GENERAL TEST REQUIREMENTS FOR DEMINING TESTING

1. SCOPE.

This document provides guidance for testing the ability of demining equipment to withstand natural and induced environments encountered during storage, transport, handling, use, or maintenance. These environments may be due directly or indirectly to interaction with the

environment, transport media, or battlefield stimuli. Based upon experience and engineering judgment, procedures may be altered to accommodate unique applications or deployment, delivery, or employment methods. This document also provides guidance on performance, reliability, safety and human health, climatic suitability, transportation and handling, integrated logistic support, human factors, electromagnetic environmental effects (E3), vulnerability, and software.

In general, this procedure provides the structure necessary to determine whether an item is suitable for standard use (ready for production) and does not dictate how an item is to proceed through earlier developmental testing. Due to the advent of novel technologies, advancements in modeling and simulation, and increased sophistication of unique test support equipment, variations from sample sizes will be permitted in other related document referenced in the attached figures and spreadsheets. No sample sizes are suggested in this document.

1.1 Terms and Conditions.

This document specifically applies to demining equipment. It is intended to provide an overarching framework for the testing of diverse types of demining equipment. This equipment may be mounted on existing standard platforms or may be entirely new systems designed expressly for the purposes of demining. It is intended that a family of documents be used to support his document, covering specific topical areas due to this diversity. Depending upon the nature of the equipment, one or more of these documents will be used in conjunction with the overarching document. Demining equipment is defined as equipment for detecting and locating, marking, clearing minefields and Unmanned Target Activated Weapon (UTAW) arrays and also single mines and UTAWS.. In the further text single mines and UTAWS are called targets, mine fields and UTAW arrays are called target arrays. Detecting tools may be hand-held, airborne or vehicle mounted. Marking equipment is to define single targets or target arrays. The largest number of devices belongs to clearing equipment. There are mechanical devices, explosive devices, and electromagnetic devices

1.2 Tailoring.

It must be recognized that statistical inference may be enhanced through creative use of modeling and simulation supported by testing. Additionally, the advancements in unique test support equipment have enabled monitoring of functions on a real-time basis as well as condition of electronics through direct interface with the electronic devices using umbilical equipment or other techniques such as data memory boards. The use of special test support equipment should be emphasized to reduce risk associated with reduced sample size below those suggested in related documents.

1.3 Limitations.

The inclusion of specific test data topics in this document does not mandate that each included topic be addressed specifically through testing. It is the intent of this document to serve as general guidance, with the specific need to test determined based upon a careful documented review of the design; prior history of similar design components or subsystems; test strategy; and the complementary consideration of modeling and simulation. Review of the design may be accomplished by special boards or panels with expertise in certain design features or data considerations.

2. FACILITIES AND INSTRUMENTATION.

For testing of demining equipment, it might be required to consider all kinds of climatic and environmental conditions in a great variety of terrain all over the world. Because of this, it is likely that more than one test facility will be required. Test facilities for testing demining equipment ought to have all different kinds of soil and ground cover and all climatic conditions. Handling and detonating mines and explosives must be possible. Sensors and mines of all types must be available. Photographic and video equipment is necessary for recording pictures and films of the test items. For the measurement of electronic detecting and/or clearing devices applicable receivers and measuring instruments must be available. All instrumentation used for testing must be calibrated in accordance with national standards.

3. REQUIRED TEST CONDITIONS.

3.1 Test Item Configuration.

In general, the item should be tested at system level unless it can be shown that system integrity does not contribute to the specific results. Instrumented systems or subsystems should be used to enhance quality assurance, in-test inspections, failure analysis or diagnostics, and data acquisition, where it can be shown that results are not compromised or that results are better quantified. Care should be taken to ensure that integral instrumentation is sufficiently rugged to withstand natural and induced environments.

3.2 Test Planning.

3.2.1 Test planning should be initiated early in the acquisition process to yield the most cost effective approach to decision risk mitigation. Novel technologies used with demining equipment will require novel approaches to testing and design of test samples. Long-lead planning will provide the greatest opportunity to minimize the impact of testing on acquisition costs, the environment, and hazards to test participants. Live fire testing may be required.

