



# WELCOME

**Presented by:**

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**Environment & Fire protection, Safety**





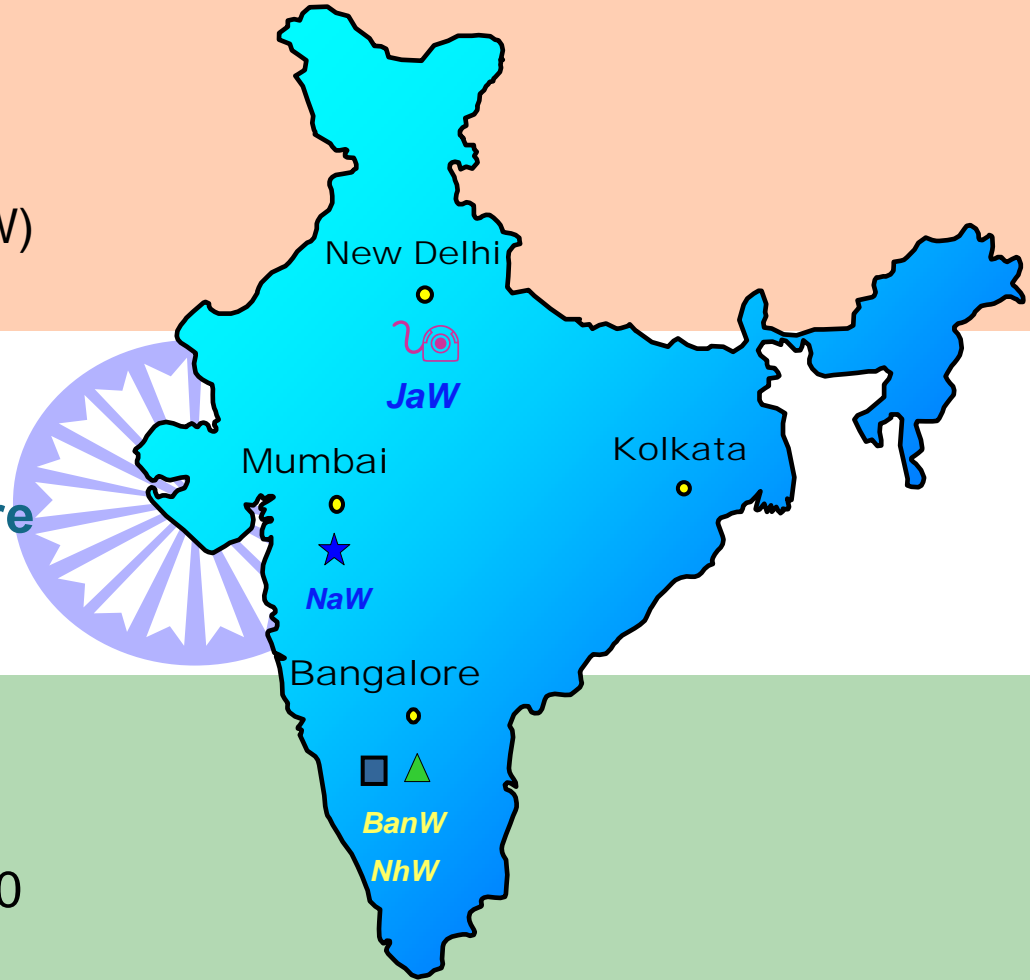
## Factories: 4

- Bangalore (BanW)
- ✎ Nashik (NaW)
- ◆ Naganathapura (NhW)
- 📷 Jaipur (JaW)

Turn Over : 2000 Crore

Personnel Strength :  
9965 (as on 01.08.03)

Sales Network : > 4000  
sales outlets





## Products Manufactured & Applications

[Diesel Fuel Injection System](#)

[Auto Electricals](#)

[Automotive Accessories](#)

[Industrial Equipment](#)

[Applications](#)





## Parameters focussed :

Metal finishing/ Electroplating/Cleaning



Elimination of process hazards



Life of chemicals



Segregation of wastewater and



Treatment System & Type of Treatment



Optimum utilization of resources.





