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PROCEDURES FOR THE ASSESSMENT OF DEFENSIVE AID SUITES (DAS) FOR LAND VEHICLES – DAS INTEGRATION CONSIDERATIONS

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NATO LETTER OF PROMULGATION

17 November 2021

1. The enclosed Allied Engineering Publication AEP-62, Volume VII, Edition C, Version 1, "PROCEDURES FOR THE ASSESSMENT OF DEFENSIVE AID SUITES (DAS) FOR LAND VEHICLES – DAS INTEGRATION CONSIDERATIONS", which has been approved by the nations in the NATO Army Armaments Group, is promulgated herewith. The agreement of nations to use this publication is recorded in STANAG 4686.

2. AEP-62, Volume VII, Edition C, Version 1, is effective on receipt and supersedes AEP-62, Volume VII, Edition B, which shall be destroyed in accordance with the local procedure for the destruction of documents.

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4. This publication shall be handled in accordance with C-M(2002)60.

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Major General, GRC (A)
Director, NATO Standardization Office

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RECORD OF RESERVATIONS

CHAPTER	RECORD OF RESERVATION BY NATIONS

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RECORD OF SPECIFIC RESERVATIONS

NATION	DETAIL OF RESERVATION

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TABLE OF CONTENTS

LIST OF ABBREVIATIONS

AECTP	Allied Environmental Conditions and Test Publications
ATGM	Anti-Tank Guided Munition
ATR	Anti-Tank Rocket
BIT	Built-in test
BMS	Battlefield Management System
C2	Command and Control
CM	Countermeasure
CS	Conducted Susceptibility
DAS	Defensive Aid Suites
EID	Explosive and incendiary devices
EO	Electro-optics
EM	Electromagnetic
EMC	Electromagnetic Compatibility
ESD	Electrostatic Charging and Discharging
FA	False Alarm
FAR	False Alarm Rate
GUI	Graphical User Interface
HE	High Explosive
HERO	Hazards of Electromagnetic Radiation to Ordnance
HFE	Human Factors Engineering
HMI	Human Machine Interface
IEC	International Electro-technical Commission
ILS	Integrated Logistics Support
IVIS	Integrated Vehicle Information System
KE	Kinetic Energy
LEMP	Lightning Electromagnetic Pulse
MBSE	Model Based Systems Engineering
NA	National Authority
NEMP	Nuclear Electromagnetic Pulse
NNEMP	Non-Nuclear Electromagnetic Pulse

OEM	Original Equipment Manufacturer
QSTAG	Quadripartite Standardization Agreement
RBJ	Rotary Base Junction
RE	Radiated Emission
RF	Radio Frequency
RoE	Rules of engagement
RS	Radiated Susceptibility
STANAG	Standardization Agreement (NATO)
S&A	Safety and Arming
SCG	Security Classification Guide
TREE	Transient Radiation Effects on Electronics
TTP	Tactics, Techniques and Procedures

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1 SCOPE

This AEP-62 Edition C Volume VII (Version 1) is part of a document series, as laid down in AEP-62 Edition C from STANAG 4686 "PROCEDURES FOR THE ASSESSMENT OF DEFENSIVE AID SUITES (DAS) FOR LAND VEHICLES".

Volume I provides the definition of DAS and the Security Classification Guide (SCG).

Volume VII[1] lists the specific considerations that should be made during the design, test and evaluation of DAS integration on a host vehicle.

Excluded are wider considerations that a National Authority (NA) should make as part of their national DAS acquisition process that may not relate specifically to integration, for example this volume excludes consideration of:

- Impacts to tactics, techniques and procedures (TTPs) that are not related specifically to integration e.g. doctrinal impacts;
- Integrated Logistic Support (ILS) issues that are not related specifically to integration e.g. spares provisioning.

2 SIGNIFICANCE OF USE

This document applies to any vehicle on which a DAS may be integrated.

