

~~SECRET~~
~~SECRET~~

DASALG

SUBJECT: Test to Determine the Scavenging Qualities of Earth

Air Force use, has received general approval within the Air Force, and is of interest to the Canadians. The Air Force wishes to test it both for propagation and for scavenging qualities, and it wishes to test it as soon as possible. It is the Air Force's desire that this be an actual test of operational conditions and it would therefore desire that the explosive charge be actual missiles (MB-1 and GAR). The Air Force offered Wendover as a site for the test and offered either to participate with others or to conduct the test under DASA supervision.

(4) It was the Navy view that both concrete and steel structures, with the basic design of the DASA-proposed structure, should be tested. The Navy preference for concrete apparently stems from certain experiences it has had with steel structures that leak in wet weather, coupled with the fact that the Navy standard keyport magazine is an earth-covered concrete arch and it naturally desires that the test validate this design. The Navy representative stated that since they did not know that structures supported by concrete would behave the same as structures supported by steel where scavenging was concerned, both should be tested. They therefore proposed that a concrete arch magazine and a steel arch magazine, each with two feet of earth cover, be tested and compared. They also proposed that a steel arch magazine with eight feet of earth be tested to provide yet another point on the curve of scavenging versus depth of earth cover.

(5) The ASESB representative voiced a desire to construct two concrete magazines side-by-side with two feet of earth cover, rather than the one magazine with two feet of earth cover proposed by the Navy. This was requested purely to obtain propagation data and had no direct bearing on the scavenging test itself.

(6) The Army representative concurred with the Navy. He reasoned that their principal interest lay with the great number of standard ordnance igloos now in use by the Army, which are of concrete and are covered by two feet of earth. He also felt that the steel structure would be of interest for future construction. Since the Navy proposal covered both of these areas, the Army concurred in it.

(7) It was agreed that all test structures should have an earth berm or barricade in front of the magazine entrance to assist in fire-ball confinement and scavenging.

~~SECRET~~ 2

~~SECRET~~ JA
ATOMIC ENERGY ACT 1954

Declassified WITH DELETIONS by
DNA, Chief, ISTS

[Signature]
DATE 16 SEP 1994

HRE-0789

DNA1.940930.090

~~SECRET~~

DASALG

SUBJECT: Test to Determine the Scavenging Qualities of Earth

(8) In summary, then, the majority of the group considered the following test shots necessary:

- (a) A shot in the open for calibration purposes.
- (b) A shot in one bay of a multibay Air Force design.
- (c) A shot in one bay of a twin-bay concrete-arch igloo with two feet of earth cover.
- (d) A shot in a steel-arch igloo with two feet of earth cover.
- (e) A shot in a steel-arch igloo with eight feet of earth cover.

(9) The DASA representatives voiced the opinion that there would be no measurable difference in the scavenging qualities of a structure designed with a steel arch and one designed with a concrete arch since the only function of the arch is to support the earth cover and since scavenging is attributed to finely divided particulate matter whether it comes from two feet of earth mixed with bits of a ruptured steel arch or two feet of earth mixed with a pulverized concrete arch.

b. Specification of the charge:

(1) The strong Air Force desire to test an operational loading was acceded to by the group, and it was agreed that either four or two MB-1s, with tracer, would be a suitable charge to fire in one bay of the Air Force multibay structure.

(2) It was agreed that the charge in other test structures should represent the worst case that could reasonably be expected to occur, taking into account the composition of the stockpile as it will be in the next few years. In determining this worst case the current Pu storage criteria would be used. It was determined that sufficient Mark 25 spheres to aggregate 2000 pounds of HE and sufficient tracer to reasonably represent [REDACTED] Pu would make an appropriate charge.

