



مكتب التنظيم و الرقابة
Regulation & Supervision Bureau

The Fuel Storage Tank Regulations 2009

Regulations

October 2009

ED/RO1/015

www.rsb.gov.ae

water, wastewater and electricity sector of the Emirate of Abu Dhabi

The Fuel Storage Tank Regulations

Issued by:

**The Regulation and Supervision Bureau
for the water, wastewater and electricity sector
in the Emirate of Abu Dhabi**

www.rsb.gov.ae

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1. Introduction

1.1 Citation and commencement

- 1.1.1 These Regulations shall be cited as the Fuel Storage Tank Regulations 2009.
- 1.1.2 These Regulations shall come into force on 1 October 2009.
- 1.1.3 These Regulations are issued by the Regulation and Supervision Bureau under Article (62) of Law No (2).

1.2 Purpose

- 1.2.1 These Regulations ensure the prevention and early detection of any fuel Release from fuel storage tanks and minimise the risk of fuel Releases affecting the environment and public health.
- 1.2.2 The Regulations address existing and potential sources of pollution that may result from fuel storage tanks. Any new fuel storage tanks are required to meet the criteria set out in these Regulations. Existing fuel storage tanks must be upgraded according to the relevant comparable standards and conditions and within a time schedule approved by the Bureau.

1.3 Scope, enforcement and disputes

- 1.3.1 The Regulations apply to all Licence Holders who own and operate (either directly or through any agreement with a third party) fuel storage tanks.
- 1.3.2 These Regulations are subject to amendment or replacement by the Bureau at any time, and from time to time.
- 1.3.3 Failure to comply with these Regulations, or any part thereof, shall be deemed as contrary to the Law. Such failures will be penalised by the Bureau in accordance with the Law.
- 1.3.4 Any disputes relating to these Regulations shall be dealt with in accordance with the Law.

2. Definitions

2.1 Interpretation

Terms in common use are not defined in this section and normal dictionary definitions shall apply.

Words and expressions other than those described in this section, which are defined in the Law, shall have the meanings ascribed to them in the Law.

Words using the singular or plural number also include the plural or singular number, respectively.

In these Regulations, unless the context otherwise requires, the following definitions apply:

- 2.1.1 **ADWEA:** Abu Dhabi Water and Electricity Authority.
- 2.1.2 **API 650:** American Petroleum Institute Standard 650 “Welded Steel Tanks for Oil Storage”.
- 2.1.3 **API 651:** American Petroleum Institute Standard 651 “Cathodic Protection of Aboveground Petroleum Storage Tanks”
- 2.1.4 **API 653:** American Petroleum Institute Standard 653 “Tank Inspection, Repair, Alteration and Reconstruction”
- 2.1.5 **Bureau:** the Regulation and Supervision Bureau for the Water, Wastewater and Electricity Sector in the Emirate of Abu Dhabi, as established under the Law.
- 2.1.6 **Cathodic Protection:** the method used to prevent corrosion of a metal surface by making that surface the cathode of an electrochemical cell.
- 2.1.7 **Certification Mark:** the mark, such as a tag, label, and plate or embossing on or affixed to a tank or a component of the Fuel Storage Tank System, certifying that the tank conforms to the standards of the American Petroleum Institute or such similar international standards.
- 2.1.8 **Compatible:** the ability of two or more substances or materials in a tank system to maintain their respective physical and chemical properties upon contact with one another.
- 2.1.9 **Corrosion:** the deterioration of a material, (usually a metal surface), that results from a reaction with the environment.
- 2.1.10 **Corrosion Expert:** a professional engineer who is qualified to engage in the application of corrosion control on metal tanks and metal piping systems.

