



IJRASET

International Journal For Research in
Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 6 Issue: VIII Month of publication: August 2018

DOI:

www.ijraset.com

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Water Audit for Distribution Network: A Review

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Abstract: *No life exists without water, which is essential for the animated animals. Water is natural resources, has been under unprecedented stress in recent time, but human being not worried about the implementation of conservation the water. The water audit displays how quantity of water flows into and out of the distribution system and to the customer. Water auditing is a systematic & scientific examination of water accounts of the projects. The most important issue in water distribution systems is leakages at various levels, which largely affects the water companies and further to their consumers. To minimise the water losses, optimizing various uses and various sectors such as irrigation, domestics, industrial and power plants are empowered to consider the conservation of water uses.*

Keywords: *water audit, Unaccounted for Water (UFW), Leak Detection*

I. INTRODUCTION

Water is naturally a renewable resource, which tends to contribute to this misconception of its infinite supply, however, with the increasing world consumption and pollution problems; degradation of water quality becomes eminent. The water audit displays how quantity of water flows into and out of the distribution system and to the customer. Water auditing is a systematic & scientific examination of water accounts of the projects. It provides a rational, scientific framework that categorizes. The dominant ideology of fresh water as an abundant and unlimited resource continues to persist despite the common global knowledge that only less than one per cent of the Earth's fresh water source is readily available for human use. Water is naturally a renewable resource, which tends to contribute to this misconception of its infinite supply, however, with the increasing world consumption and pollution problems; degradation of water quality becomes eminent. Water conservation has not been implemented fully in our society. Given low economic consequences from water use, water efficient strategies of education, public awareness, and conservation techniques and technologies need to be addressed to counteract this non-conservable behaviour. A switch from the current practice of demand-orientated management of water to a conservation-based system is required. Because water has been relatively cheap and readily available in the past, many municipal corporations and councils, have not considered the reduction of unaccounted-for water to be a cost-effective way to lower operating costs and increase revenues. With the upward spiral of today's water production costs and water rates, the cost of finding unaccounted-for water can often be made up within a short time.

To determine the amount of water lost from water supply component and the total value of these losses to the utility can measure by water audit. This water audit can measure Unaccounted for water (UFW) and Non-Revenue water (NRW). These water audits study give the detailed sheet of water supply system and water users, to allow easier resource management and to improve the precision of water supply.

II. LITERATURE REVIEW

Amol A. Kulkarni (2014) et al. Had carried out studies on the Leak Detection of Water Supply System by Water Audit– a Case Study of Ahmedpur reveals that Comprehensive audits can give the utility a detailed profile of the water supply system and water users, allowing easier management of resources and improved reliability. It is an important step towards water conservation and, if linked with a leak detection plan, can save the utility a significant amount of money and time.

Amol A. Kulkarni (2014) et al. had carried out studies on the water supply scheme of Shrivardhan by water audit concluded that A water audit determines the amount of water lost from a water supply system and the cost of this loss to the utility. It will quantify Unaccounted for Water (UFW) and Non-Revenue Water (NRW). All-encompassing audit provide a total profile of water supply system along with the consumers, which makes it comfortable for managing resources and give better reliability.

R.A. Ganorkar and Isha.P. Khedikar (2011) reveals that Water audit study shall be covered the holistic approach towards total water resource, distribution and its efficient use to reduce the capital and operating cost as an added advantage over the optimized use of water resource with environment protection.

R. R. Dighade (2014) et al. had carried out high value of non-revenue water reflects huge volumes of water being lost through leaks, not being invoiced to customers. It intensely affects the financial possibility of water utility via lost revenue and enhanced cost of

operation. The overall objective of a distribution system is to deliver wholesome water to the consumer at adequate residual pressure in sufficient quantity and achieve continuity and maximum coverage at affordable cost. This provides a comprehensive insight of the issues pertaining to the challenges in water loss management of water distribution systems in developing countries.

R.A.Ganorkar (2013) et al. investigated the world's water resources are finite but exist on a planet with a constantly growing population. Water audits provide a rational, scientific framework that categorizes all water use in your system. It is a tool to overcome drought related problem, shortage, leakage and losses. International water association (IWA)/ American water work association (AWWA) started huge scale efforts to prevent water losses with the help of water audit.

Suruchi Tembhrne (2017) et al. has discussed the Water loss in water distribution system is an important issue in India. Up to 50% to 60% of treated and pumped water is lost during transit from source to consumers end. An overview of techniques and equipment used for water audit and leaks in water distribution systems. Furthermore, a strategy for reducing water loss is addressed.

Mansi Master (2017) had focused as water is available for free; the people who are getting water are using it haphazardly without seeking future consequences. On analysis of total water usage for the study area which is found more than the capita limit. Hence it is necessary to optimize this excess water usage. Comparative study has been carried out to analyse the water usage after and before water meter installation for the study area. Some of the suggestion has been discussed to minimize the excess usage and water losses.

Nagpur Municipal Corporation (NMC) had carried out the comprehensive water sector audit done resulted in recommendations for improvement at two levels: water distribution and water supply energy efficiency to increase the efficiency of the treatment plants.

Dr. Kartiki S. Naik and Madelyn Glickfeld (2015) had studied that to improve water efficiency, small retailers could pool resources and expertise to better detect, monitor and reduce distribution water losses. California water regulation must set a goal to advice and implement, accurate along with verifiable water loss monitoring and formulate the base line and set a standard road map for water suppliers.

Neha Hardikar had carried out the study in water audit and leak detection that the water loss in the form of leakage, theft, consumer waste and insufficient delivery all directly affect the amount of energy required to deliver water to the consumer. Wastage of water leads to a waste of energy.

Vijay Kulkarni et al. (2014) had studied those high important to urban local bodies to put efforts in the direction of bringing water losses to the extent less than 15%. Corrective measures have also been proposed with rough costing to address the issue of water loss. It is also studied that reform work need to be carried out as a first step to need to daily water supply.

III. SUMMARY OF LITERATURE

After examine the above literature it should be reveal that most of the water audit are installation with the mechanical devices and manual devices. Which was resulted that the water is essential to human life, but due to industrialization, urbanization mostly water body are contaminated, so this was affecting on the water reservoir. It is necessary to conserve the water body. Water audit can give the important report about the present status of water supply system and cost of energy to utilise on the water supply scheme. This water audit is necessary at domestic, institutional, industrial level to measure consumption, wastage and provide optimum use of as per given standards. The water audit are recommended to total use of water should be optimize to better growth of future generation and put the efforts in the direction of bringing water losses to the extent less than 15%.

IV. CONCLUSION

Above mentioned literature has conclude that the water audit give an inexpensive and simple technique about the finding the water usage. It is necessary to use the water and should be optimize as per require condition. It is also necessary to reliable and useful data of water quality and to adopt safe supply of drinking water.

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