

United States Government

Department of Energy

**memorandum**

Albuquerque Operations Office

DATE: APR 05 1995

REPLY TO WFOMD/STTD/Alvarez, 845-5685  
ATTN OF:

SUBJECT: Freedom of Information Requests 94-241T-A, 93-312-A, 93-313-A, and 93-314-A

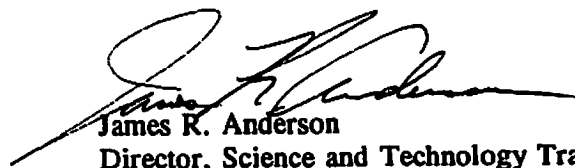
[REDACTED]

The four subject requests were provided to us by on March 7, 1995. A review of our files indicates that only one project falls under the subject requests. The project started in September 1991, and it was transferred to the Los Alamos Area Office (LAAO) for their administration in October 1992. Therefore, for current information pertaining to the project, personnel from LAAO should provide the response.

The following response is based on the file that we kept which includes a classified proposal package which we got from LANL in FY91:

1. FOIA 94-241T-A (Jane Affleck): Attached are two papers prepared by *ble* ;  
(1) Executive Summary, Potential Non-Lethal Policy Issues (12 pages), and (2) Non-Lethal Technology Overlap-Draft (3 pages).
2. FOIA 93-312-A (A. Victorian): As discussed above, the project described above was transferred to LAAO in October 1992; therefore, our response to this FOIA request is negative as we do not have any current information on the project.
3. FOIA 93-313-A (A. Victorian): The proposal which we endorsed to the DOD in August 1991 was sent to a Captain David Carroll, USN, OJCS, J-33, The Pentagon, Room 2C865, Washington, DC 20318-3000. Funding was received in August 1991 from the DOD Washington Headquarters Services, Installation Accounting Division, Room 3B269, The Pentagon, Washington, DC 20301-1155, L. R. Hottot, Cert. Off. Our contacts at LANL included *bo*
4. FOIA 93-314-A (A. Victorian): Again, because of 2. above, our response is negative.

The amount of time was minimal, as follows: 3 hrs. @ \$32/hr = \$96.00.

  
James R. Anderson  
Director, Science and Technology Transfer  
Division

Attachments



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## NON-LETHAL TECHNOLOGY OVERLAP

Questions have been raised concerning which technologies proposed in Non-Lethal Defense Concepts for the DoD have applicability to DOE functions. I believe the question can be addressed two ways. First, there is general applicability of NLD to the strategic weapons program and the vulnerabilities of those systems. In addition, the concepts involving strategic immobilization of countries gives rise to the potential vulnerabilities of our energy generation and distribution systems. Second, there are specific technologies that have clear benefits on both sides.

From a strategic perspective the ability of the United States to protect nuclear assets and to use them to project force could be in jeopardy. In order to preserve our strategic capabilities we need an understanding of the basic science behind all of these potential threats as well as countermeasure development.

Examples of technologies under consideration that could destroy or degrade the systems functioning include:

**Biology:** There might be introduction of microorganisms that inhibit functioning of various components of the system. At risk could be all computers, plastic components, petroleum product employing systems, and other key material.

**Chemistry:** Development of NLD includes superreagents that could rapidly react with critical subcomponents of weapons systems. They have been proven effective against optics and electronics and may provide an ability to dissolve or disrupt functioning of metal, rubber, and plastic materials. Additionally, polymers that attack any air-breathing system are under consideration.

**Information Technology:** While present systems are relatively secure, we believe advanced computer viruses may be developed that can inhibit or alter command and control procedures.

**Electromagnetic:** Directed energy advances generate greater risks to strategic systems. This may be accomplished through disruption of any of the components of the system including, command and control, target acquisition, platform mobility, or the weapon itself.

The second category includes various technologies that have direct applicability to DOE missions. It should be noted that the initial work in NLD came from scientific endeavors resident in DOE, many specifically related to the weapons program. Technologies with DOE and DoD applications might include, but not be limited to:

### Materials:

- The superreagents are a direct spin-off from the superacid work done to reduce actinides. These agents will have applications in the management of radioactive

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waste. We have stressed that a need exists to conduct basic science experiments in order to understand the relationships between very aggressive chemical agents and the universe of substrates on which these agents may be used. The broad basic work has yet to be done.

- Special materials were developed for optical munitions that also expand our capabilities. Additionally much was learned about explosive shock wave mechanics during that project.

- Work in a number of polymer chemistry projects will produce products that tie the need for materials with new capabilities and a better understanding of the field.

- There is also a need for very strong materials. These would be used in entanglement and other weapons systems by DoD and for other applications requiring high strength by DOE.

## Biology:

- Bioremediation is a rapidly expanding field. There is direct applicability of bioremediation to some of the waste problems facing DOE. Bioremediation is now the treatment of choice for oil spills and is being explored as a volumetric reduction technique for the world's waste problem.

- In addition to petroleum products, work in reduction of explosives, plasticizers, and selected metals offer interesting possibilities.

## Information Science:

- The national labs have been at the forefront of code development. The continued development of these codes will play a key role in projects in both agencies.

- Given the level of use of computers in the national labs, it is imperative that we stay ahead of the potential dangers to those systems from unauthorized intrusion. We believe that in the future the simple security measures now protecting our systems will be insufficient. We must understand computer viruses and their countermeasures. Work based on neural nets, fuzzy logic, and other emerging approaches will provide the information necessary to protect systems in both agencies.

## Electromagnetics:

- The non-nuclear high-power microwave program has always had a close tie to the weapons program. In NLD concepts remote pulse power will continue to be important particularly the development power sources.

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- The explosive pulse power system was a product of our previous work in explosively driven magnetic flux compression generators. That work has been support the weapons program for 30 years and is now being transferred for other applications.

- Isotropic radiators present the potential for countering many sophisticated sensors. This is an area of concern for both agencies.

## Acoustics:

- Recent advances in phase-locking acoustic signals may provide a protective system for physical security of weapons complexes and storage areas. These systems may be unmanned and yet be safely employed.

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