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Advisory Circular to Aerodrome Operators

GROUND VEHICLE OPERATIONS AT AERODROMES

1. PURPOSE

1.1 This Advisory Circular (AC) and the attached appendices provide guidance to aerodrome operators in developing training programs for safe ground vehicle operations and pedestrian control on the airside of an aerodrome. Not all the items addressed in this document will be applicable at every aerodrome. Aerodrome operators should examine each item to determine how it may apply to the size, complexity, and scope of operation of the aerodrome. This AC contains recommended operating procedures, a sample training curriculum (Appendix A), and a sample training manual (Appendix B).

2. BACKGROUND

2.1 Every year there are accidents and incidents involving aircraft, pedestrians, and ground vehicles at aerodromes that lead to property damage and injury, which may be fatal. Many of these events result from inadequate security measures, a failure to maintain visual aids, a lack of such aids, and inadequate vehicle operator training. Ground vehicle operation plans promote the safety of aerodrome users by helping identify authorized areas of vehicle operation, outlining vehicle identification systems, addressing vehicle and operator requirements, and coordinating construction, maintenance, and emergency activities.

3. APPLICABILITY

3.1 The overall responsibility for the operation of vehicles on an aerodrome rests with the aerodrome operator. The aerodrome operator is also responsible for compliance with the requirements of Myanmar Aircraft Rules (1937) and Myanmar Civil Aviation Requirements (Operations) at aerodromes holding an aerodrome operating certificate.

- a. Aerodrome operators should establish procedures and policies concerning vehicle access and vehicle operation on the airside of the aerodrome. These procedures and policies should address such matters as access, vehicle operator requirements, vehicle requirements, operations, and enforcement and should be incorporated into tenant leases and agreements. These procedures and policies could be incorporated into a single document/booklet that could be referred to by any vehicle operated on the airside of the aerodrome.
- b. Each bidding document (construction plans and/or specifications) for development work on an aerodrome or for installation of an air navigation facility (NAVAID) should incorporate a section on ground vehicle operations on aerodromes during construction activity.

c. RELATED READING MATERIAL

Additional information is available in the following publications:

1. ICAO Runway Safety Tool Kit
2. FAA – Driver Training CD
3. European Action Plan for the Prevention of Runway Incursions

4. VEHICLE OPERATOR REQUIREMENTS

4.1 Vehicle operators on aerodromes face conditions that are not normally encountered during highway driving. Therefore, those persons who have vehicular access to the airside and a need to be there must have an appropriate level of knowledge of aerodrome rules and regulations. Aerodrome operators should require vehicle operators to maintain a current driver's license and should establish a means of identification that would permit the operation of a vehicle on the airside of an aerodrome.

5. TRAINING

5.1 Appendix A includes a sample training curriculum. This curriculum should include initial, and may include recurrent and/or remedial, instruction of aerodrome employees, tenants, contractors, and users who have access to the airside of the aerodrome. The aerodrome operator should retain records of this training as long as this person is authorized to operate on the aerodrome. Escorted access does not normally require training. The aerodrome operators may modify these documents to meet their individual situations and may find it beneficial to have separate requirements for vehicles operated solely on a ramp area and those that operate on the manoeuvring area.

5.2 Initial training is the training provided to a new employee or aerodrome user that would enable that person to demonstrate the ability to operate a vehicle safely and in accordance with established procedures while functioning independently on the airside. Recurrent training is the training provided to an employee or aerodrome user as often as necessary to enable that person to maintain a satisfactory level of proficiency. Appropriate schedules for recurrent training will vary widely from aerodrome to aerodrome and from one employee to another. Aerodrome operators might consider requiring annual recurrent training when a vehicle operator renews an expired aerodrome ID badge or when a tenant renews a lease agreement. A sample Ground Vehicle Operating Familiarization Program Training Record is included in Appendix B.

5.3 Aerodromes use a variety of methods for training ground vehicle operators. In some cases, aerodrome operators delegate the requirement of employee training to aerodrome tenants or a contractor. Some aerodrome operators choose to include training manuals or vehicle-operating requirements as part of tenant lease or use agreements. An aerodrome operator may choose to distribute training manual information via a Web page, videos, or booklets. Formal classroom instruction provided by the aerodrome operator or tenant can include either personal instruction or a computer-based interactive training system.

5.4 Aerodrome operators should provide a means of testing trainees on the information presented. In addition to standard question and answer classroom testing methods, the aerodrome operators should have potential ground vehicle operators demonstrate their

proficiency in operating a vehicle on the airside before authorizing driving privileges, especially if those operators will be driving on the manoeuvring area. It is also recommended that on-the-job training be completed before personnel have unescorted access to the airside of the aerodrome.

6. VEHICLES ON AERODROMES

6.1 Aerodrome operators should keep vehicular and pedestrian activity on the airside of the aerodrome to a minimum. Vehicles on the airside of the aerodrome should be limited to those vehicles necessary to support the operation of aircraft services, cargo and passenger services, emergency services, and maintenance of the aerodrome. Vehicles on the manoeuvring area should be limited to those necessary for the inspection and maintenance of the manoeuvring area and emergency vehicles responding to an aircraft emergency on the manoeuvring area. Vehicles should use service roads or public roads in lieu of crossing manoeuvring area whenever possible. Where vehicular traffic on aerodrome operation areas cannot be avoided, it should be carefully controlled.

6.2 When necessary, runway crossing should occur at the departure runway end rather than the midpoint. In the event of a runway incursion, an aircraft would have more time and runway length to react if the vehicle incursion is at the end of the runway. The aircraft might be able to come to a stop before striking the vehicle or it may be able to abort the landing.

6.3 Some aspects of vehicle control and identification are discussed below; however, every aerodrome presents different vehicle requirements and problems. Every aerodrome will require individualized solutions to prevent vehicle or pedestrian traffic from endangering aircraft operations. It should be stressed that aircraft ALWAYS have the right-of-way over vehicles when maneuvering on movement and other areas. Aircraft also have the right-of-way on the manoeuvring areas, except when the Aerodrome Control Tower (TWR) has specifically instructed an aircraft to hold or give way to vehicle(s) on a runway or taxiway.

