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A Note on Wireless Water Level Control & Monitoring system for urban need

Problem Statement-

Due to so many challenges associated with handing the WATER systems, there is a huge wastage of water due to leakages and overflowing.
This leads to waste the precious amount of water, electricity and water tank structures. The problem of wastage is more severe if the system is not controlled and monitored on daily basis.

Existing scenario –

Basic Pumping System-

The urban irrigation system comprises of a water source, water pump and number of water tanks controlled by valves. The source of water is from the government and local sources. The government water comes into the sump for which a meter is installed for measuring the amount of water. The water is pumped to the overhead water tanks.

There are different modes of operations like manual or automatic or hybrid.

Daily manual operation – A person is nominated for controlling the water pumps, monitoring the water levels in the overhead tanks and control valves on daily basis. Normally a watchman or any responsible person from the premises does this work. They keep a regular track of water pump operations, duration, water consumption and electricity units.

Limitations and challenges in manual operations-

1. For monitoring the water levels in the high rise buildings, a person has to frequently climb up by the slim ladders on the water tank leaving his other duties. If there are more buildings in the premises, it is an exhausting as well as fearful task for the operator. Many times they do not climb up and wait till the water overflows.
2. The overhead tanks are too risky to climb up in the rainy seasons.
3. There is a big issue due to the fear phobia of height of the new high rise buildings.
4. He has no idea of the consumption rate of water by the residents and hence unaware of the rate of filling up of the water tank. He operates the overall system based on his regular experience. There is a big wastage of time and labour in this whole process.
5. If the person is engaged in some other duties or forgotten, there are chances of overflowing the water.
6. Similarly, there are chances of scarcity of water if the valve or pump is not made on as soon as the water level goes down in the tank.
7. Due to the scarcity of water, there is a strict need of monitoring every drop.

8. There are challenges in monitoring the sump tank on regular basis for government inlet water flow, timings, pumping rates, foot valve water level etc.
9. If the pump is run without water, they are likely to damage and burn.
10. There is a need to have standby pumping system to avoid inconvenience to the residents due to the damage of the water pumps.
11. A watchmen or security guard leaves his security gate for the WATER operation and there are likely to happen unwanted crimes and threat to the residents by unauthorized entrants.

Automatic Control with sensors, cables - At many of the places, there are automatic or pressure controlled electronic systems for switching on/off the water pumps as per the water level. The level of the water is sensed by the sensors and signals are carried to the electronics controllers through cables towards the main electronics unit in the basement near the water pump control panel.

Limitations and challenges in fully automatic operations-

1. The fully automatic system can be installed at affordable cost for only single pump and single overhead tank or equilibrium level multi water tanks on the same terrace.
2. For more number of tanks for different buildings, there is a need of complex industrial type control system consisting of electronics valves and cabling which is not feasible in the residential buildings. In addition to huge investments, this system is not full proof due to associated faults in the cabling network in the long run.
3. Cabling becomes too difficult if the pump room is too away from the buildings.
4. Cables are likely to damage due to birds, rodents, weather and physical obstructions.
5. Due to civil work modifications in the premises, the cables are likely to damage.
6. After few months or years, the whole system is brought to manual operation.
7. The residential market segment of Automatic Water Level controller is such a sensitive that it needs a strong and prompt back-up of the services in addition to the robust performance in hazardous areas.
8. Many of the manufacturers enter into this market with an illusion of lucrative business without efforts and run away from the field when they face so many challenges.
9. If the system is fully automatic there is no monitoring on the consumption of water or any leakages in the flats. For example, if there is negligence in locating the leakage in any one of the flats, the water is wasted for 24x7 and nobody is bothered till water tank is completely empty and a noise is created by the other people. This has been the normal scenario in many of the buildings causing a huge wastage of electricity and water.
10. In the time of scarcity of water in the summer, there is a strict need of monitoring the water levels in percentage instead of FULL or EMPTY. The residence management overtakes the control as an emergency. The operations are turned to manual and require a big help of the technology to observe the exact current water levels of the tank at the basement only instead of frequently climbing up the tanks.
11. When automatic operations are turned to manual operations due to any reasons, all challenges mentioned in the manual operations are applied.

What is the real need in water management in urban area?

A simple and robust technology solution providing timely updates of the water levels in the control room or on operator's mobile phone which will reduce the stress on the operator and avoid his frequent trips to the water tanks.

This will allow him to operate the valves efficiently reducing the time of operations and saving every drop of water and unit of electricity.

This ensures timely supply of water to the residents saving their bills and damage to the civil structure.

Water Level on Mobile Phone

Advanced solution for Water Level monitoring and control of water pumps – Nano Ganesh
This solution is based on the internationally recognized state-of-the-art technology, Nano Ganesh, a baby of Santosh Ostwal, CEO & Founder Director of Ossian Group.

Functions of Nano Ganesh Wireless Water Level Control and Monitoring system -

1. Nano Ganesh system provides the water level indications on the mobile phones.
2. It provides water level indications on an electronics panel in the control room.
3. A watchman or operator can control the water pump remotely by a mobile phone.
4. In few models where distance between the water pump and tank is too much, pumps are automatically switched on or off depending on the water level. No cable is needed from tank to pump. At the same time alerts about "Water Level Low, Pump On" "Water Level High, Pump Off" are sent on the operator's mobile phone.
5. 24x7 operation is possible irrespective of electricity availability.
6. As it does not require any cable to be laid along the heights and grounds from the water tanks, it becomes a reliable system avoiding major possibilities of faults.