

May 26, 1955

Proposal Concerning the Testing of an Experimental System for the Verification of the Casing Design

Citation:

"Proposal Concerning the Testing of an Experimental System for the Verification of the Casing Design", May 26, 1955, Wilson Center Digital Archive, Archive Rosatom, f. 4, op. 10, d. 32, l. 274-282. Document no. 152 in Atomnyi proekt SSSR. Dokumenty i materialy. [The atomic project of the USSR. Documents and materials.], vol. 3, book 2, p. 362. Translated for CWIHP by Ronen Plechnin.
<https://digitalarchive.umd.edu/document/118808>

Summary:

Proposal to develop a test warhead using radiation implosion to induce a thermonuclear reaction. The proposal emphasizes that the device will be compatible with the existing R-7 ICBM delivery system.

Credits:

This document was made possible with support from Carnegie Corporation of New York (CCNY)

Original Language:

Russian

Contents:

Translation - English

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In accordance with the plan set earlier, the primary task during the first half of this year was the construction of an experimental device intended for the verification of the environment principle.

At this time, the decision regarding the construction of the system was taken, and basic calculations about the operation of the system were made.

The proposed system consists of the following components: [redacted] the primary device RDS-4 (. . .).

. Primary device comprised of the following (. . .)

. Pear shaped casing (. . .), in which the main and the primary products will be enclosed.

[redacted]

The expected yield of the explosion will be approximately 1 million tons [of TNT] \pm 40%. (. . .)

For reasons of convenience, the device will be packed inside an aerial bomb, within the dimensions of and with similar weight as the RDS-6DS (5570).

(. . .)

The testing of the proposed device should attest to the principle of radiation implosion, confirming that there are no major problems, and provide the information necessary for the designing of a device that uses the radiation implosion method.

Long-term theoretical work should develop along the following lines: [redacted] designing a device with a yield of 10-25 megatons (midsection diameter up to 2.3 meters, weight up to 25 tons, flow rate of active heavy isotopes up to (. . .) kg, Li6 flow rate up to (. . .) kg). The size and the weight of the product should be specified such that the rocket launcher will be able to carry the load over a distance of about 8,000 kilometers.

. Designing a device within the contours and the weight specifications of the RDS-6SD, which is distinguished from the proposed system by its yield and cost effectiveness, as well as by its applicability for use in the warhead of an R-7 rocket.

[redacted]

In order to complete the construction of this product it would be essential to: [redacted] . .)

(. . .)

. Construct the product in such a way so it could withstand the acceleration necessary for its application to the R-7 system.

[redacted] [redacted]

[redacted]

At this time we decide to proceed with this program, and it will require an overall one year of work.

During the time of designing the experimental device, the following steps were taken:

(. . .)

Iu. Khariton.

A. Sakharov.

Ia. Zel'dovich.