Introduction

Over the last century there has been continuous innovation in the methods used to control scale and corrosion in water systems.

In Boiler Treatment, the evolution of treatment has gone from potato peels, to soda ash, to tannins and lignin, to phosphates, chelants, polymers, and amines. The advancements in technologies employed have not been limited to internal treatment strategies, as complex ion exchange systems, reverse osmosis, deareating heaters, economizers, and automatic blowdown controllers have all become part of the playbook in most steam plants. In fact, sodium zeolite, and later, the use of synthetic ion exchange resins, revolutionized the way boilers were operated.

In Cooling Water Treatment, acids & alkalis along with the use of the phosphate represented the first attempt at controlling scale and corrosion. Fifty years ago saw the widespread use of acid along with chromate. As the century progressed, phosphates and acrylate polymers emerged as part of alkaline cooling water treatment programs. More recently "environmentally friendly" biocides and more organic/biodegradable treatments have come to the forefront. These higher performance programs along with make-up pretreatment, condensate capture and blowdown recovery have allowed for the implementation of the high cycle cooling water programs we see today.

Validation

Any treatment strategy that is widely employed today has proven successful across a broad landscape of systems and operating parameters. During the evolution of some treatment methods, strategies that are unsuccessful, underachieve or don't add value get discarded from the water treatment toolbox. Occasionally, other methods linger in the marketplace almost indefinitely. While never gaining widespread acceptance, they capture enough interest to resurface as treatment options over and over again.

Electrostatic, pulsed electric field, ultrasonic and hydrodynamic cavitation, and electromagnetic treatment methods are examples of non-traditional treatment strategies that have been available for decades and occasionally seem to offer alternatives to conventional water treatment but all to frequently seem not to perform as expected.

The cause of these failures vary, but perhaps many could be avoided by subjecting alternative treatment methods to the same acquisition assessments and criteria as a conventional water treatment purchase decision. An assessment such as this might start with a simple analysis of the water taken before the proposed device and another taken after it. If these two analyses are different then it is safe to assume the waters will behave in and affect your system differently. If, on the other hand, the analyses are alike, then it is wholly unreasonable to expect these waters to react differently in your system.

The second step in the assessment of these types of technologies is to investigate the limitations of the device. Any legitimate treatment method will have been pushed to a failure point so as to establish its successful operating parameters. Find out what conditions the treatment technology you are considering cannot handle.

If none are identified, don't automatically assume the treatment program will work for your system. It probably means the technology has not been evaluated across a broad selection of water types and qualities.

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Any successful conventional water treatment program being used today is made up of inhibitors, dispersants and biocides that have all been validated by independent third parties. The same standards should be used for the non-traditional treatment methods. Relying on the manufacturer's claims is a recipe for disappointment. Any legitimate strategy will have been evaluated and its performance validated by a government, institutional, or industry related third party.

Remember if such a validation could be obtained, why wouldn't the purveyor of the treatment device get it? Manufacturers, sellers or even users testimonials do not carry the same weight as an independent validation.

Another step in the assessment process should include a review of any evaluations or trials conducted by Industry or Trade Associations. Much like third party validation, significant weight should be given to these organizations if they have evaluated and rendered findings on the performance of a particular treatment strategy.

Next, evaluate the warranties offered around conventional and alternative treatment strategies. Historically the water treatment supplier takes full water side responsibility for any treatment or technical related failure. Further, the company should agree to language around restoring system conditions in the event of such a failure. If a potential supplier has warranty language limiting their responsibility to replacing a treatment device and does not include related costs resulting from a failure, it is a red flag. Additionally, if a potential water treatment partner excludes consequential damages and loss of revenue from their warranty or fails to guarantee proposed savings in water or electricity as part of their offering, it may be prudent to continue your evaluation and find someone who will. Evidence of the strength of a company's offering could include proof of liability insurance or a performance bond issued to the user. Anyone with real confidence in the outcome they will be providing should be entirely willing to offer this level of security to a user of their technology.

Any reputable player offering products and services in the water treatment arena should be willing to offer a guarantee. In fact, someone who is confident they can deliver the results they are promising should be willing to do a no charge trial for 90 -120 days with inspections before and after. As an alternative, any water treatment supplier should be willing to agree to a money back guarantee if performance standards are not met.

Be on the lookout for savings a water treatment supplier promises that may never be realized. For example, if a cost analysis includes savings resulting from a cleaner heat exchanger or less downtime but your heat exchanger is already clean you need to disregard that claim. Likewise, water savings are easy to claim but if the potential supplier will be running the same number of cycles as you are now, there will be no savings. Factor these claims out of any proposal that includes them.

Finally, it's always a good practice to identify how long the people you will be working with have been in business. Traditional water treatment providers have professionals they can put in front of you who have twenty, thirty, even forty years of experience. That should be compared to the experience and tenure of a non-traditional supplier's representative. If you can't find someone who has been able to make a career out of solving water treatment problems with the non-traditional technology they want you to buy, then it's a good bet their tenure as your problem solver will be short lived. In a similar vein, any references you investigate need to be multi-year customers. Regardless of the technology, someone you partner with should be able to give you references who have had successful experiences for five to ten years.

Conclusion

The decision about treatment strategy is not one to take lightly. The ramifications of a treatment failure can be wide ranging and expensive. As you evaluate non-traditional strategies, be sure to include your present vendor. Assuming they have been successful, no one will know your system better. And don't overlook the fact they have been part of an industry that has innovated for decades and can be a valuable resource in evaluating alternative technologies.