NATO STANDARD

ANEP-97

KEY REQUIREMENTS FOR MARITIME INTERDICTION/COUNTER-PIRACY BOARDING TEAM EQUIPMENTS

Edition A, Version 1
NOVEMBER 2020

NORTH ATLANTIC TREATY ORGANIZATION

ALLIED NAVAL ENGINEERING PUBLICATION

Published by the
NATO STANDARDIZATION OFFICE (NSO)

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NORTH ATLANTIC TREATY ORGANIZATION (NATO)

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NATO LETTER OF PROMULGATION

4 November 2020

1. The enclosed Allied Naval Engineering Publication ANEP-97, Edition A, Version 1, KEY REQUIREMENTS FOR MARITIME INTERDICTION/COUNTER-PIRACY BOARDING TEAM EQUIPMENTS, which has been approved by the nations in the NATO NAVAL ARMAMENTS GROUP (NNAG), is promulgated herewith The recommendation of nations to use this publication is recorded in STANREC 4284.

2. ANEP-97, Edition A, Version 1, is effective upon receipt.

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

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RECORD OF RESERVATIONS

CHAPTER	RECORD OF RESERVATION BY NATIONS
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RECORD OF SPECIFIC RESERVATIONS

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TABLE OF CONTENTS

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CHAPTER 1 INTRODUCTION

1.1. RELATED DOCUMENTS

1.1.1. Background Information

a. AC/141(MCG/1)WP(2011)0001 (PFP) dated 17 Feb 2011 (working paper on the CNAD counter piracy technology initiative);

b. DI(LMC)(2012)0026 NAVY dated 31 May 2012 (NNAG meeting in San Diego).

1.1.2. References

a. STANAG 2333 MMS (Edition 4) – Performance and protective properties of combat clothing;

b. STANAG 2911 MMS (Edition 2) – Design Criteria for Fragmentation Protective Body Armour;

c. STANAG 2920 PPS (Edition 2) – Ballistic test method for personal armour materials and combat clothing;

d. STANAG 2997 RTIOS (Edition 2) – Life Jackets and personal flotation devices;

e. STANAG 4609 JAIS (Edition 3) – NATO digital motion imagery standard;

f. STANAG 4364 PPS (Edition 2) – Waterproof clothing;

g. ACCP-01 (Edition 2) – Heat transfer and physiological evaluation of clothing;

h. MIL-STD-662F "V_{50} ballistic test for armor" edited by U.S. Department of Defense;

i. NIJ Guide 100-01 "Selection and Application Guide to Personal Body Armor" edited by U.S. National Institute of Justice;

j. NIJ Standard 0101.06 "Ballistic Resistance of Body Armor" edited by U.S. National Institute of Justice;

k. NIJ Standard 0115.00 "Stab Resistance of Personal Body Armor" edited by U.S. National Institute of Justice;

l. IEC 60529 ed. 2.1 “Degrees of protection provided by enclosures (IP code)”;

m. IEEE 802.11-2012 IEEE Standard for Information technology – Telecommunications and information exchange between systems Local and metropolitan area networks - Specific requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications;

n. ISO 12402-2 ed. 1 “Personal flotation devices – Part 2: lifejackets, performance level 275 – safety requirements”;

o. ISO/IEC 10918 (all parts) “Information technology - Digital compression and coding of continuous-tone still images”;

p. ISO/IEC 14496-2 ed. 2004 “Information technology - Coding of audio-visual objects - Part 2: Visual”;

q. ISO/IEC 14496-3 ed. 2009 “Information technology - Coding of audiovisual objects - Part 3: Audio”;

r. ISO/IEC 14496-10 ed. 2010 “Information technology – Coding of audiovisual objects - Part 10: Advanced video Coding”;

s. ISO/IEC 14496-14 ed. 2003 “Information technology – Coding of audiovisual objects - Part 14: MP4 File format”;

t. ISO/IEC 14496-15 ed. 2010 “Information technology – Coding of audiovisual objects - Part 15: Advanced Video Coding (AVC) file format;

u. ISO/IEC 15444 (all parts) “Information technology - JPEG 2000 image coding system”;

v. ITU-T/Rec G.711 “Pulse code modulation (PCM) of voice frequencies”;

w. ITU-T T.81 “(JPEG-1)-based still-image coding using an alternative arithmetic coder”;

x. ITU-T H.264 ed. March 2005 “Advanced video coding for generic audiovisual services”;