The NA may at their discretion accept any deviation from the procedures outlined in this Annex, provided the procedures used are judged equivalent and are well documented. Nothing in this document supersedes applicable national laws and regulations unless a specific exemption has been obtained.

The evaluation of a product using these procedures may require the use of materials and/or equipment that could be hazardous. This document does not purport to address all the safety aspects associated with their use. It is the responsibility of the organization using this specification to establish appropriate health and safety practices and to determine the applicability of any regulatory requirements prior to its use.

This document may be updated by means of recorded changes as further data becomes available.

Where stated in this document, the NA is an appointed expert or group of experts.

3 OVERVIEW

In order to assess the integration effort, requirements for the DAS have to be well defined and understood.

[1] Here and in the following text "Volume *N*" stands for "AEP-62 Edition C Volume *N* (newest version)".

The assessment process involves consideration of the vehicle and DAS specifications, physical characteristics, capabilities, interface control documents (including both software and hardware interfaces) and logistics.

The sequence in which the various aspects are presented in the document does not necessarily represent the order of consideration. This document is not intended to be a feasibility guide for selection of DAS for any specific vehicle.

4 DAS INTEGRATION IMPACTS

4.1 System Coverage

In order to achieve the required DAS coverage, the following vehicle integration steps should be considered:

- Based on the user requirements for coverage, multi-hit capability, availability for operations and redundancy, identify the set of coverage zones for a specific vehicle configuration, resulting in a DAS coverage specification;
- Determine the number of system modules required to meet the specification (e.g. how many sensors, countermeasures, processing unit(s) and interface boxes, etc.);
- Determine vehicle “No-Fire, Fire-Inhibit” zone requirements that the DAS must meet to ensure full vehicle functionality (e.g. fire-inhibit zones for main armament functionality).

4.2 States and Modes Capabilities

In order to determine overall integration requirements deemed essential for efficient operation of the DAS, the following steps should be taken:

- Determine all DAS states and modes capabilities (Built-In Test [BIT], Sensor only, Semi-automatic, Automatic, Manual, Reload). Consider the DAS activation process sequence (e.g. soft kill mode followed by hard kill mode in a hybrid system);
- Determine the DAS degradation modes (if applicable) and the effect on vehicle primary mission in case of module failure.
- Determine all DAS failure modes and the effect on the vehicle primary mission (i.e. what is the impact of a DAS system failure on the vehicle capability?).

4.3 System Configuration

The overall DAS configuration will be dependent on the vehicle configuration constraints. In order to determine the integrated DAS/vehicle solution, the following questions should be taken into consideration:

- Does the DAS require system or subsystem calibration activities? What are the frequency, duration and manpower requirements of these activities? These activities should be added to the overall sustainability plan for the vehicle to determine if there needs to be adjustments or modifications to the plan due to the DAS integration.

- Does the DAS require mission or vehicle specific configuration(s) (e.g. subsystem positions or orientations, threat definitions, etc.)? How the data is provided to the DAS controller(s) (e.g. interface requirements for vehicle-specific networks)?
- Does the DAS require the purge of data or configurations during either upgrade or routine maintenance actions (e.g. to determine back-up requirements in the DAS and/or the vehicle)?
- Does the DAS enable the storage of data (e.g. threat detection and signature information)? Also, does the DAS enable the application and exchange of stored data to future missions within each vehicle? In addition, does the DAS enable sharing stored data with Command and Control (C2) networks (e.g. to help determine bandwidth requirements on the vehicle)?

4.4 Additional Protection Requirements for a DAS Event

The vehicle will generally have a physical protection system, separate from the DAS. Following engagement of a threat by the DAS, there is likely to be a residual effect, which must be mitigated by the vehicle protection system.

The NA should confirm appropriate vehicle protection to prevent a perforation of the vehicle infrastructure by the residual threat effects (e.g. protection to the crew compartment and mission critical systems). The NA should refer to STANAG 4569 AEP 55 Volume I and Volume IV to quantify the residual risk to the vehicle.

