

MEMORANDUM FROM

This document consists of 28 pages.

Major Rex R. Kiziah, USAF

HQDP010014277



Office of the Assistant to the Secretary of Defense for Atomic Energy Room 3C125, The Pentagon Washington, DC 20301-3050 (703) 697-3575 FAX (703) 697-2199

DERIVATIVE ASSIGNED Jeff Underwood Project Engineer January 31, 1996 [DOE info only]

December 9, 1994

TO: B53 Replacement Working Meeting Attendees

SUBJECT: Summary of B53 Working Meeting of December 6, 1994 (u)

A meeting was held from 0830-1200 on December 6, 1994 at DOE/Germantown to discuss replacement of the B53. A list of the attendees is attached. The purpose of the meeting was to provide and exchange information so that the AF and DOE would have sufficient definition of the replacement weapon requirements to enable development of the best cost and schedule estimates possible by early January 1995. Dr. Freedman, Deputy Assistant Secretary of Defense for Atomic Energy (Nuclear Matters) and Mr. Harry Season, Acting Associate Deputy Assistant Secretary for Military Application and Stockpile Support, made introductory remarks stressing the OSD and DOE commitment to proceed with replacement of the B53 in a timely fashion. Lt Col Mullins, AF/AQQS, presented the options, schedule, and issues of the B53 replacement from the AF perspective (attached). Mr. Ellsworth Rolfs, SA-ALC/NWIW spoke about the information needed to develop the MCs. As a goal, there was agreement that we should use the MCs of the existing B61-7. Mr. Bill Patterson, SNL, presented a design concept for the replacement weapon (attached). An open exchange of viewpoints and constraints among AE, DOE, SNL, LANL, and the AF occurred throughout the meeting. The results are summarized below.

The AF presented the requirements and best cost and schedule estimates available at this time. They adamantly stated that no more information can be provided by the AF until they receive official tasking to work on the replacement of the B53. Official tasking, as viewed by the AF, consists of NWC approval, Congressional notification, and a subsequent letter from Dr. Deutch as DEPSECDEF or Chairman of the NWC to Secretary of the Air Force Widnall. The AF presented the following information:

DEPARTMENT OF ENERGY DECLASSIFICATION REVIEW. DETERMINATION (CIRCLE NUMBER(S)) 1. CLASSIFICATION RETAINED 2. CLASSIFICATION CHANGED TO: 3. CONTAINS NO DOE CLASSIFIED INFO 4. COORDINATE WITH: 5. CLASSIFICATION CANCELLED 6. CLASSIFIED INFO BRACKETED 7. OTHER (SPECIFY): 1ST REVIEW DATE: 4-16-96 AUTHORITY: DAOC DAOC DAOC NAME: R. D. Kahr 2ND REVIEW DATE: 1-6-97 AUTHORITY: ADD NAME: R. D. Kahr

Obtained Under the Freedom of Information Act by Hans M. Kristensen

5 U.S.C. 552(b)(1) (b)(3)

Only the first of the two options presented was deemed viable by the meeting participants because of

SECRET - FORMERLY RESTRICTED DATA

COPY

DERIVATIVE

Attachment II R. D. Kahr, Dir. RP-22

96SA200000061

unacceptable cost and schedule impacts of the second option—estimated schedule and costs of 3 years and \$50 million plus and B-2 flight testing could not begin until the year 2000. The B-2 SPO defines identical properties/interfaces as:

- safe separation and flight characteristics are within the same standard B61-7 parameter volume,
- the data package is identical,
- the Interface Control Document is identical, and
- the aircraft control software is identical.