y. ITU-T H.264-1 ed. March 2005 “Conformance specification for H.264 advanced video coding”;

z. ISO 9865 ed. 1991 “Textiles - Determination of water repellency of fabrics by the Bundesmann rain-shower test”;

aa. ISO 811 ed. 1981 “Textile fabrics - Determination of resistance to water penetration - Hydrostatic pressure test”;

bb. ISO 11092 ed. 1993 “Textiles - Physiological effects - Measurement of thermal and water-vapour resistance under steady-state conditions (sweating guarded-hotplate test)”;

cc. IMO Resolution A.658(16) “Use and fitting of retro-reflective materials on life-saving appliances”;

dd. STANAG 4204 (Edition 3) - Technical standards for single channel VHF radio equipment;

ee. STANAG 4205 (Edition 3) - Technical standards for single channel UHF radio equipment;

ff. MIL-STD-810G “Environmental engineering considerations and laboratory tests” edited by U.S. Department of Defence;

gg. MIL-STD-461F “Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment” edited by U.S.Department of Defence;

hh. Universal Serial Bus specifications package revision 2.0;

ii. Universal Serial Bus specifications package revision 3.0;

jj. On-The-Go and Embedded Host Supplement to the USB Revision 2.0 specification, revision 2.0 version 1.1a dated July 27, 2012;

kk. On-The-Go and Embedded Host Supplement to the USB Revision 3.0 specification, revision 1.1 dated May 10, 2012;

ll. Specification of the Bluetooth system (Package version 2.1 + EDR) issued July 26, 2007;

mm. Software Communications Architecture (SCA) specification version 2.2.2 dated May 15, 2006 developed by US Joint Program Executive Office for the Joint Tactical Radio System (JPEO JTRS);

nn. STANAG 4715 “NATO Biometrics Data, Interchange, Watchlisting and Reporting” (DRAFT);

oo. AEDP-15 “NATO Biometrics Data, Interchange, Watchlisting and Reporting” (DRAFT enclosed in ref nn.);

pp. Integrated Data Dictionary for AEDP-15 (DRAFT enclosed in ref nn.);

qq. ANSI/NIST-ITL 1-2011, “American National Standard for Information Systems – Data format for the interchange of fingerprint, facial & other biometric information” (NIST Special Publication 500-290).

1.2. INTRODUCTION

1. Following the Counter-Piracy Technology Initiatives (CPTI) conducted in 2011 by former- MCG/1, multinational development of specific equipment were identified in order to improve a common interoperable boarding team capability.

2. Among those equipment, as initial part of a step-by-step approach, it’s deemed necessary to identify common key operational requirements regarding:

- audio communications operational requirements, video live transmission and recording devices;
- integrated lifejacket and bullet-proof vest;
- electronic language translation devices.

1.3. SCOPE

This document, taking into account specific considerations, restraints and constraints, describes specific key operational requirements regarding:

- Audio/video live transmission and recording device;
- integrated lifejacket and body armor;
- electronic language translation device.

Desirable future multinational developments and/or purchasing will be based on those requirements.

1.4. CONSIDERATIONS, RESTRAINTS AND CONSTRAINTS AFFECTING THE REQUIREMENTS

For the purposes of this document:

1.4.1. Boarding operations conducted by Navy forces can be considered as blue water police operations aimed at inspecting civilian vessels (Merchant vessels, fishing boats, etc.) in order to verify their compliance to international rules and/or resolutions (i.e. UN embargo resolutions); thus, some requirements can be derived from well-known analogue police devices.

1.4.2. The equipment handled by this document are the one that will be used by Navy ships' crew and their foreseen usage is during compliant boarding only; considering that non-compliant and opposite boarding are usually carried out by special operation forces and/or specifically trained and equipped personnel, their specific requirements won't be discussed.

1.4.3. Considering that some requirements may vary depending on the scenario, following will be considered as standard conditions:

- devices/equipment employment time: 4 to 8 hrs;
- air temperature: -10 to +50 °C (+14 to +122 °F);
- all weather conditions regarding humidity and meteorological precipitations;
- presence of close assistance in case of man overboard (recovery time not more than 1 hour);
- presence of mother ship within 1000mt from the vessel under inspection;
- boarding team who will operate all over the ship under inspection and who needs to communicate among the team members (audio) and with the mother ship (audio, video, data).

1.4.4. There is the possibility of data/comms interceptions, deception and jamming; thus, any communication equipment shall permit encrypted comms.

