline

- Respiration
- Hypoxia and its effects
- Time of consciousness at altitude without supplemental oxygen
- The effects of trapped or dissolved gas
- Causes and effects of rapid decompression
- Procedures in the event of rapid decompression

#### **Maintenance Resource Management (MRM) – 16 lessons**

Maintenance Resource Management (MRM) is a variant of Crew Resource Management (CRM). Compared to CRM, MRM has received relatively little formal attention from the industry as a whole. While pilots' errors can have immediate and highly visible effects, maintenance errors can be less apparent, and therefore go undetected for longer periods of time. Our MRM topic provides individuals in the maintenance industry with practical strategies for reducing human error, which are reinforced through an array of maintenance-specific case studies and examples. The topic is designed not only for maintenance staff, engineers, and technicians, but also for managers, supervisors, and other personnel.

#### Topic Outline

- Human Factors issues (overview)
- Communication principles and strategies
- Safety culture/the maintenance operation as "system"

- Human error
- Decision-making and leadership
- Stress and fatigue management
- Norms
- Assertiveness
- Teamwork and conflict resolution
- Professionalism and integrity

### **Maintenance Review – Operations, Regulations & Standards – 2 lessons**

This topic guides personnel through the components of their organization's Maintenance Control System. It also reviews the regulations and standards that govern operator maintenance requirements, aircraft maintenance requirements, and approved maintenance organizations (AMOs).

Versions of this topic are also available for US Part 91 and Part 125/135 operators.

#### Topic Outline

- Components of the maintenance control system, including defect reporting, technical dispatch instructions, service information review processes, service difficulty reporting procedures, maintenance schedules, and evaluation or quality assurance programs
- AMO, commercial operator, and private operator variations
- Maintenance regulations and standards

### **Marshalling – 1 lesson**

In this topic, we review aircraft marshalling information and procedures (fixed wing and rotary wing).

#### Topic Outline

- The importance of marshalling
- Preparation and safety
- Hand signals for arrivals and departures

### **Minimum Equipment List Update – 1 lesson**

The Minimum Equipment List Update features instruction on the use of an MEL, including deferral procedures. It explains operator/company MEL procedures and it provides a clear description of the MEL format.

#### Topic Outline

- Instruction on the purpose and use of an MEL
- Air operator/company MEL procedures
- Responsibility of the pilot in command
- Recurrent training to refresh procedural knowledge

### **No-Carry Operator Dangerous Goods Training – 2 lessons**

This topic is for operators who are not authorized to carry dangerous goods but must learn to identify their presence to prevent unintentional carriage. These lessons focus on education and awareness concerning hidden, unidentified, and misdeclared articles and/or substances that may be dangerous goods. Emergency procedures and operator training requirements related to dangerous goods are also discussed.

#### Topic Outline

- General philosophy
- Limitations
- List of dangerous goods
- Labelling and marking
- Recognition of undeclared dangerous goods
- Provisions for passengers and crew
- Emergency procedures

#### **Performance Airspace: PBN Concepts for Maintenance (incl. PBCS) – 1 lesson**

This topic covers PBN concepts specifically for maintainers. The concept of Performance-Based Navigation (PBN) shifts navigation away from a sensor-based model which uses ground-based navaids, such as VOR, to navigation specifications. PBN also specifies the navigation sensors and equipment that may be used to meet performance requirements.

#### Topic Outline

- PBCS including RCP and RSP explanation, operations, and failures
- Performance-Based Navigation
- Navigation specifications
- Area Navigation (RNAV) and Required Navigation Performance (RNP)
- PBN requirements
- Navigation Database requirements

#### **Runway Awareness\* – 2 lessons**

This topic is intended to raise awareness of a number of runway related concerns, including: runway incursions, runways excursions and confusion. Information on low visibility operations are provided, as well as non-standard phraseology and human factors that affect runway awareness. Salient examples are used to illustrate the issues.

