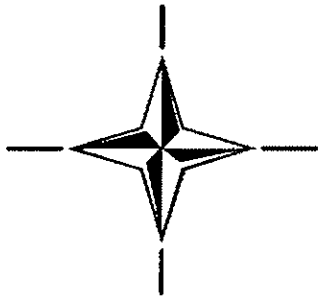
STANAG 2352
(Edition 5)

NORTH ATLANTIC TREATY ORGANIZATION
(NATO)



NATO STANDARDIZATION AGENCY
(NSA)

STANDARDIZATION AGREEMENT
(STANAG)

SUBJECT: NUCLEAR, BIOLOGICAL AND CHEMICAL (NBC) DEFENCE EQUIPMENT – OPERATIONAL GUIDELINES

Promulgated on 22 September 2005

J. MAJ
Brigadier General, POL(A)
Director, NSA

RECORD OF AMENDMENTS

No.	Reference/date of Amendment	Date entered	Signature

EXPLANATORY NOTES

AGREEMENT

1. This NATO Standardization Agreement (STANAG) is promulgated by the Director NATO Standardization Agency under the authority vested in him by the NATO Standardization Organisation Charter.

2. No departure may be made from the agreement without informing the tasking authority in the form of a reservation. Nations may propose changes at any time to the tasking authority where they will be processed in the same manner as the original agreement.

3. Ratifying nations have agreed that national orders, manuals and instructions implementing this STANAG will include a reference to the STANAG number for purposes of identification.

RATIFICATION, IMPLEMENTATION AND RESERVATIONS

4. Ratification, implementation and reservation details are available on request or through the NSA websites (internet http://nsa.nato.int; NATO Secure WAN http://nsa.hq.nato.int).

FEEDBACK

5. Any comments concerning this publication should be directed to NATO/NSA – Bvd Leopold III - 1110 Brussels - BEL.

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NAVY/ARMY/AIR

NATO STANDARDIZATION AGREEMENT (STANAG)

NUCLEAR, BIOLOGICAL AND CHEMICAL (NBC) DEFENCE EQUIPMENT - OPERATIONAL GUIDELINES

Annexes:
- A. Tri-Service NBC defence Individual Protection Equipment (IPE)
- B. Unit/Installation NBC Equipment
- C. Specialist NBC unit Equipment
- D. Description of NBC Equipment

Related Documents:

STANAG 2002 NBC -	Warning Signs for the Marking of Nuclear, Biological and Chemical Contamination
STANAG 2047 NBC -	Emergency Alarms of Hazard or Attack (NBC and Air Attack only)
STANAG 2083 NBC -	Commanders' Guide on Nuclear Radiation Exposure of Groups During War
STANAG 2112 NBC -	Nuclear, Biological and Chemical Reconnaissance
STANAG 2126 MED -	First-Aid Kits and Emergency Medical Care Kits
STANAG 2150 NBC -	NATO Standards of Proficiency for NBC Defence
STANAG 2353 NBC -	Evaluation of NBC Defence Capability
STANAG 2426 NBC -	Nuclear, Biological and Chemical (NBC) Hazard Management Control Policy for NATO Forces
STANAG 2871 NBC/MED -	First-Aid Materiel for Chemical Injuries
STANAG 2941 NBC -	Guidelines for Air and Ground Personnel Using Fixed and Transportable Collective Protection Facilities on Land
STANAG 2957 NBC -	International System (SI) Units used by Armed Forces in the Nuclear Field
STANAG 2984 NBC -	Graduated Levels of NBC Threat and Associated Protection
STANAG 3864 AMD -	The Measurement of Protection Provided to the Respiratory Tract and Eyes by Aircrew Equipment Assemblies against NBC Agents in Particulate, Aerosol and Vapour Form
AEP-10 -	Handbook for the Sampling and Identification of Chemical Warfare Agents

AJP-3.8 -	Allied Joint Doctrine for NBC Defence
AEP-49 -	Sampling and Identification of Radiological Agent (SIRA)
ATP-45 -	Reporting Nuclear Detonations, Biological and Chemical Attacks, and Predicting and Warning of Associated Hazards and Hazard Areas (Operators Manual)

AIM

1. The aim of this agreement is to provide a NATO agreed detailing CBRN defence equipment requirements based on the main threats from CBRN Weapons and environmental hazards to Alliance territories in general and deployed NATO forces in particular. The equipment requirements should follow the 5 components of NBC defence and consider NATO Essential Operational Capabilities (EOC's) such as mobility and deployability, and identify capability gaps, which prioritised should be main focus of future developments.

