

**MUNICIPAL CORPORATION OF GREATER MUMBAI**  
**(Hydraulic Engineer's Department)**

**WRITE UP**

The Municipal Corporation of Greater Mumbai was formed way back in the year 1865 as Mumbai's civic body. The M.C.G.M. is variably the cradle of Local Self Government of India. It embodies the principle of democracy of "Governance of the People, by the people, for the people".

Through the multifarious civic and recreational services that it provides, the M.C.G.M. has always been committed to improve the quality of life of Mumbai. M.C.G.M. covers an area over 437.71 square Kilometers, catering to the civic needs of over 1.25 crores Citizens. The Corporation operates an annual budgetary outlay of more than Rs.9,000/- crores. Most of the functions carried out by this Corporation are service oriented. The services offered includes Sanitation, Health (Public Health Care and Secondary Health Care Services through its Hospitals, Maternity, Child Health Care Units, Dispensaries and Field Services) Water, Community service, Primary Education and Town Planning etc.

The Hydraulic Engineer's Department is the one responsible for supply of potable to the city of Mumbai. The present water sources are –

Tulsi	18 MLD	0.5 %
Vihar	90 MLD	2.6 %
Tansa	440 MLD	13.10 %
ModakSagar	455 MLD	13.10 %
Upper Vaitarna	635 MLD	18.85 %
Bhatsa	1830 MLD	51.82 %
TOTAL	3368	100%

There are two major water treatment plants namely Bhandup Complex within the Mumbai City and Pise- Panjrapur Complex about 25 kms. from the Mumbai City Limits. The water from Tansa, Modak Sagar, Upper Vaitarna and part of Bhatsa (Injection) is treated at Bhandup Complex having capacity of 1910 MLD.

The Bhatsa Water released from Bhatsa Dam traverse a river course of 42 kms. before impounded at Pise Weir. The Raw water from Pise is lifted with the help of vertical pumps of 37 mtr. head and brought to

Panjrampur Water Treatment Plant of about 8 kms. having designed capacity of 1365 MLD and 455 MLD (III A Pumping Raw Water injected in the Vaitarna mains to treat at Bhandup Complex).

Considering the huge area and various departments which are rendering the services, it is rather difficult to represent for the National Energy Conservation Award as one Municipal Corporation and even one complete department. The Panjrampur Water Treatment Plant has implemented energy conservation measures and would like to participate on behalf of M.C.G.M. for the particular plant.

The Panjrampur Treatment Plant consisting of Settling Tanks, Filter plants, Chlorination Plant, Pumping Station and 100 KV Sub Station. The 100 KV Sub Station have 4 Nos. of 7.5 MVA, 100/3.6 KV Main Transformers. The 100 KV supply is from MSEDCL Padgha Sub Station with ring main arrangement with Pise Sub Station. There are in all 23 Nos. Horizontal Split case, double volute pumps of 66 meters head. The pumps are driven with the help of 3.3 KV SCI motors. There are 3.3 KV switchboards and their associated equipments. The plant power factor of 0.96 was maintained by connecting HT capacitors across the motors. The treated water is being pumped to Master Balancing Reservoir erected nearby at a height of 62 mtrs. static head and from there the water goes to various reservoirs in city area by gravity through 3000 mm and 2435 mm Transmission Mains. This Panjrampur Treatment plant is developed in three stages and commissioned in the year 1979, 1988 and 1996 respectively.

The reactive compensation of Stage-III was done and improved the bus factor to 0.996 and overall plant p.f. to 0.98 in January 2005. Thereafter Stage-II 3.3 KV Bus power factor was improved to unity by adding additional capacitor and also 400 KVAR APFC panel was connected to L.T with sensing from 100 KV side by dedicating one auxiliary transformer so as to maintain the plant power factor to 0.99 and availing 5% incentive.

Maharashtra State Electricity Board has introduced incentive scheme to the consumer for maintaining good power factor. Then this department has enhanced the existing capacitor banks ratings wherever possible with the available sources and improved the power factor upto 0.97 to avail a 2% incentive.

Improvement of Power Factor of the plant -: Initially, the reactive compensation of Stage-III 3.3 KV Bus was done and improved the 3.3 KV Bus Power Factor to 0.98 in January 2005 and switched to 3% incentive slab from 2% slab.

Thereafter Stage-II 3.3 KV Bus was improved to 0.996 by adding additional H.T. capacitors and with the help of 400 KVAR APFC panel connected on L.T. side with sensing on 100 KV side by dedicating one Auxillary Transformer in normal condition so as to maintain the plant power factor to 0.99 in 2006 and since then availing 5% incentive on electricity charges.

At present, the Stage-I 3.3 KV reactive compensation work is under progress and is on the verge of completion (Targeted in October 2008). The coarse balanced compensation at 3.3 KV Bus with H.T. capacitor banks, switching panel and fine tuning is done at Filter Plant, Yewai Chlorination Plant with the help of 3 Nos. APFC panels to improve the plant power factor to above 0.996 so as to avail an incentive of 7%.

Earlier to this, department has provided digital multi function conserve make meters to all 29 outgoing feeders namely pumps and auxillary transformer feeders and 4 incomer feeders with Elan Energy management System Software for online monitoring various power and energy parameters as a first step to measure accurately, then to detect and control.

## **II Replacement of Street light provided at Panjrapur Complex.**

At Panjrapur Water Treatment 147 Nos. existing street lights are replaced with energy efficient fittings in the F.Y. 2006-07 and 07-08.

## **III Replacement of Tube Lights**

Steps are taken to replace conventional tube light fittings with energy efficient fittings in 2007-08.

## **IV Solar Heater**

The Panjrapur Water Treatment works round the clock. The existing water heaters are being replaced by solar water heater in stages.

## **V Audit Report**

The energy audit was carried by M/s. Dinesh Rathi and Associates of Nagpur. Some of the recommendations were already initiated by this department and some of them are under process.

- (i) Replacement of rotating assembly by new ones etc.
- (ii) Providing coating to pump impellers.
- (iii) Online monitoring of pump efficiency.

## **VI Raw Water Pumping Station (III-A) -**

455 MLD Raw Water Pumping Station is commissioned at Panjrapur on March 2007. Hence less pumps were The details of the same are as under:-

FINANCIAL YEAR	ELECTRICITY CONSUMED IN LAKHS	TOTAL BILL IN LAKH	TOTAL P.F. INCENTIVE IN LAKH	QUANTITY OF RAW WATER PUMPED	SPECIFIC ENERGY UNITS PER ML
2007-08	385.38	1494.42	101.93	197454	195.17