

# WATER AUDIT

J. Madhu Babu M. Tech FIE

Chief Engineer ( O&M)

Mission Bhagiratha




# AUDIT

- Audit is to assess the gap between target and achievement, income and expenditure, Inputs and outcomes.
- It identifies the lapses and recommends the correctness to be made to reduce the gaps.






# WATER AUDIT

- 🔧 Water audit provided a way to inventory all water usages in your facility and identify ways to increase water use efficiency
- 🔧 Water audit is important because it is a useful mechanism for conserving water while enhancing public accountability, thereby helping to ensure that water use and supply are balanced and the water needs are fulfilled.
- 🔧 Water audit is used to determine how much water is being lost or unaccounted for in a water network due to seepage, evaporation, leakage, over flow, meter malfunction, theft, unauthorised and illegal drawals from the system.

# WATER AUDIT

-  In order to make this determination, information about the amount of water produced is compared to the amount of water distributed and billed.
-  Water audit determines the amount of water lost from the water network. The audit establishes the quantity of water being used, also wastage and excess usage.
-  Water audit improves the knowledge and documentation of the distribution system, identifies the problems and risk areas and a better understanding of what is happening to the water after it leaves the source point. The first step to water audit is to follow the flow. Once you know where the water is flowing, you need to know how much is flowing.

# Quantity Audit

-  Total Capacity Designed
-  Total quantity of Raw water drawn
-  Total quantity of Treated clear water
-  Total quantity of water supplied
-  Total quantity of water consumed