AGREEMENT

2. Participating nations agree to be guided by this STANAG when providing NBC defensive equipment for their forces.

3. The provision of individual, unit and specialist NBC unit defence equipment is a national responsibility.

4. The scales of equipment in this STANAG are applicable to NATO assigned and earmarked forces. The scales for NATO International Headquarters will be provided in separate directives issued by appropriate commanders.

5. This STANAG does not deal with prophylactic, diagnostic or therapeutic NBC medical equipment to be used by medical specialists.

DETAILS OF THE AGREEMENT

6. To achieve the aim of this agreement, in accordance with the five components of NBC defence; Detection, Identification and Monitoring, Warning and Reporting, Physical Protection, Hazard Management and Medical Countermeasures and Support, NATO forces are to be equipped to defend themselves, by their parent nations as follows:

a. As a minimum, each individual should be provided with defence against NBC weapons in the form of:

(1) Personal detection equipment;

(2) individual respiratory protection and protective clothing;

(3) first-aid self-treatments; and

(4) personal chemical decontamination equipment.

b. Units should have the equipment to:

(1) detect, alert, warn and report of the presence of NBC and toxic industrial hazards;

(2) provide collective protection to critical functional areas and for periodic R&R;

(3) treat casualties in an NBC environment in accordance with STANAGs 2126 and 2871; and

(4) perform operational decontamination in order to minimise casualties and continue and complete the mission.

c. Specialist NBC units should have the equipment to:

(1) detect, alert, warn and report of the presence of NBC and toxic industrial hazards;

(2) identify and confirm NBC contamination;

(3) sample and transport NBC agents and toxic industrial material (TIM) to nearest analysis facility; and

(4) carry out thorough and clearance decontamination.

7. There is a particular need for adequate training equipment to permit regular training in order to sustain a satisfactory state of preparedness against NBC attacks and/or TIM release. Ideally this training equipment should resemble as far as possible the operational equipment.

IMPLEMENTATION OF THE AGREEMENT

8. This STANAG is implemented when forces concerned are equipped with the items detailed in this agreement.

ANNEX A TO
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TRI-SERVICE NBC DEFENCE INDIVIDUAL PROTECTION EQUIPMENT (IPE)

Item[1]	Quantity[2]	Remarks
1. DETECTION, IDENTIFICATION AND MONITORING		
a. NBC detection equipment		Equipment may be an electronic or chemical/physical device or a set of detection papers, including a sufficient number of replacement papers, in accordance with national regulations.
2. PHYSICAL PROTECTION		
a. Protective mask	1	In haversack or carrier, spare canister or filter elements should be included in accordance with national regulations. Specialised respiratory protection should be provided for personnel, i.e. aircrew, whose function precludes wearing a standard issue respirator. Industrial respirator-filters should be available, in accordance with national regulations.
b. Protective ensemble	As required	The quantity necessary is based on providing protection to enable operations for 24 hours in a contaminated environment. Specialised protective ensembles should be provided for those personnel, i.e. aircrew, whose function precludes wearing a standard protective ensemble. Protective clothing designed to withstand toxic industrial chemicals (TICs) should be available for a limited number of personnel. Spare ensembles in accordance with national regulations.