Residual effects that result from the action of the DAS (e.g. residual CM fragmentation or blast) must also be considered during integration design, including:

- The addition of blast shields to protect crew and equipment;
- The robustness of materials that may be within the field of effect;
- The location of mission equipment that may be within the field of effect.

The NA should consider vehicle-specific requirements, which may be pertinent to vehicle type or role, when assessing risk in order to determine the optimum solution for the addition of mitigating design elements (e.g. additional protection to crew locations or mission critical equipment).

4.5 Signature

Management of the vehicle signature is an important factor for both vehicle and crew survivability. During integration design the NA should identify signature management procedures in accordance with national requirements. In order to ensure that the vehicle signature remains acceptable, the following should be considered:

- Determine the standalone DAS signature across the spectral range relevant to the anticipated threat environment.
- Determine the baseline vehicle signature (without DAS) across the spectral range relevant to the anticipated threat environment.
- Determine the signature of the vehicle with the DAS integrated to identify the impact caused by the DAS integration, including consideration of any additional signature management implications (e.g. active emissions, thermal hotspots, retro-reflection or radar corner reflections).
- Consider the impact of the modified signature on the overall survivability of the vehicle and crew.
- Determine mitigation measures to reduce the risk due to vehicle signature to an acceptable level.

4.6 Location, Weight and Volume of Components

The integration of DAS onto a vehicle will require a space and weight budget. The availability of these may limit the ability to integrate, or drive design change requirements for, a specific DAS. It may also impact on the performance of the DAS.

A detailed design analysis should be conducted to identify engineering and performance constraints to both the DAS and vehicle.

The following steps should be considered:

- Identify DAS internal and external space claims, taking into account the consideration of:
  - Human Factors e.g. access, egress and system operation in accordance with national standards;
  - Interference with existing vehicle systems e.g. turret rotation;
  - The carriage and stowage of DAS counter measures;
  - The carriage and stowage of DAS specific ancillaries e.g. maintenance laptops and special tools and test equipment;
  - Maintainability requirements e.g. repair, replacement, and calibration;
  - Other platform installations that may affect Fields of View (FoV) and Fields of Effect (FoE).
- Analyze the impact of DAS module location(s) with respect to both DAS coverage and vehicle functionality (e.g. integration of the DAS may impact main weapon fire-inhibit zones or sight lines).

- Analyze the impact of DAS module location(s) with respect to DAS performance and vehicle emissions (e.g. the effect of host vehicle systems on DAS performance such as false alarm rates and probability of threat declaration).
- Determine the impact of DAS module and overall system weight on vehicle functional dynamics (e.g. centre of gravity, turret rotation, etc.) including consideration of DAS mounting hardware, stowage of spare countermeasures and any DAS module physical protection.

5 ROBUSTNESS

5.1 Vulnerabilities

The NA should determine DAS vulnerabilities. As a minimum the following should be determined as common DAS integration considerations:

- Determine DAS module vulnerability to damage based on defined threats expected to be exposed to the vehicle (for example but not limited to kinetic energy threats, artillery fragments, mine blast, EM and EO threats and IED threats). Determine any requirement for further external protection for the DAS modules including configuration changes to the vehicle.
- Determine DAS module vulnerability to environmental conditions expected to be exposed to the vehicle (including rain, solar loading, sand & dust, snow, freezing rain, humidity, vibration, etc.).
- Determine DAS vulnerability to cyber threats. Consideration should be taken of the potential for the DAS to expose the vehicle to cyber threats, or for the DAS to be exposed to cyber threats as a result of integration to the vehicle (e.g. as a result of legacy vehicle architectures).

Having identified vulnerabilities, all relevant security classification guides should be consulted regarding appropriate treatment of this information (for example the vehicle security classification guide and STANAG 4686 SCG).

