



Blue Grass Chemical Agent-Destruction Pilot Plant

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# How the Static Detonation Chamber Will Augment the Blue Grass Chemical Agent-Destruction Pilot Plant

The Blue Grass Chemical Agent-Destruction Pilot Plant, or BGCAPP, is being built to safely and efficiently destroy the chemical weapons stockpile currently in storage at the Blue Grass Army Depot. A two-step technology, neutralization followed by supercritical water oxidation (SCWO), will destroy a majority of the chemical weapons. However, the use of an explosive destruction technology (EDT) is necessary to destroy a portion of the inventory of chemical munitions that present a problem to process in the main plant. The EDT chosen to augment the pilot plant is the Static Detonation Chamber (SDC).

**Q: What technology will be used at BGCAPP to destroy the chemical weapons?**

**A: The main plant will use neutralization followed by SCWO.**

During the neutralization process, munitions will be taken apart and the chemical agent drained and separated from the weapons' explosive components (energetics). The chemical agent will be mixed vigorously with hot water and sodium hydroxide to destroy, or neutralize, it. The energetics will be neutralized in a similar process. The resulting byproducts, known as hydrolysates, will be held and tested to ensure chemical agent destruction before proceeding to secondary treatment.

The agent and energetic hydrolysates will be fed to the SCWO units to destroy the organic materials. SCWO will subject the hydrolysates to very high temperatures and pressures, breaking them down into carbon dioxide, water and salts.

**Q: What technology will be used by the SDC?**

**A: The SDC will use thermal destruction.**

The SDC uses the heat of the electrically heated containment vessel to detonate the munition and destroy the agent and energetics. Chemical munitions are placed in a feed tray, conveyed to the top of the SDC vessel and fed into the electrically heated detonation chamber. The high heat (approximately 600 degrees Celsius or 1,100 degrees Fahrenheit) detonates the munition, and the chemical agents and energetics are destroyed by thermal decomposition. Gases generated as a result of the detonation are treated by an off-gas system that includes a thermal oxidizer, scrubbers and a carbon filter system.

**Q: Why is the use of the SDC necessary?**

**A: It is needed to destroy the mustard projectiles that pose a problem to process in the main plant.**

A 2011 X-ray assessment of the Blue Grass chemical weapons stockpile confirmed the solidification of mustard agent in a significant number of 155mm mustard projectiles, rendering them unsuitable for automated processing in the main plant. These problematic munitions, together with some 200 mustard projectiles that have leaked in the past and are now overpacked, require a different technological approach for their destruction. To resolve this issue, the SDC will be used to destroy the inventory of 15,492 mustard projectiles, as well as two 3-gallon Department of Transportation bottles containing mustard agent.