3.2.2 Fully define the logistic life cycle of the item under test. Define the storage, transport, delivery, handling, use, and maintenance constraints of the item. Define the expected climatic

conditions that the item is expected to withstand and operate in without degradation. Define the expected threat environment by different targets. Define the target set and employment scenarios for the item. These constraints will provide the boundary conditions for testing in conjunction with special boards or proceedings.

3.2.3 Define objectives for each subtest data topic with regard to the intended application and the criteria.

3.2.4 Define criteria for each subtest data topic based upon applicable contractual specification. Tailoring criteria should consider the logistics concept, employment concept, intended application, novel technologies, and as appropriate, the threat environment. Special boards of experts may be convened to define criteria where highly specialized knowledge is desirable (explosives, threat mines, mine warfare, mine clearing operations, electromagnetic phenomena, etc.). Failures/successes should be defined to provide for a clear understanding of relevant conclusions for certain subtest data topics (e.g. reliability, performance, climatic suitability, and safety).

3.2.5 Establish data requirements necessary to address objectives and criteria. Establish what data requirements will be determined directly from test or will be determined subsequently through modeling and simulation. Design data sheets for each subtest data topic and tailor to the planned functions for the item.

3.2.6 Determine the most appropriate test procedures for each subtest topic in light of objectives, criteria, and data requirements. Convene special boards as necessary to review whether all, a portion, none, or tailored test procedures are necessary in view of preceding results on similar systems. Determine what level of tailoring is necessary to provide for a realistic, yet reasonable physical simulation of a natural or induced environment. Determine where special instrumentation or facilities will be necessary to fully characterize or evaluate the novel technologies. Determine whether the test item will require integral instrumentation or inert fills to reduce hazards, enhance inspections or data acquisition, or support modeling. Define all the potential test item types that will be used for each subtest data topic, as well as the sample size of each special type necessary for testing.

3.2.7 As a tool to audit, change, or summarize the test program, it is desirable to layout all planned testing in spreadsheet form relative to each subtest data topic, relevant test procedure, sample size, sample type, packaging configuration (if applicable), and planned functions. Where appropriate, additional spreadsheets may be added to fully define test constraints. Supplement spreadsheets as necessary with flow charts to clearly identify whether tests will be performed sequentially or independently.

3.2.8 Define all unique resources necessary to conduct subtests. These resources may include special simulators, real or surrogate countermeasures, portable or fixed signature measurement devices, etc.

3.2.9 Define the appropriate analytical methods necessary to process and reduce data to a usable format. Use modeling and simulation as necessary to derive figures of merit or measures of effectiveness from test data appropriate to the subtest data topic (performance, reliability, safety). Use modeling and simulation to expand the context of the database where all potential test conditions cannot economically be addressed. Where modeling or simulation is used, ensure that the models have been validated prior to use during test or that specific plans are made to validate during planned test before inclusion in final reports.

3.3 Layout of Test Target Arrays.

A kind of standard target array is to be established containing representative targets. The structure of the array is to be defined.

3.4 Test Controls.

Test controls are listed for each subtest test data topic in accordance with the applicable document. Other specific test controls are listed under inspections below.

4. TEST PROCEDURES.

4.1 Inspections.

Inspections will be used as test controls to assure readiness for test and to reduce decision risk where sample sizes are limited. Inspections will document the packaging, nomenclature (serial number or identifying number), type (if special variants are built), and quantity of each type of test item. Inspections may consist of a combination of physical and nondestructive examinations to determine the safety of the item and the physical condition prior to and following tests. Inspections may be augmented by other forms of electronic checks with special test instrumentation if test hardware has been designed to facilitate this type of check. Nondestructive inspections are desired whenever shock and vibration are involved during the tests.

4.2 Performance.

The performance of detecting equipment is expressed in the accuracy of finding the location of mine targets. It is important to find every kind of target and each single target in a defined depth under the surface in every kind of soil. The most important aspect of the performance of clearing equipment is, that the targets in the clearing area are destroyed or picked up in a safe, disarmed state.

