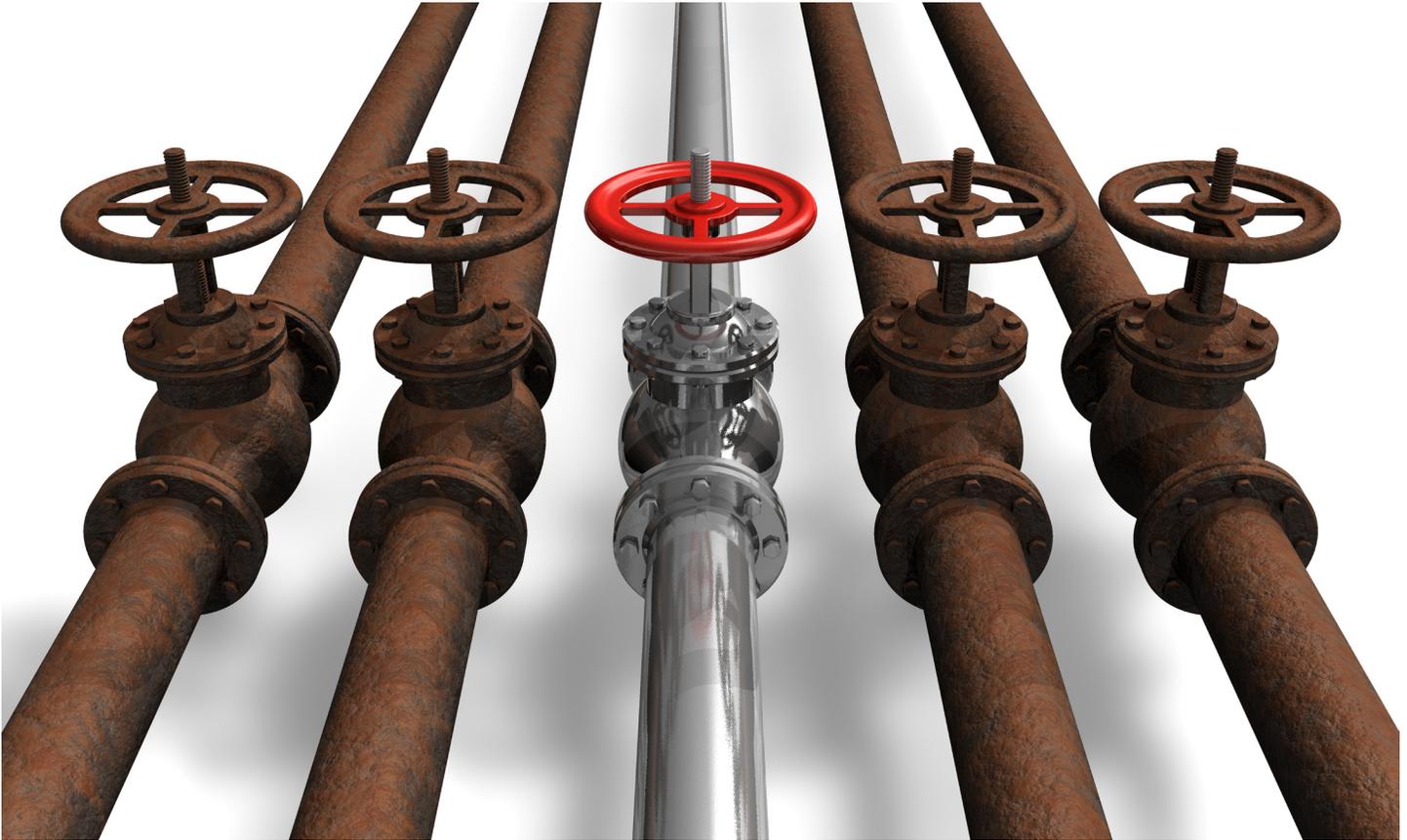


Effective Management of Corrosion and Biofilm in Cooling and Heating Systems with SafeGuard™ H2O



Many industries, hospitals, institutions, and buildings are faced with the inevitable task of managing corrosion and biofilm in their cooling and heating systems. Through the implementation of an intelligent corrosion management program these facilities can extend their useful life, reduce maintenance expenditures and foster sustainability.

With SafeGuard™ H2O, an innovative electrochemical water treatment solution developed by Aqua Metrology Systems (AMS), a non-toxic and environmentally safe stannous reagent is generated on-site using only tin and electricity and is delivered in a tightly controlled dose. This all-in-one reagent acts as both a biocide and a corrosion inhibitor.

SafeGuard H2O is a scalable solution designed to treat streams of 10 – 1000+ m³ and the “plug and play” stannous generator can be sized according to the treatment requirements based on the volume or the surface area of the system to be protected. The treatment system can be fully controlled, monitored and optimized remotely and is designed to operate unattended for up to several weeks. This unique feature reduces the need of personnel for onsite supervision.

SafeGuard H2O systems can include an integrated water quality analyzer for online, multi-point, real-time monitoring of corrosion by-products or scale which is used to automatically control the dosing volume and frequency. Alternatively, this can be done by manual sampling and laboratory-based analysis; however, these infrequent samples are prone to error and the results are not as timely as the on-demand SafeGuard H2O solution.

The fully integrated and online SafeGuard H2O treatment approach eliminates the pitfalls of conventional corrosion and biofilm management systems and aids in the delivery of an affordable and reliable process.

Challenges of Current Corrosion and Biofilm Management Systems

- Toxicity and fate of some reagents in the environment (e.g., orthophosphates, nitrite)
- Bulk reagent logistics (shipping, handling and storage requirements)
- Reagent availability and supply chain issues (orthophosphates)
- High dosing requirements and associated waste problems
- Supervisory and maintenance requirements
- Difficulty of controlling and automating reagent dosing of multiple reagents
- High reagent cost

Advantages of the SafeGuard H2O System

- Inert, non-toxic and environmentally benign precursor
- Reduced footprint for in-situ reagent generator
- Plentiful long-life precursor
- Low dosing rate with no waste challenges
- Extended reagent replacement cycle
- Automated, on-demand dosing and continuous performance monitoring
- Highly cost-effective, the only consumables are tin and electricity
- All-in-one reagent (biocide and corrosion inhibitor)



SafeGuard™ H2O

SafeGuard H2O Competitive Cost Analysis

The lifetime costs of SafeGuard H2O are considerably less than that of alternative systems with their attendant challenges of toxic waste disposal, high inertia, large footprints, chemical storage, and handling that make them cost-prohibitive solutions. In a competitive cost analysis of SafeGuard H2O for a 1000 m³ cooling system, this novel technology was shown to provide a 39 – 60% lifetime cost reduction compared to a treatment approach based on expensive molybdate.

Molybdate Based Treatment (From Institute of Chemical Engineering, UK Data)					SafeGuard™ H2O		
Inhibitor	Biocide	Labor	Total	Lifetime (10 years)	CAPEX	OPEX	Lifetime (10 years)
\$124K	\$7K	\$1.1K	\$132K	\$1.32M	\$129K* \$209K**	\$40K* \$60K**	\$529K* \$809K**

* without online byproduct monitoring
 ** includes online byproduct monitoring

There are no similar technologies to SafeGuard H2O that integrate a low lifetime cost treatment system with real-time performance controls. By implementing a data-driven SafeGuard H2O treatment system to effectively manage and control corrosion and biofilm, organizations can achieve affordable and genuine control over water systems throughout their built environment. SafeGuard H2O successfully minimizes the costs of managing corrosion and eliminates the use of bulk chemicals and their associated disadvantages.