

333

PROPOSED NON-LETHAL WEAPON PROJECT

1. TITLE: Depolymerization
2. TYPE REPORT: Exploratory (6.2) & Advanced Development (6.3a)
3. PROPOSED BY: Los Alamos National Laboratory, Dr. John Alexander
4. CAPABILITY SOUGHT AND USES TO WHICH IT COULD BE PUT: Ability to induce chemical breakdown of truck tires and other polymeric components.

This technology would allow for degradation of threat (or undesired) vehicle mobility, or delay/degrade transit of hostile reinforcements and/or escaping threat assets. It is likely to be most useful on a large scale (affecting many vehicles by covering a section of road), but could also be specifically targeted against selected vehicles.

Effect on personnel requires further study and is dependent on final chemical formulations

5. TECHNICAL DESCRIPTION: Depolymerization agents are relatively new catalysts which induce breakdown of the chemical bonds in polymers (e.g., rubber and plastic) resulting in degradation of tires, which would eventually cause their catastrophic failure and immobilization of the affected vehicle. Since they are catalysts, smaller amounts of depolymers should produce the desired effect compared to some other vehicle immobilizing substances.

In addition to depolymer research and development, this effort proposes to examine the system integration options of delivering depolymers from laminar flow nozzle technology (for increased range, accuracy and precise wetting of target surface), and/or from Unmanned Aerial Vehicles (UAVs) / Remotely Piloted Vehicles (RPVs).

6. RISKS AND LIMITATIONS: The technical risk to finding suitable chemicals is moderate to high. The principal limitation lies in finding a suitable means of delivery based on the payload volumes required for effective target area coverage within existing system size and weight constraints. Deployment risk using mines is relatively low but still dependent on required payload volumes. Delivery using artillery will likely require higher precision than conventional tube launched munitions for effective area coverage. UAV delivery depends on availability of these expensive assets for this type of mission.

Other risk factors include environmental impact (if any), susceptibility to weather and road conditions, and formulation of depolymers with acceptable exposure / reaction times critical to mission success (i.e., since vehicles will not stop instantaneously but over some amount of time as the tires fall apart, what amount of time is acceptable) and chemically achievable.

7. PROJECT PLAN: There is no known program for the weaponization of depolymers.

ACTIVITY	START DATE	COMPLETION
Determine best chemical(s)	1QFY94	4QFY94
Develop model(s) to assess operational value	1QFY94	4QFY94
Field test delivery options	1QFY95	4QFY95
Test chemistry on road	3QFY95	4QFY95
Award 6.3a contract		2QFY95
Develop & integrate chemicals	3QFY95	4QFY95
System design, fabrication		

ONR-NEW-096
Depolymerization
Other

333

& test	1QFY96	4QFY96
Determine environmental impact	1QFY96	4QFY96
Complete brassboard for user tests	1QFY97	4QFY97
User field tests	1QFY98	4QFY98

8. PROJECT RAMP COST BY FISCAL YEAR: \$ 0.2M. \$0.3M FY94-95 (6.2) \$4M. \$4M. \$3M. \$2M in FY95-98 respectively. (All unfunded).

9. ORGANIZATION POINT OF CONTACT: John Cline, U.S Army ARDEC, Attn: SMCAR-CCL-CF, Bldg. 65, Picatinny Arsenal, NJ 07806-5001, (201) 724-7924 (voice), (201) 724-3793 (facsimile).