Optimum Design or Value Control, Rehabilitation And Multiple Methodology or Water Distribution Network

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Abstract- *The problem is solved globally by a separate and bound innovation using asperous optimization and duality theory. Hazen-Williams equation is used, in this equation a relationship is drived which relate the flow of water in a pipe with the physical properties the source should be permanent reliable and should provide water with maximum impurities. The planning or operation decisions that are based on simulation and series error, it is also nonlinear programming algorithm present in the paper. In the water distribution network, the leakage represents a significant economic loss. It is up to 50% in urban network, in the United Kingdom 50% high value of leakage has been reported in the case of some aging and decay distribution of water distribution network. the rehabilitation strategy, relevant literature that describes the unearthing and opinions of policy makers, researchers, industrialists and others is appraising. principal source of water supply as the need for water increase and tools were developed wells were mode deeper*

Keywords- Rehabilitation, decision models, water distribution networks, water supply, optimum design, water distribution network.

I. INTRODUCTION

A methodology based on genetic algorithm has been developed for lower cost design of new, and augmentation of existing water distribution network. The genetic algorithm is a method for solving both constrained and unconstrained optimization problem that is based on natural selection. Rehabilitation of water care that can help you get back, keep or improve ability of water that you need in daily life.The problem is solved globally by a separate and bound innovation using asperous optimization and duality theory. the true global optimum is within a prescribed tolerance. Which is related to the imbalance matrix of the appraise. optimal assessment can reduce the profit of experimentation. the aim of a distribution network is to supply a community with the expropriate quantity and worth of aqua.In this paper we have come across various terminologies regarding water distribution network such as nodes & junction and tree-like structures for water distribution.

Hazen-Williams equation is used, in this equation a relationship is drived which relate the flow of water in a pipe with the physical properties, pressure drop caused by the friction it is used in water supply system. Parallel network for water distribution is most economically effective design for existing system of tunnels. mainly this types of water distribution network used in New York cities.

$$V=CR_n^{0.63}S_f^{0.54}$$

This is original form of Hazen-Williams equation
Where C = dimensional coefficient; V = flow velocity, in ft./s;
Sf= hydraulic gradient;
R_n = hydraulic radius, in ft.;

dimensional coefficient should change value on coversion to different units, the value of circular cross section $R_n = D/4$.
For a flow Q head loss is h_f, then the equation for a pipe written as

$$h_{f=w}(L/C^a D^b) Q^a$$

where w = a numerical conversion constant, a = coefficient equal to 1.851; b = 4.370; L = length of the pipe.

The most important aspect of any water supply scheme is the choice of source of supply.

the source should be permanent reliable and should provide water with maximum impurities.

Surface sources are lack, stream, pond, river, reservoirs, and ground sources are wells and infiltration galleries etc. before the distribution of water treatment is required, the treatment of depends on the source of supply and the amount and reduce of impurity present in it. Water is carried through pipe from source to treatment plant and then from treatment plants to distribution system. Distribution system consist of large arterial mains distribution mains minor distribution and appurtenances including valves meters and hydrants. Treated water in stored in clean water reservoir from where it is distributed to the consumers through distribution system of pipes. In low level area water will flow directly

under gravity but for high level area elevated tank and pump will have to be installed.

Since old days there has been search for pure water some of the earliest civilizations flourished along rivers bank archaeological excavation revels that as early 2500 BC the people of Harappa Mohenjo-Daro and around Indus river basin had well organized water supply system. Indian epics like Ramayana and Mahabharata make mention of digging of well and used well as principal source of water supply as the need for water increase and tools were developed wells were mode deeper. However, these wells caused water supply problem in times of drought. hence cisterns where constructed for collecting rain water while reservoirs were constructed to store water from stream and rivers during mansoon period.

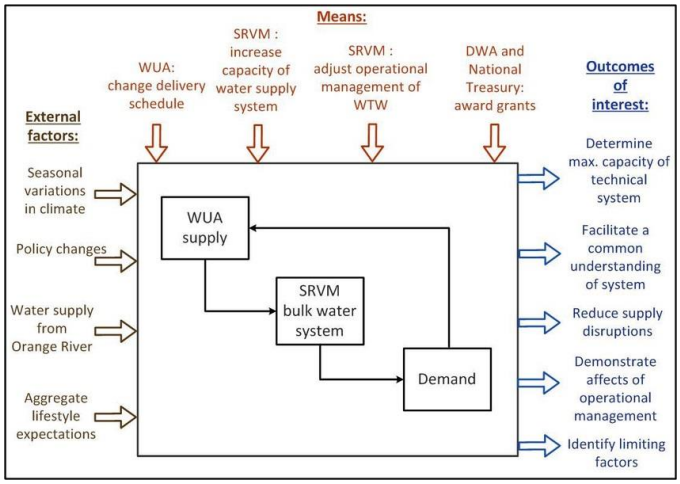

Fig: - outline of water supply system

Importance of safe water supply in water distribution network

water constitutes one of the important physical environment of man and has a direct bearing on the health and hygiene of mankind. The contamination of water leads to numerous health hazards. Water is a good carrier of disease germs. If water is not mode of safe against disease germs. It may become responsible for many disease and epidemics. Disease such as typhoid, cholera dysentery etc are the direct cause of defective water supply that why safe water supply system is necessary. if water content excessive amount of minerals or poisonous dissolved substances it will again cause so many difficulties to the public there for water which is used by the public should be whole some and must be free from disease producing becteria.

