REFURBISHEMENT OF PUMPS:

MCGM BHANDUP

Background/Objective:

The Bhandup complex is an interesting project for VEMC, the challenge was not just to deliver an efficient system but deliver a cost effective solution. The work of refurbishment along with complete overhauling of 4 Nos. of 246 MLD (Million Litres per Day) and 2 Nos. of 82 MLD(Million Litres per Day) WILO Mather and Platt make centrifugal pump. For efficiency improvement, installed on 2750 mm dia North main at the old pumping Station Bhandup Complex.

Generally, these pumps have a long life placed anywhere between 20-25 years. However, over a period of time, the efficiency drops down due to the constant contact with water & continuous running of the pump, as in case of Bhandup Complex. The power consumption on each of these pumps is about 620 KW, improving the efficiency by even a few points could mean huge savings at the end of the day. The efficiency of the pumps in question led MCGM to look for solutions to not only fix the issue but to find a means to increase the life of the pump.

Approach:

After completing the recce of the Bhandup complex, conducting an energy audit and taking into account the various nitty-gritty's of the case, the process followed was as follows.

1. Recording Energy Parameters of Pump set at Bhandup complex.
2. Dismantling and Transportation of Pump set to Kirloskarwadi.
3. Testing of Pump set at Kirloskarwadi before Coating.
4. Testing of pump set after coating :

a. Dynamic balancing.
b. Spark test.
c. DFT test.

5. Transportation of pump set to Mumbai and installation at Bhandup complex.
6. Recording of Energy parameters of pump set after coating at Bhandup complex

VEMC's Role as a solution provider:

The possible solutions in cases such as this are 1) replacing the system, which is a huge investment of time and money. 2) Making use of Corrocoating (Fluiglide) to increase the life of the pumps and reduce the corrosion.
Solution 2 was opted and VEMC corrocoated the pump, and also restored the original impeller that had corroded, In practicality this coating has a life of 10 years but protects the original surface of all the wetted parts which can again be restored by applying the same coating.

The features of corrocoating

Fluiglide is a glass flack friction-reducing, energy-efficient protective coating forming a corrugated structure over the metal surface.

Increasing concern about making effective use of energy resources has led companies to use a modern technology that helps coat metal surfaces with thin films so as to avoid direct exposure of the elements to corrosive environment. This technology is aimed at maximizing the performance of pumping systems used in areas including power generation cooling water systems, the process industries and water and waste treatment.

Advantages of the proposed system

A coat of the hydrophobic material reduces friction from 18 micron to 0.08 micron; meaning almost no friction bet water & pump surface. This has lead to an efficiency increase by about 7 percent in the pumps. A 350MW saving could mean proper energy utilization and monetary returns to the tune of 178 lakhs.

Challenges

Outcomes:

Pump No.04 reports

Testing	**Flow in m^3/hr**	**Head (mtr)**	**Pump input (KW) At site**	**Efficiency (%)**
Before coating	9609.9	17.33	583.6	77.19
After coating	9722.0	17.16	553.5	83.41
Difference	112.1	-0.17	30.1	6.22

Pump No.05 reports

Testing	**Flow in m^3/hr**	**Head (mtr)**	**Pump input (KW) At site**	**Efficiency (%)**

Before coating	2858.0	17.21	208.00	65.83
After coating	3315.2	17.16	188.88	81.87
Difference	457.2	-0.04	19.12	16.04

Pump No.03 reports

Testing	**Flow in m^3 /hr**	**Head (mtr)**	**Pump input (KW) At site**	**Efficiency (%)**
Before coating	9772.2	17.53	623.7	79.54
After coating	10155.6	17.6	564.1	87.14
Difference	+382.8	+0.07	59.6	+7.6

Status of project: Under execution. Coating of pump No. 1,2,6 planed till march 2017.