If these identical property/interface requirements are met by the modified B61-7 replacement weapon, the B-2 SPO has stated "No issue with B-2 integration." For the B61-11, Option 4, the AF proposes to use the B-52 aircraft to demonstrate that the standard B61-7 and the B61-11, Option 4 are identical. Rough order of magnitude cost and schedule estimates for the B-52 flight tests are \$6 million and 6 months, respectively. Some cost reductions may be possible for the flight tests if the program can obtain any "free rides". No B-2/B61-7 flight testing beyond the current, already programmed B-2 flight testing would be required. Furthermore, no B-2/B61-11, Option 4 flight testing would be required. Nonetheless, there are B-2 integration tasks estimated to cost \$6 million. Therefore, the total AF cost and schedule estimates are \$12 million and 6+ months (the + is for B-2 integration).

In addition to the tasking issue, the AF also stated that the funding source for the DoD efforts had yet to be determined and ACC and STRATCOM will need to update the B-2 Operational Requirements Document for the modified B61-7.

Mr. Patterson presented a design concept for a replacement weapon that is a modified B61-7 which meets the requirements of being identical except for two properties—the pitch and yaw moments of inertia for his design concept are greater than the pitch and yaw moments of inertia for the standard B61-7. The meeting participants agreed that the impact of these deviations on the replacement program will have to be investigated at a later date. Mr. Patterson's design concept, the B61-11, Option 4, basically consists of field retrofitting the B61-7 with a machined version of the W61 integral steel case, removing the parachute and installing ballast in the aft of the bomb, shortening the earth-penetrating nose, and installing a plastic (composition not determined yet) aeroshell covering to ensure identical standard B61-7 geometry.

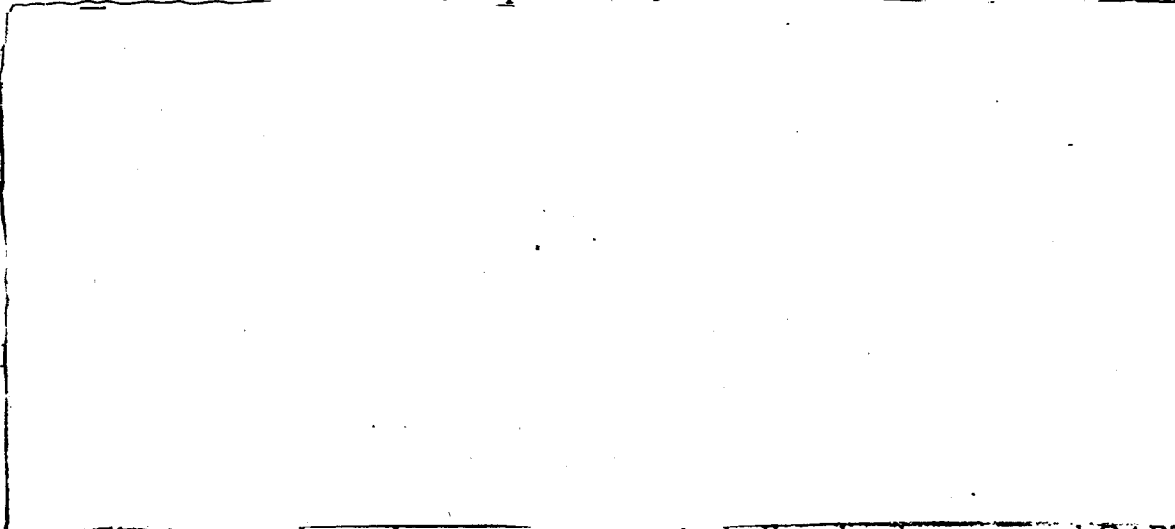
The meeting participants agreed that the cost and schedule estimates, with justification, based on Mr. Patterson's design concept would be presented by the AF and DOE to Mr. Miller on January 5 or 6, 1995. There would be a meeting with Dr. Freedman before the presentation to Mr. Miller. As stated previously, the AF presented their best estimates at this meeting. The DOE will develop their best cost and schedule estimates using the following assumptions (as agreed to by the meeting participants):

- The B61-7 modifications will be a field retrofit, but not reversible.

examples
standards

DOE
b(2)

-- The B61-11, Option 4 design concept presented by Mr. Patterson will be used as the baseline with the understanding that there are deviations from a standard B61-7, i.e., the higher pitch and yaw moments of inertia.