## Elimination of Process Hazards

- ✉ [Pickling](#)
- ✉ [Degreasing](#)
- ✉ [Electrolytic cleaning](#)
- ✉ [Zinc plating](#)
- ✉ [Passivation](#)
- ✉ [Copper Stripping](#)
- ✉ [Cleaning by TCE](#)





## Elimination of process hazards :

### **Pickling :**

#### **Prior to upgradation :**

Hydrochloric acid was used for pickling of components and the same resulted in acid fume generation. This led to corrosion of equipment surrounding the pickling bath, besides causing health problems for the workmen during handling.

#### **After upgradation :**

Replacing of Hydrochloric acid with Chem Acid (Phosphoric acid + Nitric acid+additives) for pickling resulting in reduction in fume generation and thereby minimising the impact on the surrounding equipment and workmen.





## Elimination of process hazards :

### **Degreasing :**

#### **Prior to upgradation :**

Alkali degreasing agent was used for degreasing which resulted in frequent sludge generation from the degreasing bath.

#### **After upgradation :**

Replacing of Alkali Degreasing agent with High clean /SURTREAT 179 resulting in reduction of sludge generation





## Elimination of process hazards :



### **Electrolytic cleaning :**

#### **Prior to upgradation :**

Sodium Cyanide was used for electrolytic cleaning of components resulting in generation of toxic waste water and hazardous solid waste ( sludge from baths ), besides creating unsafe working environment while handling of Sodium Cyanide by workmen.

#### **After upgradation :**

Sodium Cyanide replaced with Alkali based SURTREAT / PICSAL solution resulting in elimination of toxic waste water and hazardous solid waste, besides providing safe working environment for the workmen.





## Elimination of process hazards :

### Zinc plating :

#### **Prior to upgradation :**

Sodium Cyanide was used for Zinc plating components resulting in generation of toxic waste water and hazardous solid waste ( sludge from baths ), besides creating unsafe working environment while handling of Sodium Cyanide by workmen.

#### **After upgradation :**

Sodium Cyanide replaced with Alkali based SURTEC-704 consisting of Zinc Carrier, Brightner & Purifier solution resulting in elimination of toxic waste water and hazardous solid waste, besides providing safe working environment for the workmen.





Elimination of process hazards :

## Passivation :

### Prior to upgradation :

Hexavalent Chromium was used for passivation of components after Zinc plating resulting in generation of toxic waste water.

### After upgradation :

Hexavalent Chromium replaced with Trivalent Chromium ( Chrocoat 667 ) resulting in elimination of toxic waste water, besides providing safe working environment for the workmen.





Elimination of process hazards :

## Copper Stripping :

### Prior to upgradation :

Hexavalent Chromium was used for stripping of Copper from components after brazing resulting in generation of toxic waste water and corrosive emissions.

### After upgradation :

Hexavalent Chromium replaced with METSTRIP A & B resulting in elimination of toxic waste water, besides providing safe working environment for the workmen.





## Elimination of Trichloroethylene

### Vacuum based aqueous cleaning machine



### ✉ Cleaning with TCE :

#### **Prior to upgradation :**

Trichloroethylene(TCE) was used for cleaning of the components to remove the lapping paste after lapping operation.

#### **After upgradation :**

TCE is now replaced with Surteat and Isopar H, ecofriendly cleaning chemicals for cleaning of the components and a vacuum based aqueous cleaning process is also introduced for the purpose.