5.2 Environmental testing

There is potential for DAS performance to be affected by the natural environment (e.g. the natural climatic environment) and the induced environment (e.g. those environmental conditions which are either man made or generated by the materiel).

When determining the requirements for robustness and durability the NA should consider the employment of the system for the purpose of both training and operational use. This is to ensure that the NA can achieve the desired level of availability across the lifecycle of the equipment.

The environmental standards listed in Section 8 should be considered when designing qualification testing for the integrated DAS.

5.2.1 Natural Climatic Environment

As a minimum, the testing of natural climatic environments should consider measuring the effect of:

- Rain;
- Dust and sand;
- Snow and freezing rain;
- Solar loading;
- High and low temperature;
- Temperature variations;
- Humidity;
- Fungal growth;
- Salt environment;
- Fire and smoke.

5.2.2 Induced Mechanical Environment

During the integration design process, the NA should determine the:

- Host vehicle's induced mechanical environment e.g. vibration and shock;
- Compatibility and suitability of the DAS considering both the characterised induced mechanical environment of the host vehicle and the validated design limits of the DAS;
- Design requirements for the DAS installation equipment e.g. mounts and bracketry.

The DAS engagement cycle is likely to induce additional loading on the vehicle infrastructure. This loading should be quantified and evaluated through physical testing of the DAS prior to integration on the actual vehicle. This testing is applicable to both hard and soft kill systems. The following DAS activities should be considered where applicable to the system:

- Slewing acceleration and braking of pointer tracker sensor types;
- Slewing acceleration and braking of aimed countermeasures;
- Physical loading during the DAS activation sequence, e.g. launch or detonation of hard kill and soft kill countermeasures.

5.2.3 Chemical, Biological, Radiological and Nuclear (CBRN) Environment

As a minimum, the testing of DAS robustness in CBRN environments should be commensurate with the requirements that define the host vehicle's expected operating environment. This testing should consider:

- Material susceptibility to the chemical or biological agent (defined within the requirements);
- The effect of "persistent" chemical agents on sensors and effectors;
- Vehicle CBRN decontamination procedures including cleaning agents and cleaning materials;
- Radiological and nuclear hardening.

5.3 Other Qualification and Evaluation Considerations

Prior to final design acceptance, the NA should consider subjecting the installed DAS to User and Operational acceptance and qualification testing in accordance with the procedures defined within national Quality Management Systems. This should include testing not only in a controlled environment e.g. qualification test facility but also in a field environment e.g. vehicle proving trial facility. Integration design and test requirements should consider:

- Vehicle interaction with non-hostile objects within the environment e.g. tree brush;
- Vehicle interaction with hostile objects within the environment e.g. thrown objects;
- Impact to the general operational employment of the vehicle e.g. tactical and strategic deployability;
- Vehicle installation scope e.g. Fitted For But Not With;
- Weaknesses induced through the integration design e.g. water traps;
- Operator interaction with the equipment e.g. during daily use and maintenance activities.

6 DAS INTERFACE REQUIREMENTS

6.1 Power and Electrical Interface Analysis

Successful integration of a DAS will be dependent on the compatibility of system interface requirements and vehicle interface capabilities, including the DAS power requirements and the power interfaces within the vehicle. In order to understand power and electrical compatibility, the NA should consider:

- Baseline vehicle loads to existing power system in all modes of operation (OFF, steady state and peaks);

- The DAS grounding requirements and their compatibility with the host vehicle's grounding scheme;
- Impacts to existing power distribution system including potential additional circuit protection, power system isolation, and cabling requirements;
- Impacts to existing electrical distribution network capacity, including Rotary Base Junctions (RBJ) for turreted vehicles and through-hull interface availability. This should consider electrical connectivity for data, power and discrete interfaces e.g. hatch interlocks or others safety related controls;
- Compatibility with power quality available on the vehicle and whether additional power isolation or filtration is required;
- Requirements for through-hull interfaces such as the consideration of EMC in accordance with national standards.

