



## Conservation of Water in the Engineering Industry

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**ABSTRACT:** Water is becoming day by day a precious commodity. We have to bring it up from 400-700 feet for instance and soften it and subject it to demineralization process to make it fit for use in boilers and other engineering operations. All this costs money and the approximate cost of treated water comes to a few rupees per litre. Considering the fact that most industries particularly chemical plants consume large amounts of water, anything like a few lakh liters per day. Thus the cost of bringing up water and treating it comes to about a few lakh rupees per day.

### I. INTRODUCTION

Is water really important? Is such a simple liquid all that vital? Imagine with me what it would be like to have a day without water. What would you drink? How would you clean yourself? In what would you swim? You see, water is very large part of our lives. In fact, 57% to 75% of your body is made out of it. But, did you know that 1.4 billion people don't have clean drinking water? In a world of 6.8 billion people, 20.59% don't have clean drinking water. Obviously water is a huge part of our daily lives and without it you cannot live. So, how can you help to conserve the water and keep it clean? How could we make clean water accessible in other nations?

Water is increasingly becoming a much fought and much sought after commodity. Numerous governments and bodies around the world are exerting all out to spread water conservation methods in public. Several advertisements and school children's books are full of such measures and the need to conserve water. I also became interested in this battle. Often I have seen how water is wasted in public and private life. When I saw large scale wastage of water in Indian factories, I became conscious of the need to save water. Above all wastage means wastage of electricity, water treatment chemicals, time and manpower. Water conservation is thus a need of the hour. The more we waste it the more we will have to spend in the time to come to bring it up from an ever increasing depth from under the surface.

### II. LITERATURE REVIEW

I have read several supporting & instructional material from the following site's [www.onedrop.org](http://www.onedrop.org), [www.pulitzercenter.org](http://www.pulitzercenter.org), [www.lienaid.org](http://www.lienaid.org) & also read the following books by several eminent authors George Ella Lyon-Atheneum/Richard Jackson Books, A cool

drink of water-Barbara Kerley-National Geographic Chiochildrens Books, A drop in the ocean-Jacqui Bailey, Mathew Lily-Picture Windows Books, Precious water-Anne Moller-Northsouth PUBLISHERS.

### III. MEATHODOLOGY

The boiler blow down water was stored in underground concrete pits and allowed to cool for a few hours. Water from the steam traps was collected by fabricating M.S funnels connected to half inch G.I pipe which was led to underground concrete tanks. The water for cooling reactors was stored in M.S tanks, allowed to cool and recirculated for cooling when needed.

### IV. EXPERIMENTATION

Water is becoming day by day a precious commodity. We have to bring it up from 400-700 feet for instance and soften it and subject it to demineralization process to make it fit for use in boilers and other engineering operations. All this costs money and the approximate cost of treated water comes to a few rupees per litre. Considering the fact that most industries particularly chemical plants consume large amounts of water, anything like a few lakh liters per day. Thus the cost of bringing up water and treating it comes to about a few lakh rupees per day. I developed and installed my own water conservation plant in laxmi aromatics in the year 2000 when I was the plant head there. An example in study is the wastage of water from boiler steam traps. Considering a 5 ton boiler, 15000/- rupees of pure treated water is wasted per hour. That is 360,000/- per day. Consider 1000 chemical plants and that is 36000000/- .We can construct a 10 or 20 or 30 cubic meter underground storage tank, take water by half inch gi pipe from all traps and store it there. Using a small water pump we can periodically pump this soft water to

the boiler feed tank. This way very large sum of money can be saved.

Another way large amounts of good quality water can be saved is by concentrating upon water cooled and water flushed reactors, kettle and vessels particularly of chemical plants. In reactors say for example a 30 ton industrial urea formaldehyde glue plant after every few hours the reaction is over. The glue is taken out and pumped to storage tanks. This is followed by washing the reactor with approx 30 tons of water says four times in 24 hours that is 120 tons of good quality water about 360,000/- per day per reactor per chemical plant. All this water is discarded after use and drained in the plant. The very large number of chemicals is such that this water could be recirculated for use again and again. We can make an underground tank and connect it to cooling towers and use water pumps to wash the reactors several times instead of once. Thus very large sums can be saved.

In several jacketed vessels cooling water is used during the reactions to control temperature. In several plants this water is discarded after cooling application. Similarly this water after cooling a reaction and be taken to underground storage tanks and connected to cooling towers. Thus the same water can be circulated in the jacketed vessels for cooling for months. Thus very large amounts of money can be saved per plant. If such measures are adopted in 1000 plants, the amount saved per day could easily run into crores of rupees.

Such conservation measures are too important because bringing up water from 400-700 feet from below the surface needs electricity, maintenance of equipment, pumps etc, water sampling and treatment chemicals and labour costs. Once we discard useful water, it adds a burden on the effluent treatment plant, which again means acceptance as per government norms, treating it with several chemicals, labour costs and the problem of handling the un disposables. Besides useable water is becoming an increasingly costly commodity day by day. Thus water used for flushing the kettles, reactors and vessels can be recycled in large number of cases. Water blown down from boilers can be similarly stored in underground tanks and used to cool reactor and vessels in chemical plants. Let us suppose 2400 kgs of water is blown down from a one tone boiler in one day, this quantity becomes about 25000 kgs of good quality water in case of a single 10 tone boiler which means approx rupees 125000/- per day. Considering 1000 chemical plants each with a 10 tone boiler, this figure comes to about 1250000/-rupees per day. We are well aware that the number of chemical plants in the world is

thousands of times more than this figure. Thus the amount of money that can be saved in this exercise would be tremendous. This money can be used for increasing plant capacity which would mean increasing revenue which would mean setting up of more plants worldwide.

Similarly water used for washing of vehicles can be stored in tanks, sediments drained off and good water may be used for cooling chemical reactors or for watering flower beds in nearby areas. We are well aware that inside plants water harvesting can be also done during rains because the floor is generally cemented and run off is in one direction. Such water collected during rainy season can be collected from certain low lying points in the factories and cycled off to underground pits from where they may be pumped to cool chemical reactors.

This exercise again can be done to harvest very large volumes of good quality water and millions of rupees saved annually. Rain water is quite good quality and needs little further water treatment.

## V. RESULT AND CONCLUSION

Many of the figures which were achieved are mentioned in the text below. I saved rupees 145000/- per year during the years 2000 to 2003 for LAXMI AROMATICS Bhiwadi, Rajasthan as plant in charge by using the below mentioned techniques and by saving only water from steam traps. When I applied water recycling techniques on 30 tone hydro generator in the same plant I saved 180000/- rupees per day in that same plant.

## REFERENCE

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