## Life of chemicals :

- ✉ **Pickling -**
  - Filtration of acid bath**
- ✉ **Degreasing :**
  - Effective oil separation**
  - Oil skimmers**
  - Additional spray**
- ✉ **Deburring :**
  - Effective clarification**
- ✉ **Blackening :**
  - Topping up with rinse water**
- ✉ **Phosphating :**
  - Chemical filtration**





## Segregation of wastewater

Collect each type of wastewater in separate collection tanks (Inorganic)

Cyanide  
Rinse  
Tank

Chrome  
Rinse  
Tank

Acid  
Alkali  
Rinse  
Tank

Material of construction : Mild Steel tanks with impervious lining ( Rubber/PVC )

### Type of Treatment :

Batch type treatment system and Continuous treatment





## Optimum utilization of resources :

### Water conservation :

### Key Projects

- ✉ Cascade rinse to optimize water consumption
- ✉ **Low flow rinse - 40 - 80 lit/hr**
- ✉ **High flow rinse - 200 - 300 lit/hr**
- ✉ Flow regulators for water inlet and **Solenoid valves interlocked with process software.**
- ✉ Reverse Osmosis plant for recycling of high flow rinse water





**T**HANK YOU





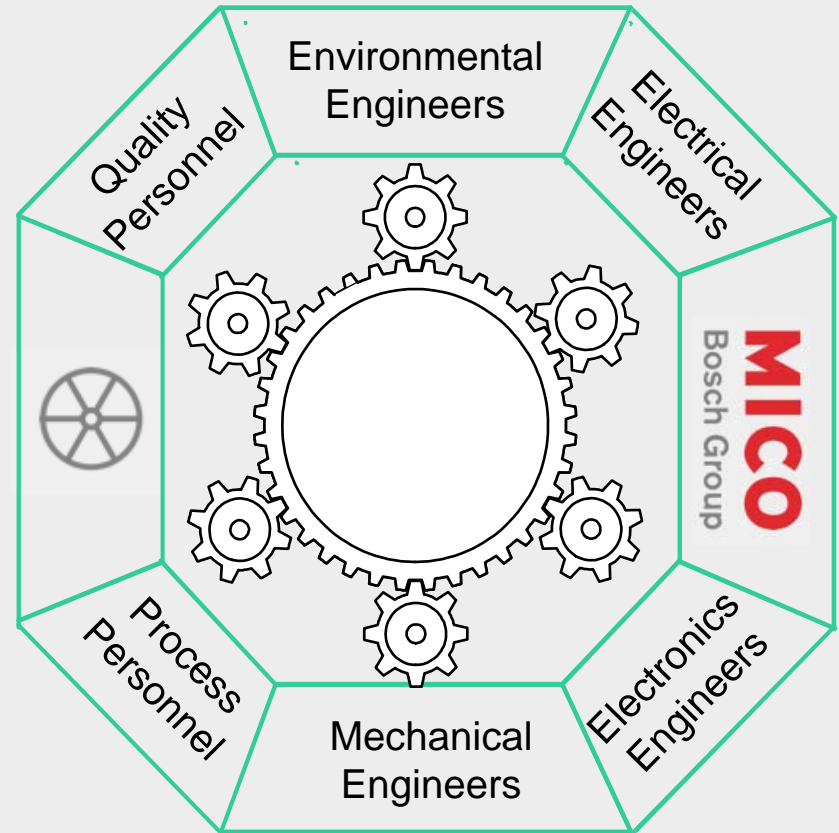
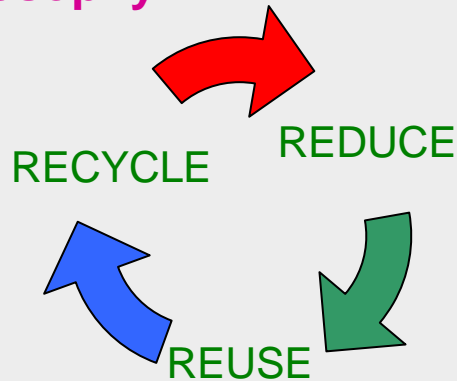
## Water Conservation and Management Efforts

