

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NEW MEXICO



LOS ALAMO STUDY GROUP and)
CONCERNED CITIZENS FOR NUCLEAR SAFETY,)
)
Plaintiffs)
)
vs.)
)
HAZEL O'LEARY and)
DEPARTMENT OF ENERGY)

No. CIV 94-1306 M

DECLARATION OF J. CARSON MARK

I, J. Carson Mark, hereby declare as follows this 20th day of October, 1995:

I received my doctorate at the University of Toronto. Before coming to Los Alamos, I worked at the Montreal Laboratory where the Chalk River Nuclear Reactor was designed. In May of 1945 I joined the Theoretical Division at Los Alamos, and I became Head of this Division in 1947. I served in this position for the next 26 years until my retirement in 1973. The Theoretical Division designed the Trinity bomb and remained responsible for nuclear weapons design after the war. I served on the U.S. Nuclear Regulatory Commission Advisory Committee on Reactor Safeguards and on the Science Advisory Board of the U.S. Air Force. I remain a resident of Los Alamos.

The following statement is based upon my professional experience as a scientist with 28 years involvement in nuclear weapons design, including experience with the PHERMEX facility, and upon my review of various unclassified descriptions of the proposed DARHT facility.

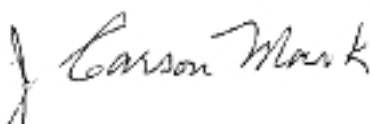
1. A delay in the completion of DARHT for a period of one year or less to allow completion of the Stockpile Stewardship and Management PEIS would not be important to the

safety and reliability of the U.S. nuclear weapons stockpile.

2. The information that hydrodynamic radiographic test facilities such as DARHT have provided in the past has been useful in the design of nuclear weapons, but of little use in assuring the safety and reliability of weapons.

3. DARHT would not be able to directly confirm the safety of any nuclear weapon type because such direct confirmation is only possible by facilitating, and producing, a nuclear explosive yield and precisely measuring that yield. Such experiments would not be feasible or prudent at DARHT or any other above-ground test facility near a populated area.

4. DARHT would not be able to directly confirm the reliability of any current U.S. nuclear weapon design known to me. The fundamental reason for DARHT's (or any other hydrodynamic test facility's) inability to do so arises from the fact that all current U.S. nuclear weapons known to me depend on the principle known as "boosting": that is, the ignition of a mixture of deuterium and tritium gases to greatly increase the nuclear explosive yield of the primary. Without this boosting of the primary's explosive yield, insufficient energy will be produced to ignite the thermonuclear secondary of the weapon. Thus, confirmation of the reliability of the entire weapon requires confirmation of the ignition of the boost gas. This ignition, however, will only occur at energies and nuclear explosive yields which are far beyond those attainable with DARHT or any other hydrodynamic test facility. Further, any tests conducted in an energy regime sufficient to study boost gas ignition could not be prudently conducted above-ground near populated areas.



J. Carson Mark
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