6.2 Human Machine Interface

The DAS Human Machine Interface (HMI) should be assessed against NA Human Factors Engineering (HFE) requirements. The aim should be to optimize the integration design where possible.

The following steps should be followed to identify NA HFE requirements:

- Define common user interface requirements;
- Define common icons for use in any Graphical User Interface (GUI);
- Define overlay requirements (if any);
- Define an alarms and alerts taxonomy with associated HFE-driven specification and behaviours;
- Identify optimal location(s) of DAS control(s) within each vehicle configuration.

HFE assessment should include both formal assessment against the compliance to NA HFE requirements as well as Operator and Maintainer assessment. It should also consider the concept of use and employment of the DAS installed vehicle. This should include the vehicle's entire operational life (across all states and modes), including:

- Training;
- Maintenance;
- Threat scenarios;
- Silent watch;
- Equipment initialisation and shut down;

- Security compromise;
- Personal protection equipment e.g. gloves.

The consideration of system safety should be fundamental to the HFE design assessment.

6.3 Integration with Vehicle Mission Systems

The capability provided by DAS can be maximised through effective integration to vehicle mission systems e.g. vehicle fire control system, Battlefield Management Systems (BMS), Integrated Vehicle Information Systems (IVIS) and Combat-ID systems.

Information provided by the DAS can be employed by the vehicle's mission systems to provide weapon or sight cues and to enhance the overall situational awareness capability.

Information provided to the DAS can support effective threat defeat, or assist with mitigating the risk of collateral damage to friendly forces.

In order to fully exploit the benefits of DAS and vehicle integration, the NA should conduct a full Model Based System Engineering (MBSE) design process. This should define not only DAS functionality but also wider vehicle functionality considering the integrated DAS capability.

6.4 Interoperability

The DAS will be installed on individual vehicles and will be capable of discrete operation. Interoperability with other vehicles or other force elements (e.g. dismounts) may require further integration with the BMS at a higher command and communication level.

The performance and benefits provided by DAS can be enhanced through sharing of DAS information between interoperable vehicles. This can provide collaborative effects to better detect and defeat threats, as well as shared situational awareness data. In order to support this, the following steps should be considered:

- Determine whether the DAS supports vehicle functions (e.g. the fire control system or health and usage monitoring system);
- Examine software architectures and interface requirements with a view to defining higher command level exploitation of information;
- Examine hardware architecture and interface requirements with a view to higher command level exploitation of information;
- Assess conformance to NA common data models;
- Consider vehicle Electronic Architecture standards such as STANAG 4754 (NATO Generic Vehicle Architecture).

These studies should be designed to answer the following questions:

- Can information be shared between vehicles, including between DAS-equipped and non DAS-equipped vehicles, and between vehicles being operated by different nations?
- Can information be shared between dismounts and vehicles?
- Can DAS information be exploited by the vehicle's battlefield management system?
- Can DAS information be exploited by mission systems on the host vehicle or other coalition vehicles?
- What information is available through this exploitation, both into and out of the DAS?

6.5 Electromagnetic Compatibility and Electromagnetic Interference

Electromagnetic Compatibility (EMC) refers to the ability of systems and subsystems, to operate as designed, within a shared electromagnetic environment, without suffering degradation due to susceptibility to that environment, or adversely contributing to the degradation of other systems through incompatible EM emissions.

Electromagnetic Interference (EMI) refers to an electrical disturbance event caused by unwanted, out of specification spurious signals of electrical origin that can cause degraded equipment performance and unexpected system behaviour. Due to these problems, all components must comply with specifications to ensure EMC.

Consideration should be made of EMC testing with relation to DAS components and systems.

