



Rationalization of Water Consumption



شركة أبوظبي للتوزيع
Abu Dhabi Distribution Co.



Abu Dhabi Distribution Company (ADDC) Manages the Water Distribution Network in Abu Dhabi Emirates (Excluding Al Ain), this network is divided geographically into three regions according to the following table:

	Region	Average Daily Consumption (MPD)
1	Central Region: Abu Dhabi City and the surrounding Islands.	115
2	Eastern Region: Mussaffah, Baniyas, Shahama, Samha and up to Al Khatim (Al Ain Boundaries)	270
3	Western Region: Madinat Zayed, Mirfa, Liwa, Ghayathi, Sila (up to the Borders with Saudi Arabia).	70

For the whole country the following table shows the percentage of water consumption in the emirates.

	Emirate	% of the Total Consumption
1	Abu Dhabi	59%
2	Dubai	34%
3	Sharjah	4.5%
4	Other North Emirates	2.5%



Water Rationalization:

Plans and procedures established by the Authorities of water and electricity in the country for rationalization of the water consumption are similar, this is due to the continuous coordination and exchange of experience and studies with each other through out the intensive rationalization programs.

As it is well known, the water loss is the difference between the total system input and the authorized consumption. This loss varies from one region to another, as well as between different zones within the region

Steps taken by (ADDC):

- ADDC is held responsible for the provision of safe potable water for its customers residing in Abu Dhabi Emirates (Excluding Al Ain) and in accordance with the International Standards through a technical and administrative team dedicated to this task.
- In this regard, ADDC has undertaken many tasks classified into the following groups:

1. Technical Tasks Group:

- a) The technical tasks related to internal water distribution systems for the new facilities.
- b) The technical tasks related to the Water Distribution Network.

2. Administrative tasks group (Social, Educational, and Informative).

Added to those two groups, the efforts to increase the quantity of treated water for use in agriculture purposes

The Technical Tasks:

These tasks can be summarized by employing the best technical and technological possibilities, both in designing the main Water Distribution Networks and its connections and in designing the internal water distribution systems (within the customer's premises), or the selection of materials for executing the water systems along with implementing the operational progress in such a way to ensure the setting of suitable Hydraulic Parameters that create a harmony between the transmission and distribution networks and protect them from any risk.



1) Technical tasks related to the water distribution systems within new facilities.

1. Study the design of internal Water Distribution Systems:

Where the technical staff of the company and engineers study the water distribution system designs for the different types of residential, industrial and agricultural facilities in order to achieve the ideal design by focusing on the following points.

- Calculating the daily water consumption of any facility (Commercial Building, Villa, Farms, Factory, Government Building, Hospital,...etc) taking in consideration the nature of the facility, number of users, number of sanitary units and any other related items.
- Determine the diameter of the connection and its route in such a way that reduce the friction and local losses and guarantee provision of the services with appropriate pressure.
- Determine the capacity of the water tanks to be in a limit not below the double of the daily consumption and not exceed three times of the daily consumption.
- Determine the locations of the tanks to be far from any component of sewerage system, as well as far from any source of contamination. Those tanks should be equipped with a ventilation hole to allow air to enter but not allowing the access of any other substances. The internal & external surfaces of the tanks need to be insulated to ensure its tightness.
- Determine the technical specifications for the pumps to be used.
- Determine the shape of the tank to ensure that it does not contain any narrow passages or isolated spaces may lead to a water stagnation which will lead to a change in the physical and chemical characteristics of water. The tank should have a slope in its ground ends in a sump pit to collect the sediment materials,
- Identify the diameters and the routes of the pipelines.
- Specify a mechanism that prevent the over flowing of the tanks.
- Design an internal water metering system that guarantees provision of the water for each customer from an independent meter.

2. General Requirements for the Internal Water Distribution System

- It is advisable to use as minimum number and size of vertical and horizontal distribution pipes as required without exaggeration.
- Pipes sizes should be reduced gradually from top to bottom selecting the shortest route to the customer location without passing through premises of others.
- A by-pass connection should be provided for booster pumps.
- Head pipe should be used to link all the outlets of the O/H water tanks with the distribution pipes network.
- A single main distribution pipe should be provided for each flat.
- Specify pipes of approved material and use of acceptable pipe fixing / clamping system that eliminate vibration and lateral movement.
- Ensure provision of suitable protection for the exposed pipes to protect it from deterioration.
- Protection of the exposed pipelines from the direct sunrays.
- Provision of a stop valve for each sanitary unit that is accessible for maintenance purposes.
- Install mechanical float valve/electrical float switch on water tank inlets.
- Internal ladder shall be fixed properly for the water tank for maintenance purposes.
- It is totally prohibited to use suction pumps to draw water from ADDC mains.



3. General requirements for the Internal Metering System

- Every part of building isolated from other parts shall be separately metered.
- Building's public services shall be metered separately.
- Swimming pool and health club shall be metered separately.
- Internal meters shall be fixed in a separate room or separate cabinet in a safe and easily accessible location.
- Meters shall not be installed in any of the following locations.
 - Inside the Consumer premises.
 - Inside rooms reserved for other services.
 - Over the roof top of the building.
- Tag made of plastic rigid material shall be installed beside the meter indicating the flat number / office number / other. in addition to the account number.
- Center to center spacing of meters shall allow maintaining it easily.