[1] For description see Annex D
[2] The quantities of equipment required by personnel to sustain operations in an NBC environment are not considered

	Item[1]	Quantity[2]	Remarks
3.	HAZARD MANAGEMENT		
	a. Nuclear dosimeter individual[3], collective	1	For army units; for navy units, coastal fortresses and airforce units: 1 dosimeter per group, in accordance with national regulations.
	b. Chemical Decontamination set	1	Spare parts in accordance with national regulations
4.	MEDICAL COUNTERMEASURES AND SUPPORT		
	a. First aid self treatments		Items and quantity according to medical STANAGs as mentioned at "Related Documents" or national regulations

[3] The tasks of this item may be performed by more than one device or instrument, in accordance with national regulations.

ANNEX B TO
STANAG 2352
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UNIT/INSTALLATION NBC EQUIPMENT

	Item[4]	Quantity[5]	Remarks
1.	DETECTION, IDENTIFICATION AND MONITORING		
	a. Dose-rate meter		Quantity depending on role, mission, method of operation and dispersion of the unit.
	b. Chemical point detector		Quantity depending on instrument performances, unit-deployment, etc...
	c. Chemical identification kit		Depends on the number of required monitoring parties per unit.
	d. Chemical contamination monitoring equipment		Quantity depending on instrument performances, number of contamination controlled areas, presence of decontamination station(s), etc.[6]
2.	WARNING AND REPORTING		
	a. Warning and reporting equipment		Each unit/installation should be equipped with means for warning and reporting.

4 For description see Annex D
5 The quantities of equipment required by personnel to sustain operations in an NBC environment are not considered
6 A chemical point detector can be used for this

	Item[4]	Quantity[5]	Remarks
3.	PHYSICAL PROTECTION		
	a. Impermeable suit[7]		Number in accordance with national regulations.
	b. Collective protection system		As required (e.g. command post, vehicle, citadel, shelter, operation centre, R&R, etc.) and in accordance with national regulations.
	c. Cover material chemical proof		Available in sufficient quantities including replacements, to cover equipment, supplies, etc..
4.	HAZARD MANAGEMENT		
	a. Portable decontamination apparatus		Quantity in accordance with the vehicle/equipment size.
	b. Decontaminants		Available in sufficient quantities for items 4.a., 4.b. and 4.c..
	c. Ship installed washdown system		Each ship should be equipped with a countermeasure washdown system.
	d. Radiac calculator[8]	1 per NBC specialist or NBC branch in a Command Post	Manually or electronically operated.

[7] A permeable suit with a rubber apron could also offer an appropriate protection to e.g. decontamination personnel.
[8] The function of this item may be subsumed in a "NBC automatic data processing capability" (if present at this level).

Item[4]	Quantity[5]	Remarks
e. Nuclear Dosimeter (tactical)		Quantity depending on role, mission, method of operation and dispersion of the unit.
f. Dosimeter reader		If needed, number in accordance with national regulations.
g. Dosimeter, charger		If needed, number in accordance with national regulations.

5. MEDICAL COUNTERMEASURES AND SUPPORT

a. Medical Items		Scale according to medical STANAGs as mentioned at "Related Documents" or according to national regulations.

ANNEX C TO
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SPECIALIST NBC UNIT EQUIPMENT[9,10]

Item[11]	Quantity[12]	Remarks
1. DETECTION, IDENTIFICATION AND MONITORING		
a. NBC reconnaissance and survey vehicle		Quantity depending on unit-deployment and national regulations.
b. Radiological, biological and chemical sampling equipment		Depends on the number of required sampling parties per unit.
c. NBC deployable Analytical laboratory[13]		Quantity depending on instrument performances,unit-deployment, etc.
d. Capability to record nuclear events		Quantity depending on instrument performances, unit-deployment, etc..

