Review and update of STANAG 4526 Shaped Charge Jet, Munitions Test Procedure

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Changes in Personnel

- Dr. Ernest Baker has retired from the US Army ARDEC and has taken a position with MSIAC NATO Headquarters.
- Mr. Manfred Becker has Retired with MSIAC NATO Headquarters.

Background

The current STANAG is outdated and has lost relevance. As a result, each member nation has been creating and adopting their own standards to meet their needs.

- The current STANAG references US Rockeye Shaped Charge, which is no longer used by any member nation
- Uses values of Held's Criteria (v2d) for various shaped charges that can not be verified

Background

Multiple international meetings have been held, including a technical workshop under the auspices of NATO's Munitions Safety Information Analysis Center (MSIAC):

One Workshop was held:

- ENSTA Bretagne Brest France 12 – 15 May, 2014

Two Custodial Working Group meetings were held:

- Brest, France 16 May, 2014
- Bofors Test Center, Karlskoga, Sweden 03 September 2014.

And two Update Meetings in conjunction with the Response Descriptors Working Group Meeting were held:

- Brussels, Belgium, NATO headquarters September 2015
- Brussels, Belgium, NATO headquarters April 2016.
- STANAG 4526 will be replaced by an Allied Ordinance Publication (AOP 4526) to allow for more efficient future updates.

Workshop Findings

- Bomblet – remove
- Rockeye – remove
- Ballistic Pendulum – Remove as an option from official test
- Anti-Tank Missile – remove
- Old, inaccurate v^2d table – remove
- Most member nations have adopted some form of RPG threat

Typical Shaped Charges used by MSIAC Member Nations

Nation	Shaped Charge	Threat Level	Jet Velocity (mm/µs)	Jet Diameter (mm)	V^2D (mm/µs)	Specified in IM Policy	Laboratory/ in service *
France	CCEB 62 (Former Version)	RPG-7	8	3	203	Yes	Laboratory
	CCEB 62 (New Version)	RPG-7	To be assessed	To be assessed	To be assessed	Yes	Laboratory
Germany	KB44	Bomblet	8	1.9	122**		Laboratory
	RPG 7 NB	RPG-7	7.2	3.1	166**	Yes	Laboratory
Netherlands	Small Bomblets	Bomblet					In Service
Sweden	RPG-7's	RPG-7					In Service
United Kingdom	BL 755	Bomblet				No	In Service
	M42	Bomblet				No	In Service
	K4	RPG-7				Yes	Laboratory
USA	81 mm SC	RPG-7	6.4	3.5	141	Yes	Laboratory

Typical Shaped Charges used by MSIAC Member Nations

*In Service means that the shaped charge is produced in large scale

**The jet tip is not considered

STANAG Update Suggestions

- Use the RPG-7 as a representative threat.
- Maintain the current German, French and US test standards that should be well defined in the STANAG.
- Maintain the use of actual RPG-7 warheads, although this will not be suggested in the STANAG due to the variability of these charges.
- Define jet characteristics and test configurations for new tests using the RPG-7 threat.
- RPG-7 surrogate drawing should include:
  - Standoff associated with the test configuration, including the position of conditioning plate relative to the warhead.
  - A minimum air gap behind the conditioning plate and the test item.
- Allow a THA based variation.

General Criteria

A draft has been written of the proposed AOP. The US and French testing ANNEX's have been included. Proposed general criteria for the tests that met the STANAG are:

Jet Characteristic Requirements

- The jet will penetrate a conditioning plate of suitable thickness to remove the first part of the jet.
- jet diameter at the target impact position shall be 2.5 - 3.5mm.
- v^2d shall be between 120 and 140 $mm^3/\mu s^2$.

Breakup characteristics

- Jet length, breakup times and accumulated jet mass may be measured for information.

General Criteria

Shaped Charge Requirements

- The shaped charge will be produced in a precise manner assuring that all components are properly located and that the charge is axially symmetric.

- A jet straightness exhibiting less than ½ of a jet diameter deviation at a 20 charge diameter standoff is desired.

- The explosive charge diameter should be larger than 60mm and less than 95mm with an explosive fill performance between COMP B and Pure HMX at TMD.

- The charge liner shall be made from a high quality oxygen free copper and its construction described.

- Initiation methods will be specified to assure consistent and strong symmetric initiation.

- The shaped charge shall be designed such that the output after penetrating a conditioning plate matches the performance of a shoulder launched rocket propelled grenade.

- The performance parameters describing the jet shall include the diameter and velocity both at the tip and along the jet. The characterization shall include information as to the placement that replicates the standoff of the RPG threat.

Changes Since Last Presentation

- A Standards Related Document is being prepared that will streamline updates and consolidate standards across multiple tests reducing duplication.
- While the AOP 4526 is near completion, delaying the implementation to allow the removal of duplicative sections that are in the new SRD assures the document is not outdated shortly after release.

Plan Forward

- Await completion of Standards Related Document (SRD).
- Rewrite AOP 4526 to remove duplicative portions that are in the SRD and assure documents are complimentary.
- Address issues/needs through community discussion.
- Circulate draft through community and post on NATO DI portal.
- Submit draft documents to AC326 SG/B for approval.

Participants

CWG Members:
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