1.4.5. Following are considered possible threats to own forces:

- high quality, commercially machined edged knife blades;
- lower quality knife blades and spike style weapons that have been improvised from other materials;
- 9mm bullet;

- .357 magnum bullet;
- .357 SIG bullet;
- .44 magnum bullet;
- 7,62mm bullet.

Bullets' higher calibers and/or IEDs won't be considered.

For blade-like threats, three different standard strike energies shall be considered:

- LEVEL 1 low energy threats with a strike energy of 24J ± 0.50;
- LEVEL 2 medium energy threats with a strike energy of 33J ± 0.60;
- LEVEL 3 high energy threats with a strike energy of 43J ± 0.70.

1.4.6. In order to smooth the interoperability process, in lack of specific NATO standards, the use of internationally accepted requirements (as the ones developed by IEC, ISO, IEEE, etc.) will be maximized.

1.4.7. Requirements will be specifically stated as Mandatory "-M-" or Optional "-O-"; the second choice represents a desirable development.; "shall" means mandatory "-M-", while "should" means optional "-O-" or desirable.

CHAPTER 2 AUDIO/VIDEO RECORDING DEVICE AND LIVE VIDEO FEED CONNECTIVITY

2.1. DEVICES

The boarding team shall be equipped with proper device to guarantee intra-team audio connectivity inside the ship and audio/video/data exchange with own ship as well as to record audio/video during boarding operations; key requirements as follows:

2.1.1. Boarding Team Communication System (BTCS)

- Hand Held SDR[1] equipment

Multiband / Multirole V/UHF (30-512 MHz)	-M-
Compliant to ref mm.	-M-
Architecture compliant to ESSOR[2] Specifications	-O-
VHF Standard AM/FM (ref. dd.)	-M-
UHF Standard (ref. ee.)	-M-
Self-forming, self-healing network merge & split capability	-M-
Multi-hopping capability	-M-
Dual net management	-M-
Dual PTTs[3] to support intra-team comms and team-to-ship comms	-M-
Intranet/internet WAN/LAN connectivity based on IP protocol (Ethernet standard)	-M-
RJ-45 port availabilityor any other serial port with dedicated serial-to-Ethernet transceiver or adapter	-M-
Simultaneous Voice, Data, Video TRx	-M-
Minimum data rate: 500 Kbps	-M-
Supporting of 2 real time video streaming	-M-
Embedded GPS receiver –MAES 256 encryption	-M-
Portable (weight less than 1kg)	-M-

- Headset connection

Standard mini-jack (3,5mm – 1/8”) TRS connection or non standard socket with specific cable/adapter to standard mini-jack (3,5mm – 1/8”) TRS connection	-M-

[1] Software Defined Radio.
[2] European Secure Software defined Radio.
[3] Push To Talk buttons.

- Environmental requirements (rain, wind sand, dust)
  Compliant to ref. ff. -M-

- EMI/EME
  Compliant to ref. gg. -M-

- Waterproof
  IP67 (ref l. - waterproof: 30 minutes at depth of 1m) -M-

- BTCS shall comply with relevant requirements
  as listed in para 6.1 -M-

2.1.2. Real Time Video Compression and Recording System (RT-VCRS)

- Compression requirements
  MPEG-4 AVC/H.264 in accordance with ref r. and ref y. -M-
  Other -O-

- Recording switch-on/off button
  Yes -M-

- Video recording memory
  32GB -M-
  64GB or above -O-

- Real time video streaming
  Yes -M-
  between 100kbps and 200 kbps -M-

- Supported video format/codec:
  MP4 (MPEG-4 AVC/H.264) -M-
  Other -O-

- Real-time video resolution
  QVGA 320x240 (min 10 fps) -M-
  VGA 640x480 (min 10 fps) -M-

- Recorded video resolution
  up to HD 720p 1280 x 720 -M-
  up to HD 1080p 1920 x 1080 -O-

- Supported audio codec:
  AAC (embedded in MPEG-4 AVC/H.264) -M-
  Other -O-

- Headset connection
  standard mini-jack (3,5mm – 1/8”) TRS connection
  or non standard socket with specific cable/adapter
  to standard mini-jack (3,5mm – 1/8”) TRS connection -M-

