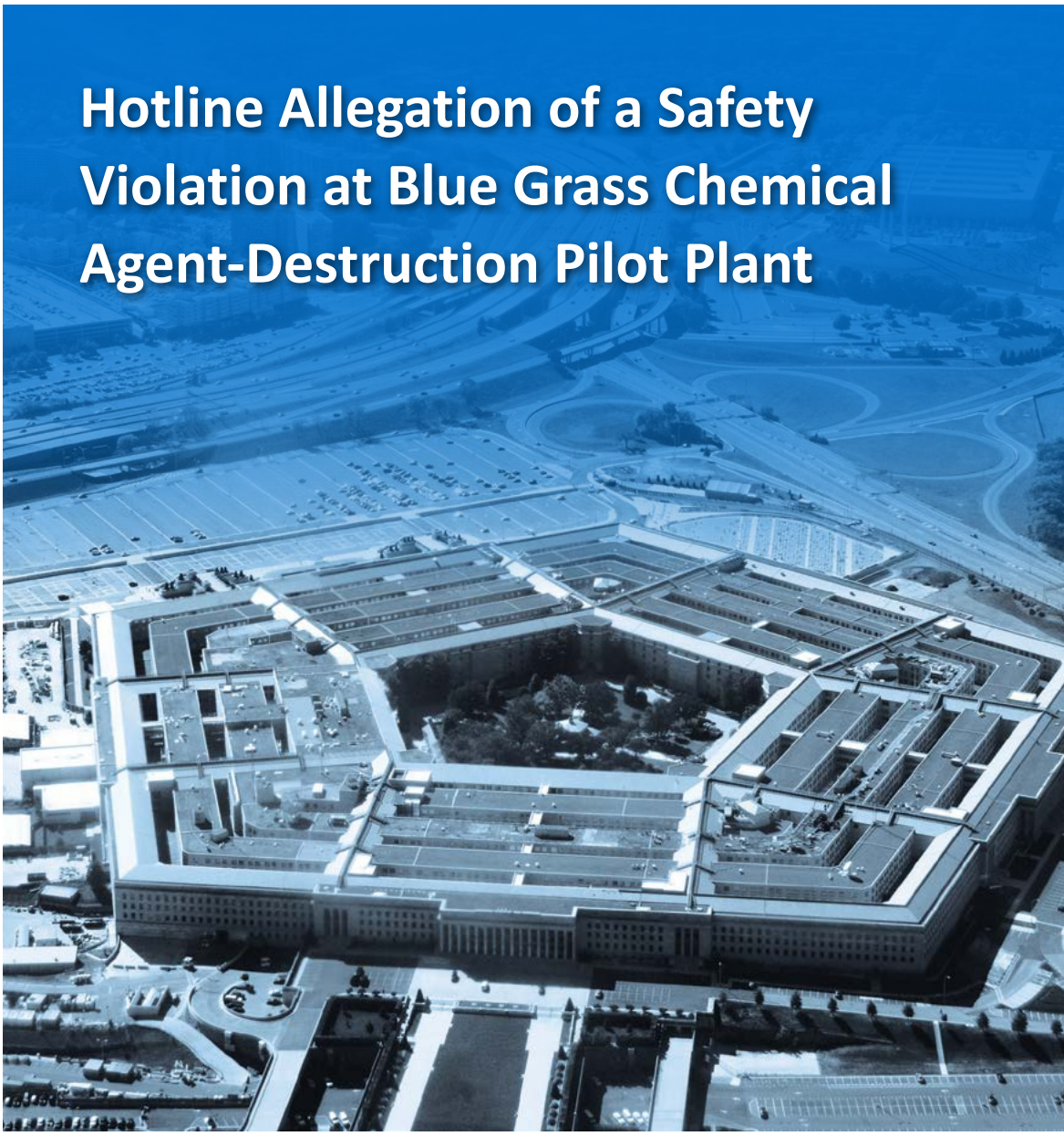
Report No. DODIG-2018-118

INSPECTOR GENERAL

U.S. Department of Defense

MAY 17, 2018

Hotline Allegation of a Safety Violation at Blue Grass Chemical Agent-Destruction Pilot Plant



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Results in Brief

Hotline Allegation of a Safety Violation at Blue Grass Chemical Agent-Destruction Pilot Plant

May 17, 2018

Objective

We conducted this evaluation to determine whether the Program Executive Office (PEO) for Assembled Chemical Weapons Alternatives (ACWA) complied with safety standards at the Blue Grass Army Depot (BGAD) in Richmond, Kentucky. Specifically, we evaluated an allegation to the Defense Hotline that the PEO ACWA did not correctly define the hazardous area that surrounds the Explosive Destruction Technology (EDT) facility.