6.5.1 EMC Testing Guidance

In order to sufficiently de-risk the electromagnetic compatibility of the integrated DAS, National Authorities are required to define the EM operating environment in which the DAS will be required to operate and to define the testing strategy for both DAS components (in isolation) and the integrated DAS (in its host vehicle environment).

Specific Radio Frequency (RF) based systems, such as Electronic Counter-Measures (ECM), may require additional consideration and interoperability testing.

Testing, at both the source and victim, should include (for both vehicle and component):

- Conducted Emission and Susceptibility testing:
    - Conducted emissions refer to the mechanism that enables electromagnetic energy to be created in an electronic device and coupled to its AC power cord. As a minimum the following should be considered.

- Conducted susceptibility refers to the capability of an equipment to maintain its designated level of performance while in the presence on interference on the power lines. The following should be considered with respect to the DAS.

- Radiated Emission and Susceptibility testing:
  - Radiated emissions refer to the unintentional release of electromagnetic energy from an electronic device (i.e. the electronic device generates the electromagnetic fields that unintentionally propagate away from the device's structure). In general, radiated emissions are associated with non-intentional radiators, but intentional radiators can also have unwanted emissions at frequencies outside their intended transmission frequency band.
  - Radiated susceptibility refers to the capability of equipment to maintain its designated level of performance when in the presence of an electric field.

The design of NA testing plans for DAS should consider, but not be limited to, the following EM categories:

- Lightening, Nuclear and Non-Nuclear EMP (LEMP, NEMP, NNEMP):
  - The susceptibilities to electromagnetic pulses (EMP) at both component and vehicle level should be identified. In response to these, modifications to the integration design in accordance with NA standards for EMP protection (i.e. Hazards of EM Radiation to Ordnance [HERO] protection) may be required.
  - Note: Any ordnance item containing electro-explosive devices that has not been classified as HERO SAFE or HERO SUSCEPTIBLE ordnance as a result of a HERO analysis or test is considered HERO UNSAFE. This may preclude the use of a DAS due to NA constraints.
- Electrostatic Charging and Discharging (ESD):
  - The phenomenon of electrostatic charging and subsequent discharges can result in interference to the operation of electronic equipment or damage to electronic circuitry. The energy released during discharges is potentially hazardous to personnel, fuel vapours and ordnance.
- Conducted EM Energy:
  - The conduction of EM energy generated from on-board vehicle power supplies and terrestrial power distribution networks.
- Static and Low Frequency Fields:
  - Static fields generated through natural (atmospheric) or unnatural (power supplies and terrestrial power distribution networks) electrical systems.
- Radiated Emissions (Communications and Radar):

  - Intentional emissions from active equipment such as communication systems and active RF sensors.

The following issues should be considered with respect to the DAS:

- Interference with other systems' functionality on the vehicle (use of own gun system, radio- and data transmission, antennas, jammers);
- Interference with system functionality of other force elements (e.g. other DAS, vehicle sensors, dismounted communications);
- Testing, handling and storage of DAS energetic components;
- Certification of safety critical firing circuits.

7 LOGISTIC CONSIDERATIONS

The NA should consider the support concept for the DAS, as system design and integration scheme will impact on the logistic burden and maintenance requirements of the vehicle. This should coincide with the overall Integrated Logistic Support (ILS) for the vehicle.

NA should consider:

- Maintenance and overhaul schedules, and any requirement for higher echelon line of repair;
- Diversity of subsystems and configuration management of these;
- Diversity and number of consumables required to support a battlefield mission;
- Tooling for installation or maintenance, and whether special tools are required;
- Lifecycle costs and burdens due to ILS requirements including spares, training and publications.

NA activities should include engagement with logistics specialists.

8 RELATED STANDARDS

The following standards are relevant to the integration of DAS and should be considered by the NA for applicability to national requirements.