- 2.1.11 **Dike:** a wall or barrier which is Impermeable to a stored substance and which forms the perimeter of the Secondary Containment area.
- 2.1.12 **Double-bottom Tank:** a fuel storage tank that has a second bottom and where the bottoms are Compatible and Impermeable to the substance stored and there is a method for monitoring the interstitial spaces between the bottoms.
- 2.1.13 **Double-wall Tank:** a fuel storage tank with an inner primary shell and an outer secondary shell that extends around the entire inner shell and for which there is a method for monitoring the interstitial space between shells for leaks.
- 2.1.14 **Field Constructed Aboveground Fuel Storage Tank:** a storage tank which is assembled and constructed on site at the relevant facility and which operates at atmospheric pressure, with more than ninety percent (90%) of its volume aboveground and having a capacity equal to or greater than fifty thousand (50,000) imperial gallons.
- 2.1.15 **Fuel Leak:** a gradual discharge or loss of fuel from a Fuel Storage Tank System, tank vehicle or vessel into the environment, other than through the usual function for which the Fuel Storage Tank System is designed.
- 2.1.16 **Fuel Storage Tank System:** all of the connecting piping, including pumps, product transfer system, barriers, overfill protection equipment and spill containment system associated with a fuel storage tank.
- 2.1.17 **Good Industry Practice:** in relation to any undertaking and any circumstances, the exercise of that degree of skill, diligence, prudence and foresight which would reasonably and ordinarily be expected from a skilled and experienced operator engaged in the same type of undertaking.
- 2.1.18 **Impermeable:** the ability to prevent a substance or combination of Compatible substances from penetrating through the Secondary Containment.
- 2.1.19 **Inventory:** the amount of fuel calculated to be in a fuel storage tank after considering the initial volume of fuel in the storage tank and the amount of fuel added to and removed from the storage tank during a period of time.
- 2.1.20 **In Service:** the fuel storage tank is actively maintained or operated, and contains fuel regularly or has fuel regularly added or withdrawn from the tank, and is emptied slowly for the purpose of cleaning or routine maintenance.

- 2.1.21 **Law:** Law No (2) of 1998 as amended by Law No (19) of 2007 and Law No (9) of 2009, and Law No (17) of 2005 concerning the Establishment of Abu Dhabi Sewerage Services Company as amended by Law No (18) of 2007, Law No (12) of 2008 and Law No (12) of 2009.
- 2.1.22 **Law No (2):** Law No (2) of 1998 concerning the Regulation of the Water and Electricity Sector in the Emirate of Abu Dhabi, as amended.
- 2.1.23 **Leak Detection:** a method or a device used to detect leaks in Fuel Storage Tank Systems.
- 2.1.24 **Licence Holder:** the holder of a licence issued in accordance with Article (82) of Law No (2).
- 2.1.25 **Out of Service:** the Fuel Storage Tank System is designated as not available for use by the Licence Holder and the Licence Holder has accordingly provided the Bureau with written notification on the status of the fuel storage tank.
- 2.1.26 **Permanently Out of Service:** the Fuel Storage Tank System is permanently not available for operational use.
- 2.1.27 **Qualified Organisation:** organisations or individuals who have qualified personnel and have appropriate accreditation for tank construction or upgrading from local authorities.
- 2.1.28 **Release:** a spill, leak, or discharge of substance from the Fuel Storage Tank System into the environment, including discharge into the ground underneath the storage tank or into a substance transfer area.
- 2.1.29 **Secondary Containment:** containment that prevents fuel which is accidentally discharged from a Fuel Storage Tank System reaching outside of the containment area and from impacting on the environment before cleanup occurs.
- 2.1.30 **Temporarily Out of Service:** that a Fuel Storage Tank System is withdrawn from service for a specified period with an intention to put it back into service.
- 2.1.31 **UAE:** United Arab Emirates.

3. Field Constructed Aboveground Fuel Storage Tanks

3.1 Application

- 3.1.1 The Regulations apply to all Licence Holders who own and operate Field Constructed Aboveground Fuel Storage Tanks having capacities equal to or greater than fifty thousand (50,000) imperial gallons per tank.

3.2 Registration

- 3.2.1 All Existing Fuel Storage Tank Systems must be registered with the Bureau on the registration form provided, refer to Appendix 1. This includes any Out of Service Fuel Storage Tank Systems which have not been put Permanently Out of Service.
- 3.2.2 To register a Fuel Storage Tank System, a registration form must be completed and lodged with the Bureau either via e-mail or postal service within three (3) months from the date these Regulations coming into force and effect.
- 3.2.3 All new Fuel Storage Tank Systems must be registered with the Bureau within thirty (30) days of coming into service.
- 3.2.4 The Bureau must be advised in writing of any changes made to the registered information within thirty (30) days of such a change occurring.
- 3.2.5 Following a review of any registered information for a Fuel Storage Tank System, the Bureau may issue a notice to the Licence Holder advising a period within which the existing Fuel Storage Tank System must be upgraded to meet the requirements of these Regulations.