- Environmental requirements (rain, wind sand, dust)
  compliant to ref. ff. -M-

- Waterproof
  IP67 (ref l. - waterproof: 30 minutes at depth of 1m) -M-

2.1.3. RT-VCRS External Devices Physical Interfaces

- Cable
  USB Type 2.0 (ref hh.) -M-
  USB Type 3.0 (ref ii.) -O-
  Dual role OTG[4] / USB 2.0 -M-
  Dual role OTG[5] / USB 3.0 -O-

- WiFi technology
  IEEE 802.11b/g in accordance with ref m. -M-
  IEEE 802.11/n -O-

- WiFi Tx speed auto-switch
  Yes -M-

- WiFi Security
  WEP (64/128 bit) -M-
  WPA-PSK (AES/TKIP) -M-
  WPA2-PSK (AES/TKIP) -O-

- Bluetooth technology
  version 2.1 with Enhanced Data Rate (EDR) as per ref ll. -M-
  Version 3.0 or above -O-
  Power class 2 -M-
  Power class 1 -O-

- Video-in standard
  RCA socket
  or non standard socket with specific cable/adapter
  to standard RCA socket
  on BTCS Camera or non standard socket
  with specific cable/adapter to standard USB socket -M-

[4] Standard USB On-The-Go as per ref jj.
[5] Standard USB On-The-Go as per ref kk.

2.1.4. RT-VCRS Supported External Devices

- Camera
  Yes -M-
  Specs in accordance with para 2.1.5. -M-

- Computer
  Yes -M-
  Specs in accordance with para 2.1.7. -M-

- Biometrics capture devices
  Yes -O-
  Specs in accordance with para 2.1.6. -O-

2.1.5. BTCS Camera

- Supported video resolutions:
  up to HD 720p 1280 x 720 -M-
  up to HD 1080p 1920 x 1080 -O-

- Field of view:
  35° ÷ 150° -M-

- Min. illumination (day):
  1 Lux -M-

- Min. illumination (night):
  0,001 Lux -O-

- Supported video format/codec: .
  MP4 (MPEG-4 AVC/H.264) -O-
  Other -O-

- Supported audio codec:
  AAC -O-
  Other -O-

- Built-in microphone:
  Yes -O-

- SD slot:
  microSD HC (4GB to 64GB – class 6 or higher) -O-

- Recording time:
  up to 8 hrs -O-

- Battery[6]
  exchangeable, rechargeable -M-
  8 operating hrs -M-

- Date/time stamp
  Yes -M-

- Power supply[7]
  110/220V 50/60 Hz -O-
  DC 12V/24V -M-

- Operating temperature
  -10 to +50 °C (+14 to +122 °F) -M-

- Operating humidity
  20-80%RH (Non-condensing) -M-
  10-90%RH (Non-condensing) -O-

- PC system requirements[8]
  MS Windows -M-
  Linux -O-

- Enclosure
  IP67 (ref l. - waterproof: 30 minutes at depth of 1m) -M-

- RT-VCRS logical interface
  analog PAL/NTSC video -M-

- Physical interface with RT-VCRS video-in socket
  standard RCA socket -M-
  USB Type 2.0 (ref hh.) -O-

- Physical interface with RT-VCRS USB socket[9]
  USB Type 2.0 (ref hh.) -O-

The BTCS camera itself should (-O-) perform video compression and encoding according to above mentioned requirements; in such case, following requirements and operating constraints shall apply:

[6] Not required if the RT-VCRS connectivity is only through video-in/cable as per para 2.1.3.
[7] Acceptable through specific power adapter.
[8] Requirements to be applied to software eventually supplied with camera.
[9] Employed if the compression is performed by the BTCS camera itself.

- Video resolutions
  QVGA 320x240
  or
  VGA 640x480 -M-

- RT-VCRS physical interface
  cable (as per para 2.1.3.)
  or wireless (bluetooh or WiFi as per para 2.1.3.) -M-

2.1.6. BTCS Biometric Capture Devices (BTCS-BIOCD)

BTCS-BIOCD should be remotely employed with on-board mother ship specific software if the device is cable-connected (para 2.1.3.) directly to RT-VCRS. BTCS-BIOCD, if cable-connected (para 2.1.3.) to BTCS Computer (fitted with specific software to support BTCS-BIOCD), should be also locally operated with remote database real time access capability. BTCS-BIOCD shall have the capability to erase biometric data stored inside assuring that it won't be possible to recover it later on. Specific requirements as follows:

- Biometric data
  in accordance with refs nn.
  through pp. (version/edition in force)[10] -O-