6.4 Vehicles that routinely operate on the airside should be marked /flagged for high daytime visibility and, if appropriate, lighted for nighttime operations. Vehicles that are equipped with marking and lighting devices should escort vehicles that are not marked and lighted.

7. VEHICULAR ACCESS CONTROL

7.1 The control of vehicular activity on the airside of an aerodrome is of the highest importance. The aerodrome operator is responsible for developing procedures, procuring equipment, and providing training regarding vehicle operations to ensure aircraft and personnel safety. At aerodromes with an operating TWR, controllers and vehicle operators should use two-way radios to control vehicles when on the manoeuvring area. To accomplish this task, the aerodrome operator and the TWR should develop a letter of agreement outlining standard operating procedures.

7.2 Inadvertent entry by vehicles onto manoeuvring and movement and other areas of an aerodrome poses a danger to both the vehicle operator and aircraft that are attempting to land or take off or that are maneuvering on the aerodrome. Methods for controlling access to the airside will vary depending on the type and location of the aerodrome. The Aerodrome Layout Plan is a useful tool for accomplishing this. Aerodromes may erect a fence or provide for other natural or physical barriers around the entire aerodrome in

addition to providing control measures at each access gate, such as guards, magnetic card activated locks, or remotely controlled locks. Gates may either be opened/closed electronically or secured by lock and chain.

8. VEHICLE REQUIREMENTS

8.1 Requirements for vehicles will vary depending on the aerodrome, the type of vehicle, and where the vehicle will be operated on the aerodrome. An aerodrome operator should limit vehicle operations on the manoeuvring area of the aerodrome to only those vehicles necessary to support the operational activity of the aerodrome. Aerodrome operators might find it beneficial to have separate requirements for vehicles operated solely on a ramp area as opposed to those vehicles that operate on manoeuvring area.

8.2 Some aerodromes have benefited from establishing their own vehicle inspection program to assure that all vehicles are maintained in a safe operating condition. In establishing vehicle requirements, some items to consider include:

- a. Marking and identification of vehicles
- b. Minimum equipment requirements
- c. Inclusion in all vehicles of a placard diagram depicting the aerodrome's manoeuvring area. The diagram should display prominent landmarks and/or perimeter roads. Vehicles intended to operate within the manoeuvring area should also include a placard showing the meaning of TWR light gun signals and airfield sign and marking information.
- d. Vehicle condition requirements and inspection

9. VEHICLE OPERATIONS

9.1 The rules and regulations pertaining to vehicle operations should provide adequate procedures for the safe and orderly operation of vehicles on the airside of the aerodrome. In developing such procedures, aerodrome operators should consider—

- a. Requirements that vehicles operating on manoeuvring area be radio equipped or escorted by a radio-equipped vehicle
- b. Specific procedural requirements for vehicle operations on aerodromes without an operating TWR
- c. Advance notice/approval for operating a non-aerodrome owned vehicle on the manoeuvring area
- d. Speed limits
- e. Prohibitions on:
 - (1) Passing other vehicles and taxing aircraft
 - (2) Leaving a vehicle unattended and running
 - (3) Driving under an aircraft except when servicing the aircraft
 - (4) Driving under passenger bridges
- f. Requirements stipulating when vehicle lights must be operated
- g. Requirements for the use of dedicated vehicle lanes and perimeter roads whenever possible

- h. Locations where vehicles may and may not park
- i. Rules of right-of-way (e.g. for aircraft, emergency vehicles, other vehicles)
- j. Areas where vehicles may be serviced
- k. Procedures for inoperative radios while on a manoeuvring area
- l. Requirements to report all accidents involving ground vehicles on the airside
- m. Requirements making the vehicle operator responsible for passengers in the vehicle

10. EMERGENCY OPERATIONS AND OTHER NON-ROUTINE OPERATIONS

10.1 Aerodrome operators allow a number of non-routine operations to occur on the airside of the aerodrome. Such non-routine activities include airfield construction, airshows, aircraft static displays, VIP arrivals/departures, commercial photo shoots, or a host of other activities. In addition to security requirements, aerodrome operators should recognize and prepare for the unique challenges that arise during non-routine operations as they relate to vehicle operations.

10.2 Aerodrome operators should review non-routine operations that involve ground vehicles and develop vehicle operation procedures to accommodate these special operations. Planning meetings associated with such activities offer an opportunity to review driving rules and regulations, communications and procedures, and air traffic control procedures as well as other important operational issues. These meetings should pay special attention to the following activities:

a. Airside Construction

The aerodrome operator should develop procedures, procure equipment, and provide training on vehicle operations to ensure aircraft safety during construction.

b. Low-Visibility Operations

Additional consideration should be given to vehicle operations during low visibility. Poor weather conditions (snow, fog, rain, etc.) may obscure visual cues, roadway markings, and aerodrome signs.

10.3 Some aerodromes have a Surface Movement Guidance and Control System (SMGCS), which provides guidance to, and control or regulation of, all aircraft and ground vehicles on the manoeuvring area of an aerodrome. Guidance relates to facilities, information, and advice necessary to enable pilots of aircraft, or drivers of ground vehicles, to find their way on the aerodrome and keep the aircraft or vehicles on the surfaces and areas intended for their use. Control or regulation means the measures necessary to prevent collisions and to ensure that the traffic flows safely.

11. SITUATIONAL AWARENESS

11.1 There are a number of factors that hamper vehicle operator situational awareness. Situational awareness declines as a driver's attention is drawn into the vehicle or is focused on any one thing to the exclusion of everything else. Other such factors include vague or incomplete communications or a vehicle operator's personal conflicts, which may involve

fatigue and stress. Running behind schedule or being over-tasked also contributes to a reduction in situational awareness. Certainly, degraded operating conditions, such as equipment malfunctions, rain, fog, or snow, may also diminish a vehicle operator's situational awareness.

11.2 There are ways to enhance situational awareness. As part of a ground vehicle operator's training program, aerodrome operators may concentrate on having vehicle operators visually scan fixed and moving objects that may be converging into the vehicle's path. Aerodrome operators should also promote the use of clear and concise communications by vehicle operators. Most important, aerodrome operators should alert vehicle operators to distractions caused by social interactions while operating a vehicle on the airside.