3.3 Design parameters

- 3.3.1 Fuel storage tanks are required to comply with API 650 or similar internationally recognised standard. The Bureau must be informed of any fuel storage tanks constructed according to other similar internationally recognised standards. Such design and construction activity must be carried out by a Qualified Organisation.

- 3.3.2 Fuel storage tanks must carry a name plate or placard providing the specifications of the tank including, at least:
- (a) tank identification number;
 - (b) date of installation;
 - (c) capacity;
 - (d) material of construction; and additionally; and
 - (e) must contain a Certification Mark provided by the manufacturer confirming the design standards of the tank.

3.4 Release prevention and detection

- 3.4.1 Any Fuel Leaks detected shall be contained before contamination of soil or water resources outside the Secondary Containment area occurs.
- 3.4.2 Facilities should provide for early Fuel Leak Detection in storage tanks either through remote instrument alarms like fall-in-level, detection-of-vapours or other remote instrument intervention or through manual inspection during regular operations.
- 3.4.3 Any Fuel Leaks detected must be cleaned up immediately and corrective actions initiated as required.
- 3.4.4 Any interstitial spaces (including but not limited to those located in Double-walled Tanks, Double-bottom Tanks, and double piping) shall be equipped with interstitial monitoring equipment capable of detecting a Release from the primary containment into the interstitial space under all operating conditions.
- 3.4.5 The base of a steel fuel storage tank must be protected from Corrosion using Cathodic Protection or a similar internationally recognised method.
- 3.4.6 All equipment used for Release detection, monitoring, or warning shall be maintained in functioning condition.

3.5 Secondary Containment

- 3.5.1 The area around a fuel storage tank must have a Secondary Containment designed to contain a Fuel Leak and prevent it from impacting on the environment and on public health.
- 3.5.2 A Secondary Containment must be able to contain at least one hundred and ten percent (110%) of the design capacity of the largest tank in the secondary containment area.

- 3.5.3 A Secondary Containment must be constructed with materials which are Impermeable to, and Compatible with the substances stored, and that will prevent a Release into the environment.
- 3.5.4 A Secondary Containment shall be designed and constructed to contain any fuel released from the Fuel Storage Tank System and prevent fuel from reaching surface water, ground water, or adjacent land before clean-up.
- 3.5.5 A Secondary Containment shall be equipped with a manual controlled pump or drain pipe to remove any accumulated water or fluids.
- 3.5.6 All drainage valves located within the Secondary Containment shall remain closed at all times except during controlled drainage events.
- 3.5.7 Rain water or any other fluids which have accumulated in the Secondary Containment must be decontaminated before discharge.
- 3.5.8 The Secondary Containment must not be used for general storage purposes.

3.6 Corrosion protection

- 3.6.1 Licence Holders must ensure Compatibility between any fuel oil to be stored in the system and the material used in the construction of the system.
- 3.6.2 Tank requirements:
- (a) metallic fuel storage tanks on foundations consisting of material that can allow moisture penetration and Corrosion must be protected from Corrosion;
 - (b) where Cathodic Protection is used it must be designed by a Corrosion Expert and comply with API 651 or with similar internationally recognised standards; and
 - (c) exposed surfaces of Fuel Storage Tank Systems shall have a protective coating to prevent and control atmospheric Corrosion. The coating shall be applied according to the manufacturer's instructions and approved for use by ADWEA.
- 3.6.3 Steel piping must be protected from external Corrosion by:
- (a) piping located above ground and not in contact with the soil;
 - (b) Cathodic Protection; or
 - (c) Double-walling.

