5 MINUTE GUIDE

Top 10 Water Saving Actions

This 5 Minute Guide discusses the 'Top 10' actions to save water. While water is seen to be cheap, there can be many hidden costs in its use. The true cost of water can include sewage and trade waste, any water treatment chemicals required, and energy for heating, cooling and pumping.

To investigate the real costs and therefore the benefits of water saving options, calculate and use the full cost of water, not just what is on the company water bill. This is likely to indicate its true value and provide the company with a better understanding of production efficiency.

By embedding water saving actions and the true cost of water into a company's everyday running can produce surprising results. Water saving goals can be included into the company's Key Performance Indicators, Personal Development Goals or Team Targets. The Nufarm Case Study on the PACIA website discusses how to include these issues into company goals *(http://www.pacia.org.au/DownFile.Aspx?fileid=848).*

Fig.1 Pipes

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Top 10 Water Saving Actions

1. Check for leaks

Leaks can double water consumption and waste large amounts of high quality water, costing the company in water bills. Above ground leaks are usually easier to find, however, below ground (such as in building slabs) can be much harder.

A physical inspection of all pipes and water using equipment (such as boilers) should be carried out for leaks and problems rectified during routine maintenance.

The easiest way to check for leaks that are harder to see is to monitor water usage during shut down. Take a meter reading before shut down and one before recommissioning. Any changes could indicate a leak to find and repair.

2. Ask operators why and how

An effective way to find out about water usage in the plant is to consult the staff and ask "**why?**" and "**how?**". Sometimes habit becomes truth and a process is done in a particular way just because "that's the way it has always been done". Understanding and questioning "**why?**" can reveal where improvements or changes can be made.

Plant and equipment operators and other staff members will also have ideas about how to save water, implement change and improve environmental outcomes. So ask the question, and sit back and listen. Involving people in the process will provide a fresh perspective, create a sense of ownership, create champions for efficiency and company sustainability and ensure that new measures are successfully implemented.

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3. Set a baseline and watch for changes

A baseline of water usage is simply a measure of the water use trends at a facility over time. Setting a baseline is the best way to establish water use and understand any variations. Equipped with the baseline work can begin at minimising water use, monitoring how well any new initiatives are working and measuring success.

It can be relatively quick and easy to gather the last 2 years of water bills and graph these using a spreadsheet. Share this data with work colleagues so they can help keep an eye out for leaks and find improvements.

People have a great affinity with water and it may be the ideal way to engage the workforce. Monthly trend data can be posted on the noticeboard, production output against water usage can be calculated and periods of great efficiency celebrated.

4. Identify large water use areas

While it is often thought the major areas of water use are known, it is surprising how often they are misunderstood. Determining large water use areas at a plant will help prioritise saving actions.

Large water users at industrial facilities typically include:

- cooling towers
- boilers
- wash down
- vessel cleaning
- clean in place (CIP) systems
- product addition
- lubrication
- sealing and acoustic control
- staff amenities, and
- fire water

Many larger pieces of equipment come with water meters and, daily readings can be taken over a period of time to establish water use.

Sub-meters or ultrasonic flow meters can be installed and moved to various areas to determine how much water is really used, where, and to maintain it as a minimum.

Armed with the facts, work to reduce water usage and identify the potential to use fit-for-purpose water instead of best quality mains water can be undertaken.

Fig.2

Boilers
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Fig.3

Large water users: cooling towers and boiler units
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Leaks can double water consumption and waste large amounts of high quality water

5. Conduct audits of cooling towers and boilers

Cooling towers and boilers are generally the biggest water users. Auditing water use and comparing this with operational benchmarks and best practice can help ensure plant systems are operating at maximum efficiency [for benchmarks see; *http://www.citywestwater.com.au/business/3052.aspx]*. This can save water, but will also save significant costs associated with trade waste, energy, treatment chemicals and maintenance. Visit *www.ctwec.com* (*www.mycoolingtower.com.au* from July 2011) for the AIRAH cooling tower efficiency calculator.