4.2.1 Detecting and clearing/destroying accuracy and probability. Testing will be designed to yield probability for detecting or clearing/destroying targets under a variety of engagement conditions. Testing will address the effects of target type, countermeasures, battlefield stimuli, and background environment on the ability to find and clear/destroy the target. Targets will be engaged singly and in arrays. Depending upon threat tactics, target population may not be uniform.

4.2.2 Special Performance Topics. When testing battery powered equipment and complex duty cycles, battery performance should be considered an integral portion of the performance test. Where possible, battery state monitors should be included as part of unique item instrumentation. Also, radio frequency communication devices and the performance of those devices, will be included as part of performance tests when the item features communication links. Communication performance may examine encoding, signal strength/character as a function of range, false code rejection, and other features as an integrated portion of field tests as well as attenuated bench tests.

4.3 Reliability.

Testing should be planned to examine reliability of all equipment essential features with special emphasis on the reliability of safety features. Reliability data will be collected throughout all testing for which the item is expected to be functional as an outcome, including testing performed under unfavorable environmental conditions. Reliability data will be gathered in field environments to corroborate data gathered following controlled single-or-multiple factors chamber screening tests.

4.4 Safety and Human Health.

Safety-specific and safety-related tests will be planned to thoroughly screen the item in accordance with its planned life cycle. All safety-related and safety-specific testing will be front-loaded in the test cycle to establish and confirm inherent safety features. Safety-related screening tests will be tailored to life cycle environments associated with storage, transport, delivery, and use under a variety of natural and induced environmental conditions reflective of the intended application. Measures will be taken to assure that stress challenges are imposed that fully screen unique environments related to the mission environment. Tests will ensure that safety information necessary for all storage and transport certifications and hazard classifications are gathered. Safety observations will be made throughout testing. All hazards identified will be evaluated and resolved according to hazard severity and probability. Resolution of hazards may be design, packaging, procedural, or training.

Safety-related data will include but not be limited to, indications of premature arming, premature functions, hazardous duds, subverted safety features by induced environments, high order detonation before arming or safe separation, and high-order detonation as a result of handling, shock/vibration, extreme natural environments, or induced environments in the unarmed condition. Safety-specific data will be gathered in subtests for insensitive munition/hazard classification (fast cookoff, slow cookoff, bullet impact, fragment impact, stack burn, etc.), electromagnetic effects, and terminal handling. Safety-specific data will be gathered to evaluate static fragmentation, blast overpressure, noise, and other human health related issues. Compatibility of radio frequency (RF) control with surface danger zone due to noise or fragmentation will be examined based upon test data.

4.5 Climatic Suitability.

Testing in climatic chambers and facilities will be creatively exploited. Based upon definitions of natural extreme climatic conditions, conditions expected to be encountered in storage, transit, and use should be screened using single-or-multiple factor tests. Climatic factors should encompass temperature, solar radiation, precipitation, winds, salt fog, sand and dust, pressure-altitude, and immersion. Where desired, screening of climatic factors should be combined with the shock and vibration associated with transportation and handling. Tests should include packaged and bare items, as appropriate to the phase of the life cycle being screened and the intended application. Where appropriate, tests should include extreme conditions because of potentially hazardous results or degraded performance or reliability. These extreme conditions should be included because of the unpredictable nature of logistics movement and storage as well as potentially hazardous consequences. Testing in the natural environment should be performed to determine the effects of field synergism in realistic mission environments

4.6 Transportation and Handling.

Transportation and handling tests will reflect the logistics and mission environment. Specific screening tests will be conducted as a necessary measure to support transportability certifications. Screening tests will focus on intermodal transport, air delivery, and handling related shock and vibration effects on the item and will be coupled with climatic conditions as stated above. Screening tests will also include examination of electromagnetic effects when appropriate (see paragraph 4.9). Detailed technical inspections will be incorporated into all tests involving shock or vibration whether they are conducted singly or in sequence as a test control. Packaging configuration will be tailored to the planned life cycle. Testing should be planned to explore whether the item is safe to handle and function or safe to handle and dispose of following testing. If the former, samples may be used as part of the reliability or performance subtests. If the latter or former, data may be used towards the safety subtest. Special tactical mockups will be fabricated to physically simulate the carrier (tank, vehicle, helicopter etc.). Packaging configuration will be tailored to the planned life cycle (palletized, crated, bare). Testing should be planned to explore whether the item functions following screening testing. If functional without degradation, samples may be used as part of the reliability or performance subtests.