3.7 Overall protection and spill prevention

- 3.7.1 The Licence Holder shall establish safe fill, shutdown, and transfer procedures that minimise spills resulting from overfills or other transfer operations.
- 3.7.2 Fuel storage tanks shall be equipped with a level indicator or other measurement device that accurately indicates the level of fuel in the tank. The level indicator or the measurement device must be accessible and installed so that it can be conveniently read locally or provide remote control room indication. The level detectors should be interlocked with the filling-line control valve as well as outflow pump.
- 3.7.3 Fuel storage tanks shall be equipped with an alarm or other automatic mechanism that automatically shuts the flow into the tank when the tank reaches the safe fill level recommended by the manufacturer. All automatic shutoff equipment shall be equipped with a mechanism that will function in the event of power failure, malfunction or other similar events.
- 3.7.4 The alarm referred to in Clause 3.7.3 shall consist of a visual or audible device capable of alerting the transfer operator, by sight or by hearing, to prevent an overfill situation.
- 3.7.5 All fuel transfer areas, where filling connections are made with vehicles, shall be equipped with a spill containment system, such as spill boxes or containment areas capable of containing and collecting spills and overfills at connection points and preventing a Release during the transfer of the substance to and from the tank. The spill containment areas must be kept clean and water-free at all times.

3.8 Fire protection

- 3.8.1 Licence Holders with Fuel Storage Tank Systems shall comply with the UAE national civil defence codes and standards.

3.9 Maintenance and inspection

- 3.9.1 Fuel storage tank instruments, such as level indicators, level transmitters, alarm systems, valve actuation systems, pump cut-off systems, should be tested before every start-up and as frequently as possible during operations. This is to make sure that the system performs to design and operational requirements.
- 3.9.2 The Licence Holder shall inspect the tank pressure vacuum relief systems regularly and ensure that there are no blockages to the vents or intake systems that could endanger tank safety.

- 3.9.3 Daily inspections - Fuel Storage Tank Systems and the surface of the Secondary Containment area must be visually inspected daily for evidence of problems, damage, or Fuel Leaks. Any spills or Fuel Leaks must be cleaned up immediately and corrective action must be initiated as required.
- 3.9.4 Inspections every six (6) months - Licence Holders must inspect, every six (6) months, Fuel Storage Tank Systems. Such an inspection shall include:
- (a) visually inspecting the exterior surfaces of tanks, pipes, valves and other equipments for leaks and maintenance deficiencies;
 - (b) identifying cracks, areas of wear, Corrosion and thinning, poor maintenance and operating practices, separation or swelling of tank insulation, malfunctioning equipment and structural or foundation weaknesses;
 - (c) inspecting and monitoring all Fuel Leak Detection systems, Cathodic Protection monitoring equipment or other monitoring or warning systems which may be in place at the facility; and
 - (d) inspecting the condition and integrity of the Secondary Containment System.
- 3.9.5 Ten (10) year inspections - In addition to the requirements of Clause 3.9.3, all Licence Holders must perform a detailed inspection of fuel storage tanks. Initial inspection must be performed upon the life of the tank reaching a complete ten (10) years.
- 3.9.6 The ten (10) year inspections must be performed by an individual trained in the care and use of the test equipment and its operating procedures using a documented and validated method.
- 3.9.7 The ten (10) year inspection must include:
- (a) a tightness test of the tank and connecting pipes and must be in accordance with the industry testing and inspection practices, or API 653;
 - (b) cleaning the tank and difficult-to-reach areas within the tank in accordance with Good Industry Practice;
 - (c) removal, transportation and disposal of sludge in a manner which is consistent with all applicable federal and local environmental statutory requirements and Abu Dhabi Municipality orders which may be applicable from time to time;

- (d) inspecting the tank shell for soundness and testing all welds and seams on the tank bottom for porosity and tightness;
- (e) visual inspection of the internal surfaces of the tank and difficult-to-reach areas for corrosion or failure; and
- (f) inspecting of internal coatings for any signs of failure of the coating system such as, cracks, peeling, or separation.

3.9.8 Inspection reports - reports for each six (6) months and ten (10) year inspection of a fuel storage tank must be retained by the Licence Holder and made available to the Bureau upon request. These inspection reports must include the following information:

- (a) identification number for tank inspected;
- (b) results of inspection, including a report on the need for repair;
- (c) details of any repairs made to equipment deficiencies;
- (d) certification by the inspector that the inspection has been performed in a manner consistent with Good Industry Practice;
- (e) address of inspector; and
- (f) signature of inspector.