11.3 Aerodrome operators may also be able to increase situational awareness for vehicle operators with enhancements on the airside. Such enhancements may include establishing dedicated marked routes for vehicles that avoid high activity, congested areas, or blind spots. The elimination or relocation of fixed objects that hinder a vehicle operator's line of sight or block radio transmissions may also enhance safety.

12. ENFORCEMENT AND CONTROL

12.1 Aerodrome operators should establish procedures for enforcing the consequences of non-compliance, including penalties for violations. Tenant lease or use agreements may include these enforcement provisions. Listed below are control issues that aerodrome operators should address as part of a ground vehicle control program:

- a. Implementation of a tiered identification system of badges that permits easy recognition of a vehicle operator's permitted driving area privileges
- b. Prohibition against transfer of registration media to a vehicle other than the one for which originally issued
- c. Policies for surrendering permits to aerodrome management when a vehicle is no longer authorized entry into a facility
- d. Periodic checks to ensure that only properly authorized persons operate vehicles on the airside
- e. System to control the movement of commercial trucks and other goods conveyances onto and out of the airside of an aerodrome
- f. Briefing or training for delivery drivers if they are permitted direct access to the airside
- g. Implementation of a progressive penalty policy.

APPENDIX A**GROUND VEHICLE ACCESS PROGRAM TRAINING CURRICULUM****NOTE:**

The purpose of the Ground Vehicle Access Program Training Curriculum is to provide aerodrome operators with a comprehensive list of training topics for educating vehicle operators who may have access to the airside of an aerodrome. Each individual aerodrome has unique situations that might require site-specific training. Aerodrome operators may use this training curriculum as a guide for developing and implementing a detailed training program tailored to the aerodrome's individual situation.

The purpose of a training program is to provide vehicle operators with the level of training necessary for their positions so they are capable of operating safely on the airside of an aerodrome. Specific programs may be tailored to account for the items listed below:

1. Various infield aircraft navigation aids
2. Identification of a given point on a grid map or other standard map used at the aerodrome
3. Applicable aerodrome rules, regulations, or procedures pertaining to vehicle operations
4. Aerodrome layout, including designation of runways and taxiways
5. Boundaries of manoeuvring area
6. Interpretation and color coding of airfield signs, pavement markings, and lighting
7. Location and understanding of critical areas associated with instrument landing system (ILS) and very high frequency omni-directional radio ranges (VORs)
8. Proper terminology (including phonetic alphabet) and procedures for radio communications with the aerodrome control tower (TWR).
9. TWR light signals
10. Established routes for emergency response vehicles
11. Dangers associated with jet blast and prop wash
12. Traffic patterns associated with each runway (left or right) and location of each leg; i.e., downwind, base, final, and crosswind
13. Situational awareness; An aerodrome operator may choose to develop customized training programs for vehicle operators, such as airline employees, who may be restricted to operating ground vehicles only on ramps areas.

AREAS OF TRAINING

All drivers should have training in the following areas:

1. *Discussion of Runway Incursions, Airfield Safety, and Security*

Training Outcome(s) – Trainee should be able to define a runway incursion and explain the benefits of airfield safety/security.

2. *Definitions and Terms*

Training Outcome(s) – Trainee should be knowledgeable of the terms used on an aerodrome.

3. *Vehicle Operating Requirements*

- a. Authorized Vehicles and Vehicle Identification
- b. Vehicle Lighting
- c. Vehicle Insurance
- d. Vehicle Inspection
- e. Vehicle Parking
- f. Accident Reporting
- g. Perimeter Roadways
- h. Aircraft Lighting

4. *Rules and Regulations*

- i. Review
- j. Noncompliance/Penalties

Training Outcome(s) – Trainee should be knowledgeable of ground vehicle rules and regulations.

5. *Testing*

- k. Written Test
- l. Practical Test

Training Outcome(s) – Trainee should be able to pass a written examination with a minimum score of 90 percent or other minimum passing score agreed to by the airport operator and the regulatory authority.

In addition to items 1–5, instruction for drivers authorized to drive on the manoeuvring area should also include those subject areas identified under Aerodrome Familiarization and Communications.

6. Aerodrome Familiarization

- a. Runway Configuration/Safety Area
- b. Taxiway Configuration/Safety Area
- c. Manoeuvring Area and Movement and other Areas
- d. Confusing Areas
- e. Aerodrome Lighting

(1) Runway

- Runway Edge Lights
- Touchdown Zone Lights
- Rapid Exit Taxiway Indicator Lights
- Threshold Lights
- Approach Lighting System

(2) Taxiway

- Taxiway Edge Lights
- Taxiway Centre line Lights
- Runway Guard Lights

f. Aerodrome Signs

- Runway Holding- Position Sign
- Location Sign
- ILS Category I, II or III Holding Position Signs
- Direction Sign

g. Aerodrome Marking

(1) Runways

- Centre line marking
- Side strip Markings
- Runway designation marking
- Threshold Markings
- Runway Holding-position marking

(2) Taxiways

- Runway Holding-positions marking
- Centre line marking
- Edge Markings

(3) ILS Critical Areas

(4) Movement and other Area Boundary Marker

h. Aerodrome NAVAIDS and Visual Approach Aids

- Location
- Non-interference

Training Outcome(s) – Trainee should be able to label all critical parts on the aerodrome and explain the purpose of all marking, lighting, and signs on the aerodrome.

7. *Communications*

Ground Vehicle Communications

- (1) Radio Frequencies
- (2) Procedural Words and Phrases
 - a. Radiotelephony Spelling Alphabet
 - b. Aviation Terminology
 - c. Procedures for Contacting the TWR
 - d. Airfield Communications at Aerodromes Without Operating TWR
 - e. Light Signals
 - Description of Light Gun and How to Signal Tower

Training Outcome(s) - Trainee should be able to adequately send and receive radio messages.