4. Conducting an inspection prior connecting the Water Services

Where the company's inspectors ensure the implementation of the internal water distribution system as the approved plans states and the inspection contains the following points.

- Making sure that the tanks are isolated from the inside and the outside.
- Making sure that the pipes exposed to the sunlight are insulated.
- Making sure of the locations of the meters.
- Ensure the quality of materials used and in a case of any technical observations, a technical report should be raised to the assigned intity to correct the observations.



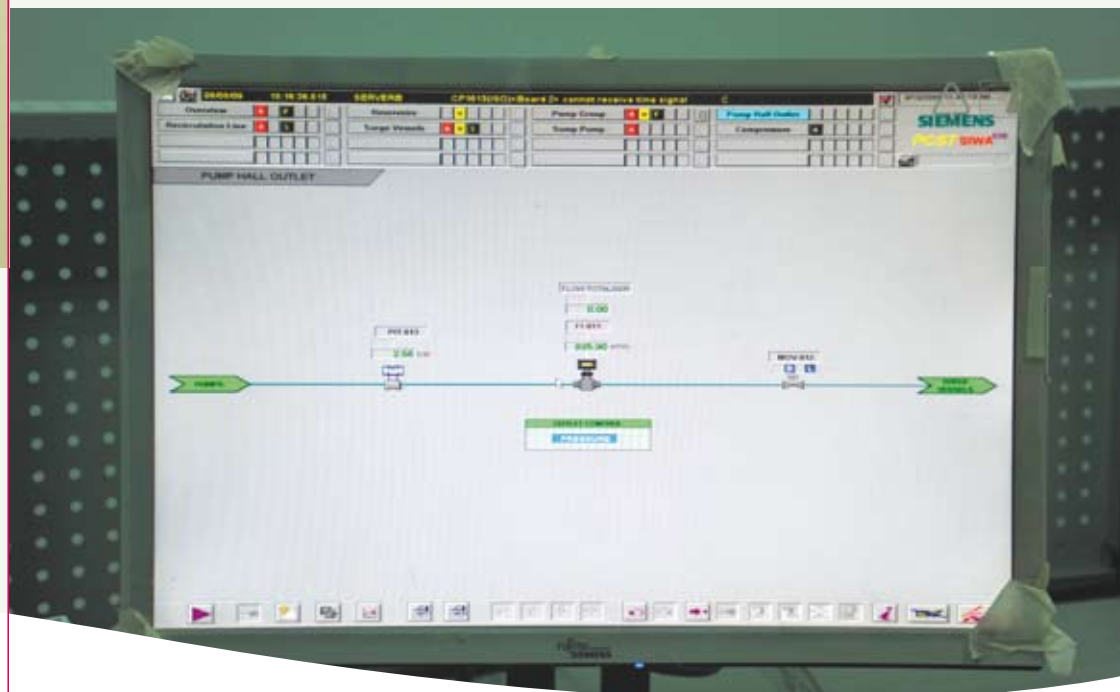
5. Block the use of the Mechanical Meters

Given the many failures of those meters, and the low accuracy of the readings have been recorded by it, a decision been taking to stop using it and uses the meters that doesn't have moving parts, and currently a major project in the Emirate of Abu Dhabi implementing for the replacement of all mechanical meters.

6. A Comprehensive field survey of the Water Connections and Meters.

As in previous years a comprehensive field survey of all water connections and meters installed has been scheduled in order to achieve the following objectives.

- Regeneration of the databases of all categories and segments of the consumers to form the rule ground and framework for action intended to achieve the company's policy that all connections are given to all consumers are legal controlled by a meter.
- Increase the revenue of the company through finding the connections without meters.
- The achievement of justice among customers.
- Reduce the wasteful use of water by installing meters on the old connections and the repair and maintenance of existing meters.
- Provide data for Geographical Information System (GIS).
- Provide technical information necessary for the maintenance of meters.
- Provide the information necessary to study projects to develop a system for Automatic Meter reading.



2. Technical Tasks Related to the Water Distribution Network

1: Preparation of an integrated program to investigate the leakage of water.

- Where in this regard, ADDC has purchased the latest developed equipments necessary to conduct the field survey of the main water distribution network and the connections branched from it by a trained team selected from ADDC Staff. The teams survey the network in accordance with a scheduled program and inform their findings to maintenance team for repairing immediately and also prepare a monthly report shows the water losses.
- In the past, water losses have expressed as a percentage between the quantity of water received from TRANSCO to the quantity of water received by ADDC's customers legally, but expressing the leakage as a percentage is often misleading technical measure of leakage control performance because it is strongly influenced by variation in volume of water delivered and does not take in to account key distribution characteristic notably the length of network, pressure or number of connections. Recently some utilities have moved away from the percentage term and commenced using (Gallon per customer connection per day) or (Gallon per kilometer per day).



