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Advisory Circular

AC 139-03-A

GROUND VEHICLE
OPERATIONS AT AERODROMES

June 2008

AANSOO-RSSD

Advisory Circulars (AC) are intended to provide recommendations and guidance to illustrate a means, but not necessarily the only means, of complying with regulatory requirements, or to explain certain regulatory requirements by providing interpretative and explanatory material.

ATO will generally accept that when the provisions of an Advisory Circular have been met, compliance with the relevant regulatory obligation has been satisfied.

Where an AC is referred to in a 'Note' within regulatory documentation, the AC remains as guidance material.

ACs should always be read in conjunction with the referenced regulations.

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1. REFERENCES

- 1.1 This document may refer to portions of the following:
- Republic Act 776 as amended;
 - Civil Aviation Authority Act of 2008;
 - Administrative Order 139;
 - Manual of Standards for Aerodromes; and
 - ICAO Annex 14 Volume 1 4th Edition as amended.

2. PURPOSE

2.1 Republic of the Philippines has developed a system for regulating aerodromes as prescribed in AO 139. Aerodromes that have international air transport operations, or domestic air transport operations by aircraft certified to carry more than 30 passengers are required to be certified, and part of the certification requirement is that the aerodrome manual shall contain operating procedures and that aerodrome personnel involved with safety related activities shall be properly trained. This Advisory Circular (AC) and the attached appendices provide guidance to aerodrome operators about 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 particular circumstances such as size, complexity, and scope of operation of each aerodrome. This AC contains recommended operating procedures, a sample training curriculum (Appendix A), and a sample training manual (Appendix B). However, it is stressed that the regulations must always be read for complete and detailed information on requirements.

3. STATUS OF THIS AC

3.1 ACs are numbered to reflect the regulatory basis, the serial number of the circular issued for that regulation and the revision status for that AC. In this case, the regulatory basis is AO 139, this is the third AC to be issued regarding AO 139 and it is revision A. Consequently, the status of this AC is 139-03-A.

4. BACKGROUND.

4.1 Every year there are accidents and incidents involving aircraft, pedestrians, and ground vehicles at aerodromes that lead to property damage and personnel fatalities and injuries. 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. Systems for ground vehicle operations promote the safety of aerodrome users by helping identify authorized areas for vehicles, outlining vehicle identification requirements, addressing vehicle and operator requirements, and coordinating construction, inspection, maintenance, and emergency activities.

5. APPLICABILITY.

5.1 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 Administrative Order No 139 at certified aerodromes.

5.2 Aerodrome operators need to 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.

5.5 Each bidding document (construction plans and/or specifications) for major maintenance or development work on an aerodrome, including installation of an air navigation facility (NAVAID) should incorporate a section on ground vehicle operations on aerodromes during construction activity. The requirements for vehicle operations including any restrictions should also be included in contract

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*

6. VEHICLE OPERATOR REQUIREMENTS.

6.1 Vehicle operators on aerodromes face conditions that are not normally encountered during highway or city driving. Special requirements apply on airports due to the close proximity of aircraft to ground vehicles. Therefore, persons who have access to the airside and a valid need to operate vehicles there must have an appropriate level of knowledge of aerodrome situations and the special rules and regulations that apply. Aerodrome operators should require vehicle operators to maintain a current driver's license, and should require vehicle operators to hold a means of identification relevant to the operation of a particular vehicle on particular areas of the airside of an aerodrome.

7. TRAINING.

7.1 Appendix A includes a sample training curriculum. This curriculum should address initial, as well as recurrent and/or remedial, instruction needs for 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. Aerodrome operators may modify the appendices to meet 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 maneuvering area.

7.2 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 Operation Training Record is included in Appendix B.

7.3 Aerodromes may adopt a variety of methods for training ground vehicle drivers. In some cases, aerodrome operators delegate the requirement of employee training to aerodrome tenants or a contractor. In such cases the aerodrome operator must include provision for quality assurance of the training process. 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.