It may also be apparent that the equipment is nearing the end of its life and alternative technologies can be used in place of older technologies such as absorption chillers (that can use waste heat) and dry heat exchangers (that use no water).

6. Identify fit for purpose uses and alternative water sources

Water can and should be used more than once, and potable (drinking) water is not always required. Talking with staff, Department of Health or the relevant water authority will reveal many uses that do not require potable water and options for reuse or augmentation, with for example rainwater. If human exposure and sensitive machinery or processes are a concern, then high quality water is required. Knowing which areas could use alternative water may help action reuse systems such as closed loop cooling circuits and fit-for-purpose reuse.

7. Wash down and vessel cleaning changes

A large amount of water can be used in washing down floors, surfaces, and in cleaning production vessels. Where possible, spills and general cleaning of floors should be undertaken using dry methods like sweeping. Vessel cleaning can be substantially reduced if production schedules are changed, batching like products in sequence and reusing vessels rather than having to clean them after each use. A case study to review when considering CIP can be found at *http://www.citywestwater.com.au/documents/Tollman_revised_case_study_2011.pdf*

Install trigger nozzles on all wash down hoses and never use fire hydrants for wash down or any other purpose.

8. Clean in Place (CIP) improvements

CIP is an automated industrial method of cleaning the interior of processing vessels, pipes and associated equipment without the need to dismantle them. CIP systems can use large quantities of water and should be optimised to reduce usage. This can be done by changing production schedules to reduce the number of CIP cycles. For example, the final rinse cycle can be captured and stored for reuse as the first rinse cycle in the next CIP event. This can help reduce energy and chemical usage as it will likely still be hot and chemically compatible with the vessel. Also, work with suppliers or service providers to see if the duration of each wash cycle can be adjusted to reduce water use. Run trials to check if a wash cycle only needs to run for 3 minutes instead of 5 minutes. Automated dosing of chemicals can also help reduce chemical consumption and trade waste costs. (The CIP best practise guidelines can be found at: *http://www.smartwater.com.au/projects/round6/hatlar/Pages/hatlar.aspx*)

9. Reduce waste from fire water test cycles

Vast volumes of potable water are used in fire services testing and this consumption can be easily reduced or recycled. The Victorian Plumbing Industry Commission has released new comprehensive guidance on easy and smart ways to reduce the usage of water in fire water testing while ensuring proper testing takes place.
For expert advice on such options as reducing pressure, changing to monthly testing, recirculating (closing the loop) and recycling water for other purposes. Visit *www.pic.vic.gov.au/www/html/440-guide-to-water-saving-in-fire-sprinkler-systems.asp*. Some of these opportunities may also be suitable across Australia and should be confirmed with the relevant governmental plumbing authority.

Fig.4 Fire hose

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Fig.5 Install water efficient fixtures

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10. Install water efficient fittings and fixtures (toilets, showers, valves, pressure reduction)

Old equipment and facilities are generally less efficient and replacing them can reduce water use in these areas by 50%. Flow restrictors installed in pipes can dramatically and very cheaply reduce flow and save water. Waterless urinals, dual flush toilets and water saving shower heads are all available at low prices or even free via water authorities and demonstrate the company's determination to improve water efficiency. Visit *www.waterrating.gov.au/products/index.html* for full details of water saving products.

Checklist of Top 10 Water Saving Measures

- ✓ Check for leaks
- ✓ Ask operators why and how
- ✓ Set a baseline and watch for changes
- ✓ Identify large water users
- ✓ Conduct audits of cooling towers and boilers
- ✓ Identify fit for purpose uses and alternative sources
- ✓ Wash down and vessel cleaning changes
- ✓ Clean in Place (CIP) improvements
- ✓ Fire water improvement
- ✓ Install water efficiency fittings and fixtures

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