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ijirset@gmail.com

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Implementation of 24x7 of Un-Interrupted Water Supply of Dharampeth Region

Prof. Natish Sayyed ⁽¹⁾, Prof. Pournima Dongre ⁽²⁾, Aditya Gulhane ⁽³⁾, Sanskruti Dahat ⁽⁴⁾,
Rahul Wandhe ⁽⁵⁾, Roshani Gaydhane ⁽⁶⁾, Naina Warghane ⁽⁷⁾, Ritik Jamgade ⁽⁸⁾

Head of Department, Department of Civil Engineering, NIT Polytechnic College, Nagpur, India⁽¹⁾

Assistant Professor, Department of Civil Engineering, NIT polytechnic College Nagpur, India⁽²⁾

Diploma Students, Department of Civil Engineering, NIT polytechnic College, Nagpur, India^{(3),(4),(5),(6),(7),(8)}

ABSTRACT: The NMC supplies water to Nagpur city through two sources—Pench reservoir (480 MLD water per day) and Kanhan (200 MLD) river. The affected areas are receiving water from Pench. After the alternate day water supply was implemented, on the first couple of day citizens of these zones managed but now they have started complaining. NMC had said will get adequate water supply and under good pressure after the introduction of alternate day water supply. But not only residents, even elected representatives now say this claim is proving to be false.

NAGPUR: People living in 65% area of the city are complaining of inadequate and low pressure water supply since Nagpur Municipal corporation (NMC) started alternate day water supply five days ago.

From January 6, NMC had started alternate day water supply in areas coming under Laxmi Nagar, **Dharampeth**, Hanuman Nagar, Nehru Nagar, Gandhibagh, Mangalwari and parts of Satranjipura and Ashi Nagar zones for 30 day. This was done to take up repair work at five leakages in 2,300mm diameter pipeline between Itgaon and Karambhad.

I. INTRODUCTION

Municipal corporation of Nagpur has launched the Urban water supply in Dharampeth water supply zone. Under this program contract has been awarded to Veolia water Pvt. Ltd. For implementing a 24x 7 Water supply program in a Dharampeth Water Supply Zone. The was awarded to Orange city water limited- A 50:50 joint venture SPV company incorporated with equal equity stake of Vishvaraj environment Pvt. Ltd. and Veolia water of France. The project covers management of the entire water cycle from production, treatment (657 MLD), transport (2100 Kms of network), storage and delivery to the last point of usage i.e. the customers tap. This involves replacement of more than 3,00,00 house service connections, rehabilitation of treatment facilities, service reservoir and pipeline.

Research paper and literatures collected on the various topics is listed below

1} Water transmission and distribution

Carried out an investigation to determine the design, construction, operation, and maintenance of water transmission and maintenance of water transmission and distribution systems . Piping system design and installation, valves, water tank and other major components are covered. Additional topic include pipe tapping ,cross-connection and fundamentals of information management.

2} Water quality and treatment

Carried out an investigation to determine detailed coverage of drinking water standards, regulations, goals, and health effects .hydraulic characteristics of water treatment reactors .Coagulation, Flocculation, Sedimentation, and flotation .Absorption of organic compounds by activated carbon , chemical disinfection ,microbiological quality control in distribution systems.

3} Water distribution operator training handbook

Carried out an investigation to determine water resources and production, storage, distribution , chlorine , handling ,utility safety system hydraulics, pipe types, installation, maintenance ,meter, pumps, motor, public relations , and overall system operations.



II. OBJECTIVE

- 1) To better understand the nature, extent and cost of work needed within each ULB to upgrade its water service to continuous, pressurized system operation.
- 2) To demonstrate to all stakeholder, by concentration on a small demonstration Zone within each ULB supply area, that 24-hours, continuous water supply is achievable and to monitor the tangible benefits - health, technical, operation and commercial – to be derived from this type of supply.
- 3) To establish ,within the chosen Demonstration Zone , a customer billing, collection and support service and to provide an improved, continuous (i.e. 24 hours per day, 7 days a week throughout the supply service fir a period of 7 years).

Process and key steps towards 24X7

1) Preparatory Period 'A'

During the preparatory Period 'A' the following activities were carried out to decide upon the various activities required to commission the rehabilitation program.

2) Preparatory Period 'B'

- 1) Continuous pressurized water supply.
- 2) Reduction of water losses {to 20Lts / connection / day/ meter pressure}.
- 3) Metering of all customers.
- 4) Development & implementation of billing and collection software.
- 5) Customer database.
- 6) Round the clock customer service center.

3) Preparatory Period 'C'

During the operation and management Period, following are the performance Targets expected mandated by the client:

1. Continuous Pressured Water supply to be provided to every connected property and stand-post connected to the public network in the demonstration Zone.
2. Emergency stoppages not to exceed twelve hours and no more than an average of four emergency stoppage {of less than 12 hours each}not to occur in any continuous period of twelve months.
3. 100% of all property connections {individuals and shared},public stand-post and feeds to street storage tanks to be metered and computerized records of the reading to be maintained.
- 4.100% of customers meters to be read every months and a bill for water used based on these volumetric readings to be issued to 100% of connected properties each months with prior approval of the respective corporation obtained pursuant to the provision of the generated bills to the corporation before dispatch to the customers.
- 5.Real{physical}losses from the distribution networks within the demonstration zone to be reduced in the following manner.
6. Customer service and support center to be situated at a location easily accessible to residents of the given Demonstration Zone and operated on a 24-hours basis. All customer queries and complaints concerning low pressure or poor quality of water ,which to be responded to within 7 days of such complaints or query, expect the complaints concerning low pressure or poor quality of water, which to be responded to within 12 hours and redressed within 24 hours of such complaint.

