

## Chemical Demilitarization Program – Assembled Chemical Weapons Alternatives (ACWA)

### Executive Summary

- Operational testing of Chemical Demilitarization systems in FY19 demonstrated the effective, suitable, and secure destruction of chemical warfare material.
- The Army conducted operational testing at the Pueblo Chemical Agent-Destruction Pilot Plant (PCAPP) and at the Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP) in FY19.
- Disposal operations have destroyed over 90 percent of the declared U.S. chemical stockpile and is progressing to meet the Chemical Weapons Treaty deadline of December 31, 2023, in accordance with Public Law 114-92.
- As of September 30, 2019, PCAPP has destroyed 170,217 155-mm projectiles and BGCAPP has destroyed 1,275 155-mm projectiles of their respective declared chemical weapons stockpiles.

### System

- The Chemical Demilitarization Program involves the destruction of lethal chemical agents, chemical munitions, and chemical warfare material.
- The PCAPP main plant facility in Pueblo, Colorado, started destruction operations while the BGCAPP main plant facility in Richmond, Kentucky, was preparing for operations. These facilities employ chemical neutralization of agents followed by post-treatment of the neutralized waste products.
- The PCAPP main plant is a first-of-a-kind facility designed to destroy the chemical blister agent mustard stored in 155-mm projectiles, 105-mm projectiles, and 4.2-inch mortar rounds through the use of a low-temperature, low-pressure neutralization process. PCAPP processes the neutralized agent (hydrolysate) using biotreatment.
- The BGCAPP main plant is a first-of-a-kind facility designed to destroy chemical nerve agents Sarin and VX stored in 155-mm projectiles, 8-inch projectiles, M55 rockets, and M56 rocket warheads using a chemical (caustic) neutralization process. BGCAPP will process hydrolysate using supercritical water oxidation (SCWO) technology.



- The Assembled Chemical Weapons Alternatives (ACWA) uses explosive destruction technology for problematic chemical munitions that are not easily processed in the main plant. The two types of systems available for use are the Explosive Destruction System (EDS) and Static Detonation Chamber (SDC).

### Mission

The United States is using the Chemical Demilitarization Program to comply with the Chemical Weapons Convention. The United States signed an arms control and nonproliferation treaty that requires the destruction of declared stockpile of lethal chemical agents, chemical munitions, and chemical warfare material. ACWA performs a portion of the chemical demilitarization program mission to safely destroy the assembled chemical weapons stockpiles in Colorado and Kentucky.

### Major Contractors

- Chemical Materials Activity – Aberdeen, Maryland
- ACWA sites:
  - PCAPP: Bechtel National Inc. – Reston, Virginia
  - BGCAPP:
    - Bechtel National, Inc. – Reston, Virginia
    - Parsons Infrastructure and Technology Group Inc. – Pasadena, California

### Activity

- The Chemical Demilitarization Program is not a traditional acquisition program. DOT&E oversight began in 1999 when Congress directed that the DOD oversee this program as a separate major defense acquisition program due to cost and schedule overruns.
- As of September 2019, the Chemical Demilitarization Program has destroyed over 90 percent of the total U.S. chemical weapons stockpile (originally 31,498 agent tons).
- Operational testing at PCAPP began in FY16 and at BGCAPP in FY19. The Army is conducting operational

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tests in accordance with DOT&E-approved test plans. DOT&E approved the PCAPP Main Plant Test Plan on April 26, 2016, and the BGCAPP SDC test plan on April 30, 2019.

- The systems' contractors at BGCAPP successfully conducted an Initial Operations Demonstration in May 2019, which demonstrated the readiness of the SDC for operations and allowed the start of operational testing in June 2019.
- The Army conducted a Cooperative Vulnerability and Penetration Assessment and an Adversarial Assessment on the industrial control system and laboratory information system at PCAPP in FY16 and at BGCAPP in FY19. DOT&E observed all cybersecurity assessment activities. The Program Executive Office and the systems' contractors committed to remediating all defects prior to the start of operations of each agent destruction system.

## Assessment

- The T&E program for chemical demilitarization consists of two phases:
  - The developmental testing phase consists of system and subsystem component testing without a chemical agent culminating in end-to-end operations of the facility.
  - The operational testing phase consists of pilot testing that involves ramp-up operations with a chemical agent and campaign startup/changeover testing, as needed. Operational testing concludes with a Full-Rate Operational Review and a decision to proceed to full operational status for the specific agent/munitions campaign. After the completion of each campaign, the facility reverts to operational test status for changeover to the next planned campaign and continues until completion of the Full-Rate Operational Review. This process repeats until the destruction of all agent/munitions configurations in the site's stockpile is complete.

- Army testing of demilitarization systems in the Chemical Demilitarization Program has been adequate to ensure the safe and secure disposal of chemical warfare material. Fully integrated operational demonstrations that confirm all phases of operations (including preparation, destruction/neutralization, and disposal) remain critical prerequisites for transitioning to operational testing with chemical agents.
- Disposal operations of the declared U.S. chemical stockpile is progressing to meet the Chemical Weapons Treaty deadline of December 31, 2023, in accordance with Public Law 114-92.
- Since the start of the present campaign, PCAPP has safely destroyed over 50 percent of the declared stockpile of 155-mm projectiles during the current campaign.
- Operational pilot testing for the SDC began in June 2019, which initiated destruction operations using the SDC at BGCAPP. DOT&E is monitoring the pilot testing and operations.
- Cybersecurity testing at BGCAPP identified technical and physical security vulnerabilities, which have been remediated. PCAPP is currently fielding the same version of the SDC that is in use at BGCAPP. The PCAPP SDCs will benefit from the implementation of lessons learned from PCAPP.
- The EDS safely destroyed nearly 1,000 problematic mustard-filled chemical munitions from March 2015 through December 2018 at PCAPP in accordance with the DOT&E-approved test plan.

## Recommendation

1. The Program Executive Officer for ACWA should implement developmental and operational testing and cybersecurity lessons learned from the SDC at BGCAPP for the new SDC units installed at PCAPP.