DOE
5(3)
3
Exemption
Statutes

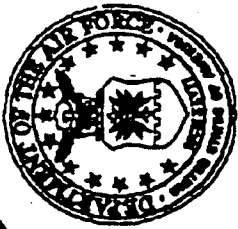
Exemption
Statute
Active
Statutes

- All assets for the replacement weapons, including development and QART units, will be drawn from the current inventory of B61-7's.
- The AF will provide an aircraft for B-52/B61-11, Option 4 certification flight tests.

The meeting participants agreed that the next steps in the replacement plan consisted of the DOE/AF presentation of cost and schedule estimates to Mr. Miller, AE presentation of the B53 replacement at the January 20, 1995 NWC meeting with or without the support of Mr. Miller, Congressional notification, and formal tasking to DOE and the AF.

~~SECRET~~

SAF/AQOS



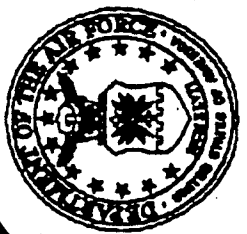
B53 GRAVITY BOMB REPLACEMENT

Options, Schedule and Issues

~~SECRET~~

~~SECRET~~

SAF/AQQS



WHY HAVE A B53 TYPE WEAPON



5 U.S.C. 552(b)(1)
(b)(3)

~~SECRET~~

~~SECRET~~

SAF/AQOS



WHY REPLACE THE B53

b(3)
set of
5

~~SECRET~~

~~SECRET~~

SAF/AQOS



B53 REPLACEMENT OPTIONS

- New nuclear weapon

5 U.S.C. 552(b)(1)
(b)(3)

- Not a viable option

variants of B61-7 or B83

- (- B61-7 variant is most mature

DOE
b(1)
1.5(a)

~~SECRET~~

~~SECRET~~

SAF/AQQS



B61-Earth Penetrating Weapon

DOE
b(1)
1.5(a)

3
EX-EM
4/2/95

552(b)(1)
(b)(3)

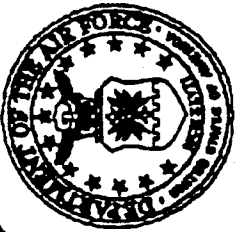
- Standard B61-7 weapon is currently certified on the B-52, however

552(b)(1)
(b)(3)

~~SECRET~~

~~SECRET~~

SAF/AQOS



B61-EPW CARRIER

- To meet JSCP direction a more survivable platform than a B-52 is needed ✓

DOE
(b)(1)

- Both increase PA over target

POE
b(1)

- certification needed

552(b)(1)
(b)(3)

~~SECRET~~

~~SECRET~~

SAF/AQQS



B61-EPW on B-2

55-2 (b)(1)
(b)(3)

- certified for standard B61-7 in Block 20 aircraft
- Two options for B61-EPW
 - Option 1: DOE develops a B61-EPW with identical properties/interfaces as a standard B61-7
(b)(1)(b)(3)
 - "No issue with B-2 integration" - B-2 SPO
 - Option 2: DOE develops B61-EPW with different properties/interfaces than standard B61-7
 - Must treat as a new weapon on the B-2 (b)(1)(b)(3)

(b)(1)(b)(3)

~~SECRET~~

~~SECRET~~

SAF/AQOS



B61-EPW: Option 1

- (b)(3).
-
- SPO defines identical properties as, when compared to standard -7, the -EPW will have:
- Safe separation and flight characteristics fall within the same basket
 - Data package is identical
 - Interface Control Document is identical
 - Aircraft control software is identical

~~SECRET~~

~~SECRET~~

SAF/AQOS



B61-EPW: Option 1 (Cont.)