4.7 Integrated Logistics Supportability.

Logistics supportability does not necessarily lend itself to standardized test design in a technical testing forum. Equipment publications, training, test, measurement, and diagnostic equipment, tools, and repair parts will be evaluated. Data will be collected to appraise the ease of use, value, or accuracy of devices, designs, manuals, or other support equipment. Data will be gathered during all testing. Where necessary, special tests or approaches may be devised to appraise unique aspects of the logistics environment (long-term storage or surveillance).

4.8 Human Factors or Ergonomics.

Human factors testing will be integrated into all phases of testing. Quantitative and qualitative data will be gathered, as applicable, for both the packaged and bare items relative to functions such as mounting/dismounting, operability, transportability, portability, and usability. Specific human factors test procedures, checklists, and questionnaires will be used, as appropriate to examine design, tasks, crew performance, and adverse natural or induced environmental conditions. Adverse environmental conditions should be included to examine the effects of extreme climates and other induced conditions such as Nuclear, Biological, and Chemical (NBC) relative to compatibility with clothing and equipment on the ability to perform key functions. Test design should include simulation of mission or work cycles. Personnel should include trained engineering technicians as well as personnel who are representative of the intended user population in terms of skills, size, strength, and wearing suitable garments and equipment appropriate to the tasks. Data will be gathered to identify and define the test participants (user population). Sufficient data will be acquired to establish the demographics, anthropometry, skills, grades, experience, gender, handedness, and sensory acuity (visual and auditory). Subjective data, including that from interviews and questionnaires, should be taken during testing and should be repeated to show learning effects as well as to examine the ease of use. Interviews should be structured and surveys scaled to provide quantitative comparison of responses. Additional data may be gathered to examine crew health environments to ascertain the severity of hazards associated with use. These may include non-ionizing radiation hazards due to lasers or radio frequency communication, impulse noise and overpressure, weight, sharp edges, et al. Findings that indicate hazard severities that require mitigation will be collated to the safety subtest.

4.9 Electromagnetic Environmental Effects (E3).

E3 testing will encompass all electromagnetic disciplines, including electromagnetic compatibility/electromagnetic interference; electromagnetic radiated emissions; electromagnetic vulnerability; electromagnetic pulse; hazards of electromagnetic radiation to personnel, ordnance, and volatile materials; and natural phenomena effects of lightning and electrostatic discharge.

Levels of E3 phenomenology shall be based on projections of offensive radio frequency (RF) capabilities radars; communications and electronics; commercial emitters; broadcast stations; and amateur radio services.

4.10 Vulnerability.

The focus of the vulnerability testing shall be directed towards examining the logistical survivability of the stockpiles and resupply/transportation systems; and the resistance to threat or threat countermeasures. Since the reactive nature of munitions makes them susceptible to violent reaction by unplanned stimuli and threat attack (e.g. heat, shock, impact), vulnerability testing should be planned to determine the potential for catastrophic events (high order detonation) due to stimuli such as fragments, fire, E3, direct fire weapons, accidents, et al. Data should be collected to appraise the sensitivity to the stimuli and identify the hazard severity and probability associated with the effect. Additionally, where appropriate, the effects of the stimuli or countermeasures on performance and reliability should be examined to determine if either is degraded. Equipment (rollers, plows, detection vehicles, etc.) shall survive required mine blasts.

4.11 Software.

Software testing techniques will vary and may not lend themselves to standardization. Software should be baselined prior to test start and should be maintained throughout each test session. Algorithms should be confirmed and not modified once testing starts.