Background

The PEO ACWA is responsible for managing the destruction of chemical weapons stockpiled at the BGAD. Bechtel Parsons, Inc. is the primary contractor for designing, constructing, and operating the BGAD Blue Grass Chemical Agent Destruction Pilot Plant (BGCAPP). The contract directed Bechtel Parsons, Inc. to destroy the stockpile of mustard H chemical weapons stored at the BGAD in accordance with Federal, State, and local laws, codes, and regulations. Bechtel Parsons, Inc. uses EDT as the approved chemical weapon destruction method. The EDT facility is a section of the BGCAPP that has a building for destroying chemical weapons.

Background (cont'd)

DoD Manual 6055.09-M, Volume 6, "Ammunition and Explosives Safety Standards: Contingency Operations, Toxic Chemical Munitions and Agents, and Risk-Based Siting," February 28, 2009, Incorporating Change 2, December 18, 2017, identifies safety standards for protecting personnel and the general public from harmful effects of toxic chemical agents. DoD Manual 6055.09-M requires that a hazardous area be determined based on the chemical and explosive properties of the weapon.

Finding

We determined that the PEO ACWA correctly defined the EDT facility's hazardous area. Although the Bechtel Parsons, Inc. contract directed Bechtel Parsons, Inc. to destroy the stockpile of mustard H chemical weapons at the BGAD, the PEO ACWA used mustard HD when it determined the EDT facility's hazardous area.

DoD Manual 6055.09-M, volume 6, establishes identical safety standards for H and HD due to their similar chemical properties. Therefore, the EDT facility's hazardous area is the same for H and HD. As a result, we did not substantiate the allegation.

Management Comments

We provided a draft report to PEO ACWA for review and comment. We considered management comments to the draft of this report and included where appropriate when preparing the final report.


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May 17, 2018

MEMORANDUM FOR UNDER SECRETARY OF DEFENSE FOR ACQUISITION,
AND SUSTAINMENT
AUDITOR GENERAL, DEPARTMENT OF THE ARMY
DIRECTOR, PROGRAM EXECUTIVE OFFICE FOR ASSEMBLED
CHEMICAL WEAPONS ALTERNATIVES

SUBJECT: Hotline Allegation of a Safety Violation at Blue Grass Chemical Agent-Destruction Pilot Plant (Report No. DODIG-2018-118)

We are providing this report for your information and use. We conducted this evaluation in accordance with the "Quality Standards for Inspections and Evaluations," published in January 2012 by the Council of the Inspectors General on Integrity and Efficiency.

We appreciate the cooperation and assistance received during the evaluation. Please direct questions to Timothy Lamb at (703) 604-9150 (DSN 664-9150).

Randolph R. Stone
Deputy Inspector General
Policy and Oversight

Contents

Introduction

Objective

We conducted this evaluation to determine whether the Program Executive Office (PEO) for Assembled Chemical Weapons Alternatives (ACWA) complied with safety standards at the Blue Grass Army Depot (BGAD) in Richmond, Kentucky. Specifically, we evaluated an allegation to the Defense Hotline that the PEO ACWA did not correctly define the hazardous area that surrounds the Explosive Destruction Technology (EDT) facility.

See the Appendix for a discussion of the scope and methodology and prior coverage relating to this evaluation.

Background

ACWA Program Authorization and Responsibility

The Department of Defense Authorization Act of 1986 directed the Secretary of Defense (SECDEF) to destroy the U.S. Army's existing stockpile of chemical weapons. The Act also required the SECDEF to provide the maximum protection to the environment during any chemical weapons destruction. As a result of the Act, the DoD established the PEO ACWA and tasked it to destroy stockpiled chemical weapons safely.[1]

The PEO ACWA is located at Aberdeen Proving Ground, Maryland, and is responsible for decommissioning assembled chemical weapons at BGAD. A chemical weapon is a projectile that releases liquid chemical agent into the air as a vapor or fine mist when the projectile explodes.

Bechtel Parsons, Inc. Contract

In June 2003, the PEO ACWA contracted with Bechtel Parsons, Inc. to design, construct, operate, and eventually deconstruct a facility for destroying chemical weapons. The contract also directed Bechtel Parsons, Inc. to destroy the stockpile of mustard H chemical weapons stored at the BGAD in accordance with Federal, State, and local laws, codes, and regulations.