- Use B-52 to demonstrate that -EPW and -7 are equal
- B-52 flight test ROM is 6 months and \$6 million from delivery of the weapon - B-52 SPO
- Time line limited by availability of test assets and range time
- integration cost estimate is \$6 million

552
(b)(1)(3)

~~SECRET~~



B61-EPW: Option 2

If B-52 comparison test finds the -EPW and -7 weapons are not identical, then

- B61-EPW is a new weapon on the B-2 ← 552
- Outside of the B-2 program ← (b)(3)
- Start date based on requirement and OSD direction
- ROM is 3 years and \$50 million for integration after start date

~~SECRET~~

SAF/AQOS



ISSUES for Option 1

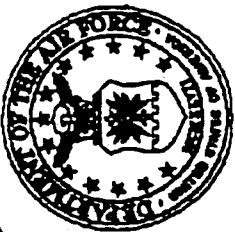
- OSD direction
- Funding source TBD
- ACC and STRATCOM update the ²² ORD for a B61-EPW

553
(611)E

~~SECRET~~

~~SECRET~~

91.
SAF/AQQS



ISSUES for Option 2

-
- All Option 1 issues plus
 - Work as part of a post Block 30 Multi-Stage Improvement Program
 - Scheduled Block 30 completion is FY00
 - Need ⁵⁵² ~~B-2~~ flight test aircraft (B)(1)(3)
 - Need flight test program extension/restart

~~SECRET~~

~~SECRET~~

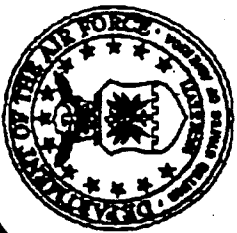
SAF/AQQS



ISSUES for Option 2 (Cont.)

-
- If AF directed to start prior to MSIP ^{SS 2 (b)(1)(B)}
 - Need congressional relief from G-2 Cap
 - Impacts baseline program Block 30 weapons requirements
 - Impacts CTF/flight test

~~SECRET~~



B61-EPW PROGRAM RISKS



	AF	DOE	Program
Option 1	Low	Med. to High ¹	Med. to High
Option 2	High ²	Low	High

1. B61-EPW must be "identical" to B61-7
2. Potential significant impact on DoD or AF champion ^{552 (B003)} high dollars, major visibility, no

~~SECRET~~

SAF/AQOS



BACK-UP SLIDES

~~SECRET~~

~~SECRET~~

SAF/AQQS



B-2 ROM FOR B61-EPW OPTION'2

-
- **\$50M -- Three Years after start date**
 - **\$5M wind tunnel test**
 - **\$2.5M B-2 near field**
 - **\$2.5M free stream ballistics**
 - **\$5M software development & integration**
 - **\$40M flight test (includes 24 missions, 12 drops)**

~~SECRET~~

~~SECRET~~

SAF/AQQS



ASSUMPTIONS

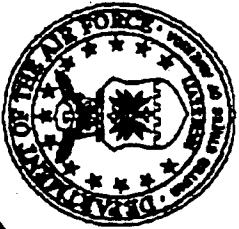
Option 1: Compared to standard -7, the -EPW has:

- Same aeroshell and physics package
- Same CG and rotational dynamics
- Same aircraft separation characteristics
- Same ballistics to target
- Same electrical interface
- Same software interface

~~SECRET~~

SECRET

SAF/AQQS



ASSUMPTIONS (Cont.)

