NOTICE OF CHANGE

NOT MEASUREMENT SENSITIVE

MIL-STD-1316E
NOTICE 1
14 JANUARY 1999

DEPARTMENT OF DEFENSE
DESIGN CRITERIA STANDARD

FUZE DESIGN
SAFETY CRITERIA FOR

TO ALL HOLDERS OF MIL-STD-1316E:

1. THE FOLLOWING PAGES OF MIL-STD-1316E HAVE BEEN REVISED AND SUPERSEDE THE PAGES LISTED:

NEW PAGE	DATE	SUPERSEDED PAGE	DATE
ii	14 January 1999	ii	10 July 1998
15	14 January 1999	15	10 July 1998
16	10 July 1998	16	REPRINTED WITHOUT CHANGE

2. RETAIN THIS NOTICE AND INSERT BEFORE TABLE OF CONTENTS.

3. Holders of MIL-STD-1316E will verify that page changes and additions indicated above have been entered. This notice page will be retained as a check sheet. This issuance, together with appended pages, is a separate publication. Each notice is to be retained by stocking points until the military standard is completely revised or canceled.

Custodians:
Army - AR
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Review activities
Army - MI
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Air Force - 99

Preparing activity:
Army - AR

(Project 13GP-0067)

AMSC N/A FSC 13GP

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FOREWORD

1. This Military Standard is approved for use by all Departments and Agencies of the Department of Defense.

2. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document shall be addressed to: Commander, US Army Tank-Automotive and Armaments Command Research and Development Center, ATTN: AMSTA-AR-QAW-E, Picatinny Arsenal, NJ 07806-5000, by using the self addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter. Comments should be forwarded through the designated Reviewing Activity listed for each Service in 4.9.

3. This standard establishes specific design safety criteria for fuzes. It applies primarily to the safety and arming functions performed by fuzes for use with munitions. The safety and arming requirements specified herein are mandatory fundamental elements of design, engineering, production and procurement of fuzes. Fuzes shall provide safety that is consistent with assembly, handling, storage, transportation, use, and disposal.

4. Munition fuzes historically have utilized sensitive explosive elements whose output has been physically interrupted until arming. Control of the arming process in these fuzes was accomplished by mechanical means. The advent and rapid advancement in solid state electronics has furnished alternatives for fuze safety design. In recent years, advances in explosive initiation elements have provided an option for eliminating the need for physical interruption of the explosive train. The application of these technology advances is addressed in the Current revision to these standards.

Supersedes page ii of 10 July 1998

TABLE I. Approved explosives

Explosive	Specification
Comp A3	MIL-C-440
Comp A4	MIL-C-440
Comp A5	MIL-E-14970
Comp CH6	MIL-C-21723
PBX 9407	MIL-R-63419
PBXN-5	MIL-E-81111
PBXN-6	WS-12604
DIPAM	WS-4660
HNS Type 1 or Type 2 Gr A	WS-5003
HNS-IV	MIL-E-82903
*Tetryl	MIL-T-339
*Tetryl Pellets	MIL-P-46464

*No longer manufactured; not for use in new developments.

5.3.3 Explosive train interruption.

a. When an element of the explosive train contains explosive material other than allowed by 5.3.2, at least one interrupter (shutter, slider, rotor) shall functionally separate it from the lead and booster explosives until the arming sequence is completed as a consequence of intentional launch. The interrupter(s) shall be directly locked mechanically in the safe position by at least two independent safety features. These safety features shall not be removed prior to initiation of the launch cycle.

b. If the primary explosive is positioned such that omission of the interrupter will prohibit explosive train transfer, a single interrupter locked by the two independent safety features is acceptable.

c. If the primary explosive is positioned such that safety is dependent upon the presence of an interrupter, the design shall include positive means to prevent the fuze from being assembled without the properly positioned interrupter.

d. The effectiveness of interruption for the fuze explosive train in its configuration prior to initiation of the arming sequence shall be determined numerically in accordance with the Primary Explosive Component Safety Test of MIL-STD-331. If the explosive train interruption is removed progressively after intentional initiation of the launch sequence, the relationship between interrupter position and its effectiveness shall be established by a progressive arming test conducted in accordance with the Primary Explosive Component Safety Test, using a test strategy given by the Projectile Fuze Arming Distance Test of MIL-STD-331. The chosen test strategy and results shall be presented and justified to the appropriate service safety authority.

5.3.4 Non-interrupted explosive train control. Explosive train interruption is not required when the explosive train contains only explosive materials allowed by 5.3.2. One of the following methods of controlling fuze arming shall be employed:

a. For systems using techniques for accumulating all functioning energy from the post-launch environment, the fuze shall not permit arming until verification, by the fuze, of a proper launch, and attainment of the required arming delay. Accumulation of any functioning energy shall not occur until as late in the arming cycle as operational requirements permit.

b. For systems using techniques that do not accumulate all functioning energy from the post-launch environment, at least two independent energy interrupters, each controlled by an independent safety feature shall prevent arming until proper launch is verified by the fuze and the required arming delay is attained. Additionally, the fuze shall not be capable of arming in cases of the absence, or malfunction, of any and all energy interrupters.

5.3.4.1 Electrical initiator sensitivity. The initiator for an electrically fired non-interrupted explosive train shall:

a. Meet the appropriate characteristics listed for Class B initiators of MIL-I-23659.

b. Not exhibit unsafe degradation when tested in accordance with MIL-STD-1512.

c. Not be capable of being detonated by any electrical potential of less than 500 volts.

d. Not be capable of being initiated by any electrical potential of less than 500 volts, when applied to any accessible part of the fuzing system after installation into the munition or any munition subsystem.