9 Nations without "Specialist NBC Units" should incorporate the equipment mentioned in this ANNEX as far as possible in the list of equipment of "Units/Installations" (ANNEX B).
10 "Specialist NBC Units" should also have the equipment of regular "Units/Installations" (ANNEX B).
11 For description see Annex D
12 The quantities of equipment required by personnel to sustain operations in an NBC environment are not considered
13 The task of this item may be performed by more than one device or instrument in one or more installations, in accordance with national regulations

Item[11]	Quantity[12]	Remarks
e. Radiological Contamination monitoring equipment		Quantity to depend on equipment performance, unit deployment, etc.
f. Biological point detector[14]		Quantity depending on instrument performances,unit-deployment, etc.
g. Biological remote detection device[4]		Deployed in accordance with national regulations.
h. Biological identification kit[5]		In accordance with national regulations.
i. Aerosol confirmation monitor (biological)[5]		Quantity depending on unit organization.
j. Biological stand-off detection equipment[5]		Quantity depending on instrument performances, unit-deployment, etc..
k. Vapour confirmation monitor (chemical)		Quantity depending on unit organization.
l. Chemical stand-off detection equipment[5]		Quantity depending on instrument performances, unit-deployment, etc..
m. Chemical Point detector		Quantity depending on unit organization.
n. Chemical Identification kit		Quantity depending on unit organization.

[14] The tasks of (some of) these items may be performed by one single device or instrument.

Item[11]	Quantity[12]	Remarks
2. WARNING AND REPORTING		
a. NBC automatic data processing capability		Quantity in accordance with national regulations.
3. PHYSICAL PROTECTION		
a. Advanced respiratory protection		Self Contained Breathing Apparatus. Especially for personnel (e.g. mass-spectrometer operators) handling vapour confirmation monitors outside vehicles with collective protection. Quantity depending on unit deployment and national regulations.
b. Advanced impermeable suits		For the same category of personnel mentioned above (Item 3.a.). Quantity also depending on unit deployment and national regulations.
4. HAZARD MANAGEMENT		
a. Power-operated decontamination apparatus		In special decontamination units/stations.

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[5] The tasks of (some of) these items may be performed by one single device or instrument.

ANNEX D TO
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DESCRIPTION OF NBC EQUIPMENT

A. INDIVIDUAL

1. DETECTION. IDENTIFICATION AND MONITORING (INDIVIDUAL)

a. Chemical detection equipment. Equipment that provides an indication of a hazard by chemical agents.

2. PHYSICAL PROTECTION (INDIVIDUAL)

a. Protective mask. Functional equipment that provides at least a protection to the eyes and respiratory tracts against chemical and biological agents and, against inhalation of radioactive dust. Special additional features may be needed for special functions (aircrew, etc.). Special filter-elements to match chemical release other than attack may be needed at special locations / for special functions.[15]

b. Protective ensemble. A suit of equipment that provides protection for the body and parts of the head which are not protected by the protective mask, against percutaneous biological and chemical agents and that provides protection against alpha and beta particles of radioactive fallout or radioactive contamination. The ensemble may be one-piece, or may consist of different items such as coverall, gloves, boots, etc.. Special personnel-categories may have a specially designed protective ensemble. The ensemble can be an over- or an undergarment.

3. HAZARD MANAGEMENT (INDIVIDUAL)

a. Radiac dosimeter. An instrument used to measure the ionizing radiation absorbed by that dosimeter.

b. Decontamination set. A light-weight equipment to enable the individual to decontaminate the skin, parts of the clothing, equipment and the individual weapon.

4. MEDICAL COUNTERMEASURES AND SUPPORT (INDIVIDUAL)

a. First aid self treatments. As mentioned in the medical STANAGs (see: "Related Documents") or in national regulations.

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[15] For general troops in the area where there may be a hazard from Toxic Industrial Chemicals (TICs) a general type of industrial filter should be available.

B. **UNIT/INSTALLATION**

1. DETECTION, IDENTIFICATION AND MONITORING (UNIT/INSTALLATION)

a. Nuclear dose-rate meter. An instrument that is capable of:

(1) determining the degree of radioactive contamination (including in water) or to check the effectiveness of decontamination measures;

(2) determining the dose-rate of residual gamma radiation and/or the presence of beta radiation in a contaminated area;

(3) measuring low level radiation dose-rates.

b. Chemical point detector. A device or system, including the observation of living organisms, employed to detect/recognise and alert an operator of the emergence, presence or absence of NBC warfare events or hazards.

c. Chemical identification kit. A kit, which provides the means to identify the different types of detected chemical agents or toxic industrial chemicals.

d. Chemical contamination monitoring equipment. An instrument that will detect/ identify (even minor) chemical contaminations. It can be used e.g. to confirm the effectiveness of a chemical decontamination or to monitor the air in a collective protection system for the absence of a chemical contamination.