Applicable NATO Standardization Agreement[2]

STANAG 2601: “Standardization of electrical systems in tactical land vehicles”

STANAG 3909: “Discrete signal interfaces”

STANAG 4093: “Mutual acceptance by NATO member countries qualification of electronic and electrical components for military use”

STANAG 4133: “Electrical Power Supplies: Standard Types and Rotating Generating Sets (AC-DC)”

STANAG 4138: “Vibration resistant equipment – testing requirements”

STANAG 4157: “Safety, Arming and Functioning Systems (SAF Systems) Testing Requirements”

STANREC 4174: “Allied reliability and maintainability publication”

STANAG 4187: “Fuzing system-safety design requirements”

STANAG 4238: “Munitions design principles, electrical/electromagnetic environments”

STANAG 4279: “NATO glossary of packaging terms and definitions”

STANAG 4280: “NATO Packaging and Preservation”

STANAG 4281: “NATO standard marking for shipment and storage”

STANAG 4326: “NATO fuze characteristics data”

STANAG 4340: “NATO standard packaging and test procedures”

STANAG 4368: “Ignition Systems for Rocket and Guided Missile Motors, Safety Design Requirements”

STANAG 4370: “Environmental testing”

STANAG 4375: “Safety drop, munitions test procedure”

STANAG 4434: “NATO standard packing for susceptible to damage by electrostatic discharge”

STANAG 4440: “NATO Guidelines for the Storage of Military Ammunition and Explosives”

STANAG 4441: “Allied Multi-Modal Transportation of Dangerous Goods Directive”

STANAG 4487: “Explosives, friction sensitivity tests”

STANAG 4488: “Explosives, shock sensitivity tests”

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[2] It is a NA responsibility to ensure all references are reviewed for relevance and currency prior to use.

STANAG 4489: “Explosives, impact sensitivity tests”

STANAG 4490: “Explosives, electrostatic discharge sensitivity tests”

STANAG 4491: “Explosives, thermal sensitiveness and explosiveness”

STANAG 4529: “Characteristics of Single Tone Modulators/Demodulators for Maritime HF Radio Links with 1240 Hz Bandwidth”

STANREC 4567: “NATO IMPLEMENTATION OF UNIFIED PROTECTION AGAINST ELECTROMAGNETIC ENVIRONMENTAL EFFECTS (UE3) - AEP-41”

STANAG 4754: “NATO Generic Vehicle Architectures”

Applicable Military Standards

Note: The MIL-STDs listed below should only be used in case their content is not addressed in STANAG 4370.

QSTAG 307: “Electrical power supply systems below 650 volts”

MIL-STD-461F: “Military standard, electromagnetic interference characteristics requirement for equipment”

MIL-STD-462E: “Requirements for the control of electromagnetic interference characteristics of subsystems and equipment”

MIL-STD-463A: “Definitions and systems of units, electromagnetic interference and electromagnetic compatibility technology”

MIL-STD-464D: “Electromagnetic environmental effects requirements for systems”

MIL-STD-1275E: “Characteristics of 28 volt DC electrical systems in military vehicles”

MIL-STD-1276H: “Leads for electronic components parts”

Note: MIL-STD-1276H should be marked if not compliant with REACH.

MIL-STD-1277B: “Splices, terminals, terminal boards, binding posts, terminal junction systems, wire caps; electrical”

MIL-STD-1512: “Electro-explosive subsystems, electrically initiated, design requirement and test methods”

Applicable commercial standards

IEEE STD C62.41: “IEEE recommended practice on surge voltages in low-voltage AC power circuits”

International electro-technical commission

IEC 61000-4: “Electromagnetic compatibility, part 4, testing and measurement techniques”

Allied Environmental Conditions and Test Publications (AECTP)

AECTP 100: “Environmental guidelines for defence material”

AECTP 200: “Environmental conditions”

AECTP 300: “Climatic environmental tests”

AECTP 400: “Mechanical environmental tests”

AECTP 500: “Electrical/electromagnetic environmental tests”

AEP-62 VOL VII (C) (1)