

# ADVISORY CIRCULAR

Subject	Issuance Date	AC Number	Version
Guidance Material on Water Conservation Measures	1-September-2024	156-08	1.0

Note: This Advisory Circular is published to provide additional information and recommended actions that further elaborate on provisions or concepts prescribed in the GACAR-156.

## 1. Introduction

### 1.1 Purpose

The purpose of this advisory circular is to:

- Present and discuss several water conservations measures that can be undertaken by aerodrome operators.
- Refer to water conservation programs case studies.

### 1.2 Applicability

This advisory circular is applicable to all aerodrome operators

### 1.3 Cancellation

This is the first official version of this advisory circular, and it cancels no other advisory circular on the subject matter.

### 1.4 Related regulatory references

- GACAR Part-156.

### 1.5 Related reading materials and references

ICAO, Water Management at Airports, Eco Airport Toolkit, available at: <https://www.icao.int/environmental-protection/Pages/Ecoairports.aspx>

### 1.6 Approval

This advisory circular has been approved for publication by the Executive Vice President for Safety and Environmental Sustainability of the General Authority of Civil Aviation.

## 2. Introduction

The strain on water resources is intensifying due to escalating demand, urbanization, and climate change. When it comes to water management, aerodrome operators should consider three primary perspectives. Firstly, they should prioritize assessing the water supply source to the airport facility and identifying strategies to minimize demand. Secondly, airports are susceptible to various water events, including flooding, drainage issues, erosion, and more. Thus, it is crucial to address these concerns. Lastly, airports must ensure that the water discharged from their premises is environmentally clean and safe.

This guidance addresses the first consideration only and presents several measures to reduce water demand at the airport facility.

## 3. Water conservation measures levels

This section describes three general levels of measures: Level 1, Level 2, and Level 3. A variety of specific conservation measures are grouped into categories.

- Level 1 Measures
  - Metering
  - Water accounting and loss control
  - Awareness
- Level 2 Measures
  - Water-use analysis
  - Retrofits
  - Pressure Management
- Level 3 Measures
  - Reuse and recycling
  - Water-use restriction

## 4. Level 1 Measures

### 4.1 Metering

The use of water meters is one of the most fundamental tools for managing and conserving water systems. It is necessary to measure consumption to improve. The first step towards improving a system is to measure it.

As water meters age, they can become damaged and deteriorate, resulting in inaccurate readings. A system with inaccurate readings will provide misleading information about water usage, hinder leak detection, and result in additional costs for the airport. The accuracy of all meters, particularly older meters, should be checked on a regular basis.

After determining the accuracy of the metering system, a schedule of correction activities should be provided, and water meters should be calibrated regularly to ensure accurate billing and accounting.

### 4.2 Water accounting and loss control

To effectively manage any resource, the entity must maintain accurate records of all transactions and deliveries. Water audits involve reviewing records and data that trace the flow of water from its source to customers. Water audits are usually presented in the form of a worksheet or spreadsheet that summarizes the supply, consumption,

and loss components that exist within a water system. All the water placed into a distribution system should, in theory, equal all the water that is removed from it. The water balance summarizes these components and provides accountability for them.

Regardless of the size of the water system, it is imperative that at least a basic water accounting system be implemented. An effective loss control strategy begins with implementing a system of water accounting.

Water leakage can be measured as a function of the operating costs associated with the supply, treatment, and delivery of water. It can be costly to repair large leaks, but it can also result in substantial savings in water and expenditures in the long run.

An evaluation of non-account water use should be conducted to identify potential losses and leaks that may be recoverable. Additionally, systems should implement a comprehensive leak detection and repair strategy. An effective leak detection strategy may include on-site testing using computer-assisted leak detection equipment, a sonic leak detection survey, or another acceptable method for detecting leaks along water distribution mains, valves, services, and meters. The interior of storage tanks can be inspected and cleaned by divers.

A loss-prevention program may include pipe inspections, cleaning, lining, and other preventative maintenance activities to improve the distribution system and prevent leaks and ruptures.

### **4.3 Awareness**

A conservation program's success depends on raising public awareness. Water savings can be directly achieved when aerodrome passengers and staff change their water-use habits as a result of educational measures, but it can be difficult to estimate the amount of savings. It should also be noted that public education alone may not result in the same level of sustained water savings as other more direct methods.