Option 2: Compared to standard -7, the -EPW has:

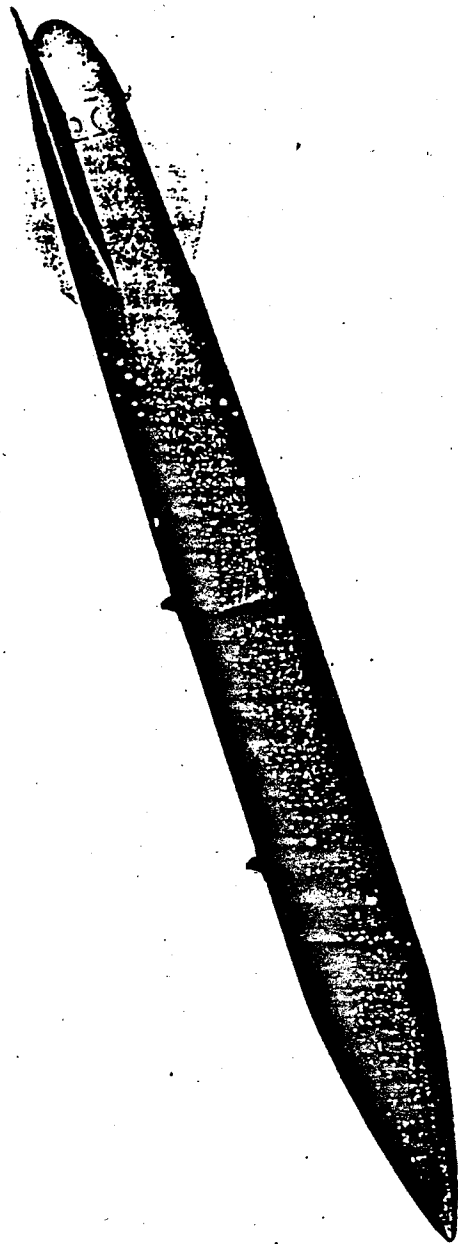
- Same physics package, but different aeroshell
- Same physical envelope, but different CG and rotational dynamics
- Same software interface
- Same electrical interface
- Different aircraft separation characteristics
- Different ballistics to target

SECRET

38.

B61-7 Conversion to B61-11 (EPW)

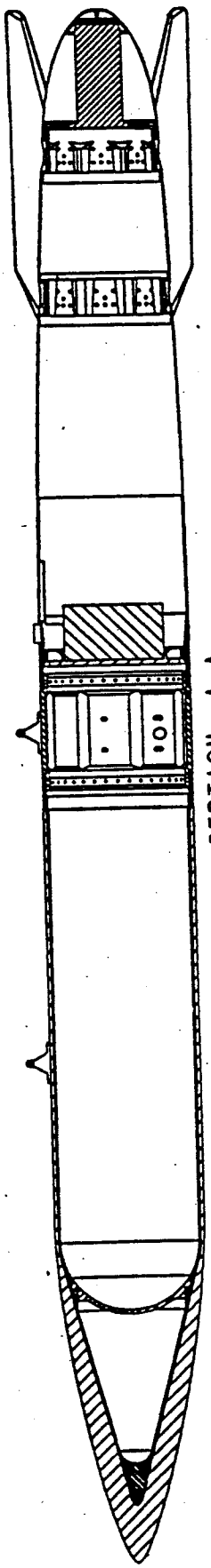
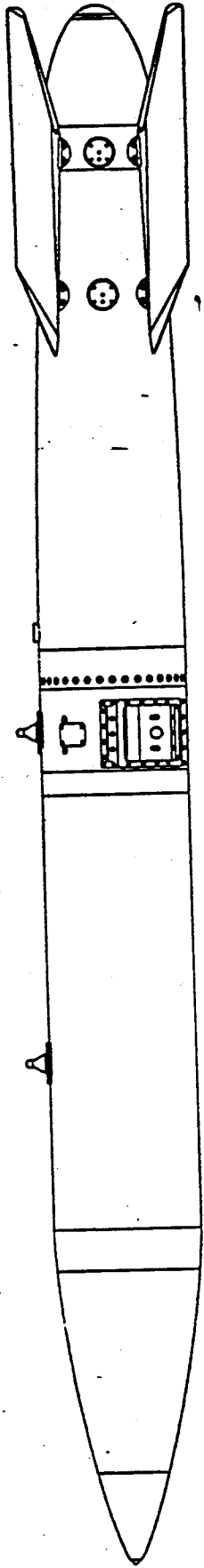
Option 4: Minimizes Certification Effort