APPENDIX B

SAMPLE GROUND VEHICLE OPERATIONS TRAINING MANUAL

NOTE:

This sample training manual provides aerodrome operators with a template for developing and implementing proposed policies or procedures for controlling ground vehicles and equipment accessing the airside of an aerodrome. Aerodrome operators may use the format below but adapt the requirements to specific conditions found on the aerodrome. The first part of the appendix could serve as driving rules and regulations that could be adopted by the aerodrome operator who would fill in the appropriate blanks or blocks of text or revise the document for a specific aerodrome. Section 2 would serve as a suggested driver training manual. In this section, the aerodrome operator could add or delete information as it applies to the aerodrome. For example, if the aerodrome has no instrument approach, reference to the ILS signs and protection of critical areas could be deleted. Also, the aerodrome operator is encouraged to replace illustrations of signs with those found on the aerodrome.

Section 1. Aerodrome Driving Rules and Regulations

1.1. Authority for Implementation of Rules and Regulations. The (NAME) Aerodrome operates under the authority of (JURDISTICTION). (CITY/COUNTY ORDINANCE OR STATE STATUTE) has granted the (AERODROME OPERATOR) the authority to make bylaws for the management and supervision of its aerodrome affairs.

1.2. Applicability. This regulation applies to all users of, and persons on any portion of, the property owned or controlled by (AERODROME OPERATOR). No persons are exempt from aerodrome operating training requirements for operating a vehicle on the airside of an aerodrome. Tenant organizations shall be responsible for the dissemination of, accessibility to, and compliance with these rules and regulations by their employees.

These Rules and Regulations may be amended, changed, or modified by (AERODROME OPERATOR), as necessary.

1.3. Definitions. The following terms are defined as indicated in this section for the purpose of this Ground Vehicle Operation Training Manual. (*The aerodrome operator should include only those definitions applicable to its aerodrome and conditions.*)

1.3.1. Accident—an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, in which a person is fatally or seriously injured or the aircraft sustains damage or structural failure which adversely affects the structural strength, performance or flight characteristics of the aircraft.

1.3.2. Airside—the movement area of an airport, adjacent terrain and buildings or portions thereof, access to which is controlled

1.3.3. Aerodrome Control Tower (TWR)—a unit established to provide air traffic control service to aerodrome traffic.

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- 1.3.4. Aircraft**—any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.
- 1.3.5. Aerodrome**—a defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft
- 1.3.6. Apron**—a defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fuelling, parking or maintenance.
- 1.3.7. Foreign Object Debris (FOD)**—debris that can cause damage to aircraft engines, tires, or skin from rocks, trash, or the actual debris found on runways, taxiways, and aprons.
- 1.3.8. Ground Vehicle**—all conveyances, except aircraft, used on the ground to transport persons, cargo, fuel, or equipment.
- 1.3.9. ILS Critical Area**—an area provided to protect the signals of the localizer and glideslope.
- 1.3.10. Runway Incursion**—any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take-off of aircraft.
- 1.3.11. Jet Blast**—jet engine exhaust or propeller wash (thrust stream turbulence).
- 1.3.12. Law Enforcement Officer (LEO)**—any person vested with police power of arrest under State, or city authority and identifiable by uniform, badge, and other indication of authority.
- 1.3.13. Light Gun**—a hand-held, directional light-signaling device that emits a bright narrow beam of white, green, or red light, as selected by the tower controller. The color and type of light transmitted can be used to approve or disapprove anticipated pilot or vehicle actions where radio communication is not available. The light gun is used for controlling traffic operating in the vicinity of the aerodrome and on the aerodrome manoeuvring area.
- 1.3.14. Mobile Fueler**—a vehicle owned and/or operated by authorized agents to pump and dispense fuel at (AERODROME). This may include fuel tankers, in-to-plane fueling pumpers, and hydrant carts.
- 1.3.15. Movement Area**—the part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and the apron(s).
- 1.3.16. Non-Movement Areas**—aprons, and other areas not under the control of air traffic.
- 1.3.17. Operator**—any person who is in actual physical control of an aircraft or a motor vehicle.
- 1.3.18. Owner**—a person who holds the legal title of an aircraft or a motor vehicle.
- 1.3.19. Restricted Areas**—areas of the aerodrome posted to prohibit or limit entry or access by the general public. All areas other than public areas.

- 1.3.20. Runway**—a defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft.
- 1.3.21. Active Runway**—any runway or runways currently being used for takeoff or landing. When multiple runways are used, they are all considered active runways.
- 1.3.22. Runway strip**—a defined area including the runway and stopway, if provided, intended to reduce the risk of damage to aircraft running off a runway; and to protect aircraft flying over it during take-off or landing operations.
- 1.3.23. Surface Movement Guidance and Control System (SMGCS)**—a system comprising the provisions for guidance to, and control or regulation of all aircraft, ground vehicles, and personnel of the aerodrome during low-visibility operations. Guidance relates to facilities and information necessary for pilots and ground vehicle operators to find their way about the aerodrome. Control or regulation means the measures necessary to prevent collisions and to ensure that traffic flows smoothly and efficiently.
- 1.3.24. Taxiways**—a defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome and another.
- 1.3.25. Vehicle Service Road**—a designated roadway for vehicles in a movement and other areas.
- 1.3.26. Very High Frequency Omni-directional Radio Range (VOR)**—a ground-based electronic navigation aid transmitting very high frequency navigation signals, 360 degrees in azimuth, oriented from magnetic north. Used as the basis for navigation.
- 1.3.27. Wake Turbulence**—effect of the rotating air masses generated behind the wing tips of large jet aircraft.

1.4 Violation of Rules—Penalties and Suspension of Driving Privileges. Any person who does not comply with any of the provisions of these Rules and Regulations, or any lawful order issued pursuant thereto, will be subject to progressive penalties for repeat violations. These penalties may include denied use of the Aerodrome by (OPERATOR) in addition to the penalties described pursuant to State, or local authorities. (*The aerodrome operator should tailor this section to discuss its enforcement policies.*)

- 1.4.1.** Penalties for failure to comply with the Airside Vehicular Traffic Regulations shall consist of written warnings, suspension of airside driving privileges, and/or revocation of airside driving privileges. Receipt of _____ written warnings by an operator of a vehicle in any 12-month period will automatically result in suspension of airside driving privileges. Receipt of _____ written warnings in any 12-month period will automatically result in revocation of airside driving privileges.
- 1.4.2.** Based on an evaluation of the circumstances or the severity of a particular incident or incidents, the (AERODROME OPERATOR) reserves the exclusive right to assess any penalty it deems appropriate at any time to any individual authorized to operate a vehicle on the airside without regard to prior operating history.