Parameter estimation is less expensive. It is mathematical representation or network simulation modal, microcomputers. The cost is not decrease. The data collection is required. The planning or operation decisions that are based on simulation and series error, it is also nonlinear programming algorithm present in the paper. The difference in the value of observed data and those computed by the model. Determine the actual value of the system can be simulated of a range condition with the result. Roughness of pipe depend on the conditions with results, water distribution network directly affected by the parameter estimation.

In the water distribution network, the leakage represents a significant economic loss. It is up to 50% in urban network, in the United Kingdom 50% high value of leakage has been reported in the case of some aging and decay distribution of water distribution network, leakage level depends on system characteristics, with some average figures being on the 24%. Leaking of water direct related to the pressure caused by water in pipe from a supply in distribution network, similarly leakage ration increased with average pressure in pipe.

In this paper we have across various formula which relate flow and head loss under various flow regimes. Hazen-Williams is used to drive flow-head-loss characteristics of a pipe modelled as follows.

$$Q_{ij} = R_{ij}.\ Sgn\ (H_i - H_j).|\ H_i - H_j|^{0.54} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$$

Where Q_{ij} represents the flow; H_i = head at node I; H_j = head at node j;

Water pressure for single storey building, two storey building or multi-storey depends on the height of the building, the fine hydrant pressure should not less than $1kg/m^2$. Minimum size of pipe 100mm required, a supply starting from the service reservoir is less among the main road. The sub mains are connected to the main in both directions among the other road, sub mains divided into several brainiess lines. Water stagnation of dead ends leads to population. Water rate of supply cannot be increased in case of blackouts. Less successful in maintaining satisfactory pressure in the remote part. Mains sub mains and branches are inter connected which each other, mains line runs through the centre of the area. Suitable o well planned city. Since water realness from different size of pipes get reduced. Very small area gets effected in case of repair and due to free circulation water cannot be polluted, water can be divide in case of fire break out, more length of pipes and large number of valves are used so it is costly and its design is difficult. Main pipe is lead peripherally laying of mains increase the pressure point. Suitable for town and well planned road.

Water from the reservoirs is supplied through radially laid distribution pipes running toward the periphery of the zones. Ensure high pressure and efficient water distribution. Ferrule is used to connect the main pipe line and close neck; ferrule is 90 degree set. Water is supply trough service pipe to individual pipe, gate valve is use to stop and open water supply of a house.

Air valve provide at the summit pressure of a pipe line, when water is summit consequence the negative pressure generates, as result of negative pressure the direction of the flow is disturbed, Air valves are used to stop reverse direction flow.

These prognostic analyses must be based on a thorough understanding the abundant and innumerable system illustrative framework consequences on the process of system decline and, in turn, on the different aspects of system act. Rehabilitation strategy must be complemented by a prospect understanding of the interactive economic consequences of system act.

It is suitable that, before A piece of endeavour is put together to obtain an approach to make conversation with enhance the rehabilitation strategy, relevant literature that describes the unearthing and opinions of policy makers, researchers, industrialists and others is appraise.

Many facets of the water supply control have a bearing on the holistic approach to distribution network management, and the volume of relevant literature is therefore large.

A relevant strategy must make certain that these act necessary are met. In addition, the strategy should aim to maximise the remunerative organization of the water company in operating its distribution networks. The strategy must ensure that the hydraulic act of the rehabilitated system is within regulatory stipulations. Added to the changing requirements of the distribution system is the impact of the circumstances environment and its role in the decline of the system's act. The specific mechanism of mains decline through internal and external erosion is largely dependent on the type of main and water quality.

Erosion is a biochemical reaction between two materials in proximity with each other that have a difference in potential. This allows for a transfer of electrons from one to the other, resulting in the loss of parent material Important rehabilitation strategy Performance indicator chemical and biological quality of the source water

- effectiveness and efficiency of treatment processes
- integrity of the treatment plant, storage and disinfection facilities and the distribution system
- age, type, design and maintenance of the distribution network
- time taken by the water to travel from the source to consumers' taps and presence of dead ends
- water pressure
- quality of treated water
- mixing of water from different sources within a distribution network and other hydraulic conditions

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