B61-7 Conversion to B61-11 (EPW)

Option 4: Minimizes Certification Effort

DRAFT



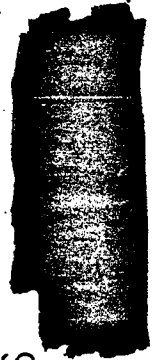
SECTION A-A

B61-7 EP MASS PROPERTIES
CALCULATED

MASS: 778,171 LBS
 XCG: 60.144 (FROM NOSE TIP)
 IXX: 15,600 ROLL
 IYY: 981,526 PITCH
 IZZ: 981,526 YAW

WR B61-7 MASS PROPERTIES
FROM CDI0080

MASS: 763±15 LBS
 XCG: 60.25±.50 (FROM NOSE TIP)
 IXX: 15,000±200 ROLL
 IYY: 819,000±25,000 PITCH
 IZZ: 819,000±25,000 YAW

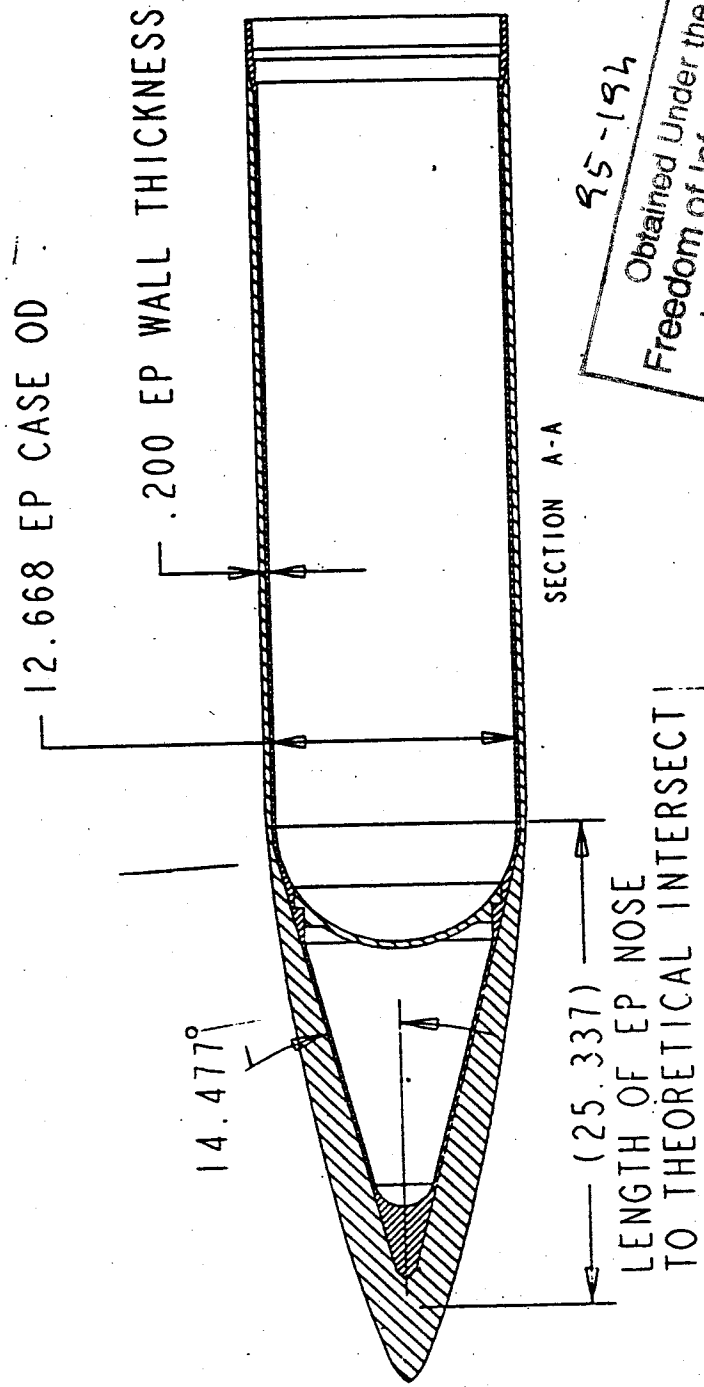


95-194

Obtained Under the
Freedom of Information Act
by Hans M. Kristensen