5. DATA REQUIRED.

Minimum data requirements are identified in each document referenced. Additional data requirements will be added for each subtest to reflect information necessary for both diagnostics and analysis of equipment essential features. Metric units will be used (not soft conversions).

6. PRESENTATION OF DATA.

a. Describe inspection, specific test procedures, and results for each item using narration, tables, photographs, x-rays, charts, and graphs as appropriate.

b. Include photographs to show type of container (when applicable), type of carrier (attachable equipment only), type of equipment, and to document any damage.

c. Reduce, summarize, and analyze data from each subtest in accordance with the document appropriate to the subtest data topic and failure definitions derived specifically for the item and the subtest category. Where unique analytical tools (e.g. models, simulations, statistical techniques) are used, these should be described in sufficient detail to enable the reader to understand the basis for the analysis.

APPENDIX A. REFERENCES.

1. document , Target Standardization for Demining ().

2. document, Testing of Mine Detection Equipment: (Ground-Based).

APPENDIX B. TEST DESIGN SPREADSHEETS FOR COUNTERMINE.

DESIGN TOPIC	TEST DATA TOPIC	SUB-ELEMENT	FRANCE	GERMANY	UNITED KINGDOM	UNITED STATES	STANAG
TRANSPORTATION AND HANDLING	ROAD TRANSPORT	SECURED CARGO VIBRATION	STANAG 4138 STANAG 4242 AOP-34	810E, METHOD 514	DEF-STAN 00-35 & 7-55	810E, METHOD 514	(D)4370
		LOOSE CARGO VIBRATION	STANAG 4138 STANAG 4242 AOP-34	810E, METHOD 514	DEF-STAN 00-35 & 7-55	810E, METHOD 514	(D)4371
	HANDLING, PACKAGED	2.1M DROP	STANAG 4375		DEF-STAN 00-35 & 7-55		(D)4375
	HANDLING, BARE	1.5M DROP	STANAG 4375		DEF-STAN 00-35 & 7-55		(D)4375
	AIR TRANSPORT	TACTICAL VIBRATION	STANAG 4138 STANAG 4289 GAM EG-13B	810E, METHOD 514	DEF-STAN 00-35 & 7-55	810E, METHOD 514	
	AIR TRANSPORT	AIRDROP					
	AIR TRANSPORT	THERMAL SHOCK	STANAG 4289 GAM EG-13B	810E,METHOD 503; MIL-STD-1791	DEF-STAN 00-35 & 7-55	810E, METHOD 503; MIL-STD-1791	(D)4370
	AIR TRANSPORT	RAPID DECOMPRESSION	STANAG 4289 GAM EG-13B	810E,METHOD 500; MIL-STD-1791	DEF-STAN 00-35 & 7-55	810E, METHOD 500; MIL-STD-1791	
	PACKAGING	PACKAGING QUALIFICATION SERIES	STANAG 2828 STANAG 4340 AEPP-3	MIL-STD-648		MIL-STD-648	
CLIMATIC	FIELD	TROPIC, DESERT, COLD REGIONS	STANAG 4370 AECTP-300	VARIOUS TOPS		VARIOUS TOPS	(D)4370
	LOW TEMP	LOW TEMP	STANAG 4370 AECTP-300	810E, METHOD 502	DEF-STAN 00-35 & 7-55	810E, METHOD 502	(D)4370
		ICING, FREEZING RAIN	STANAG 4370 AECTP-300	810E, METHOD 521	DEF-STAN 00-35 & 7-55	810E, METHOD 521	(D)4370

Note: The decision to perform an individual subtest must be made based upon a careful review of the system under test. See test planning consideration of this document. It is intended that this spreadsheet provide a convenient topical framework to tailor test design regardless of the demining technology under test.