III. METHODOLOGY

1) Maps And Records

System maps helps to make understanding of the water distribution networks. These maps illustrate wide range of system characteristics such as pipeline alignment, elevation of nodes, location of tanks, reservoirs and valves etc. water transmission pipelines were then skeletonized and the position of water treatment plants, master balancing tanks and the elevated service reservoirs and the entire distribution system in the water supply zone were plotted on the Auto Cad drawing.



2) Existing Network - Main Replacement Program

Under this program, all unlined cast iron water mains were replaced with cement-lined ductile iron pipes and all unlined galvanized iron connections were replaced with MDPE (Medium Density Polyethylene) connections. Beside the mains replacement program, every opportunity is exploited to constantly review and upgrade the existing transmission and distribution system through the following measures;

- a) Replacing old pipeline system with new ones in areas undergoing redevelopments.
- b) Using better quality materials for water pipes and fitting to reduce leaks.

Regular maintenance and servicing program for the transmission and distribution network. These programs and measures for new and existing transmission and distribution networks have been effective in reducing the number of leaks.

3) New Network - Use Of Better Quality Pipes And Fittings

The main step towards reducing UFW was to minimize the occurrence of leaks in the transmission and distribution network. This was done by introducing new and better quality corrosion-resistant materials for new pipelines and tightening supervision of pipe laying work to ensure high quality workmanship. The objective was to ensure that newly-laid pipelines are watertight.

4) Connection Survey & Leakage Detection

The lack of an independent database and suspicion of considerable number of illegal / unregistered connections resulted in a decision to carry a field exercise with the objective of;

- The compilation of a reliable property database that relates to the plot database.
- The establishment of the geographical position of a connection by linking it to a property, which in turn is linked to a plot.
- The verification / improvement of the existing (in the Billing System) connections (water supply) database.
- The establishment of various connection / meter conditions that might be contributing to UFW, such as; Faulty / broken meters, with damaged windows, meters buried / covered by sand, leaking connections.
- To establish connections without meters.
- To establish a means of easily identifying connections in field. Towards a numbering system was adopted and a tagging process was initiated to permanently mark connections.
- To identify connections in the field, that are not included in the billing database.(illegal and unknown / lost connections)

The status of connections was also recorded to be used towards formulating an appropriate rehabilitation plan.

5) Rehabilitation

Based on the finding of the survey and consumer data evaluation rehabilitation plan was drawn up and addressed by the utility itself. The plan included the replacement of faulty meters, fixing problematic / leaking connections, changing of meters of wrong size, installation of meters in connections with on meters, providing access to problematic access connections, legalizing unregistered / illegal connections and approaching prospective customers to offer them new connections. It also included the laying of new pipe line, installation of new valves etc.

6) Distribution And House Service Connection Using Innovative Products

The information forth is based on the experience of municipal corporations, inputs from manufactures, demand experience available from municipal bodies worldwide. Water distribution world over switching to polyethylene piping system from the conventional metallic piping system due to its advantages of cost, easy and swift installation, flexibility in laying and jointing, Zero contamination and higher flow coefficient, availability of different types and varieties of fittings to suit specific requirements coupled with its advantages has greatly enhanced to usage of polyethylene system.

7) House Service Connection

A typical house service connection (HSC) from a MDPE distribution mains comprises of a elector fusion tapping tee (a conventional on-line tapping tee with a coupler or a tapping tee suitable for fixing a standard ferrule available length, a 90 degree compression elbow if required and finally a male / female adapter or a compression ball valve.



Several variations in terms of combinations of these fitting ate in use in various municipal corporations depending on their specific requirements.

IV. RESULTS

Advantage Of 24*7 Water Supply

1. 24x7 system reduces contamination as the pipes are under positive pressure and entries of contaminants into the pipes are restricted. This factor helps to achieve as steady pressure in the pipes causes less damage to the pipes.
2. Life of distribution network increases as steady pressure in the pipes causes less damage to the pipes.
3. A better demand management is possible due to elaborate metering and effective leakage control.
4. Reduction in consumption due to change in habit from storing of water is non-storing, also it generates excellent consumer satisfaction which enhance willingness to pay even in the slum pockets, i.e. poor consumers.
5. Consumer can manage their time effectively, they can allot more time for rewarding activities. It compensates for coping with poor quality of water services and lower health risk.
6. High quality of water boots cities economy and attracts more industries and business.

Demerits of the present system are as follows:-

- 1} Individual domestic storage is inevitable.
- 2} For housing societies, individual building etc underground storage tanks are required.
- 3} Water supply in a limited time span leads to possibilities of no supply to poor hamlets.
- 4} Due to intermittent water supply, pipe lie remains as hollow conduit in no supply time zones.
- 5} Possibility of injection of contaminated water through joints/leakages in no supply period.

V. CONCLUSIONS

The project include an accurate method for Active. Leak control and it is best method for preventing water contamination, best method for achieving customer satisfaction, And,because of this water is also conserved,bestmethod for water is also conserved, best method for water auditing.

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