

March 31, 1954

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*Use of an
successful enough
to solve our problem*

Statement by Lewis L. Strauss
Chairman, Atomic Energy Commission

The President has authorized me to make available those portions of my report of yesterday to him, the publication of which would not compromise information vital to our national security.

I have just returned from the Pacific Proving Grounds of the Atomic Energy Commission where I witnessed the second part of a test series of thermonuclear weapons. I will describe it as well as I am able, but perhaps before doing so it would be appropriate to begin with a short summary of the historical background.

We detected the test of an atomic weapon, or device, by the Russians in August of 1949. Realizing that our leadership was therefore challenged and that our sole possession of the weapon which had been a major deterrent to aggression had been cancelled, it became clear that our superiority would thereafter be only relative and dependent upon a quantitative lead -- that is to say, upon our possession of greater numbers of atomic weapons so long as that could be maintained. There was, however, the alternative of a qualitative lead if we could make a weapon of greater force -- greater than the fission weapons by a degree of magnitude comparable to the difference between fission bombs and conventional bombs. A theoretical method of accomplishing this was known to our scientists.

In January 1950 the President directed the Atomic Energy Commission to undertake the necessary steps to see if this weapon, variously called the hydrogen bomb, the Fusion bomb, and the thermonuclear bomb, could in fact be made. As you know, thanks to the ingenuity of those scientists and engineers who devoted themselves to the project, the feasibility of the fusion reaction was demonstrated and a prototype was tested at Eniwetok in November 1952.

This test produced the largest man-made explosion ever witnessed to that date, and from that point we moved into refinement of design and other development. In August of last year the Russians also tested a weapon or device of a yield well beyond the range of regular fission weapons and which derived a part of its force from the fusion of light elements. There is good reason to believe that they had begun work on this weapon substantially before we did.

The present series of tests has been long in the planning. It is conducted jointly by the Atomic Energy Commission and the Department of Defense. A Task Force composed of the three armed services and a scientific staff representing the Commission was established last year in accordance with the procedure successfully followed in preceding tests outside our continental limits. The Navy, Air Force, and Army have successively supplied the command for the Task Forces.

Early this January, men and supplies began to move out to the Proving Grounds for this series. The first shot took place on its scheduled date of March 1, and the second on March 26. Both were successful. No test is made without a definite purpose and a careful determination that it is directed toward an end result of major importance to our military strength and readiness. The results which the scientists at Los Alamos and Livermore had hoped to obtain from these two tests were fully realized, and enormous potential has been added to our military posture by what we have learned.



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It should also be noted that the testing of weapons is important likewise in order to be fully aware of the possible, future, aggressive ability of an enemy for we now fully know that we possess no monopoly of capability in this awesome field.

Now as to this specific test series. The first shot has been variously described as "devastating", "out of control", and with other exaggerated and mistaken characterizations. I would not wish to minimize it. It was a very large blast but at no time was the testing out of control. The misapprehension seems to have arisen due to two facts. First, that the yield was about double that of the calculated estimate -- a margin of error not incompatible with a totally new weapon. (The range of guesses on the first A bomb covered a relatively far wider spectrum.) Second, because of the results of the "fall-out,"

When a large explosion occurs on or within a certain distance of the ground, an amount of earth or water or whatever is beneath the center of the explosion is sucked up into the air. The heavy particles fall out quickly. The lighter ones are borne away in the direction of the wind until they too settle out. If the explosion is a nuclear one, many of these particles are radioactive as are the vaporized parts of the weapon itself.

For this reason the Atomic Energy Commission has conducted the tests of its larger weapons away from the mainland so that the fall-out would occur in the ocean where it would be quickly dissipated both by dilution and by the rapid decay of most of the radioactivity which is of short duration. The Marshall Islands were selected for the site of the first large-scale tests -- Operation Crossroads -- for reasons which will be apparent from the maps which I shall show you. The late Admiral W. H. P. Blandy, under whom I had the privilege of serving, selected the Bikini site.

The Marshall Islands during the months of February, March, and April are usually favored by winds which would blow away from any inhabited atolls. The two atolls of Bikini and Eniwetok were chosen as the base for these operations. Each of these atolls is a large necklace of coral reef surrounding a lagoon two to three hundreds of square miles in area, and at various points on the reef like beads on a string appear a multitude of little islands, some a few score acres in extent -- others no more than sandspits. It is these small, uninhabited, treeless sand bars which are used for the experiments. As a matter of fact, the Task Force dredged up enough sand and coral to build one of these so-called islands to have it where it was wanted most advantageously for shot number one. The impression that an entire atoll or even large islands have been destroyed in these tests is erroneous. It would be more accurate to say a large sandspit or reef.

Before the shot takes place, there is a careful survey of the winds at all elevations up to many thousands of feet. This survey is conducted by weather stations on islands and on fleet units at widely separated points. Contrary to general belief, winds do not blow in only one direction at a given time and place. At various heights above the earth, winds are found to be blowing frequently in opposite directions and at greatly varying speeds. An atomic cloud is therefore sheared by these winds as it rises through them. The meteorologists attempt to forecast the wind direction for the optimum condition and the Task Force Commander thereupon decides on the basis of the weather reports when the test shall be made. The weather forecast is necessarily long-range because a warning area must be searched for shipping and the search which is carried out both visually and by radar in P2V Navy planes requires a day or more to complete.