# Transmission losses (INTAKE WELL to AERATOR)

## Modes of water supply

- Raw water from Intake well to WTP

## Reasons for gap & Losses

- Leakages
- Pilferage

## Measuring procedure

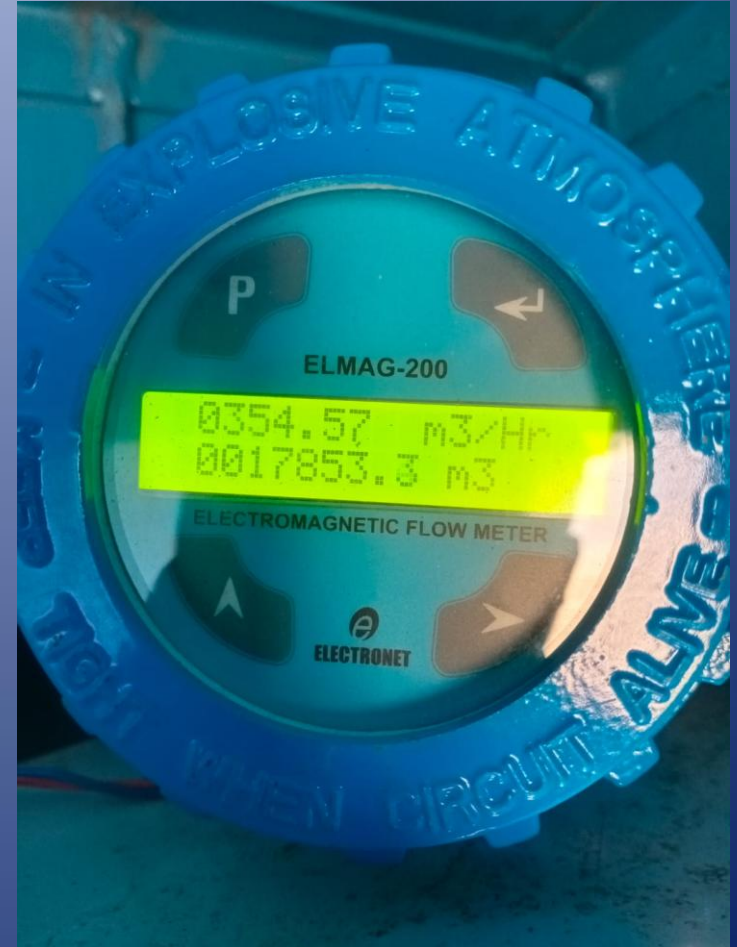
- Flow meters
- Pump rating

## Ways to minimise losses

- Minimize leakages
- Arrest pilferage

# Electromagnetic Flow meters

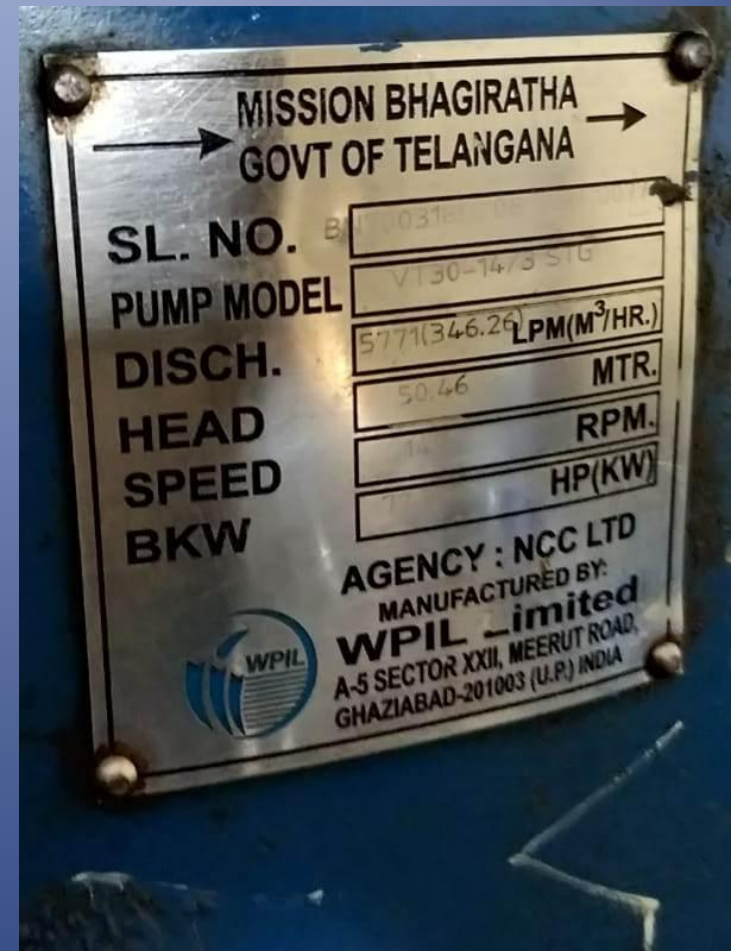
Electromagnetic flow meters help measuring discharge to the service area and plays a key role in water audit. However frequent watch and ward and maintenance is a challenge



# Electromagnetic Flow meters

In absence of flow meters, Quantity pumped is measured with the help of rated discharge of the pumps

However, the discharge depend on many factors and the pumps may not give the rated discharge



# Leakage of Air valve

Continuous leakage in Air valves, though does not hamper the system, results huge quantity of water



# Leakage in Trunk main

To arrest leakages in the pipelines, it is required to bailout water. In-line isolating valves reduce the wastage of water. Though the bailed water is not accounted for, it is a necessary to take up the repair.



# Leakage through Air valve

Leakage through Air valve can be arrested immediately by operating Isolated valve



# Leakage in transmission lines

Leakages in transmission lines result loss of huge quantity of water, hampers the system



# Ultrasonic Flow meter

Ultrasonic flow meters help measuring discharge to the service area and plays a key role in water audit. However frequent watch and ward and maintenance is a challenge



# Treatment Losses (AERATOR to CWR)

## Modes of water supply

- Treated water to CWR
- House keeping and gardening
- Back Wash

## Reasons for gap & Losses

- Sludge water
- Leakages
- Pilferage

## Measuring procedure

- Flow meters
- Parshall flume
- Notches at filter beds

## Ways to minimise losses

- Optimise scour and Back Wash water
- Make the plant leak proof
- Recycle Back Wash water

# Measuring through Rectangular notch

Analogue meters give exact discharge and also quick result with the help of ready reckoners



# Flow meters

Ultrasonic flow meters help measuring discharge, which can be integrated with SCADA.

