

205 H3

Non-Lethal Technologies Concept Abstract

- 1. **Title:** Contaminant Aerosol Munitions
- 2. **Type Effort:** Science and Technology
- 3. **Proposed by:** Defense Nuclear Agency
- 4. **Capability Sought and Uses to Which It Could be Put:**

This effort is intended to develop the capability to destroy, damage, disrupt or degrade the operation of electrical and/or mechanical systems inside target facilities with non-lethal effects on occupants. The proposed concept releases airborne contaminant aerosols from a penetrating munition within a targeted facility.

DNA is currently conducting a hard target functional vulnerability program which includes evaluation of contaminants as a means to obtain improved lethality of targeted facilities through functional kills. Many of the contaminant materials are non-lethal. While the DNA program has focused on C3I and weapons of mass destruction-related targets, contaminant aerosols might be employed against virtually any target containing electrical or mechanical systems in scenarios covering the spectrum from traditional warfare to peacekeeping.

Attacks utilizing contaminant aerosol munitions might also minimizing the cost of facility reconstruction, or enable selective targeting of specific equipment components throughout a facility.

5. **Technical Description:**

Contaminants are released from penetrating munitions as aerosols within targeted facilities. Airborne contaminant aerosols are transported throughout a facility by forced air ventilation systems and/or by natural diffusion through any air pathways which may be available.

Contaminant materials act on electronics by shorting exposed connectors or by reacting with or corroding insulator materials. Components of mechanical systems such as seals may also be vulnerable to contaminants. The proposed research addresses electronics as targets for non-lethal disablement by contaminants.

a. **Objectives:**

- (1) Determine the vulnerability of materials found in potential targets to contaminants
- (2) Determine damage levels achievable and whether levels are sufficient to disable equipment

Contaminant Aerosol Munitions
 Other

- (3) Identify most effective contaminant(s) and the concentration required
- (4) Determine suitability of contaminants for weaponization

b. Approach:

- (1) Identify materials used in both military and commercial-off-the-shelf (COTS) equipment likely to be found in potential targets
- (2) Identify possible contaminants
- (3) Screen contaminants to identify those capable of degrading materials and determine failure mechanism
- (4) Determine if contaminants are harmful to personnel, at what concentrations and if safe concentrations are effective on materials
- (5) Conduct tests to quantify effectiveness of contaminants, determine dispersal within target facilities and provide a database for developing dispersal and effectiveness models
- (6) Evaluate existing delivery platforms/weapons systems, including man-delivery, to determine suitability for delivery of contaminant payloads

c. Expected Capabilities: Military and COTS electrical equipment such as computers and radios throughout a target facility exposed to contaminants are expected to be rendered permanently inoperable in minutes to hours after exposure. Some mechanical equipment may be susceptible; however, the time required may be greater.

6. Risks and Limitations:

Status of Technology: Initial studies conducted to date indicate that both military and COTS electrical equipment is vulnerable to a wide range of contaminant interactions. Preliminary tests have shown that electrical equipment such as computers can be permanently ruined. Salts such as calcium chloride appear to be especially effective and will be investigated further. Actual damage achieved, the time required and the extent of the damage will vary depending on the type of equipment, the facility or vehicle in which it is housed, and the contaminant ultimately chosen for weaponization.

New Discoveries Needed: None

Operational Limitations: None

Susceptibility to Countermeasures: Low for contaminant released internal to the target facility (such as when a penetrating weapon is used for delivery). Moderate for contaminant released external to the target facility.

7. Project Plan:

- a. Acquire contaminants for initial testing: Jul 94 - Feb 95
- b. Prepare test SOP and obtain approval: Apr 94 - Sep 94

- c. Acquire target materials for initial testing: Jul 94 - May 95
- d. Contaminant screening tests (single room): Aug 94 - Mar 95
- e. Contaminant dispersal tests (multi-room): Apr - Sep 95
- f. Volume, concentration, kinetics analysis: Oct 94 - Mar 95
- g. Warhead design, materials procurement, fabrication, and prototype testing:
Mar 95 - Sep 97
- h. Fabricate warheads for White Sands Missile Range (WSMR) static & live drop
demonstration tests (ACTD): Apr 96 - Mar 97
- i. WSMR demonstration test support: Aug 96 - Sep 98

8. **Project Cost by Fiscal Year:**

FY94: \$263k

FY95: \$250k

FY96: \$600k

FY97: \$800k

FY98: \$425k

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9. **Organization Point of Contact:**

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