2. WARNING AND REPORTING (UNIT/INSTALLATION)

a. Warning and reporting equipment. Instruments for warning and reporting, e.g. means for giving alarm and means for communications.

3. PHYSICAL PROTECTION (UNIT/INSTALLATION)

a. Impermeable/permeable suit for decontamination purposes. An impermeable/permeable suit, designed for special purposes (e.g. for decontamination personnel), which provides whole body protection against contact with liquid toxic and biological agents, and radioactive fallout. At unit-level disposables are preferred.

b. Collective protection system. A system that provides protection to a group of individuals in a NBC environment, which permit relaxation of individual NBC protection, or for use by sub-units which, in certain situations, have to perform their mission without NBC protective clothing in an NBC environment (e.g. medical personnel and electronic equipment maintenance personnel). Two types can be distinguished:

(1) a filter-overpressure system that prevents the intrusion of unfiltered (contaminated) air;

(2) a ventilated facepiece installation which provides filtered air, by means of flexible hoses, whether or not coupled onto a protective mask or a special facepiece.

COLPRO facility fitted with a Contamination Control Area (CCA) and an airlock ensures that contamination does not enter the Toxic Free Area (TFA) of the COLPRO. The CCA is designed to ensure that personnel processing through do not cross contaminate the TFA.

c. Cover material chemical proof. A protective material, which is to be applied over supplies, equipment, etc., to provide a barrier for an adequate time to prevent direct contamination with liquid chemical agents, biological agents, and radioactive dust.

4. HAZARD MANAGEMENT (UNIT/INSTALLATION)

a. Portable decontamination apparatus. A light-weight apparatus for quick decontamination of essential parts of equipment.

b. (Steam) cleaning system. A system, which sprays hot water or steam on contaminated equipment in order to increase the effectiveness of a decontamination.

c. Decontamination or cleansing station. A fixed or mobile installation where personnel can remove contaminated clothing and don clean clothing. The installation may include a showering or bathing facility for decontamination purposes, if required according to decontamination policy.

d. Decontaminants. A range of materials to perform effective and rapid decontamination of equipment or facilities from radioactive particles and biological or chemical agents. Materials that are not harmful to the environment prevelate.

e. Counter-measure washdown system. A combination of pre-hazard precautions and decontamination efforts whereas the decontamination function of washdown is a system which sprays seawater over a ship or parts of a ship to provide a constant moving film of water over the ship's surface.

f. Radiac calculator. A device to perform the calculations/estimates of the radiation effects of nuclear weapon explosions.

g. Nuclear dosimeter (tactical). An instrument for determining the dose of gamma and neutron radiation received by the personnel of a group or a unit. A direct readable instrument is preferred.

h. Dosimeter reader[16]. An instrument to read out both gamma and neutron doses monitored by individual and tactical dosimeters.

[16] Only in cases the dosimeter is not direct readable.

i. Charger for dosimeters. An instrument for resetting individual and tactical dosimeters.

5. MEDICAL COUNTERMEASURES AND SUPPORT (UNIT/INSTALLATION)

a. Medical items. As mentioned in the medical STANAGs (see: "Related Documents") or in national regulations.

C. SPECIALIST NBC UNIT

1. DETECTION, IDENTIFICATION AND MONITORING (SPECIALIST NBC UNIT)

a. NBC reconnaissance and survey vehicle. Conformation of NBC agents as well for TIM, so far achievable (see also Item C.1.j. on the next page). The mission of a NBC reconnaissance vehicle is to obtain information by visual observation or other methods, to confirm or deny the presence of NBC hazards or attacks. A reconnaissance and survey vehicle may accomplish some or all of the following roles:

- Area reconnaissance;
- Point reconnaissance;
- Route reconnaissance;
- NBC survey;
- Sampling Identification of Biological, Chemical and Radiological Agents (SIBCRA);
- Marking contaminated areas;
- Gathering of meteorological data for NBC hazard prediction.