- Battery[11]
  exchangeable, rechargeable -M-
  8 operating hrs -M-

- Power supply[12]
  110/220V 50/60 Hz -O-
  DC 12V/24V -M-

- Operating temperature
  -10 to +50 °C (+14 to +122 °F) -M-

- Operating humidity
  20-80%RH (Non-condensing) -M-
  10-90%RH (Non-condensing) -O-

- PC system requirements[13]
  MS Windows -M-

[10] Before the ratification and implementation of the STANAG (ref nn.) and enclosed documents (refs oo. And pp.), ref qq. shall be used as reference.
[11] Not required if the RT-VCRS connectivity is only through cable as per para 2.1.3. or if it's cable-connected to BTCS computer as per para 2.1.7.
[12] Acceptable through specific power adapter.
[13] Requirements to be applied to software eventually supplied with BTCS-BIOCDs.

- Enclosure
  IP67 (ref l. - waterproof: 30 minutes at depth of 1m) -M-

- Physical interface with RT-VCRS
  cable (as per para 2.1.3.)
  or other socket (i.e. mini-USB)
  with specific adapter/cable
  for RT-VCRS standard cable physical interface -M-

- Physical interface with BTCS Computer
  cable (as per para 2.1.3.)
  or other socket (i.e. mini-USB)
  with specific adapter/cable
  for BTCS Computer standard cable physical interface
  with BTCS-BIOCD -M-

2.1.7. BTCS Computer

- Battery
  exchangeable, rechargeable -M-
  8 operating hrs -M-

- Power supply[14]
  110/220V 50/60 Hz -O-
  DC 12V/24V -M-

- Operating temperature
  -10 to +50 °C (+14 to +122 °F) -M-

- Operating humidity
  20-80%RH (Non-condensing) -M-
  10-90%RH (Non-condensing) -O-

- Enclosure
  IP67 (ref l. - waterproof: 30 minutes at depth of 1m) -M-

- Physical interface with RT-VCRS
  cable (as per para 2.1.3.) -M-

- Physical interface with BTCS-BIOCD[15]
  cable (as per para 2.1.3.) -O-

[14] Acceptable through specific power adapter.
[15] Connectivity available only if the BTCS Computer is fitted with no. 2 USB Type 2.0 or (optional) Type 3.0.

2.2. SOFTWARE

The BTCS shall come with specific/s software/s:

- to view real-time BTCS Camera real time video received through RTVCRS/BTCS -M-

- to broadcast[16] (delayed) it over IP -M-

The software/s requirements as follows:

- saving video
  Yes -M-
  .MP4 (MPEG-4 AVC/H.264) -M-

- extracting and saving images
  Yes -M-
  JPG -M-
  BMP,TIFF, PNG, others -O-

- Operative System
  MS Windows -M-

2.3. MOTHER-SHIP ON-BOARD COMPUTER REQUIREMENTS

The on-board computer shall be connected to BTCS hand held SDR equipment through Ethernet FTP cable (Cat5e) and RJ45 plug (-M-); if needed, dedicated serial-to-Ethernet transceiver or adapter should be used (-O-). The on-board computer should operate as gateway in order both to allow LAN/WAN access by BTCS Computer (and connected devices) and to broadcast delayed real time video available on LAN/WAN. The on-board computer shall be fitted with MS Windows operative system (-M-).

[16] If the computer on which is installed is LAN/WAN connected.

CHAPTER 3 INTEGRATED LIFEJACKET AND BODY ARMOR

3.1. GENERAL REQUIREMENTS

3.1.1. Boarding team shall be equipped with integrated lifejacket & ballistic- and stab-resistant soft body armor during boarding operations; key requirements as follows:

3.1.2. Soft body armor shall be designed in order to ensure maximum comfort (-M-) for the operator, with particular consideration to following details/parts (ref. i.):