## **5. Level 2 Measures**

### **5.1 Water-use analysis**

Analyzing water use can provide valuable insight into how water is used and how specific conservation strategies can reduce water usage. Water analysis should begin by identifying the categories of water use and ranking them according to the quantity of water consumed. The categories of water use may include process, sanitary, domestic, heating, cooling, outdoor, and other uses. As a second step, a water analysis should identify areas where alternative technologies or practices can improve overall water use efficiency. By analyzing practices, large-volume usage categories can gain insight into usage patterns and techniques for reducing usage.

### **5.2 Retrofits**

Retrofitting water systems can promote conservation. Retrofitting involves improving an existing fixture or appliance, rather than replacing it, to increase its water efficiency. A retrofit program typically targets plumbing fixtures.

Basic retrofit kits may include low-flow faucet aerators, low-flow showerheads, leak detection tablets, and flapper valve replacements.

### **5.3 Pressure management**

The reduction of excessive pressures in the distribution system can result in significant savings in water usage. Reduced water pressure can decrease leakage, flow through open faucets, and stresses on pipes and joints that may result in leaks. Moreover, lower water pressure may reduce system deterioration, which may reduce the need

for repairs and extend the useful life of existing facilities. In addition, lower pressures may help extend the life of end-of-life fixtures and appliances.

## 6. Level 3 Measures

### 6.1 Reuse and recycling

Graywater, or treated wastewater for non-potable purposes, can be used as an alternative source of water for some systems. The use of water reuse and recycling practices reduces the demand on the water system. It is recommended that airports work with their team to identify potential areas for reuse or recycling of water such as irrigation and toilet flushing.

### 6.2 Water-use restriction

An airport may impose water-use restrictions on its service provider in order to promote water conservation. Water-use restrictions may include banning a particular water-use or enforcing a method that reduces water consumption. For instance, these restrictions could be in place:

- Nonessential uses such as lawn watering, car washing, sidewalk washing
- Commercial water-use such as restaurants, cafes and stores
- Standards for water-using fixtures and appliances

## 7. Setting up a water consumption reduction plan

Airport operators are encouraged to develop and implement a water consumption reduction plan. This can be a stand-alone document or integrated within a wider environmental management plan. Either way, the plan should incorporate the following components:

- 1) **Assessment of current water usage:** Begin by conducting a comprehensive assessment of the airport's current water consumption patterns. This includes analyzing water bills, meter readings, and data from various water-consuming systems and facilities within the airport.
- 2) **Set specific reduction targets:** Establish measurable targets and objectives for reducing water consumption. These targets can be based on a percentage reduction from the baseline water usage or specific volume reduction goals.
- 3) **Identify water-saving measures:** Identify and prioritize water-saving measures that can be implemented at the airport. This can include installing water-efficient fixtures, implementing smart irrigation systems, rainwater harvesting, greywater recycling, leak detection and repair programs, and promoting water-wise landscaping practices.
- 4) **Develop an implementation plan:** Create a detailed plan outlining the specific actions required to implement the identified water-saving measures. This plan should include timelines, responsibilities, and budget considerations for each activity.

- 5) **Staff and stakeholder engagement:** Involve airport staff, tenants, and stakeholders in the water consumption reduction efforts. Conduct training programs, awareness campaigns, and provide resources to educate and engage them in adopting water-saving practices.
- 6) **Monitoring and measurement:** Implement a monitoring system to regularly track and measure water consumption. This can include metering systems, sub-metering of specific areas or facilities, and data analysis to identify trends, anomalies, and opportunities for improvement.
- 7) **Regular reporting and communication:** Establish a reporting mechanism to share progress and results with airport management, staff, and stakeholders. Transparently communicate achievements, challenges, and ongoing efforts to create awareness and maintain momentum for the water consumption reduction plan.
- 8) **Continuous improvement:** Regularly evaluate the effectiveness of implemented measures and identify areas for further improvement. This can involve conducting periodic reviews, soliciting feedback from stakeholders, and exploring new technologies or strategies for water conservation.

## 8. Examples of global airports' actions

Refer to “Water Management at Airports” document mentioned in the “Related reading materials and references” section for several water conservation programs case studies.

### GACA Contact:

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