1.4.3. Suspension of airside driving privileges shall be no less than _____ calendar days and no greater than _____ calendar days.

1.4.4. The (AERODROME OPERATOR) will provide a copy of all written warnings issued to an operator to the local manager of the company owning or in possession and control of the vehicle or vehicles involved in the violation(s).

1.5. The (AERODROME OPERATOR) may require any individual involved in a runway incursion or other vehicle incident to complete remedial airfield driver training.

1.6. Driver Regulations on the Airside of an Aerodrome.

1.6.1. Vehicle Operator Requirements.

1. All applicants must satisfactorily complete the applicable driver's training class before receiving an airside driver's license.
2. All applicants must pass the written test with a grade of at least _____ percent. Applicants who do not pass the written test may retake the test after additional study and a _____ day period.
3. Applicants for manoeuvring area driving privileges shall be required to successfully complete an airside driving test by a designated representative of (AERODROME OPERATOR).
4. No vehicle shall be operated on the airside unless—
 - a. The driver is authorized to operate the class of vehicle by an appropriate state-licensing agency or by the driver's employer through a company training/certification program.
 - b. The driver properly displays an approved, aerodrome-issued ID card with the Authorized Driver designation (*if applicable*).
5. No person operating or driving a vehicle on any aircraft ramp shall exceed a speed greater than _____ kilometers miles per hour. Factors including, but not limited to, weather and visibility shall be taken into consideration when determining safe operating speed.
6. No vehicle shall pass another ground vehicle in a designated vehicle roadway.
7. No vehicle shall pass between an aircraft and passenger terminal or passenger lane when the aircraft is parked at a gate position except those vehicles servicing the aircraft. All other vehicles must drive to the rear of the aircraft and shall pass no closer than _____ meters from any wing or tail section.
8. Moving aircraft and passengers enplaning or deplaning aircraft shall have the right-of-way at all times over vehicular traffic. Vehicle drivers must yield the right-of-way.
9. No vehicle operator shall enter the airside unless authorized by (AERODROME OPERATOR) or unless the vehicle is properly escorted.
10. No vehicle operator shall enter the manoeuvring area—

- a. Without first obtaining permission of the (AERODROME OPERATOR) and clearance from the TWR to enter the manoeuvring area;
 - b. Unless equipped with an operable two-way radio in communication with the TWR; or
 - c. Unless escorted by an (AERODROME OPERATOR) vehicle and as long as the vehicle remains under the control of the escort vehicle.
11. No person shall operate any motor vehicle that is in such physical or mechanical condition as to endanger persons or property or that the (AERODROME OPERATOR) considers an endangerment.
 12. No person shall—
 - a. Operate any vehicle that is overloaded or carrying more passengers than for which the vehicle was designed.
 - b. Ride on the running board or stand up in the body of a moving vehicle.
 - c. Ride with arms or legs protruding from the body of a vehicle except when the vehicle was designed for such use.
 13. A vehicle guide person is required whenever the vision of the vehicle operator is restricted.
 14. No fuel truck shall be brought into, stored, or parked within 15 meters feet of a building. Fuel trucks must not be parked within 3 meters from other vehicles.
 15. Container carriers and tugs shall tow no more carts, pods, or containers than are practical, under control, tracking properly, and safe.
 16. When not serving aircraft or undertaking their intended functions, ramp vehicles and equipment shall be parked only in approved areas.
 17. Vehicle operators shall not operate or park vehicles under any passenger loading bridge.
 18. No person shall park a vehicle in an aircraft parking area, safety area, or gross area or in a manner that obstructs or interferes with operations in the aircraft movement area or apron area.
 19. No person shall park, or leave unattended, vehicles or other equipment that interfere with the use of a facility by others or prevent movement or passage of aircraft, emergency vehicles, or other motor vehicles or equipment.
 20. No person shall park a vehicle or equipment within ____ meters of a fire hydrant or in a manner that prohibits a vehicle from accessing the fire hydrant.
 21. No person shall operate a vehicle or other equipment within the airside under the influence of alcohol or any drug that impairs, or may impair, the operator's abilities.
 22. Each vehicle operator using an aerodrome perimeter (security) gate shall ensure the gate closes behind the vehicle prior to leaving the vicinity of the gate. The vehicle operator shall also ensure no

unauthorized vehicles or persons gain access to the airside while the gate is open.

23. Vehicle operators shall not operate vehicles in a reckless or careless manner. A reckless or careless manner is one that intentionally or through negligence threatens the life or safety of any person or threatens damage or destruction to property.
24. Vehicles shall not enter the manoeuvring area or cross runways unless the operator of the vehicle has received required training and authorization from the (AERODROME OPERATOR) to operate on the manoeuvring area. Whenever possible, all aerodrome vehicles shall utilize the aerodrome perimeter and service roads to transition between areas on the aerodrome.
25. Each vehicle operator is responsible for the activities of each vehicle passenger on the airside of the aerodrome.

1.6.2. Vehicle Regulations

1. No vehicle shall be operated on the airside unless it has proper registration in the (STATE/PROVINCE) or is a qualified off-road vehicle that is not normally operated on public streets but has received the approval of the (AERODROME OPERATOR).
2. All vehicles operated on the airside must have vehicle liability insurance, as required by the (AERODROME OPERATOR).
3. The (AERODROME OPERATOR) must approve tenant vehicles operated on the manoeuvring and movement and other areas. These vehicles must display a (AERODROME OPERATOR) sticker or an aerodrome-approved company logo that is at least _____ cm in height on the passenger and operator's doors.
4. Carts or pieces of equipment being towed or carried after darkness must have side and rear reflectors or rear lights.
5. No vehicle shall be permitted on the airside unless—
 - a. It is properly marked.
 - b. It is in sound mechanical condition with unobstructed forward and side vision from the driver's seat.
 - c. It has the appropriately rated and inspected fire extinguishers (service vehicles and fuel trucks).
 - d. It has operable headlamps and brake lights.
6. Vehicles operating on the manoeuvring area shall be equipped with operating amber rotating beacon or equivalent.
7. All aircraft refueling vehicles and any other vehicle 2.5 meters or more in width shall be equipped with a flashing amber beacon and flashing front, tail, and clearance lights that are activated at all times when operating on the airside.

