



U.S. Army Research, Development and Engineering Command



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US AND NATO FUZING RELATED STANDARDS 58th Annual Fuze Conference

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Purpose of Presentation



- To appraise the fuze community of ongoing fuze standardization activities
- Explain the correlation between USA and NATO fuze standardization documents
- Assist project teams to prepare for fuze safety board/panel reviews





- JOTP – 50: Safety Design Requirements for Active Hazard Mitigation Device (AHMD) Employed to Address Fast and Slow Cook-off Thermal Threats
 - Design safety criteria for active mitigation devices employed in munitions for the purpose of reducing the severity of response when the munition is subjected to Insensitive Munitions (IM) thermal threat environments

- JOTP – 51: Technical Manual for the Use Of Logic Devices in Safety Features
 - Safety design requirements for Safety Features (SFs) implemented with logic devices, such as programmable logic devices (PLDs), complex programmable logic devices (CPLDs), field programmable gate arrays (FPGAs), application specific integrated circuits (ASICs), microcontrollers, discrete logic, etc.

- JOTP – 52: Guideline for Qualification of Fuzes, Safe And Arm (S&A) Devices, and Ignition Safety Devices (ISD)
 - Fuze level shock and environmental tests and associated sample sizes required for a fuze level safety qualification program

- JOTP – 53: Electrical Stress Test (EST)
Breadboard level electrical tests to assess fuze electronics design safety margin





- MIL-HDBK-145D (US FUZE CATALOG):
 - Datasheets of qualified US Fuzes
 - Merged with catalog of obsolete US Fuzes (MIL-HDBK-146)
- MIL-STD-1316F
 - Updated list of permitted in-line explosives
 - Control of safety logic must be dedicated and isolated
 - Updated requirements for submunition fuzing
 - For inline fuzing (ESADs), three switches are mandatory
 - Electrical firing energy dissipation no longer tied to 30 minutes
 - Invokes JOTP-51 & 52





- MIL-STD-331D
 - Shock and environmental tests procedures
 - Statistical analysis methods
- MIL-DTL-23659G
 - Design specification for electric initiators
- Safety Design Requirements for Network Command Munitions
 - Covers wireless remote controlled off/on/off networked munitions
- Safety Design Requirements for Low Voltage Command Arm System for Distributed Fuzing
 - Addresses multi-point initiation fuzing for variable yield warheads
- Guidelines for Evaluation of Electronic Safety and Arming Systems
 - Merging of AFSRB and Navy WSESRB ESAD guidelines plus more





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Comparison of Key US and NATO Fuze Documents



US	NATO
MIL-STD-1316 (Fuze safety design requirements)	STANAG 4187 & AOP-16
MIL-STD-331 (Fuze safety test procedures)	STANAG 4157 & AOP-20
MIL-DTL-23659 (Qualification tests for EEDs)	STANAG 4560 & AOP-43
MIL-STD-1901 (launch ignition system safety design requirements)	STANAG 4368
MIL-STD-1911 (safety design criteria for hand emplaced munitions)	STANAG 4497
JOTP-51 (Logic Devices)	Being incorporated into STANAG 4187
JOTP-52 (Fuze safety qualification test program)	Being Incorporated into STANAG 4157
JOTP-53 (Electrical stress test)	Being incorporated into STANAG 4157 & AOP-20
No US document	STANAG 4369 & AOP-22 (inductive setting for large caliber)
No US document	STANAG 4547 (inductive setting for medium caliber)
No US document	STANAG 4590 & AOP-60 (inductive setting for guided large caliber) NOTE: still in development
MIL-STD-333 (Nose Fuze Contours and Matching Projectile Cavities for Artillery and Mortar Projectiles)	STANAG 2916
MIL-HDBK-145 (US Fuze Catalog)	STANAG 4326 & AOP-8 (NATO Fuze Catalog)



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QUESTIONS?????