#### Topic Outline

- Runway safety initiatives
- High traffic volume
- Non-standard radio phraseology
- Lack of adequate visual aids and reviewing standard airport signage
- Airport familiarization
- Human factors

#### **RVSM for Maintenance – 1 lesson**

This topic reviews the principles of Reduced Vertical Separation Minima (RVSM) operations and the components of the RVSM system from a maintenance perspective.

#### Topic Outline

- Aircraft requirements
- Approval procedures
- Instructions for Continued Airworthiness

- Dispatching
- Troubleshooting
- Repairs and modifications

### **Safety Management Systems – 4 lessons**

This topic provides trainees with fundamental information concerning the ongoing support of a company's safety management system. It includes information on risk management, hazard analysis and change management. The topic also discusses risk assessment, safety studies and reviews along with SMS evaluation and improvement.

#### Topic Outline

- Hazard identification
- SHEL model
- Safety risk profile, including flight risk assessment tool
- Different management systems, including QMS
- Safety culture
- Performance monitoring
- Safety studies and reviews
- Internal safety investigations
- Other tools to assess safety (e.g., audits, surveys, meetings)

### **Security Management – 4 lessons**

Our security lessons consider the changes that have taken place in aviation security since 9/11. We provide an overview of the core elements of a business aviation security program, including security risk assessment.

#### Topic Outline

- Elements of a business aviation security program
- Developing a security risk profile
- Threats and risks
- Threat assessment
- Determining event vulnerability, probability and criticality

### **Threat and Error Management – 1 lesson**

Our TEM topic recognizes that every crew faces threats throughout a flight. Because our responses to threats can be erroneous, appropriate training and procedures must be implemented to trap errors before they lead to undesired aircraft states. Forming a cornerstone of our Crew Resource Management topic, this topic focuses on the application of TEM philosophy in day-to-day operations.

#### Topic Outline

- Definitions of threat, error, and undesired aircraft state
- Relationship between TEM and CRM
- Countermeasures against threats and errors
- TEM "toolkit" defenses
- Overcoming complacency

### **Towing – 1 lesson**

In this topic, we review aircraft towing information and procedures.

#### Topic Outline

- Why training is important
- Preparation and safety for all towing procedures
- Towing procedures

## **OCCUPATIONAL HEALTH AND SAFETY TOPICS**

### **Accident Reporting – 1 lesson**

Our accident reporting lesson lists steps to take if a workplace accident occurs and discusses reporting expectations. It explains the procedures to be followed in case of a medical emergency, and it also discusses first aid and non-emergency care.

#### Topic Outline

- Keys to preventing accidents
- Notification and documentation of accidents
- Medical emergencies and non-emergency care
- First aid
- Required medical treatment for employees

### **Back Injury Prevention – 1 lesson**

This lesson provides an overview of how back injuries occur and explains different strategies that can help prevent them. It discusses the anatomy of the body and includes safe lifting, carrying, and lowering techniques and postures.

#### Topic Outline

- Causes of back injuries
- Anatomy of the body
- Prevention strategies against back injuries
- Correct lifting, carrying and lowering techniques

### **Blood Borne Pathogens – 1 lesson**

Any contact with bodily fluids can place an individual at risk of exposure to blood borne pathogens. This topic reviews methods of keeping workers safe from infection, emergency response procedures, and vaccines.

#### Topic Outline

- Types of blood borne pathogens
- How blood borne pathogens are transmitted
- What to do if you are potentially exposed to a blood borne pathogen
- Preventative methods



### **Communicable Disease Management – 3 lessons**

This topic is designed to enable operators to develop an appropriate response so that they can continue to operate during a pandemic safely and effectively. It focuses on effective planning, safety measures, and protocols for handling infectious disease and illness both in-flight and post-flight.

#### Topic Outline

- Suggested protocols for preventing the spread of infection
- Changes to a typical flight experience during a pandemic
- Crew response to passenger/crewmember illness
- Cleaning and disinfection of contaminated areas
- PPE disposal
- Critical components of an Infectious Disease Control Response Plan
- Pre-flight assessment, including risk levels for infectious disease
- Crewmember assessment and passenger screening
- Universal Precaution Kit
- Risk mitigation for ground transportation and accommodation when overnighting

### **Confined Space Awareness – 1 lesson**

In this lesson, we define confined spaces and describe the hazards associated with them. Tips are included on how to be safe in a workplace where confined spaces are present. Company requirements and procedures related to confined spaces.