1.6.3. Vehicular Accidents. Operators of vehicles involved in an accident on the aerodrome that results in injury to a person or damage to an aircraft, aerodrome property, or another vehicle shall—

1. Immediately stop and remain at the scene of the accident.
2. Render reasonable assistance, if capable, to any person injured in the accident.
3. Report the accident immediately to the (AERODROME OPERATOR) before leaving the scene, if possible.
4. Provide and surrender the following to any responding (AERODROME OPERATOR) personnel: name and address, aerodrome identification card, state driver's license, and any information such personnel need to complete a motor vehicle accident report.

Section 2. Driving on the Movement and other Areas

2.1. Movement and other areas include, aprons, and other areas not under control of the TWR. Anyone authorized to operate a motorized vehicle on the airside may do so on the movement and other areas without being in positive radio contact with the TWR. These areas include —

- 2.1.1. Service roads
- 2.1.2. Cargo aprons
- 2.1.3. General aviation apron
- 2.1.4. Air operator apron(s)

2.2. Driving.

Operating within the ramp areas requires the vehicle driver to exercise extreme caution as aircraft are always moving, aircraft passengers may be walking from an aircraft to the gate, and noise levels are high.

Vehicle drivers should—

- 2.2.1. Never drive between safety cones or across delineated passenger walkways.
- 2.2.2. Watch cockpit blind spots—pilots typically cannot see behind or below the aircraft.
- 2.2.3. Avoid jet blast or prop wash, which can blow debris or overturn vehicles.
- 2.2.4. Be aware and avoid moving propellers that can cause damage, injury, or death.
- 2.2.5. Be aware of other vehicle movements—you may not hear them approaching due to aircraft engine noise.
- 2.2.6. Yield to aircraft, passengers, and emergency vehicles, which ALWAYS have the right-of-way on any portion of the aerodrome.

When traveling on the apron, always use designated vehicle service roads. Driving close to buildings, around vehicles, or aircraft is prohibited. This policy helps to establish a predictable order to vehicle movements in congested areas and helps to ensure their visibility to aircraft and other vehicles. Parked aircraft may still have their engines running, so be aware of the hazards of jet blast or prop wash, which may overturn vehicles. Before an aircraft engine is started, the aircraft's red flashing beacons must be on. In some instances, propellers and engine spinners are marked to indicate when the engine is operating. A pilot's ability to maneuver quickly on the ground is limited. Propellers and jet engines can cause significant damage and injury to personnel. In addition, cockpit visibility prohibits the pilot from seeing under the nose or behind the aircraft and limits the pilot's ability to avoid ground vehicles.

2.3. Nighttime and Poor Weather Driving Conditions. Poor weather conditions (snow, fog, rain, etc.) might obscure visual cues, roadway markings, and aerodrome signs. Vehicle operators should remain vigilant of their surroundings and operating boundaries. Watch out for snow removal equipment and aircraft operating in the vicinity under low-visibility conditions. There are additional risks present under these conditions.

Section 3. Driving on the Manoeuvring Area

Drivers who are authorized to drive on the manoeuvring area require more training and vigilance since there are dangers associated with this area that are not present on movement and other areas. In addition to the principals for driving on the movement and other areas, drivers who have access to the manoeuvring area must be cognizant of the meaning of aerodrome signs, markings, and lighting configurations. Additionally, they must be able to communicate with air traffic control (ATC) and be able to follow ATC directions.

3.1. TWR Control. Manoeuvring area is defined as the part of the aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding the aprons. Manoeuvring area is considered "positive control," meaning that all vehicle operators will need permission from ATC before entering the area.

3.2. Authorized Vehicles. Only those vehicles necessary for aerodrome operations may enter a manoeuvring area. Therefore, fuel trucks, maintenance vehicles, tugs, catering trucks, and other nonessential vehicles should not be permitted to enter these areas. Exceptions may include (AERODROME OPERATOR)-authorized vehicles with appropriately trained personnel. Aerodrome Operations/Maintenance shall coordinate all other vehicle operations within the manoeuvring area.

3.3. Taxiways.

3.3.1. Designations. Aircraft use taxiways to move to and from the aprons and the runways. Taxiways are designated by letters or by a letter/number combination such as A, B, G2, or B3. (The Aerodrome Operator should include a diagram of the aerodrome here with the taxiway and runway designations.)

3.3.2. Lighting. Taxiways are lighted with **blue** edge lighting and/or reflectors. Some taxiways are also lighted with **green** in-paved, centerline lighting. (Use aerodrome-specific example here.)

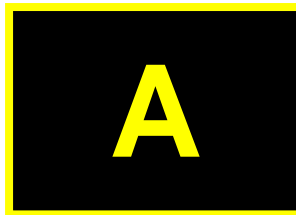
3.3.3. Signs. The signs used on taxiways are direction, destination and location signs.

Direction Signs have **black lettering** and a **directional arrow or arrows** on a **yellow background**. The arrow indicates the direction to that taxiway

Taxiway Direction Sign

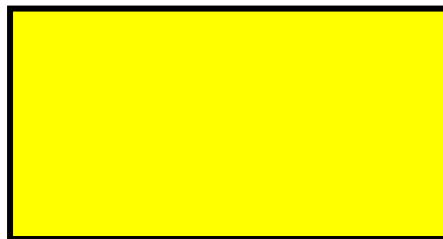


Location Signs have **yellow lettering** on a **black background with yellow border**. The location sign below indicates that the operator of the vehicle/equipment is located on the named taxiway.



Taxiway Location Sign

Runway Vacated Sign, when required, identify the boundary of the obstacle free zone, approach surface, take-off climb surface or ILS/MLS critical/sensitive area to the pilot and vehicle operator. The driver can use these signs to identify when the vehicle is clear of the runway environment. It has a **black inscription** that depicts the runway-holding position marking on a **yellow background**.