DESIGN TOPIC	TEST DATA TOPIC	SUB-ELEMENT	FRANCE	GERMANY	UNITED KINGDOM	UNITED STATES	STANAG
	HIGH TEMP AND DESERT SCREENING	HIGH TEMP	STANAG 4370 AECTP-300	810E, METHOD 501	DEF-STAN 00-35 & 7-55	810E, METHOD 501	(D)4370
		SAND AND DUST	STANAG 4370 AECTP-300	810E, METHOD 510	DEF-STAN 00-35 & 7-55	810E, METHOD 510	(D)4370
		SOLAR RADIATION	STANAG 4370 AECTP-300	810E, METHOD 505	DEF-STAN 00-35 & 7-55	810E, METHOD 505	(D)4370
	TROPIC AND TEMPERATE SCREENING	FUNGUS	STANAG 4370 AECTP-300	810E, METHOD 508	DEF-STAN 00-35 & 7-55	810E, METHOD 508	(D)4370
		TEMP-HUMIDITY	STANAG 4370 AECTP-300	810E, METHOD 507	DEF-STAN 00-35 & 7-55	810E, METHOD 507	(D)4370
		RAIN	STANAG 4370 AECTP-300	810E, METHOD 506	DEF-STAN 00-35 & 7-55	810E, METHOD 506	(D)4370
		SALT FOG	STANAG 4370 AECTP-300	810E, METHOD 509	DEF-STAN 00-35 & 7-55	810E, METHOD 509	(D)4370
		IMMERSION	STANAG 4370 AECTP-300	810E, METHOD 512	DEF-STAN 00-35 & 7-55	810E,METHOD 512	(D)4370
SAFETY AND HUMAN HEALTH	INSENSITIVE MUNITIONS	FAST COOK OFF	STANAG 4382 Instruction Technique No. 9282-6 de 1990	MIL-STD-2105A		MIL-STD-2105A	4240
		BULLET IMPACT	STANAG 4241 Instruction Technique No. 9282-2 de 1988	MIL-STD-2105A		MIL-STD-2105A	4241
		FRAGMENT IMPACT	STANAG 4496 Instruction Technique No. 9282-4 de 1989	MIL-STD-2105A		MIL-STD-2105A	4496
		SYMPATHETIC DETONATION	STANAG 4396	MIL-STD-2105A		MIL-STD-2105A	(D)4396
		SLOW COOK OFF	STANAG 4382 Instruction Technique No. 9282-6 de 1990	MIL-STD-2105A		MIL-STD-2105A	4382
		SHAPED CHARGE JET	STANAG 4526	MIL-STD-2105A		MIL-STD-2105A	

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DESIGN TOPIC	TEST DATA TOPIC	SUB-ELEMENT	FRANCE	GERMANY	UNITED KINGDOM	UNITED STATES	STANAG
		VULNERABILITY		MIL-STD-2105A		MIL-STD-2105A	
		12M DROP	STANAG 4375	MIL-STD-2105A		MIL-STD-2105A	(D)4375
	FINAL HAZARD CLASSIFICATION	SINGLE PACKAGE BURN TEST	STANAG 4240 Instruction Technique No. 9282-1 de 1987	TB 700-2		TB 700-2	(D) STANAG 4123
		STACK TEST	STANAG 4240 Instruction Technique No. 9282-1 de 1987	TB 700-2		TB 700-2	(D) STANAG 4123
		EXTERNAL FIRE STACK TEST	STANAG 4240 Instruction Technique No. 9282-1 de 1987	TB 700-2		TB 700-2	(D) STANAG 4123
	EOD VERIFICATION AND VALIDATION		STANAG 4324	MIL-STD-1902		MIL-STD-1902	
	FUZE QUALIFICATION	VARIOUS TESTS		MIL-STD-331		MIL-STD-331	
	SUBVERTED SAFETY	TAILORED					
	HUMAN HEALTH	BLAST NOISE AND STEADY STATE NOISE, OVER-PRESSURE	STANAG 4513 STANAG 2899	MIL-STD-1474		TOP 1-2-608; MIL-STD-1474; TOP 4-2-822	
		TOXIC FUMES	STANAG 4513			AR 40-5	
		VIBRATION		MIL-STD-1472;		MIL-STD-1472	
	SURFACE DANGER ZONE	ARENA OR STATIC FRAGMENTATION		TL 1300-0011, 2/82		TB 700-2; AMCR 385-100	