It is preferred that the vehicle offers collective protection (COLPRO) to its personnel.[17]

b. Radiological, biological and chemical sampling equipment. A kit that provides the possibility of sampling radioactive contamination, biological agents and chemical agents, including means for documentation and procedures for transport according to AEP-10 and AEP-49.

c. Radiological, biological and chemical deployable analytical laboratory. A nuclear, biological and chemical agent analytical facility for operational analysis and identification of CBRN agents in order to confirm the presence and type of contamination in an actual or suspected NBC environment. The laboratory will be capable of deploying into the area of operations.

d. Capability to record nuclear events. A system that is able to recognise, locate and characterise nuclear events; preferably integrated in an NBC automatic data processing capability as mentioned above (C.1.a.).

[17] Unmanned vehicles should be used when possible.

e. Radiological contamination monitoring equipment. An instrument that monitors the presence of alpha, beta and gamma radiation.

f. Biological point detector. An instrument that will detect/identify and alert an operator of the presence of an aerosolised biological agent or toxin.

g. Biological remote detection device. An instrument that detects the presence of a man-made aerosol cloud which fits the particle size parameters of a biological agent, or a toxin, at a specified distance. The instrument must be capable of providing early warning of a possible biological attack to downwind units.

h. Biological identification kit. A kit that provides the means to identify the different types of detected biological agents, or toxins.

i. Biological aerosol confirmation monitor. An instrument that confirms the presence of a biological agent, or a toxin, at a location or spot equal to or above the concentration which will cause injury/casualties to unprotected individuals (further specifications still to be determined).

j. Biological stand off detection equipment. A stand-off detector reacts to distant events or hazards, in order to provide early warning. A biological stand-off detector must be able to rapidly detect, identify, locate, and provide relative concentration of BW aerosol clouds. A biological stand-off detector may be employed from fixed sites, ground mobile, shipboard, aircraft and unmanned aerial/ground vehicle platforms.

k. Chemical vapour confirmation monitor. An instrument that confirms the presence of a chemical agent vapour at a location or spot in accordance to NATO specifications. It is preferred that the instrument also confirms the presence of toxic industrial chemicals. It is also preferred that the instrument is placed in a special NBC reconnaissance and survey vehicle (as mentioned under Item C.1.b. on page D-4).

l. Chemical stand off detection equipment. A stand-off detector reacts to distant events or hazards, in order to provide early warning. A chemical stand-off detector must be able to rapidly detect, identify, locate, and provide relative concentrations of CWAs in all forms. A chemical stand-off detector may be employed from fixed sites, ground mobile, shipboard, aircraft and unmanned aerial/ground vehicle platforms.

m. Chemical point detector. A device or system, including the observation of living organisms, employed to detect/recognise and alert an operator of the emergence, presence or absence of NBC warfare events or hazards.

n. Chemical identification kit. A kit, which provides the means to identify the different types of detected chemical agents or toxic industrial chemicals.

2. WARNING AND REPORTING (SPECIALIST NBC UNIT)

a. NBC automatic data processing capability. A system that is able to perform all functions regarding hazard warning and hazard prediction according to ATP-45 and AEP-45.

3. PHYSICAL PROTECTION (SPECIALIST NBC UNIT)

a. Advanced respiratory protection . Self Contained Breathing Apparatus (SCBA). A system that provides respiratory protection by using compressed air.

b. Advanced impermeable suits. An impermeable suit, designed for use in combination with the SCBA (Item 2.a. above), which provides whole body protection against contact with liquid toxic and biological agents, and radioactive fallout. Using the filter overpressure system, it allows wearing for an extended period of time.

4. HAZARD MANAGEMENT (SPECIALIST NBC UNIT)

a. Power operated decontamination apparatus. A large capacity, power-operated apparatus for decontamination of equipment or structures.