**Cross Functional Team :**

**Objective :**

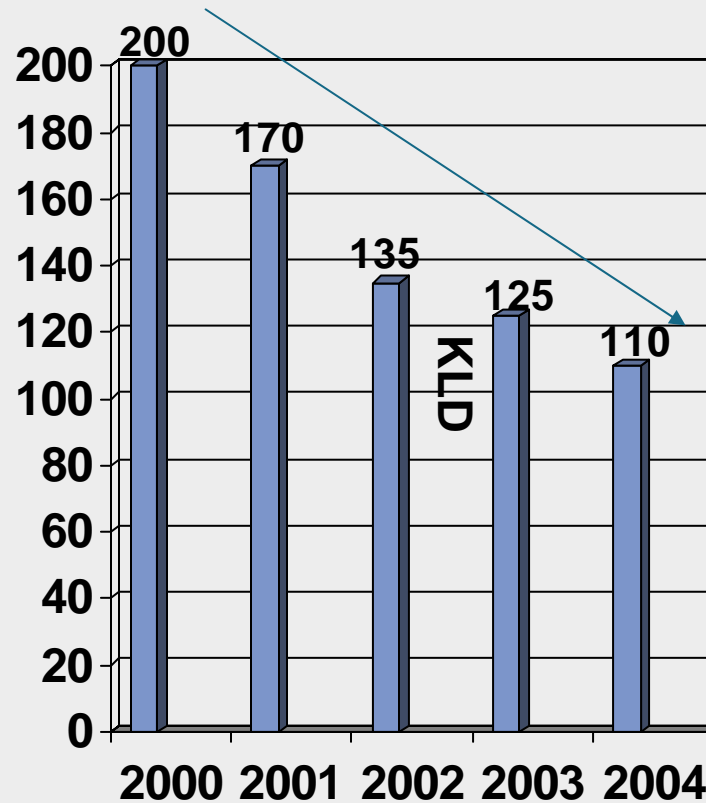
**Identify Key areas for Water Conservation**

