



Public Safety and Security

Water supply vulnerability and the potential for contamination by intentional as well as natural and other unintentional means have gained attention in recent years by federal and state agencies. USEPA, the Department of Homeland Security, and the American Waterworks Association (AWWA) have provided tools and training guides for reducing national vulnerability to attacks and minimizing damages.

The purpose of this short information bulletin is not to replace any of these important documents. Instead, it should be reviewed as another tool in the toolbox. Membrane filtration is the finest filtration, capable of removing a wide range of contaminants. While microfiltration (MF) and ultrafiltration (UF) are capable of removing bacteria, Giardia, and Cryptosporidium, reverse osmosis (RO), electrodialysis reversal (EDR), and nanofiltration (NF) can remove small ions and molecules such as pesticides, radionuclides, and arsenic.

Because of health concerns, over the past several years the EPA has reduced the maximum contaminant level (MCL) for many contaminants. The resulting number of utilities with levels of contaminants such as radionuclides, arsenic, and pesticides exceeding the EPA's MCL has increased with thousands in violation.

These contaminants can be either manmade or naturally occurring, and can enter the drinking water supply through runoff (surface water) or infiltration (groundwater). When ingested, these contaminants can have negative short and long-term effects, including birth defects, nervous system damage, and cancers of the skin, lungs,

bone, bladder, and kidneys. Membrane plants, as a positive barrier to microbial contamination, are more resistant to source water contamination attacks since the microbes just can't fit through the pores.

In addition, membrane filtration offers other benefits relating to enhanced security and minimizing exposure. Membrane filtration, unlike conventional filtration, is a process that can be fully enclosed in a building. This allows for all treatment processes to have restricted access.



Membrane plants generally have much more sensitive and extensive instrumentation than older conventional plants and can detect any contamination or tampering much quicker and allow the operators to take corrective action much more quickly. The programming that typically accompanies membrane filtration also allows for remote operation of the plant enabling the system to shut itself down on its own or an operator to shut the plant down even if they are not on site.

Finally, Membrane plants generally use less chemicals in the treatment process, thus depriving potential terrorists of potential targets at the plant.

With so many utilities facing the threat of contamination from an increasing number of sources, the need for new and better ways of treating and protecting our water supplies is paramount. Although there is no guarantee of 100% protection against an attack, spill, or infiltration of natural or intentional contaminants, the multi-barrier approach, along with the other benefits of membrane technology, can reduce the potential for disasters substantially. Together with all other safety and security measures recommended by national and federal guidelines, the installation of membrane systems in a facility provides water agencies with an effective multi-barrier system.

This material has been prepared as an educational tool by the American Membrane Technology Association (AMTA). It is designed for dissemination to the public to further the understanding of the contribution that membrane water treatment technologies can make toward improving the quality of water supplies in the US and throughout the world.

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