At the end of each stage of survey for a specific operational area (an area with an operational defined boundaries), the following table is to be filled:

Authorized Consumption	Billed Authorized Consumption	Monthly invoice based on the monthly meter reading Monthly invoice by fixed rate where it is difficult to fix a meter.
Authorized Consumption	Estimated consumption	Estimating the rate of water for some Governmental intitities based on agreed rules.
Water Losses	Apparent Losses	Un Authorized Consumption <ul style="list-style-type: none"> ▪ Theft of Water. ▪ Illegal use of Fire Hydrants. Metering Inaccuracies The meters maintenance unit is requested to calibrate the meters.
Water Losses	Realt Losses	The quantity of water lost due to the leaks.

2. Set a Suitable Operational Programs for the Network:

These programs aim to control the pressure in the water networks so that a hydraulic study to identify the minimum values of the pressure required to ensure the supply of the required quantity of water to consumers without any complaints, this is done through the crew of the operational units by setting the control valves according to the amount of water required on different places of the network.

3. Assigning a Crew for the Emergency Maintenance Works:

This team is responding to the complaints raised by ADDC's Customers (24/7) for the main lines or house connections immediately to reduce the amount of water loss due to leakage.

4. Assigning a Crew for the Preventive Maintenance Works:

This crew performs the annual programs for Preventive Maintenance as scheduled in MAXIMO, the programs includes inspecting the different components of the distribution network, repair or replace the defected ones, and listing to any unusual sound comes from the valves or Fire Hydrants, analysis it and take the necessary precautions.



3. A Group of Administrative Tasks:

1. The establishment of a campaign (prepared to consider):

It is a great demonstration activities distributed to all media, and has been launched in accordance with the field studies including the general topics; mainly targeting the means of irrigation and domestic use, and has sent its messages in several languages to target the largest possible segment of society, and ended the campaign with great success as it was confirmed by the local media.)

2. Active participation in the Annual Gulf Water Week:

Abu Dhabi Distribution Company in coordination with the Public Relations Department of Abu Dhabi Water and Electricity Authority participate in all the activities of the annual Gulf Water Week events and the water exhibitions inside and outside the UAE and always ensuring that its participation is effective and useful aiming to raise public awareness and guiding the Visitors on the quality and how to use the water. Also ADDC displayed some devices, equipment and special programs used in the company, which reflect the cope of Abu Dhabi Water and Electricity with the scientific and practical development in order to serve the nation and the citizens.



3. Respond to calls from schools and universities:

Very often ADDC respond to calls and invitations from some schools and universities where lectures by engineers of Abu Dhabi distribution Company, in the presence of the families of students and teaching staff, detail the efforts made by the Authority to ensure clean water for all consumers, the country support for these efforts and the unlimited care by UAE president His Highness Sheikh Khalifa Bin Zayed Al Nahyan, to the theme of water.

In the lectures discussion are made with the students on the importance of water for human, animal and plant and the issue of water and its limited resources in the UAE.

Also, at the end of the lectures the students were handed over with some of the summaries, which contain the advice addressed to consumers not to waste water and the need to maintain its cleanliness.

At the end of the lectures gifts are distributed bearing the emblem of ADEWA and ADDC.

4. The issuance of some publications:

Emphases were on several points which are mainly the following points:

- The great interest of His Highness the president to the water sector.
- The outstanding position the water sector program is occupying among other priorities in the country.
- Recalled the efforts made and money spent on the water sector.
- Reference to the status of water and its preservation in Islam.



5. Printing a set of regulations guiding:

These regulations included some simple ways to preserve the water including:

- The use of modern irrigation methods, such as use drip sprayers.
- Re-use of bath wash water/ablutions in Masjid, for example, for irrigating gardens.
- The use of a type of humus on the plant to prevent the leakage of water into the ground and maintain it as long as possible.
- The cultivation of plants that need little and high salinity water.
- The use of green (plastic) houses to reduce water loss by evaporation.
- The use of bucket when washing cars.
- The use of washing machines with full load.
- The use of rationalization tools and equipment.
- Installation of taps with closure mechanism, especially in public places.
- Rapid initiative to repair the internal connections especially in the continuous drip taps and the reporting of any leakage of water seen at roads and at public places.

Directions and recommendations:

We refer to the following future directions for the Abu Dhabi Distribution Company on this subject, which are including the following:

- Continue preventive maintenance systems to reduce waste of water in major networks.
- Select house connections materials, according to world standards and following a safer and more accurate ways to implementation.
- Application of automatic supervisory system for monitoring and control.
- Coordination with national stakeholders for the holding of seminars and meetings to raise awareness of the water conservation in the community.
- Implementing training programs for staff of the company.
- Determining the level of loss and evaluation of techniques that allow for the economic reduction of loss.
- Motivate and reward initiatives that are in the area of performance improvement and upgrading.
- Openness to modern technology through conferences and research.
- Establishment of scientific seminars with representatives of companies producing equipment for the water to keep up with the latest modern and global developments.
- Closely finding/following up customers suggestions and notes in order to raise the company level of service.