**Philosophy :**





## Process Water Consumption

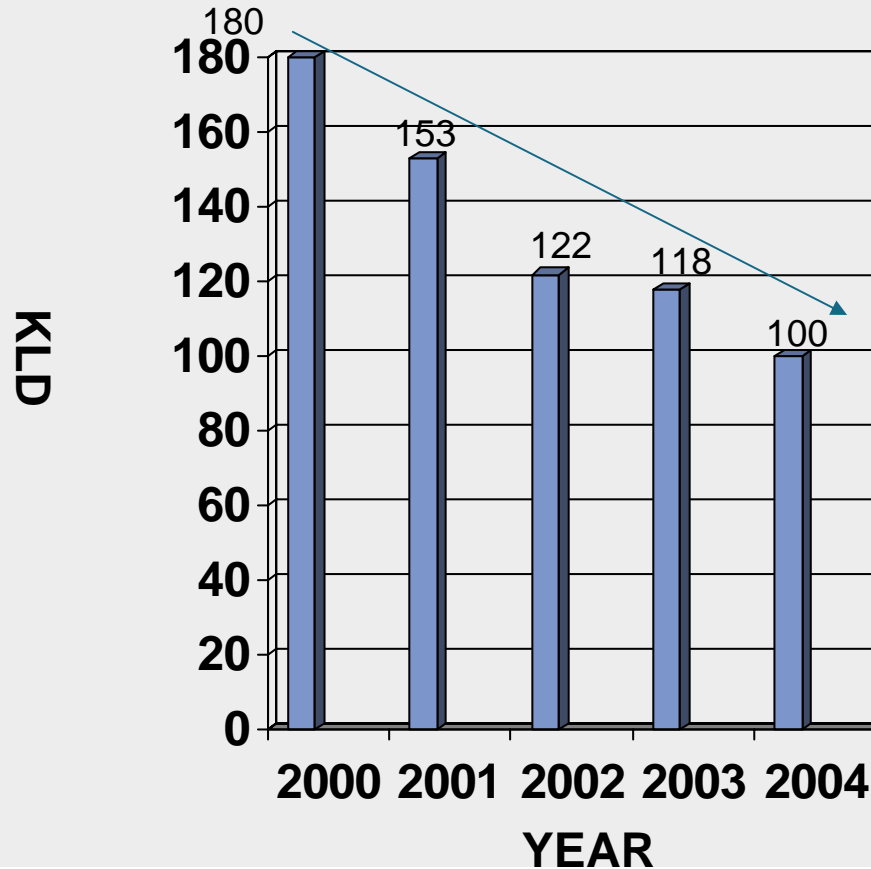


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## Reduction In Process Waste Water Generation