Bechtel Parsons, Inc. designed and built the EDT facility to destroy chemical weapons filled with mustard H. The EDT facility is a section of the BGCAPP that has a building for destroying the H weapons, three support buildings, a temporary weapons storage building, and a backup generator enclosure. The building used

[1] In June of 2003, the PEO ACWA changed its name from Assembled Chemical Weapons Assessment to Assembled Chemical Weapons Alternatives.

for destroying the H weapons is the EDT Enclosure Building. The EDT Enclosure Building contains a Static Detonation Chamber (SDC). The SDC is a sealed chamber system that destroys the chemical weapons and allows the metal parts of the weapons to be recycled appropriately.

SDC Destruction Process

The SDC is a self-contained, heated explosive and chemical agent destruction unit that destroys H weapons using a two-step process. The first step is neutralization, which is a mechanical process that separates the shell, the explosives, and the chemical agent components of the weapon. Once the weapon is separated, the second step uses water at an extremely high temperature and high pressure to break the mustard agent down into water, carbon dioxide, and salt.[2] The second step of the process also cleans the remaining parts of the weapon to allow the metal pieces to be recycled.

Maximum Credible Event

The destruction of chemical weapons is a hazardous operation that could result in a Maximum Credible Event (MCE). An MCE is a potential explosion, fire, or release of chemicals in a worst case, single event that would likely occur based on defined amounts of chemicals, ammunition, and explosives.[3] In the event of an MCE, the area surrounding the EDT facility becomes hazardous. After an MCE, personnel must wear Personal Protective Equipment in the EDT facility's hazardous area to prevent injury or death that could result from entering the area.

Establishing a Hazardous Area

DoD Manual 6055.09-M, Volume 6, "Ammunition and Explosives Safety Standards: Contingency Operations, Toxic Chemical Munitions and Agents, and Risk-Based Siting," February 28, 2009, Incorporating Change 2, December 18, 2017, identifies safety standards for protecting personnel and the general public from the harmful effects of toxic chemical agents.[4] DoD Manual 6055.09-M requires that a hazardous area be determined based on the worst possible MCE. Personnel working inside this area would be required to wear Personal Protective Equipment following an MCE. If a hazardous area is not properly defined, unprotected personnel could enter the area and be at risk of injury or death.

[2] This process is known as Super Critical Water Oxidation.

[3] Department of the Army Pamphlet (DA PAM) 385-65, "Explosive and Chemical Site Plan Development and Submission," July 20, 2009.

[4] DoD 6055.09-M was updated on December 18, 2017, to incorporate changes. However, the standards related to defining hazardous areas were the same.

Mustard Agent H and HD

Mustard H and mustard HD are variations of the same mustard agent. The chemical properties of these mustard agents are nearly identical. In fact, DoD Manual 6055.09-M, volume 6, identifies mustard H and mustard HD as "H/HD." It does not distinguish between the two and establishes the same safety standards for both. H and HD are both extremely harmful to human health and cause eye, skin, and lung irritation. Prolonged exposure to these agents could cause blindness, lung damage, and death.

Finding

PEO ACWA Correctly Defined the EDT Facility's Hazardous Area

We determined that the PEO ACWA correctly defined the EDT facility's hazardous area. Although the Bechtel Parsons, Inc. contract directed Bechtel Parsons, Inc. to destroy the stockpile of mustard H chemical weapons at the BGAD, the PEO ACWA used mustard HD when it determined the EDT facility's hazardous area.

DoD Manual 6055.09-M, volume 6, establishes identical safety standards for both H and HD due to their similar chemical properties. Therefore, the EDT facility's hazardous area would be the same for H and HD. As a result, we did not substantiate the allegation.

Allegation

We evaluated an allegation to the Defense Hotline that the PEO ACWA did not correctly define the hazardous area that surrounds the EDT facility.

EDT Facility's Hazardous Area

Bechtel Parsons, Inc. operates the EDT facility at BGCAPP for the destruction of chemical weapons with mustard agent H. The destruction of chemical weapons is a hazardous operation that could result in an MCE. An MCE is a potential explosion, fire, or release of chemicals in a worst case, single-event that would likely occur based on defined amounts of chemicals, ammunition, and explosives. In the event of an MCE, the area surrounding the EDT facility becomes hazardous due chemicals and toxins. After an MCE, personnel must wear personal protective equipment in the EDT facility's hazardous area to prevent injury or death.

PEO ACWA's Computer-Based Modeling Used HD Instead of H

We reviewed both the "Explosive Destruction Technology (EDT) Preliminary Site Plan Safety Submission," December 12, 2013, and the "Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP) Static Detonation Chamber (SDC) Chemical Site Plan Submission," October 4, 2016, and determined that the PEO ACWA used chemical agent mustard HD to define the hazardous area surrounding the EDT facility. Furthermore, we reviewed the computer-based modeling that the PEO used to determine the MCE for the EDT hazardous area and found that it used HD. However, the Bechtel Parsons, Inc. contract specifies the destruction of H at the EDT.