Runway Vacated Sign

*

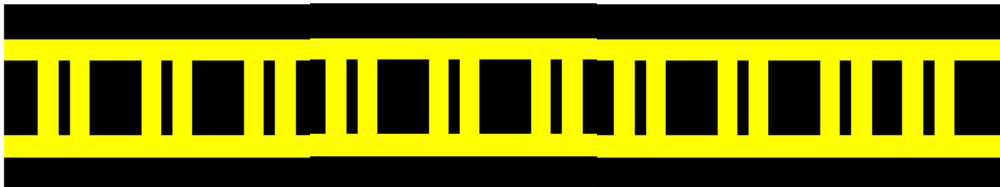


3.3.4. Markings. Pavement markings on taxiways are always **yellow**. The taxiway centerline is painted on all taxiways. On the edges of some taxiways, there is a solid, double yellow line.

Runway- Holding Position Markings Pattern A are located across each taxiway that leads directly onto a runway. These markings are made up of **two solid lines and two broken yellow lines** and denote runway holding-position markings. These markings are always co-located with a Runway Holding Position Sign. A vehicle operator must not cross from the solid-line side of the marking without first obtaining clearance from ATC.



Runway-Holding Position Markings Pattern B are comprised of **two parallel yellow lines** with lines running perpendicular between the two parallel yellow lines. These markings identify the location on a taxiway where an aircraft or vehicle is to stop when it does not have clearance to enter ILS /MLS critical/sensitive areas. The ILS/MLS critical/sensitive area must remain clear, especially in inclement weather. If a vehicle proceeds past this marking, it might cause a false signal to be transmitted to the landing aircraft.

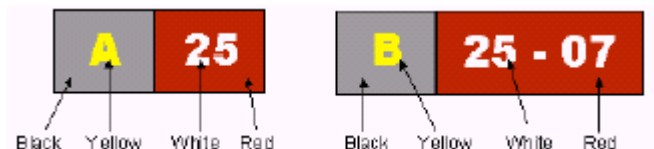


Runway-Holding Position Marking Pattern B

3.4. Runways (*Use Aerodrome Specific Examples*).

3.4.1. Designations. Runways are areas where aircraft land and take off. Runways are always designated by a number such as 07 or 25. The number indicates the compass heading of the runway. An aircraft taking off on runway 25 is headed 250 degrees. In the event of parallel runways, a letter designation is added to indicate either the right or left runway; e.g., 07L-25R, 07R-25L.

A Runway Designation Signs are provided in conjunction with a taxiway location sign.



Runway Designation signs with taxiway location sign

3.4.2. Lighting. Runways are lighted with a variety of colored lights.

Runway Edge-lights are **white**, except that:

- a) in the case of a displaced threshold, the lights between the beginning of the runway and the displaced threshold shall show red in the approach direction; and
- b) a section of the lights 600 m (2000 feet) at the remote end of the runway from the end at which the take-off run is started , may show yellow.

Runway Centerline Lights are white except for the last 900 m (3,000 feet) to 300 m (1000 feet) from the runway end, where they begin to alternate red and white. For the last 300 m (1,000 feet) of runway the centerline lights are all red.

Runway Touchdown Zone Lights are white.

Runway End Lights are red..

Runway Threshold Lights are green.

3.4.3. Signs.

Mandatory Runway Holding Position Signs have white umbering/lettering on a red background. These are located at each entrance to a runway and at the both edges of obstacle-free zone (OFZ) and are co-located with runway holding- position markings. Do not proceed beyond these signs until clearance is given by the TWR to enter onto the runway.



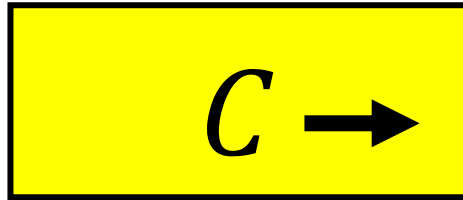
Mandatory Runway Holding Position Sign

Category I, II or III Holding Position Signs have white numbers/letters (runway designation number followed by CAT I, CAT II, CAT III or CAT II/III) on a red background. These signs tell pilots and vehicle operators where to stop to avoid interrupting a type of navigational signal used by landing aircraft. This is a critical/sensitive area, and a vehicle/equipment operator must remain clear of it (*use aerodrome-specific policy*). If a vehicle proceeds pass this ILS/MLS critical/sensitive area, it may cause a false signal to be transmitted to the landing aircraft.



Category I Runway-Holding Position Sign

Runway Exit Sign is a destination sign located prior to the runway/taxiway intersection on the side and in the direction of the runway where the aircraft is expected to exit. This sign has black lettering and a directional arrow on a yellow background.



Runway Exit Sign

3.4.4. Markings.

Pavement markings on a runway are white. Runway Threshold Markings, Displaced Threshold Markings, Transverse Stripe Markings, Runway Aiming Point Markings, Runway Designation Markings, Runway Touchdown Zone Markings, Runway Centerline Markings and Runway Side Stripes Markings are white.

Section 4. Communications

4.1. Any vehicle driving on the **manoeuvring area (runways and taxiways) must** be in contact with the TWR. Vehicle operators must always monitor the appropriate radio frequency when in the manoeuvring area on controlled aerodromes. Permission must be requested and clearance given prior to driving on a manoeuvring area. A vehicle that is equipped with a radio may escort vehicles without radios. When a manoeuvring area is closed for construction, vehicles may traverse that area without TWR contact but must be escorted if their travels require them to cross an active manoeuvring area.

4.2. The TWR controller may use separate or common radio frequency to control all ground traffic, vehicle and aircraft, on the manoeuvring area. The frequency is only to be used to get clearance onto and off the manoeuvring area.

