On-Site Chlorine Production

Luke Simpson, Associate Editor

EST's M-series generator.

At the end of 2009, Clorox changed the way it produced its bleach products as a response to proposed legislation aimed at reducing the transport and storage of chlorine. The Chemical Facility Anti-Terrorism Standards (CFATS) bill and the push for inherently safer technologies (ISTs) made Clorox and a number of other companies rethink the way that they manufacture, store and transport the chemicals of concern targeted in the bill.

ISTs have not been widely embraced by chemical manufacturers, due in part to the idea that the use of such technologies cannot be measured by regulators, and therefore, cannot be properly enforced. It is also now apparent that the solutions available to one facility are not always appropriate for another, resulting in a lack of clear guidelines and cohesive solutions. A bill to update and re-authorize CFATS is currently being revised by Congress, with the latest version dropping a mandate for ISTs.

Generating Solutions

Among all the politics and industry resistance, one company has found a way to bypass the need for large-scale production and transport of disinfectant chemicals

through the use of on-site chemical generation equipment: Electrolytic Technologies Corp.'s (ETC) on-site Klorigen generators produce chlorine, sodium hydroxide and sodium hypochlorite through the electrolysis of brine and the use of membrane systems.

The M-series generator is designed for remote locations where the transport and installation of large pieces of equipment is an issue. The system's capacity is 200 pounds per day of equivalent chlorine as either elemental chlorine gas or liquid bleach. It also has a SCADA-compatible touch-screen PLC that allows for remote monitoring and control.

The larger K-series generators use modular components to produce up to 2,500 pounds per day of chlorine gas, 2,000 pounds per day of membrane-grade sodium hydroxide at 15 percent concentration, or 2,500 pounds per day of sodium hypochlorite at 12 percent concentration. Its electrolyzer is a partitioned cell using an ion-selective Nafion® membrane with coated titanium DSA® electrodes.

EST's K-series generator.

There is a noticeable difference in performance between the two units, with the M-series generators using two pounds of salt and 2.5 kWh DC per pound of chlorine produced, while the K-series uses only 1.65 pounds of salt and 1.75 kWh AC to produce the same amount.

ETC originally recognized a need for secure chlorine production after the chemical was used in a terrorist attack against local residents in Iraq. It is therefore fitting

that the technology recently became a qualified anti-terrorism technology under the Support Anti-Terrorism by Fostering Effective Technologies (SAFETY) Act, recognized by the U.S. Department of Homeland security.