The PEO ACWA used HD instead of H in the computer-modeling program to determine the MCE and the size of the hazardous area. DoD Manual 6055.09-M, volume 6, establishes identical safety standards for H and HD due to their similar chemical properties. Therefore, we determined that the results of the computer-based modeling for the hazardous area surrounding the EDT facility would be the same.

Discussions Regarding the Use of H and HD

We spoke with the PEO ACWA chemical weapon agent subject matter expert and he told us that the computer-based modeling accounts for the highest possible risk associated with a potential MCE. He also told us that there is no significant difference between HD and H; HD is "simply more pure" than H. We also spoke with the PEO ACWA BGAD site manager and he told us that the PEO ACWA used HD in the computer modeling because the DoD does not distinguish between H and HD.

In addition, we spoke with an independent DoD chemical weapon subject matter expert who confirmed that the DoD does not differentiate between HD and H because the chemical properties of HD and H are nearly identical.[5]

Summary

The Bechtel Parsons, Inc. contract specifies the destruction of H at the EDT facility. The PEO ACWA used HD instead of H in the computer-based modeling to determine the MCE and the EDT facility's hazardous area. The chemical properties of H and HD are nearly identical and the DoD Manual 6055.09-M, volume 6, establishes the same safety standards for both H and HD. Therefore, we determined that the hazardous area surrounding the EDT facility would be the same regardless of the use of H or HD. As a result, we did not substantiate the allegation.

[5] The subject matter expert worked for the DoD Explosives Safety Review Board and was not an employee of PEO ACWA.

Appendix

Scope and Methodology

We conducted this evaluation from July 2017 through May 2018 in accordance with the "Quality Standards for Inspection and Evaluation," published in January 2012 by the Council of the Inspectors General on Integrity and Efficiency. Those standards require that we adequately plan the evaluation to ensure that objectives are met and that we perform the evaluation to obtain sufficient, competent, and relevant evidence to support the findings, conclusions, and recommendations. We believe that the evidence obtained was sufficient, competent, and relevant to lead a reasonable person to sustain the findings, conclusions, and recommendations.

We reviewed required regulations, standards, and codes and appropriate contract and design documentation. We interviewed the complainant, PEO ACWA personnel, and Bechtel Parsons, Inc. employees. We also performed a site visit to the EDT area of the BGCAPP facility in Richmond, Kentucky, to visually inspect and verify the facility's conformance to required codes and regulations.

Use of Computer-Processed Data

We did not use computer-processed data to perform this evaluation. However, we reviewed data processed on a computer to model information.

Use of Technical Assistance

We used subject matter experts including a chemical engineer, quality assurance engineer, and quality assurance specialists.

Prior Coverage

During the previous 5 years, the DoD OIG issued one report about the PEO ACWA Program. Unrestricted DoD OIG reports can be accessed at http://www.dodig.mil/pubs/index.cfm

DoD OIG

Report No. DODIG-2018-076, "Chemical Demilitarizaton – Assembled Chemical Weapons Alternatives Program," February, 22, 2018

> We determined whether the PEO ACWA, the executive agent, effectively managed program cost, schedule, and performance for the ACWA Program.

Acronyms and Abbreviations

ACWA	Assembled Chemical Weapons Alternatives
BGAD	Blue Grass Army Depot
BGCAPP	Blue Grass Chemical Agent-Destruction Pilot Plant
DA PAM	Department of the Army Pamphlet
EDT	Explosive Destruction Technology
MCE	Maximum Credible Event
PEO	Program Executive Office/Officer
SDC	Static Detonation Chamber
SECDEF	Secretary of Defense

Glossary

Bechtel Parsons, Inc. Contractor designated to destroy chemical munitions at the BGCAPP, Blue Grass Army Depot, Richmond, Kentucky.

BGAD. U.S. Army depot located in Richmond, KY that temporarily stores chemical weapons.

BGCAPP. Chemical weapons destruction plant designed, constructed, and operated to destroy all chemical weapons temporarily stored at BGAD.

EDT. The technology developed to destroy mustard agent (H) by thermal oxidation as opposed to incineration.

MCE. In hazards evaluation, the MCE from a hypothesized accidental explosion, fire, or agent release is the worst single event that is likely to occur from a given quantity and disposition of AE. The event must be realistic, with a reasonable probability of occurrence considering the explosion propagation, burning rate characteristics, and physical protection given to the items involved.

Mustard Agent. Chemicals that severely blister the eyes, respiratory tract, and skin on contact. The term "mustard gas" usually refers to this variety of sulfur mustard. It can be in the form of Mustard Agent (H) or Mustard Agent (HD).

SDC. An 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.

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