#### Topic Outline

- Definition and types of confined spaces
- Confined space accidents
- Hazards associated with confined spaces
- Company requirements regarding confined spaces

### **CPR – 1 lesson**

Our CPR topic presents current CPR procedures, including airway and breathing support. The lesson also discusses CPR variants, such as hands-only CPR. It also explains how to use the Automated External Defibrillator in concert with CPR.

#### Topic Outline

- Appropriate use of CPR in the case of a heart attack
- Evaluating the victim for responsiveness
- CPR procedures and guidelines
- AED use and considerations

### **Electrical Safety – 1 lesson**

Our electrical safety topic provides trainees with information on preventing electrical injuries in the workplace and recognizing electrical hazards. The lesson discusses the main categories of electrical injuries and safe work practices that can prevent them. It also includes a review of electrical terminology and systems.

#### Topic Outline

- Electricity-related terms
- Three main categories of electrical injuries
- Electrical hazards and clues
- Safe work practices

### **Emergency Action Plan – 1 lesson**

This lesson discusses procedures to follow when confronted with a fire, extreme weather event, or other emergency situations. Key teaching points focus on prevention and planning strategies. The lesson also discusses fire prevention and procedures to be followed during tornados or hurricanes.

#### Topic Outline

- Fire prevention
- Tornado or hurricane safe zones and safety procedures
- Workplace violence and prevention

### **Ergonomics – 1 lesson**

This lesson discusses ergonomic injuries – what they are, how they occur, and how they can be prevented. It includes information on risk factors and proper workstation setup along with other safety measures to prevent ergonomic injuries.

#### Topic Outline

- Causes of ergonomic injuries, including awkward or static postures
- Symptoms of musculoskeletal disorders
- Carpal tunnel syndrome
- Risk factors that lead to the development of repetitive stress injury
- Workplace factors that lead to repetitive stress injury
- Safety measures to prevent workplace injury

### **Fall Protection – 1 lesson**

In our fall protection topic, we consider how to avoid falls and recognize fall hazards. We also discuss the use of fall protection equipment (such as safety harnesses). We explain the two major categories of falls and the required protection for employees when they work in certain areas. The anatomy of a fall is described, as well as the training required to inspect and use fall protection equipment properly.

#### Topic Outline

- Two major categories of falls
- Required protection for workers
- Ways to prevent falls
- Systems that can protect an employee from injury
- Anatomy of a fall
- Training on how to inspect and use fall protection equipment properly

### **Fire Prevention Practices – 1 lesson**

This topic focuses on how trainees can prevent fires in the workplace. The lesson includes tips on housekeeping and safe storage of solid and liquid materials. It explains the fire tetrahedron and electric hazards. Compartmentalization and fire door practices are also discussed.

#### Topic Outline

- Fire tetrahedron
- Good housekeeping to prevent fires
- Proper storage
- Electrical hazards
- Compartmentalization
- Fire door practices

### **First Aid Kits – 1 lesson**

In this lesson, we review items that are commonly included in first aid kits and explain their uses. The lesson also explains how to administer medical oxygen, and it discusses blood sugar measurement and the equipment that is needed for the procedure.

#### Topic Outline

- First aid kit compartments
- Items contained within the compartments
- How to use the kit and its equipment
- How to administer medical oxygen
- Blood sugar measurement

### **Fuel and Ignition Source Control – 1 lesson**

In this lesson, we present guidelines for controlling substances that can cause fires and explosions in the workplace, and review procedures for assessing and mitigating the risks of a particular substance or work process. We provide examples of fuel and ignition sources and explain the zoning process. We also explain workplace fire hazards and discuss strategies to prevent fires from occurring.