4.3. **Phraseology.** Vehicle operators must contact the TWR ground controller each and every time they proceed onto or leave the manoeuvring area. When proceeding onto a manoeuvring area, vehicle operators must tell the controller three things: **WHO you are, WHERE you are, and WHAT your intentions are.** Vehicle operators must always acknowledge all communications so ground control and other persons know that the message was received. **Vehicle operators must always give aircraft and ground control transmissions priority unless an emergency exists.** Very high frequency frequencies are for the primary use of aircraft and TWR personnel. Some typical transmissions are as follows:

- (AERODROME NAME) ground control, this is Aerodrome 21 at Charlie 6. Request permission on all taxiways for a pavement inspection.”
- (AERODROME NAME) ground control, this is Aerodrome 21 at Taxiway Alpha. Request clearance south on runway 19 right for a light inspection.”

Reply transmissions may be brief, such as—

- TWR: “Aerodrome 21, hold short of runway 19 right.”
- Driver: “Aerodrome 21 holding short of runway 19 right.”
- TWR: “Aerodrome 21 cleared south on runway 19 right.”
“Please expedite, landing aircraft on a 10 mile final for runway 19 right.”
- Driver: “Aerodrome 21 cleared south on runway 19 right, will expedite.”
- Driver: “Ground control, Aerodrome 21 is clear of runway 19 right.”

NOTE: If you are unsure what the controller has said, or if you don't understand an instruction, you should ask the controller to repeat it. Good communications only occur when each party knows and understands what the other is saying.

4.4. Common Use Phrases.

What Is Said:	What It Means:
Acknowledge	Let me know you have received and understand this message.
Advise Intentions	Let me know what you plan to do.
Affirmative	Yes.
Correction	An error has been made in the transmission, and the correct version follows.
Go Ahead	Proceed with your message only.
Hold/Hold Short	Phrase used during ground operations to keep a vehicle or aircraft within a specified area or at a specified point while awaiting further clearance from air traffic control.
How do you hear me?	Question relating to the quality of the transmission or to determine how well the transmission is being received.
Immediately or without delay	Phrase used by ATC when such action compliance is required to avoid an imminent situation.
Negative	"No" or "permission not granted" or "that is not correct."
Out	The radio conversation is ended, and no response is expected.
Over	My radio transmission is ended, and I expect a response.
Read Back	Repeat my message to me.
Roger	I have received all of your last transmission.
Stand By	Means the controller or pilot must pause for a few seconds, usually to attend to other duties of a higher priority. Also means to wait as in "stand by for clearance." The caller should reestablish contact if a delay is lengthy.
Unable	Indicates inability to comply with a specific instruction, request, or clearance.
Verify	Request confirmation of information.
Wilco	I have received your message, understand it, and will comply with it.

4.5. Radiotelephony Spelling Alphabet. Because some letters have similar sounds, like B and P, the international civil aviation uses the following words to reduce confusion. For example; Taxiway B would be referred to as Taxiway Bravo on the radio.

A	ALFA	N	NOVEMBER
B	BRAVO	O	OSCAR
C	CHARLIE	P	PAPA
D	DELTA	Q	QUEBEC
E	ECHO	R	ROMEO
F	FOX-TROT	S	SIERRA
G	GOLF	T	TANGO
H	HOTEL	U	UNIFORM
I	INDIA	V	VICTOR
J	JULIET	W	WHISKEY
K	KILO	X	X-RAY
L	LIMA	Y	YANKEE
M	MIKE	Z	ZULU

4.6. TWR Light Signals. Air traffic controllers have a backup system for communicating with aircraft or ground vehicles if their radios stop working. The controller has a light gun in the tower that can send out different colored lights to tell the pilot or driver what to do. If a vehicle operator experiences a radio failure on a runway or taxiway, the operator should vacate the runway as quickly and safely as possible and contact the TWR by other means, such as a cellular telephone, and advise the TWR of the situation. If this is not practical, then the driver, after vacating the runway, should turn the vehicle toward the tower and start flashing the vehicle headlights and wait for the controller to signal with the light gun.

Light signals, and their meaning, are as follows:

Green flashes	Permission to cross landing area or to move onto taxiway
Steady Red	STOP
Red flashes	Move off the landing area or taxiway and watch out for aircraft.
White flashes	Vacate manoeuvring area in accordance with local instructions.
Flashing runway or taxiway lights	Vacate the runway and observe the tower for light signal. In emergency conditions or if the signals mentioned above are not observed, the signal given here shall be used for runways or taxiways equipped with a lightning system.

4.7. Safety. ICAO defines runway incursion as “**Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for landing and takeoff of aircraft.**”

Runway incursions are primarily caused by error in one or more of the following areas:

- Pilot/ground vehicle/controller communications
- Aerodrome familiarity
- Loss of situational awareness

An example of an incursion is a vehicle at an aerodrome with an operating TWR straying onto a runway in front of an aircraft causing the pilot to take an action to avoid a collision. When driving on the airfield, vehicle operators need to always be aware of their location and the meaning of all pavement markings, lights, and signs. When on the aprons and taxiways, stay away and steer clear of aircraft. **Aircraft always have the right-of-way.**

NOTE: Any individual involved in a runway incursion should receive remedial airfield driver’s training given by the (AERODROME OPERATOR).

This is an appropriate place to describe an individual aerodrome’s runway and taxiway identification system. In addition to the system description, it is recommended that the aerodrome operator provide a runway (RY) and taxiway (TWY) diagram, especially if the aerodrome’s identification system varies from the norm or is otherwise complicated.

SAMPLE
GROUND VEHICLE OPERATING FAMILIARIZATION PROGRAM
TRAINING RECORD

Employee's Name: _____

Employee's Position:

Company Name: _____

Driver's License Number: _____

Driver's License Expiration Date: _____

I agree to abide by all rules and regulations prescribed for the operations of a vehicle within the aerodrome operations area.

As of this time, I certify that I hold a current and valid driver's license. If for any reason my license becomes invalid, I will notify the (AERODROME OPERATOR) immediately. Sign your name and indicate today's date below:

 (NAME)

 (DATE)

PERMITTED VEHICLE OPERATING AREAS

Location

- General Aviation Ramp
- Air Carrier/Terminal Ramp
- Firehouse
- Air Cargo
- Tie-downs
- All Areas

I certify that the above named individual has satisfactorily completed the Driver Training Program.

Instructor's Signature: _____