3.9.9 If an inspection report reveals:

- (a) a Fuel Leak;
- (b) a deficiency in monitoring equipment;
- (c) excessive thinning of the tank shell which would indicate structural weakness when the tank is filled with fuel; or
- (d) any other deficiency which would result in failure of the facility to function properly or store and contain the products in storage,

remedial measures must be promptly taken to eliminate the leak or deficiency and clean up any residues.

3.10 Reporting of spills and discharges

3.10.1 General Requirements:

The Bureau must be notified of any Releases greater than or equal to 200 imperial gallons from Fuel Storage Tank Systems. The notification shall include:

- (a) the registration or notification number of the Fuel Storage Tank Systems;

- (b) the date, geographic location and time of the Release;
- (c) the type of fuel Released;
- (d) the quantity or estimated quantity of the fuel Released;
- (e) the circumstances surrounding or causing the Release;
- (f) a description of the receiving environment (surface water, ground water, soil, etc.); and
- (g) the measures that have or are being taken to control the Release and any remedial actions to be taken.

3.10.2 Requirements for major spills or Fuel Leaks:

- (a) In the case of major spills or Fuel Leaks, the fuel Release emergency response plan should be activated (as required in Clause 3.11) and all resources required for responding to an emergency should be secured as soon as possible.
- (b) In the event of a major Fuel Leak or spill, which:
 - (i) has or is likely to have a significant environmental impact;
 - (ii) that requires intervention; or
 - (iii) that requires external expertise and equipment to confine and recover the contaminants,

the Bureau must be notified in accordance with the correct procedures set out in the Incident Reporting Regulations 2008.

3.10.3 In the event of a major Fuel Leak or spill requiring the permanent closure of a fuel storage tank, the Bureau may require the Licence Holder to submit a written closure plan.

3.10.4 The closure plan referred to in clause 3.10.3 shall describe the procedures to be used for tank decommissioning and site assessment to determine potential impacts if, in the reasonable opinion of the Bureau, a Fuel Leak or spill from a tank may have contaminated surrounding soils or groundwater resources.

3.11 Fuel Release emergency response plan

3.11.1 All Licence Holders shall prepare a fuel Release emergency response plan for Releases from fuel storage tanks, within ninety (90) days of the date on which these Regulations come into effect. The plan shall be designed to minimise hazards to human health or the environment from fires, explosions, or any unplanned Releases to soil, surface or ground water.

- 3.11.2 A fuel Release emergency response plan shall contain:
- (a) a facility map showing the location of the tanks, buildings, and site utilities;
 - (b) the general location of area receptors and points of exposure such as surface water bodies, natural resources, and residential communities;
 - (c) the names, addresses and phone numbers of persons qualified to act in emergencies together with a description of their roles and responsibilities;
 - (d) an up-to-date list of all emergency equipment at the facility such as fire extinguishing systems, spill control equipment, communications and alarm systems and this list shall always be kept up to date;
 - (e) the actions facility personnel shall take to respond to the emergency including an evacuation plan for facility personnel where there is a possibility that evacuation could be necessary;
 - (f) fire, explosions and health and safety contingency plans; and
 - (g) measures to be used to notify members of the public who may be adversely affected by the emergency.

3.11.3 The Licence Holder shall keep the emergency plan up-to-date and keep a copy of it readily available for the individuals who will put it into effect.

3.12 Decommissioning of tanks

3.12.1 The Licence Holder shall notify the Bureau immediately upon taking a fuel storage tank Out of Service, unless the tank is Out of Service because of scheduled testing or maintenance.

3.12.2 Any fuel storage tank that is Temporarily Out of Service, for a period exceeding ninety (90) days, shall not be placed back In Service until the Licence Holder notifies the Bureau (in writing) that the tank complies with the requirements of these Regulations.

- 3.12.3 Any fuel storage tank that is Permanently Out of Service can be:
- (a) dismantled and removed from site for disposal;
 - (b) relocated and isolated in an appropriate temporary storage area and then removed when the site is decommissioned; or
 - (c) permanently closed on site.