7.4 Aerodrome operators should provide a means of testing trainees on the information presented. In addition to standard question and answer classroom testing (examination) methods, the aerodrome operators should have applicants demonstrate their proficiency in operating a vehicle on the airside before authorizing driving privileges, especially if those operators will be driving on the maneuvering area. It is also recommended that a period of on-the-job training be completed before personnel have unescorted access to the airside of the aerodrome.

8. VEHICLES ON AERODROMES.

8.1 Aerodrome operators should restrict vehicular and pedestrian activity on the airside of the aerodrome to the minimum necessary for safe operations. Vehicles on the airside of the aerodrome should be limited to those vehicles necessary to support the operation of aircraft operations and cargo and passenger services, emergency services, and maintenance of the aerodrome. Vehicles on the maneuvering area should be limited to those necessary for inspections, surveys and maintenance and emergency vehicles responding to an aircraft emergency. Vehicles should whenever possible use service roads or public roads instead of crossing a maneuvering area. Where vehicle traffic on aerodrome operation areas cannot be avoided, it should be carefully controlled.

8.2 When runway crossings are necessary, 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.

8.3 Some aspects of vehicle control and identification are discussed below. However, every aerodrome presents different vehicle requirements and problems. Each 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. Aircraft also have the right-of-way on the maneuvering 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.

8.4 Vehicles that routinely operate on the airside should be marked/flagged for high daytime visibility and, if appropriate, lighted for night-time operations. Vehicles that are not marked and lighted equipped with marking and lighting devices should be escorted by vehicles that are.

9. VEHICLE ACCESS CONTROL.

9.1 The control of vehicle 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 control tower, controllers and vehicle operators should use two-way radios for vehicle control on the maneuvering area. To accomplish this task, the aerodrome operator and the air traffic service provider should develop a letter of agreement outlining standard operating procedures.

9.2 Inadvertent entry by vehicles onto maneuvering 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 Plan is a useful tool for accomplishing this. Aerodrome operators 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,

- 11.1.14 Requirements making the vehicle operator responsible for passengers in the vehicle

12. EMERGENCY OPERATIONS AND OTHER NON-ROUTINE OPERATIONS.

12.1 Aerodrome operators may allow a number of non-routine operations to occur on the airside of the aerodrome. Such non-routine activities include airfield construction, air shows, 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.

12.2 Aerodrome operators should review non-routine operations that involve ground vehicles and develop vehicle operation procedures to accommodate these special operations. Meetings associated with planning 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:

12.2.1 Airside Construction

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

12.2.2 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.

12.3 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 maneuvering 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.

13. SITUATIONAL AWARENESS.

13.1 There are a number of factors that hamper a driver's situational awareness. Situational awareness declines if a driver's attention is drawn into the vehicle or becomes 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 haze, may also diminish a vehicle operator's situational awareness.

13.2 There are ways to enhance situational awareness. As part of a ground vehicle operator's training, 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.

13.3 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.

14. ENFORCEMENT AND CONTROL.

14.1 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:

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

15. FURTHER INFORMATION

The information in this circular is provided to address general matters likely to be encountered by aerodrome operators. Please refer to the ATO Executive Director for specific individual aerodrome matters not covered by this AC.

By authority of the Secretary, DOTC



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APPENDIX A

GROUND VEHICLE OPERATOR TRAINING CURRICULUM

The purpose of the Ground Vehicle Operator training curriculum is to provide aerodrome operators with a comprehensive list of training topics for educating vehicle operators who require access to the airside of an aerodrome. Each individual aerodrome has unique situations that 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 appropriate level of training necessary 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 aircraft navigation aids on the aerodrome;
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 aprons, runways and taxiways;
5. Limits of maneuvering areas;
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 of the circuit pattern, i.e., crosswind, downwind, base and final; and
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 ramp areas.

AREAS OF TRAINING

All drivers should have training in the following areas:

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

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

2. Definitions and Terms – an explanation of specific terms used in the aviation context

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

5. Testing

- k. Written Test
- l. Practical Test

Training Outcome – Trainee should be able to pass a written examination with a minimum score of 90 percent.