74

DRAFT



95-194

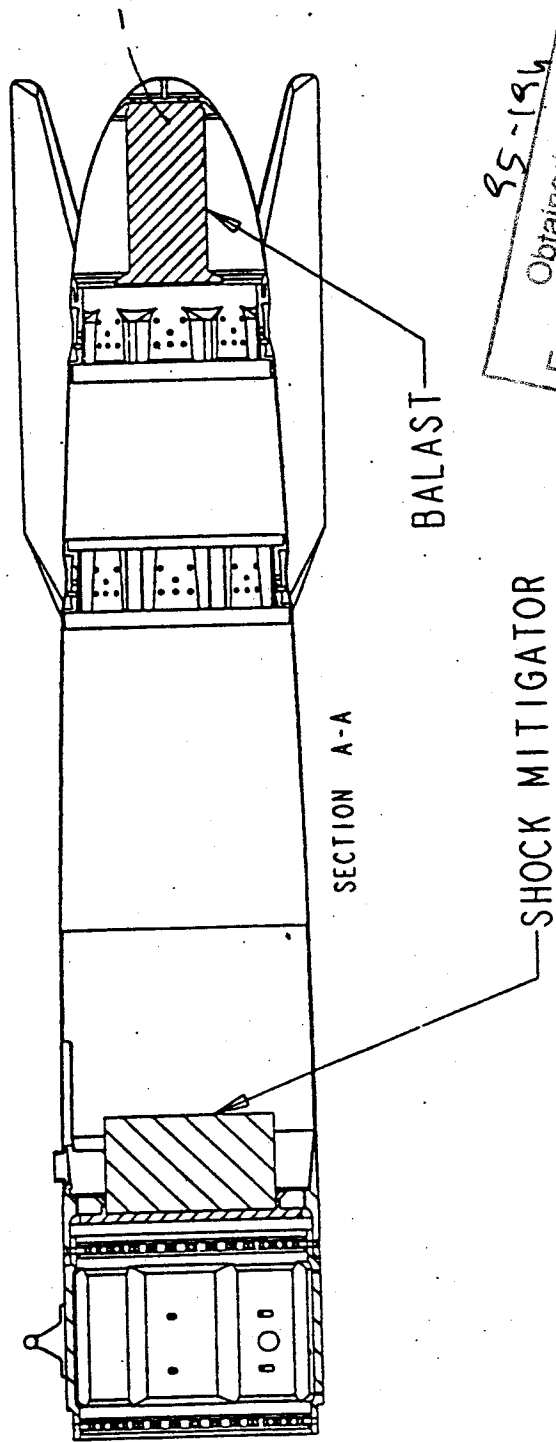
Obtained Under the
Freedom of Information Act
by Hans M. Kristensen

W61MODIASM-U 12-2-94 AM

~~CONFIDENTIAL DATA~~
~~This document contains Protected Data~~
~~relating to the Atomic Energy Act of~~
~~1954, the Espionage Laws, the Select~~
~~Administration and Communications~~

25

DRAFT



85-184
 Obtained Under the
 Freedom of Information Act
 by Hans M. Kristensen

TAILASSY4-U 12-2-94 AM

28

T

528

Erin Phillips
5/12/13

1000 →

Impact Velocity (ft/sec)

Example 3
states