3.12.4 Any Fuel Storage Tank System to which Clause 3.12.3 (a), (b) or (c) applies shall be required to:

- (a) remove fuel from the tank and isolate connecting piping;
- (b) secure the tank to prevent any unauthorised entrance so that fuel is not accidentally or intentionally introduced into the tank;
- (c) thoroughly clean the interior of the tank and piping of all sludge, solids, and residuals and retain documentation of proper disposition of the removed sludge, solids and residuals;
- (d) any waste products removed must be disposed of in accordance with the federal and local environmental statutory requirements and Abu Dhabi Municipality orders which may be applicable from time to time;
- (e) the tank must be rendered free of petroleum vapours. Provisions must be made for natural breathing of the tank to make sure that the tank remains vapour-free;
- (f) all connecting lines must be disconnected and removed or securely capped or plugged;
- (g) the tank must be stencilled with the date of permanent closure; and
- (h) upon removal of the tank, the soil surrounding the tank must be assessed to determine whether there is soil and water contamination attributable to the Fuel Storage Tank System.

3.12.5 All decontamination and remediation work must be documented and made available promptly to the Bureau, upon request.

Appendix A

A1 Fuel storage tank systems registration form

Fuel Storage Tank System Registration Form

A. GENERAL INFORMATION

Company name:		
Generation capacity:		
Desalination capacity:		
No. of Field Constructed Aboveground Fuel Storage Tanks:		
Section - (responsible for operation and maintenance of tanks)		
Supervisor:		
Telephone:	Office	
	Mobile	
Email:		

B. FUEL STORAGE SYSTEM

No.	Item	Tank ID			
		Tank No.	Tank No.	Tank No.	Tank No.
1	Tank capacity in imperial gallons				
2	Fuel stored				
3	Date installed				
4	Tank type				
5	Tank current status				
6	Tank design standard				
7	Piping type				
8	Piping location				
9	Tank base material				
10	Type of secondary containment				
11	Type of overfill protection				
12	Tank filling mechanism				
13	Transfer area safeguards				
14	Type of leak detection				
15	Type of corrosion protection				
16	Tank monitoring frequency				

Note: for more than 4 tanks, print extra copies.

GUIDELINES TO COMPLETEING THE FORM

1. The following list of definitions and classification can be useful in filling out the form:

Item	Classification/Description
<u>Tank type</u>	Steel
	Concrete
	Other-specify
<u>Tank status</u>	In Service
	Temporarily Out of Service
	Closed but still in place
	Other-specify
<u>Piping type</u>	Steel
	Stainless steel alloy
	Copper
	Plastic
	Fiberglass reinforced plastic
	Other-specify
<u>Piping location</u>	Aboveground
	Underground
	Combination
	None
<u>Tank Base Material</u> (What is under the tank)	Concrete pad
	Asphalt
	Ground (soil, rock, sand, etc)
	Supports (elevated aboveground)
	Impermeable liner- specify Other-specify
<u>Secondary Containment</u> (Containment which prevents any Releases from the storage tank system from reaching any lands or water outside the containment area, this can include)	Containment barrier:
	Dike
	Vault
	Double-Walled
	Double-Bottomed
	Synthetic liner
	Other-specify
	Containment material:
	Concrete
	Clay liners
	Synthetic membranes
	Steel basins or spill skids
	Other-specify

Item	Classification/Description
<u>Overfill protection</u>	High level alarm
	Automatic shut off
	Vent whistle
	Manual gauge
	None
	Other-specify
<u>Leak Detection</u>	Visual
	Interstitial Electronic Monitoring
	Interstitial Manual Monitoring
	Statistical Inventory reconciliation
	Soil vapor monitoring
	Release prevention barriers
	Tank tightness test
	None
Other –specify	
<u>Transfer Area Safeguard</u> (An area designed to catch Releases that may occur during the transfer of product into or out of the tank. Safeguards must protect the area directly beneath and around the hose connections of the tank and the transfer vehicle, this may include)	Pad
	Curbed Pad
	Spill Box
	Other - specify
<u>Corrosion Protection for metal tanks</u>	Tank on concrete pad
	Elevated tank
	Cathodic Protection
	Internal liner
	Double-Walled tank
	Double-Bottomed tank