However, crosscheck with analog flow meters and calibration at periodic intervals is necessary



# V Notch for Filter effluent

V notch, with the help of ready reckoner, gives the discharge of each filter bed



# Water for Plantation

Watering for plantation is a regular exercise.

Drip system saves water and man hours

Raw water is the safest to water plants



# House keeping

Water utilised for House keeping, though non revenue water, is essential



# Evaporation losses

Reservoirs open to air result evaporation losses



# Sludge removal from CFL

Removal of sludge at frequent intervals help prevention of accumulation of sludge in the clariflocculator

Sludge removal shall be monitored closely not to waste water as the sludge water is not recycled



# Leakages in the fittings

Whenever a leakage is found in the fittings, it should be attended immediately.

Periodical painting of MS pipes control rusting of pipes



# Leakage of Back wash pumps

Leakage of Back wash water pumps result unhygienic conditions in filter gallery



# Leakage from Inlet Valves

Leakages in the filter house are continuous and round the clock resulting huge quantity of loss



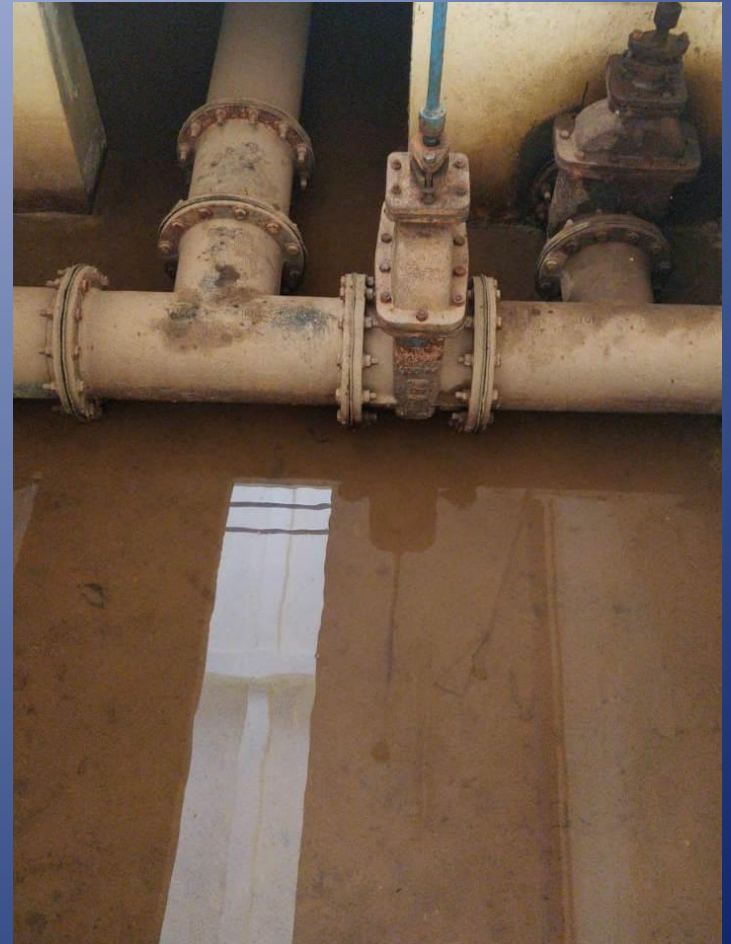
# Leakages from Outlet Valves

Continuous leakages of air valves result unhygienic conditions, in addition to waster of water



# Leakages in Filter gallery

Even minute leakages in the valves and fittings result to stagnation in the filter house which leads to unhygienic conditions



# Transmission Losses ( CWR to OHSR)

## Modes of water supply

- Rural Water Supply
- Urban Water Supply
- Industrial Bulk Supply
- Supply to Schools and Hostels
- Supply to Govt. Offices and Institutions

## Reasons for gap & Types of losses

- Leakages
- Scour
- Overflow
- Pilferage

## Measuring procedure

- Flow meters
- Assessment based on Capacity of storage reservoir
- Log sheets

## Ways to minimise losses

- Minimize leakages
- Arrest pilferage

# Leakages of pumpsets

Utmost care should be taken to arrest leakage in pump house.