~~SECRET~~ 3

RESTRICTION DATA
ATOMIC ENERGY ACT 1954

~~SECRET~~

DASALG

SUBJECT: Test to Determine the Scavenging Qualities of Earth

(3) Since one would normally expect that an accident would be initiated by an accidental explosion in one weapon and not by a simultaneous explosion of the entire igloo full of weapons, it was agreed that the test shots should be initiated by firing one weapon and then firing the others 600 microseconds later. There is experimental data available to indicate that this interval represents the time necessary for propagation of an explosion from one weapon to an associated group of weapons by fragments.

c. Selection of the Service to conduct the test and of the most suitable site for the test:

(1) As previously indicated, the Air Force offered Wendover with virtually no strings attached. The only apparent problems connected with the use of this site are difficulty of access and somewhat unpredictable meteorological conditions late in the year.

(2) Mr. Taton's discussions with NOTS have indicated that they can probably do the tests but that they have some reservation on the use of plutonium. Advantages here are the facility with which tests of this sort can be handled as regards instrumentation, construction, etc., and the ease of access. The Navy representative agreed to obtain definitive answer from NOTS as to whether or not they could undertake a test involving Pu, these answers to be available prior to the 8th.

(3) For planning purposes in determining a suitable range, it was tentatively agreed that a downwind safety distance of 10,000 feet would be needed and a crosswind safety distance of 5,000 feet would be needed.

d. Tracer or active material to be used:

(1) It was tentatively agreed, subject to further discussions with the AEC, that 200 grams of Pu would be an appropriate quantity of active material to be used as a tracer. It was felt that the dispersion resulting from the explosion of a 2000-pound charge would require at least this amount of tracer if instrumentation was to be feasible.

(2) It was tentatively agreed, subject to further discussions with the AEC, that the tracer should be placed in four of the spheres in each charge.

~~SECRET~~

4

~~RESTRICTED DATA~~
ATOMIC ENERGY ACT 1954

~~SECRET~~

DASALG

SUBJECT: Test to Determine the Scavenging Qualities of Earth

e. Requirements relative to instrumentation:

It was agreed that the method of instrumentation would have to wait on more precise determination of the tracer to be used and the conditions that would pertain at the range. Dr. Otting undertook to explore these matters with appropriate laboratory representatives.

f. Time schedule:

(1) As previously indicated, the Air Force is in a great hurry and desires to move directly to a test.

(2) It was agreed that DASA would determine construction time for test structures under average conditions.

(3) A tentative date of mid-August for the test was regarded as reasonable, but by no means firm.

g. Funding:

(1) DASA will estimate the cost of test structures.

(2) Costs of active material, test spheres, instrumentation, etc., will be investigated by Dr. Otting.

h. British participation:

It was fully understood by the group that British participation was virtually inevitable. It was the sense of the meeting, however, that, in so far as the scavenging tests themselves are concerned, the British participation should be held to the minimum compatible with Dr. Johnson's views. The following hazards of British participation were recognized:

(1) Possible insistence by the British that unfavorable test results, should they occur, be rigidly applied as criteria to existing and contemplated construction in the United Kingdom.

~~SECRET~~

5

~~RESTRICTED DATA~~
ATOMIC ENERGY ACT 1954

CONFERENCE ATTENDEES

AEC

Commander Paul Wagner

Army

Mr. James A. Tyler
Colonel George Wigger (Ret.)
Major David T. Baker

ASESB

Colonel Leland McCants
Mr. Russel Perkins

DASA

Dr. William Otting
Colonel Paul Brengle
Colonel Max Tyler
Mr. Karl Taton
Mr. Charles Haney
LtColonel Bentley
LtColonel Charlton
LtColonel Francis Kelly
LtColonel W. S. Mullins

Navy

Commander F. D. Milner
Mr. Herbert Roylance

USAF

Colonel Robert Duff
Mr. James R. Powers
LtColonel ~~James D.~~ Bowen
R.L.

Incl 1

~~SECRET~~

DASAIG

SUBJECT: Test to Determine the Scavenging Qualities of Earth

(2) Unreasonable delays resulting from a
necessity to coordinate test planning with the British.

1 Incl
as

Max C. Tyler

MAX C. TYLER
Colonel, GS
Director of Logistics

~~SECRET~~

6

~~RESTRICTED DATA~~
ATOMIC ENERGY ACT 1954