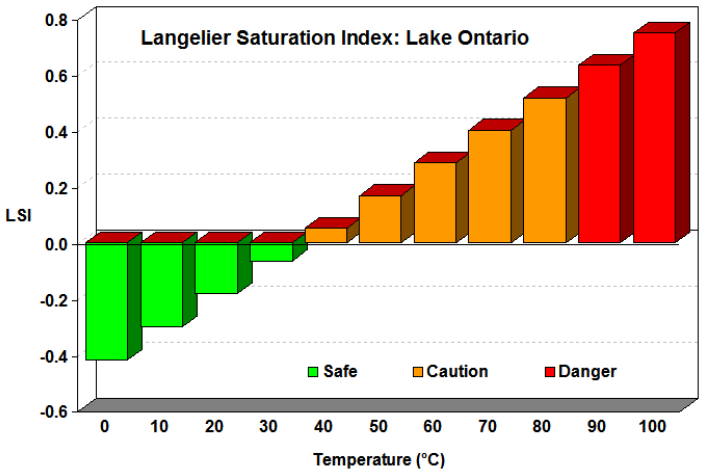
Water-Treatment Software

Marvin Silbert and Associates are pleased to offer four water-treatment Excel spreadsheets. These are enhanced versions of those we developed for our consulting work. These spreadsheets are simple to use and compatible with essentially all versions of Excel. Each contains numerous tables and some spectacular graphs which can be printed directly from the spreadsheet. They can also be imported into a word processor to make a high-quality report or proposal or into a graphics program to make a slide for projection.



W-index

Scaling is a fact of life in water systems and its presence can lead to reduced transfer of heat. As the scale thickness builds up, it leads to deratings, outages and increased maintenance. The way to avoid these problems is to be prepared. If the system is adequately monitored, corrective actions can be planned before the loss of heat transfer gets so high that there is a panic to apply some form of drastic action, e.g., an acid cleaning.

W-index calculates:

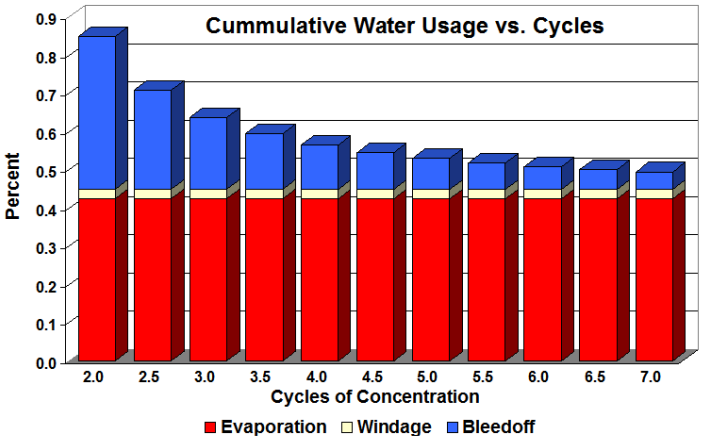
- Langelier Saturation Index, including high-pH applications
- Ryznar Scaling Index
- Puckorius Scaling Indices
- Distribution of carbonate species
- Calcite saturation index
- Skillman index for calcium sulfate
- Larson-Skold Index for corrosivity carbon steel.

W-index has a powerful *what if?* engine to show what happens to that water as you

- change the temperature of the water
- cycle it in a cooling tower
- adjust the recovery rate in an RO system.

W-index is not just another scaling index program. It goes to the original carbonate equilibrium equations discussed by Langelier to calculate the various scaling indices. Try with your present program or calculation with a 12°C water with 2,000 ppm TDS, 585 ppm Ca, 495 ppm total alkalinity (all ppm as $CaCO_3$) and a pH of 12.6. If you get an LSI of 5.7, you are with the majority. Your program has made a fundamental error and found this a very scaling water. This is not a scaling water. An LSI of -0.1 would be much more appropriate. You have justified your need for W-index.

Price $150



C-tower

Cooling towers are an excellent way to conserve water. They reduce the quantity of cooling water make-up that is needed to only a few percent of the total recirculating flowrate. They also make it possible to use more cost-effective treatment products to keep the system surfaces clean. Unfortunately, there is a negative. The water and chemical balance can be quite complex. C-tower performs all the *standard* cooling-tower chemical and water usage calculations and it does so over whatever range of COC that you choose to select. Each calculation provides several sets of tables and more than a dozen graphs.

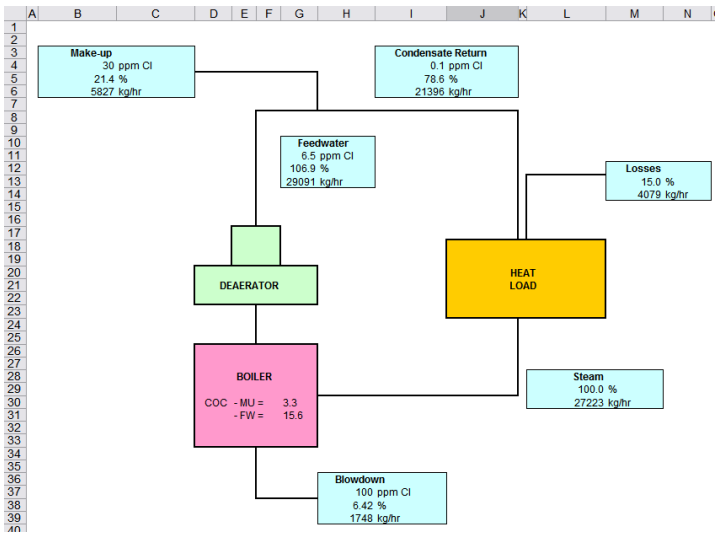
The information for each COC includes:

- Flowrates for recirculating water, evaporation and bleedoff
- The dosage and cost for each product
- How much sulfuric acid to add to maintain a fixed alkalinity
- Retention time and holding time index

C-tower immediately reacts to the questions: What if my supplier makes a change to a product's cost? ...What if I decide to boost or reduce its dosage? ...What if there is a change in the system's flowrate? You can insert your own costs for treatment products and water. Set a maximum allowable alkalinity and get the required dosage of sulfuric acid.

The powerful *what if?* engine simplifies the fine tuning a proposal and it's great for training new employees. The calculations can be performed using any currency and your choice of metric, Imperial or US unit systems or even mix them to accommodate older plants that started in one system and now operate in another.. It only takes a few minutes and those graphs can be imported directly into your proposal or report.

Price $150



BoilBal

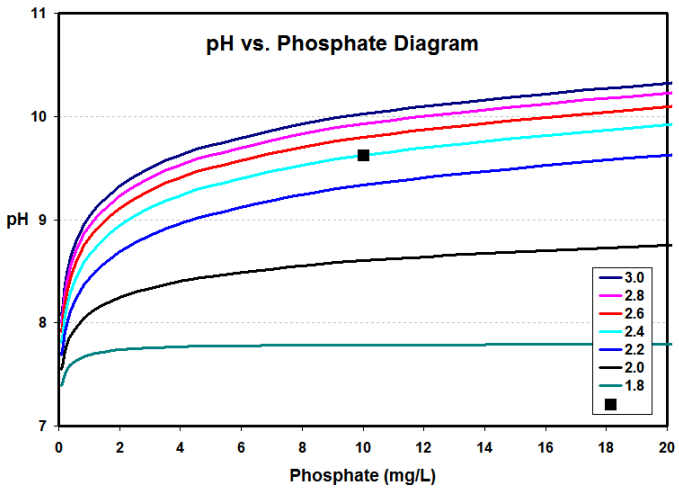
A boiler is designed to transfer heat from a combustion or nuclear source to water in a controlled manner to supply steam to heat a process or turn a turbine. When the steam has done its work, the condensed liquid returns to complete the cycle. Boilers are not all that efficient. They take a lot of energy and large volumes of treated water to do their job. To maximize the efficiency of the process, it is necessary to be aware of the flow and heat balances throughout the cycle. That is not always possible as the cycle is rarely provided with sufficient instrumentation due to the cost and the difficulty making accurate measurements with two-phase (mixed steam and liquid water) flow.

Although the instrumentation isn't there, there is another way to get the data. As part of their daily routine, operators do a set of analyses for chloride or other soluble tracers from four samples: make-up, feedwater, blowdown and condensate returns. That simple set of numbers can do a lot more than just serve to indicate if the boiler is operating within specifications.

Boil-Bal takes those numbers and calculates the water and energy balance throughout the cycle. How much is going down the blowdown line? How much steam is sent out and lost, never to return again. Those losses cost money? Boil-Bal calculates the how much water and energy is lost. Once the losses are know, it's possible to do something about them. The *what if* options enable you to assess the costs resulting from:

- bringing back more condensate
- recovering the energy lost to blowdown
- upgrading the water-treatment plant?

Price $100



Phosph8

Phosphate-based programs are used extensively in boiler systems. The control of phosphate can be very much more critical than many people realize. Failure to provide adequate control can result in caustic or acid attack that can lead to catastrophic failure. Over the years, first coordinated phosphate and then congruent phosphate control programs were introduced. These are based upon dosing the boiler to maintain a specific ratio of Na-to-PO_4. Just enter your measured pH and phosphate concentration and Phosph8 gives you the Na-to-PO_4 ratio. It also plots the point on a family of Na-to-PO_4 ratio curves.

There is a dynamic equilibrium among the various forms of phosphate which becomes very much more complex when iron is incorporated into the picture. Trying to match a boiler's operation to keep within a block on a published graph can be both tricky and misleading. It can also be risky. Many attempts to avoid excess alkalinity have actually gone well beyond what was intended and taken the system into the realm of acid attack. Increasing the feedrate of phosphate as a means to force the boiler to stay within that block can result in severe hideout problems that result in an increasing loss of efficiency. In the worst scenario, it can result in a sudden tube failure.

To help understand the process, Phosph8 also shows how the equilibrium of the tri, di and monosodium varies with both pH and temperature. It may be somewhat of a surprise to see which species are present and that the proportions can be very different from what was added.

Price $50

More details of the individual spreadsheets can be found on our website. The prices quoted are for sending the files with the manual as a PDF file either as an e-mail attachment or downloaded from our website. If you prefer a CD with a hardcopy manual or are interested in quantity discounts, please contact:.

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