These leakages result wastage of water, but more importantly leads to electric shock



# Dripping of pumpsets

Even dripping of water through fittings result wetting in pump house



# Over flow of reservoirs

Overflow arrangement reduces burden on the structure

Proper drainage arrangements are to be made to dispose overflow water

Overflow shall be controlled at the earliest



# Scouring of reservoirs

Scour the reservoirs whenever necessary

Scouring the reservoirs removes silt accumulated at the bottom of the reservoir thus reduce bacterial growth

Scour water shall be drained out properly



# Leakage in pipe line

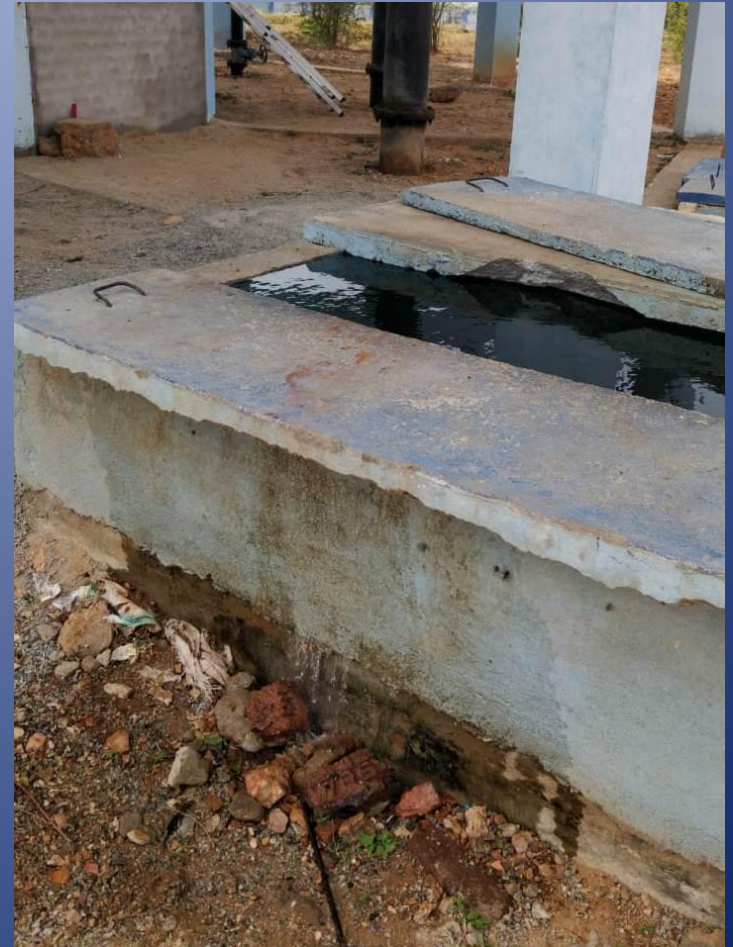
Leakage in pipeline results huge loss of water  
Interrupts the supply system  
Creates unhygienic conditions  
Leads to contamination of water



# Leakage in valve chamber

Leakage in valve chamber is the most common neglected feature the pipeline system

In addition to wastage of water, it leads to unhygienic conditions and encourages mosquito growth



# Leakage in Air valve

Continuous leakages of air valves result unhygienic conditions, in addition to waster of water.

Inspections at frequent intervals and replacement of spares improve performance of the valves



# Distribution losses (OHSR to HHC)

## Modes of water supply

- House Hold Supply at 100 LPCD
- Supply to Public Institutions

## Reasons for gap &Types of losses

- Leakages
- Scour
- Overflow
- Pilferage

## Measuring procedure

- FCV
- Assessment based on House Hold size
- Capacity of OHSRs

## Ways to minimise losses

- minimize leakages
- arrest pilferage

# Pipe line leakage in distribution system

Leakages in pipeline village pipeline system is a common phenomenon which is to be monitors daily

Leakage in the distribution system directly impacts the service level in that locality



# Tap leakage at HHC

Uncontrolled tap leakages though look small, pile up to huge losses if not attended.

A small discharge of 8 lpm results to wastage of more than 10 KL of water in 24 hours.

End users are to be educated through awareness programs



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