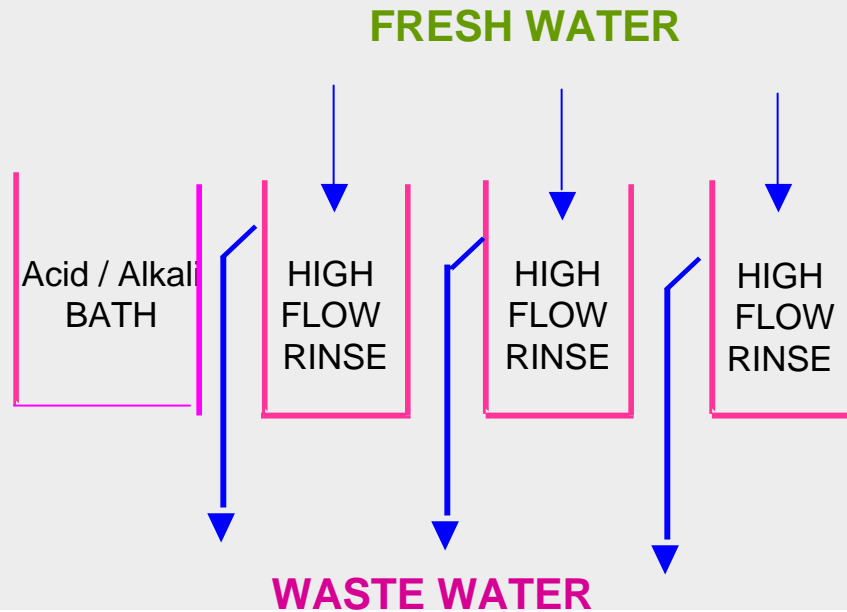




## Water conservation in Plating / Cleaning lines :

### Rinsing Technique

### Before Improvements

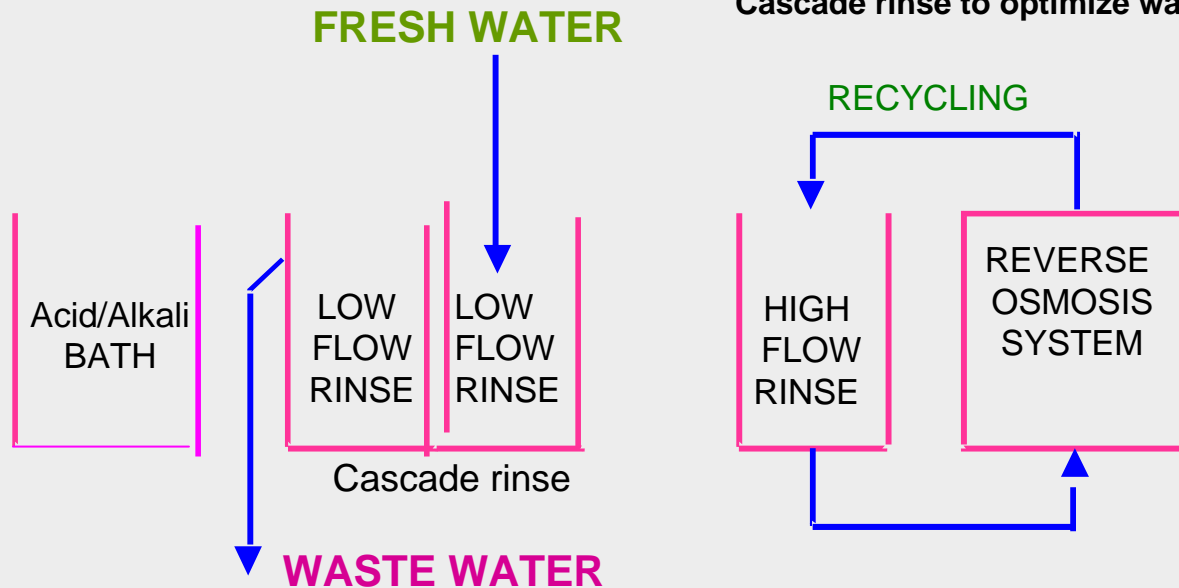




## Rinsing Technique After improvements



Cascade rinse to optimize water consumption

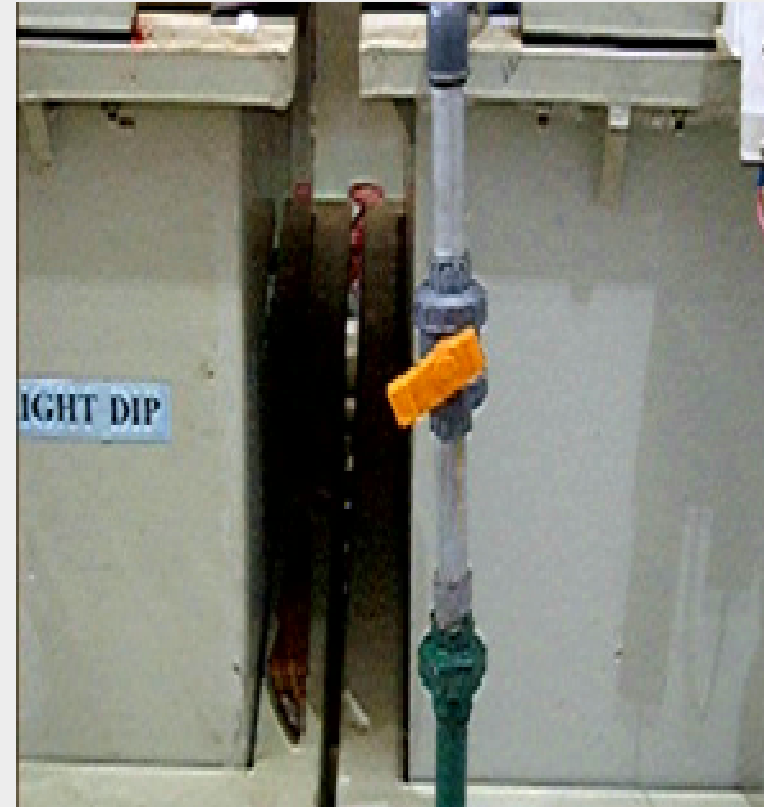




## Water conservation in Plating / Cleaning lines :

### Before improvements :

- Continuous flow of water without controls resulting in high volume of water consumption (50,000 Lit/day/line) and corresponding increase in volume at ETP ( Effluent Treatment Plant).
- High consumption of Chemicals/Energy for treating the high volume of waste water .
- Total water consumption for 4 Plating/Cleaning lines = 200 KLD





## 1. Water conservation in Plating / Cleaning lines :

### Solenoid Valve For Water Inlets

#### After improvement :

- Introduction of Solenoid valves for water inlets interlocked with process software ( Siemens S7 300) to operate only when the charge is inside the bath for cleaning and shut off with a time delay of one minute after charge is taken out of the bath.
- Total water consumption for 4 plating/ cleaning lines is 115 KLD
- Hence net savings = 85 KLD





## 2. Reuse of process waste water

Introduction of Reverse Osmosis System for the treatment and recycling of process high flow rinse waste water from surface treatment shop has resulted in annual water savings of 6,000 KL