#### Topic Outline

- Fuel and ignition sources
- Assessing and mitigating risk
- Zoning
- Workplace fire hazards
- Fire prevention strategies

### **Hazard Communication (including WHMIS) – 1 lesson**

Our hazard communication lesson reviews systems for communicating hazards, including the requirements and structure of Safety Data Sheets (SDS), labels, and pictograms. It also lists different hazards and explains the proper storage for each type of hazard. We also offer a version of the lesson based on the 2015 WHMIS, which is aligned with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

#### Topic Outline

- Written hazard communication program
- Different hazards and their proper storage
- SDS requirements and structure
- Labelling system and requirements
- NFPA and HMIS labels

### **Housekeeping and Material Handling (incl. Storage and Stacking) – 1 lesson**

This lesson consists of a discussion of good housekeeping practices. We consider safe material handling, stacking, and storage practices. We discuss hazards and strategies to prevent accidents that result from improper storage of materials, including ergonomic principles.

#### Topic Outline

- Good housekeeping practices (workplace and personal)
- Slips, trips and falls and how to prevent them
- Proper handling and storage of materials
- Assessing hazards

### **In-Flight Medical Emergencies – 6 lessons**

This series of lessons provides trainees with specific procedures for responding to in-flight medical emergencies. Emergencies covered include: cardiac, respiratory, neurological, medical disorders (such as allergic reactions, food poisoning, and diabetes) and general injuries (such as broken bones, blood loss, and spinal injuries).

#### Topic Outline

- Logical, sequential steps to follow when a medical emergency occurs
- In-flight injuries
- Cardiac emergencies
- Neurological emergencies
- In-flight respiratory emergencies
- In-flight medical disorders

### **Ladder Safety – 1 lesson**

In this topic, we consider safe setup, usage, maintenance, and storage practices for different types of ladders. The different types of ladders are explained, as well as the different ladder materials and their characteristics.

#### Topic Outline

- Ladder selection
- Types of ladders and ladder material
- Ladder set-up
- Inspecting ladders
- Ladder maintenance

### **Lockout / Tagout of Energized Equipment – 1 lesson**

In this lesson, we discuss procedures for safely locking and tagging out energized equipment during maintenance or other events. We also review specific energy hazards and how lockout/tagout can prevent them. We explain the criteria for lockout/tagout items and explain the six key steps in the procedure.

#### Topic Outline

- Energy hazards that lockout/tagout can prevent
- Step-by-step procedures for each item in lockout/tagout
- Criteria for lockout/tagout devices
- Safe electrical practices

### **Personal Protective Equipment – 2 lessons**

Our personal protective equipment lessons thoroughly discuss the proper use, storage, and maintenance of PPE for the eyes, face, hearing, limbs, and respiratory system. This lesson explains the hazards that PPE can prevent.

#### Topic Outline

- PPE for the eyes and face, including goggles and safety glasses
- Hearing protection and noise hazards
- Hard hats that prevent head injuries

### **Platforms and Manlifts – 1 lesson**

This lesson describes safe use practices and procedures for scissor lifts, boom platforms, and other aerial devices. It also lists minimum clearance requirements for working around electrical wires and fall protection.

#### Topic Outline

- Types of aerial devices
- Safe work practices
- Fall protection
- Minimum clearance requirements

### **Powered Industrial Trucks/Materials Handling Equipment – 1 lesson**

This lesson consists of a review of safe use practices for forklifts and other industrial trucks. The training required to use a forklift is described, as well as the different classes of powered industrial trucks.

#### Topic Outline

- Classes of powered industrial truck
- Manoeuvring a powered industrial truck
- Pre-operational inspection
- Important work practices
- Managing loads

### **Welding Safety – 1 lesson**

This lesson provides trainees with information on different types of welding and safety measures against fire. Basic and special precautions against fire are discussed, including personal protective equipment for welders.

#### Topic Outline

- Basic and special fire precautions
- Safety measures for welding operations, including the use of PPE



- Types of welding

*Topics are regularly updated and further topics are always under development, based on industry issues and customer requests.*

For more information, please see [www.TrainingPort.net](http://www.TrainingPort.net) or contact us at:

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