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DESIGN TOPIC	TEST DATA TOPIC	SUB-ELEMENT	FRANCE	GERMANY	UNITED KINGDOM	UNITED STATES	STANAG
	EXPLOSIVES QUALIFICATION	VARIOUS TESTS; FRICTION; IMPACT; ELECTROSTATIC; AUTOIGNITION; EXPLOSIVE TEMPERATURE; IGNITION; THERMAL STABILITY; CARD GAP; DETONATION; DUST	STANAG 4170 AOP-7 Instruction 11500	STANAG 4170		TB 700-2; AMCR 385-21; AMC 385-100	STANAG 4170
RELIABILITY	BINOMIAL(1); EXPONENTIAL(2)				DEF-STAN 00-43 & 00-44	MIL-STD-781D	STANAG 4174; ARMP 1 THR 14
INTEGRATED LOGISTICS SUPPORTABILITY	AVAILABILITY; MAINTAINABIL-ITY; LOGISTICS SUPPORTABILITY	DESIGN; SAFETY; EQUIPMENT PUBLICATIONS; TRAINING; END ITEM REQUIREMENTS; TEST, MEASUREMENT, AND DIAGNOSTICS; REPAIR PARTS	DEFSTAN 00-40		DEF-STAN 00-60	AR 702-3; AR 700-127; AMCR 700-15 W/TECOM Supp; DA PAM 700-50	STANAG 4174; ARMP 1 THR 14
PERFORMANCE	TARGET SELECTION	DETERMINATION OF TARGETS APPROPRIATE TO COUNTERMINE TECHNOLOGY					
	MINE DETECTION	TESTING OF GROUND AND AIR-BASED DETECTION SYSTEMS					

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DESIGN TOPIC	TEST DATA TOPIC	SUB-ELEMENT	FRANCE	GERMANY	UNITED KINGDOM	UNITED STATES	STANAG
	MINE CLEARING OR NEUTRALIZA-TION	TESTING OF ELECTRO-MAGNETIC AND ACOUSTIC, MECHANICAL, AND EXPLOSIVE CLEARING					
	MINE OR MINEFIELD MARKING	TESTING OF MINEFIELD MARKING EQUIPMENT					
	RF CONTROL						
ELECTRO-MAGNETIC ENVIRONMENTAL EFFECTS (E3)	TRANSPORT AND HANDLING; PERSONNEL AND HELICOPTER	ELECTROSTATIC DISCHARGE	STANAG 4324 STANAG 4239 AOP-24 STANAG 4327 AOP-25				4239, 4370
	TRANSPORT AND HANDLING; HAZARDS TO ORDNANCE	EMRH/O			DEF-STAN 59-41		
	NATURAL PHENOMENA	LIGHTNING, NEAR-STRIKE AND DIRECT			DEF-STAN 59-41		4370
	OPERATION	RADIATED EMISSIONS; CONDUCTED EMISSIONS; SUSCEPTIBLITY		MIL-STD-461 AND 462	DEF-STAN 59-41	MIL-STD-461 AND 462	4324
	NUCLEAR EVENT	ELECTRO-MAGNETIC PULSE	STANAG 4416 AOP-28			QSTAG 244	(D)4416
	COUNTER-MEASURES						

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DESIGN TOPIC	TEST DATA TOPIC	SUB-ELEMENT	FRANCE	GERMANY	UNITED KINGDOM	UNITED STATES	STANAG
HUMAN FACTORS OR ERGONOMICS	DESIGN; INTERACTION; EFFICIENCY; SAFETY	ANTHROPOMETRY; CONTROLS; DISPLAYS; WORKSPACE; ENVIRONMENT; PORTABILITY; REMOTE OPS; HAZARDS; ETC		MIL-STD-1472	DEF-STAN 00-25	MIL-STD-1472; TOP 1-2-610	
SOFTWARE	TBD					ADA AND OTHERS	
PLACEHOLDER							

Note: The decision to perform an individual subtest must be made based upon a careful review of the system under test. See test planning consideration of this document. It is intended that this spreadsheet provide a convenient topical framework to tailor test design regardless of the demining technology under test.

20 May 1999