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

6. Aerodrome Familiarization

- m. Runway configuration/safety area
- n. Taxiway configuration/safety area
- o. Maneuvering, movement and other areas
- p. Confusing areas
- q. 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
 - Stop bars
 - Runway guard lights
- r. Aerodrome Signs
 - (1) Runway holding- position sign
 - (2) Location sign
 - (3) ILS Category I, II or III holding position signs
 - (4) Direction sign
- s. Aerodrome marking
 - (1) Runways
 - Centre line marking
 - Side stripe markings
 - Runway designation marking
 - Threshold markings
 - Runway holding-position marking
 - (2) Taxiways
 - Runway holding-positions marking
 - Intermediate holding-position markings
 - Centre line marking
 - Edge markings
 - (3) ILS critical areas
 - (4) Movement and other area boundary marker
- t. Aerodrome NAVAIDS and Visual Approach Aids
 - (1) Location
 - (2) Non-interference

Training Outcomes – 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.
- u. Communications
 - (1) Ground Vehicle Communications
 - Radio Frequencies
 - Procedural Words and Phrases
- v. Radiotelephony spelling alphabet
- w. Aviation terminology
- x. Procedures for contacting the TWR
- y. Airfield communications at aerodromes without operating TWR
- z. Light Signals
 - (1) Description of light signals

Training Outcomes - Trainee should be able to send and receive radio messages, and understand and respond to light signals from the control tower.

APPENDIX B

SAMPLE GROUND VEHICLE OPERATIONS TRAINING MANUAL

This sample training manual provides aerodrome operators with a template for developing and implementing 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.

For a certified aerodrome, the manual should be compiled as a controlled document by ensuring it contains a title page, foreword, contents page, list of effective pages page, individual unique page identification and amendment record data. The distribution of the manual and amendments should be specifically managed according to process contained in the aerodrome manual.

Section 1. Aerodrome Rules for airside ground vehicle operations

1.1. Authority for Implementation of Rules. The (NAME) Aerodrome operates under the authority of Administrative Order Number 139. (CITY/COUNTY ORDINANCE OR STATE STATUTE) has granted the (AERODROME OPERATOR) the authority to establish procedures for the management and supervision of the aerodrome.

1.2. Applicability. These rules apply to all users of, and persons on any portion of, the property owned or controlled by (AERODROME OPERATOR). No persons are exempt from 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 by their employees.

These Rules may be amended, changed, or modified by (AERODROME OPERATOR), as necessary in the interests of safety:

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.

- 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 (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, systems, 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 glide slope.
- 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 maneuvering area.
- 1.3.14 **Mobile Fueler**—A vehicle owned and/or operated by authorized agents to pump and dispense fuel to aircraft at an aerodrome. This may include fuel tankers, in-to-aircraft fueling pumps, 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 maneuvering area and the apron(s).
- 1.3.16 **Manoeuvring Areas**—The part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the runway and taxiways and excluding the aprons.
- 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 area 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, or any lawful order issued pursuant thereto, will be subject to progressive penalties for repeat violations. These penalties may include being denied access to 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 training 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 maneuvering 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 maneuvering area —
 - a. Without first obtaining permission of the (AERODROME OPERATOR) and clearance from the TWR to enter the maneuvering area;
 - b. Unless equipped with an operable two-way radio in communication with the TWR; or

24. Vehicles shall not enter the maneuvering area or cross runways unless the operator of the vehicle has received required training and authorization from the (AERODROME OPERATOR) to operate on the maneuvering 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 any 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 State registration 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 maneuvering 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 during night-time 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 maneuvering area shall be equipped with operating amber rotating beacon or equivalent.
7. All aircraft refueling vehicles and any other vehicle 2.5 metres (8 feet) 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 Apron and other areas

2.1. Apron and other areas include aprons, ramps or aircraft parking areas and other areas not under control of the TWR. Anyone authorized to operate a motorized vehicle on the airside may do so on the apron 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. Operating within the apron 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.