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The "warning area" is an area surrounding the proving grounds within which it is determined that a hazard to shipping or aviation exists. We have established many such areas as have other governments. This map shows such areas off the Pacific Coast at Point Magu, and off the Hawaiian Islands. Here is a large guided missile warning area from Florida across the Bahamas. Here is one maintained by Great Britain off Australia. Including our continental warning areas, we have established a total of 447 such warning and/or danger areas. This particular warning area was first established in 1947. The United Nations were advised and appropriate notices were carried then and subsequently in marine and aviation navigational manuals.

Despite such notices there are many instances where accidents or near accidents have resulted from inadvertent trespass in such warning areas. ~~The very size of them makes it impossible to fence or police them.~~ For the day of shot number one, the meteorologists had predicted a wind condition which should have carried the fall-out to the north of the group of small atolls lying to the east of Bikini. The survey aircraft carefully searched the area and reported no shipping. The shot was fired. The wind failed to follow the predictions but shifted south of that line and the little islands of Rongelap, Rongerik, and Uterik were in the path of the fall-out. A Japanese fishing trawler, the FORTUNATE DRAGON, appears to have been missed by the search but, based on a statement attributed to her skipper, to the effect that he saw the flash of the explosion and heard the concussion six minutes later, it must have been well within the danger area. The 23 crew members on the ship, 28 American personnel manning weather stations on the little islands, and the 236 natives on these islands were therefore within the area of the fall-out. The supposition that the actual blast of the bomb extended over such enormous areas is of course entirely incorrect.

The Task Force Commander promptly evacuated all the people from these islands. They were taken to Kwajalein where we maintained a naval establishment and there placed under continuous and competent medical supervision. I visited them there last week. Since that time, it has been determined that our weather personnel could be returned to duty but are still being kept on Kwajalein for the benefit of further observation. None of the 28 weather personnel have burns. The 236 natives also appeared to me to be well and happy. ~~The exceptions were two sick cases among them; one an aged man in advanced stages of diabetes, the other a very old woman with crippling arthritis. Neither of these cases have any connection with the tests.~~ Today, a full month after the event, the medical staff on Kwajalein have advised us that they anticipate no illness, barring of course disease which might be hereafter contracted. ~~One child has been born in the group and others are expected.~~



The situation with respect to the 23 Japanese fishermen is less certain due to the fact that our people have not yet been permitted by the Japanese authorities to make a proper clinical examination. It is interesting to note, however, that the reports which have recently come through to us indicate that the blood count of these men is comparable to that of our weather station personnel. ~~Skin lesions observed are thought to be due to the chemical activity of the converted material in the coral rather than to radioactivity, since these lesions are said to be already healing.~~ The men are under continual observation by Japanese physicians, and we are represented in Japan by Dr. Morton of the Atomic Bomb Casualty Commission and Mr. Eisenbud of the Atomic Energy Commission.

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With respect to the stories concerning widespread contamination of tuna and other fish as the result of the tests, the facts do not confirm them. The only contaminated fish discovered were those in the open hold of the Japanese trawler, Commissioner Crawford of the U. S. Food and Drug Administration has advised us: "Our inspectors found no instance of radioactivity in any shipments of fish from Pacific waters. Inspections were undertaken as a purely precautionary measure. . . . There is no occasion here for public apprehension about this type of contamination." I should perhaps note that in the waters around Bikini and Eniwetok at certain seasons of the year, almost all fish caught are normally poisonous as a result of feeding on certain seasonally prevalent micro-organisms, and the natives and our Task Force personnel do not eat them at such times.

In the matter of indemnifying the Japanese, our Government has informed the Japanese Government that it is prepared to agree to reimbursement for such financial assistance as the Japanese Government and our Embassy in Tokyo, jointly, may find necessary as an interim measure to give to the persons involved for current medical care and family relief, including wages.

With respect to the apprehension that fall-out radioactivity would move toward Japan on the Japanese Current, I can state that any radioactivity falling into the test area would become harmless within a few miles after being picked up by these currents which move slowly (less than one mile per hour) and would be completely undetectable within 500 miles or less.

With respect to a story which received some currency last week to the effect that there is danger of a fall-out of radioactive material in the United States, it should be noted that after every test we have had and the Russian tests as well there is a small increase in natural "background" radiation in some localities within the continental United States, but, currently, it is less than that observed after some of the previous continental and overseas tests, and far below the levels which could be harmful in any way to human beings, animals, or crops. It will decrease rapidly after the tests until the radiation level has returned approximately to the normal background.

A recent comment which I have been shown has suggested that the incident involving the fall-out on inhabited areas was actually a planned part of the operation. I do not wish to comment on this other than to characterize it as utterly false, irresponsible, and gravely unjust to the men engaged in this patriotic service.

Finally, I would say that one important result of these hydrogen bomb developments has been the enhancement of our military capability to the point where we should soon be more free to increase our emphasis on the peaceful uses of atomic power -- at home and abroad. It will be a tremendous satisfaction to those who have participated in this program that it has hastened that day.



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