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FEB 24 1956

Honorable Henry M. Jackson
Chairman, Subcommittee on Military Applications
Joint Committee on Atomic Energy
Congress of the United States

Dear Senator Jackson:

During General Starbird's appearance before the Subcommittee on Military Applications of the Joint Committee on January 23, 1956, a discussion took place relative to the testing of live nuclear warheads in the Ding Dong rocket and the Nike B. As requested at the hearing, the following elaboration of testimony is provided relative to the need for the testing of the complete weapons to include nuclear warheads.

In producing a nuclear warhead for a missile, as for a bomb, it is necessary to follow a procedure whereby the weapon is tested in various stages of development so as to insure that it will operate reliably upon completion and be capable of being stockpiled even without a true proof test of the complete warhead-missile system. The procedure followed makes use of extensive laboratory tests and of flight tests to achieve this reliability.

Pre-production test programs can be divided into three phases. In the first phase a laboratory nuclear device is produced and fired to test experimentally the new design principles incorporated. The resulting nuclear system design is usually sufficiently close to the laboratory device design to insure a reliably predicted behavior for the stockpile weapon. In the second phase the non-nuclear components developed for the stockpile version are tested individually in the laboratory. Here, by means of test cells, cold-chambers, vibrators and other environment simulating equipment, the resistance and functioning of these components are examined under conditions more extreme than expected in actual employment. In the third phase all components are assembled and tested as a complete system with the exception that dummy nuclear material and usually dummy high explosives are substituted for the live material. The arming, fusing and firing systems are all sequentially proven in this stage, in

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part through laboratory tests and in part in flying models. Due to the ability of the laboratories to create and test under environmental conditions more extreme than those of controlled flight, the number of flight tests can be held to a minimum.

[redacted] DOE 6.1(a)

[redacted] The firing gave no measurable nuclear reaction. This was, of course, a test to determine the safety of the design to withstand fire or concussion without producing nuclear yield. Laboratory tests of the assembled components are underway and a flight test program of the complete system using simulated HE and nuclear components is scheduled for the near future.

[redacted] DOE 6.1(a)

As you can appreciate, it is essential that we know as accurately as possible the yield of the stockpile model. The attacking aircraft must be able to approach the target as closely as possible if accuracy is to be insured. At the same time, if the yield is greater than expected, it could destroy our attacker as well as the target aircraft.

[redacted] DOE 6.1(a)

I hope that the above information may be sufficient for your needs. Should it not, please call upon us for any additional information you may require.

Sincerely yours,

SIGNED AND DISPATCHED

K. E. Fields
General Manager