2.3. Vehicle drivers should:

- 2.3.1 Never drive between safety cones or across delineated passenger walkways.
- 2.3.2 Watch cockpit blind spots—pilots typically cannot see behind or below the aircraft.
- 2.3.3 Avoid jet blast or prop wash, which can blow debris or overturn vehicles.
- 2.3.4 Be aware and avoid moving propellers that can cause damage, injury, or death.
- 2.3.5 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.

2.4. 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.

2.5. **Nighttime and Poor Weather Driving Conditions.** Poor weather conditions (dense haze, 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 maneuvering area

Drivers authorized to operate on the maneuvering 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 principles for driving on the movement and other areas, drivers who have access to the maneuvering 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.** Maneuvering area is defined as the part of the aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding the aprons. Maneuvering 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 maneuvering 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 maneuvering 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.*)

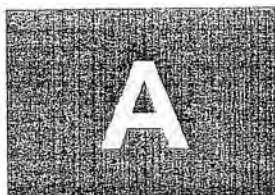
3.3.3. **Signs.** The signs used on taxiways are direction, destination and location signs.

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



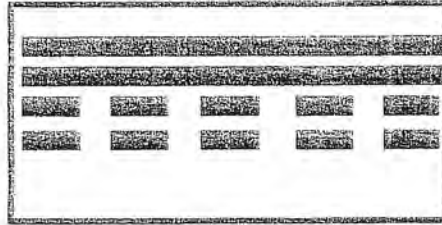
Location Signs have yellow lettering on a black background with yellow border. The location sign below indicates that the operator of the vehicle/equipment is located on the named taxiway.



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

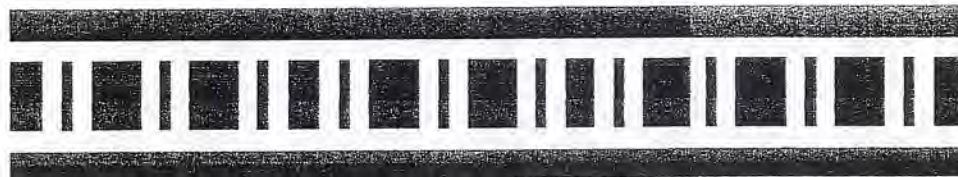
- 3.3.4. **Markings.** Pavement markings on taxiways are always yellow. The taxiway centerline is painted on all taxiways. On the edges of some taxiways, there is a solid, double yellow line.

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 Marking Pattern A

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 critical/sensitive areas. The ILS 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.



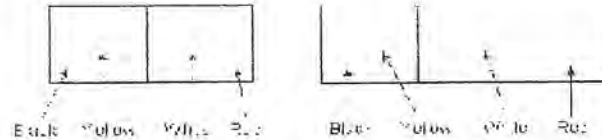
Runway-Holding Position Marking Pattern B

- 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:

- 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
- 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 numbering/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.



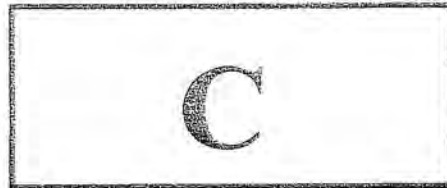
Mandatory Runway Holding Position Sign

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 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 Stripe Markings are white.

Section 4. Communications

4.1 Any vehicle driving on the **maneuvering area (runways and taxiways)** must be in contact with the TWR. Vehicle operators must always monitor the appropriate radio frequency when in the maneuvering area on controlled aerodromes. Permission must be requested and clearance given prior to driving on a maneuvering area. A vehicle that is equipped with a radio may escort vehicles without radios. When a maneuvering 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 maneuvering area.

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

4.3 **Phraseology.** Vehicle operators must contact the TWR ground controller each and every time they proceed onto or leave the maneuvering area. When proceeding onto a maneuvering 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."

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 maneuvering 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 OPERATION 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.

(SIGNATURE)

(DATE)

PERMITTED VEHICLE OPERATING AREAS

- Location**
- General Aviation Ramp
 - Air Carrier/Terminal Ramp
 - Firehouse
 - Air cargo
 - Tie-downs
 - Perimeter roads
 - All areas

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

Instructor's name: _____ Date: _____

Instructor's signature: _____