



Eaton Filters Answer the Call

Location Details:

Frederick, Maryland

Segment Details:

U.S. Department of Defense

Problem:

Filter shower water for reuse in desert conditions

Solution:

Eaton filtration systems

Results:

Improved shower water quality

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"The Shower Water Reuse Systems with the Eaton filters are currently in operation in Afghanistan saving money for the military through reuse and saving lives through the reduced demand for trucked water, which carries the inherent risk of an improvised explosive device attack or some other act of terrorism."

Rich Riddle, Director of Advanced Systems

Background

Through its more than 40-year history, Global Defense Technology & Systems, Inc., (GTEC) has been providing mission-critical, technology-based systems, solutions and services for national security agencies and other programs of the United States government. Recently the company secured a contract with the U.S. Department of Defense to provide the U.S. Army with important support systems in the recycling of water for troops based in Afghanistan.

As part of that contract, GTEC is delivering Expeditionary Tricon Systems that incorporate the latest advances in approved Shower Water Reuse Systems. Designed to support the Army's need in Afghanistan, the systems are rapidly deployable, lightweight, rugged, easily transportable, and require a minimal set-up time of roughly 45 minutes.

Challenges

In order to be fully effective, the GTEC systems required a filtration set-up that is affordable, efficient, easily maintained and fully capable of meeting the rugged demands of an active combat base. To help ensure that all of these requirements were met, GTEC tested different filtration technologies for more than five years, including systems that required labor-intensive manual cleaning.

"The need for a self-cleaning filter was determined early in the design of the overall system," says Rich Riddle, GTEC's Director of Advanced Systems. "In this application, hair removal from the waste stream was a primary challenge that would need to be handled by the filter, which needed to serve as a pre-filter upstream of a micro-filter."



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He added that not only did the ultimate challenge for the filtration set-up require the removal of large quantities of human hair, but it also required the removal of large quantities of horsehair. To best accomplish this, GTEC engineers discovered after initial testing that a 15-micron, wedge wire type filter media was needed.

Solution

Eaton's DCF-800 mechanically cleaned filter was eventually selected to meet these challenges.

Eaton's mechanically cleaned filters are believed to be one of the most efficient mechanically cleaned filters on the market. Operating at a consistently low differential pressure, the DCF filters eliminate disposable filter bags and cartridges, reduce operator handling, and are virtually maintenance-free with near 100 percent uptime.

"Since the Shower Water Reuse Systems are designed for a very high recovery for reuse, Eaton's DCF filter with mechanical cleaning of the filter media was selected," adds Riddle.

Eaton worked with the GTEC design team to confirm the selection of the DCF filter, and also to provide a specialized stainless steel support base welded to the filter. This was important to satisfy a GTEC approach that called for the integration of the filter within the available confined space.

Results

The initial testing was conducted using a synthetic shower water substitute that purposefully far exceeded actual shower waste. In these testing conditions, the removal of waste with the Eaton DCF filter was essentially 100 percent.

"The cleaning cycle was also shortened somewhat and the pressure drop stayed within our required limit," reports Riddle.

He adds that the Shower Water Reuse Systems and Eaton's filter had no problems with actual shower wastewater when tested at the Fort Dix U.S. Army Installation in New Jersey. Additionally, during testing at the U.S. Army Aberdeen Test Center in Maryland, there were no problems with road shock and vibration or with the temperature extremes that military equipment must withstand.

Deliveries of the systems began in late 2010 and will continue through 2011.

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