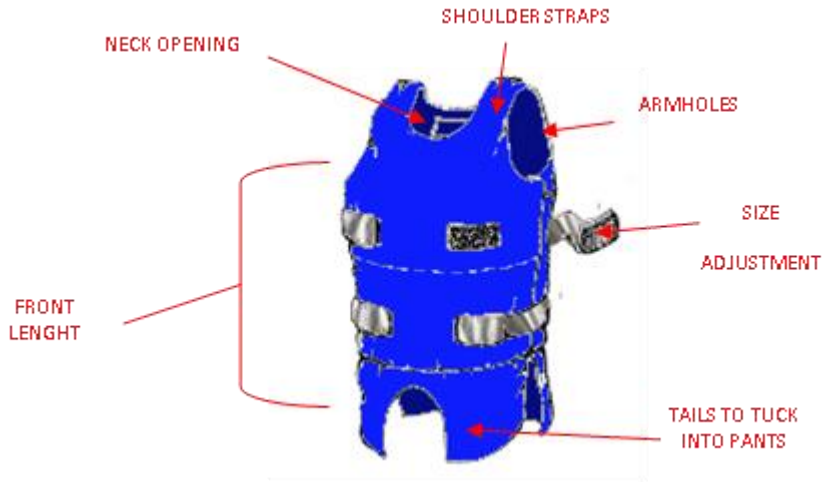

Figure 3-1

- the neck opening shall not be too high and shall be properly shaped (-M-);
- the armholes of the armor shall not be too small (-M-);
- the armor shall be wide enough to allow the front panel to overlap the back panel (-M-);
- the length of the front of the armor shall not be too long (-M-); otherwise, it will be pushed up into the throat when personnel sits or bends;
- the armor shall be as light as possible, while still providing protection against the above listed threats (-M-);
- the armor shall permit size adjustment while retaining protective integrity for the sides of the torso (-M-);

- the shoulder straps shall be wide enough for comfort and to distribute the weight of the armor, but not so wide as to restrict movement (-M-);

- the shoulder, neck, and armholes shall be feathered to minimize bulk and maximize comfort at these areas, but still not reduce protection (-M-);

- the concealed undergarments for females should conform to the female anatomy. The seam construction for such garments that include seams is critical. It is very important that the joined pieces overlap each other a minimum of 2,5cm. Particular attention should be paid to the length of the garment; the adjustment straps for the female undergarment may be fastened to the back to improve the overall appearance of the uniform (-O-);

- adjustment straps should be covered with removable retro-reflective material conformed to the specification described in ref cc. (-O-);

- Soft body armor should allow attachment of nationality badges or other badges with following max dimensions (width x height): 5cm x 8cm (-O-).

3.1.3. Soft body armor shall be designed in 7 different sizes (-M-):

Measurement	XS	S	M	L	XL	XXL	XXXL
Chest (in)	30÷32	34÷36	38÷40	42÷44	46÷48	50÷52	54÷56

3.2. BALLISTIC PROTECTION

- The soft body armor shall guarantee alike ballistic level performances as Type IIIA of ref. j. (-M-)

- The body armor shall be fitted, back and front, with pockets for exchangeable/removable hard armor plates (-M-):

Figure 3-2

- Hard armor plates shall guarantee following alike ballistic level performances (ref. j.):

  - Type III -M-
  - Type IV -O-

- Hard armor plates' size shall be maximum 10"x12" (25,4cm x 30,48cm) (-M-):

Figure 3-3

- Hard armor plates shall be properly bent in order to increase dressing comfort (-M-);

- Body armor plates testing shall be conducted in accordance with ref. c. and/or, if not in contrast, ref. h. and ref. j. (-M-).

3.3. STAB PROTECTION

- The soft body armor shall guarantee "ref. k.-alike" stab protection performances as follows:

	Energy Level	Level 1	Level 2	Level 3
Threat Type				
High quality, commercially machined edged knife blades		-M-	-M-	-O-
Lower quality knife blades and spike style weapons that have been improvised from other materials		-M-	-M-	-O-

- In case stab vs ballistic requirements deconfliction is needed, stab protection **requirements shall be considered as secondary.**

3.4. WATERPROOF REQUIREMENTS

- The soft body armor shall resist a test for determination of water repellency of fabrics by the Bundesmann-rain shower test with a rating of 5 according to ref. z. (-M-);

- penetration protection (according to ref. aa.) at a pressure of a minimum of 1,50mt height of water is desirable (-O-);

- the water vapour permeability should be as high as possible; the water vapour resistance as defined in ref. g. shall be less than 13 m^2 Pa/W (ref. bb.) (-M-);

- pockets and pass-through openings shall be designed to prevent the entry of water (-M-);

- closure systems shall be concealed (-M-);

- in case of deconfliction with the requirements stated at para 5.3 and 5.4, waterproof requirements shall be considered as secondary.

3.5. FLOTATION AND BUOYANCY REQUIREMENTS

The soft body armor shall be equipped with a removable, inflatable collar (-M-) such as the one depicted in Figure 3-4:

Figure 3-4

The soft body armor shall be equipped with zippers to fasten the inflatable collar's harnesses (-M-) as follows:

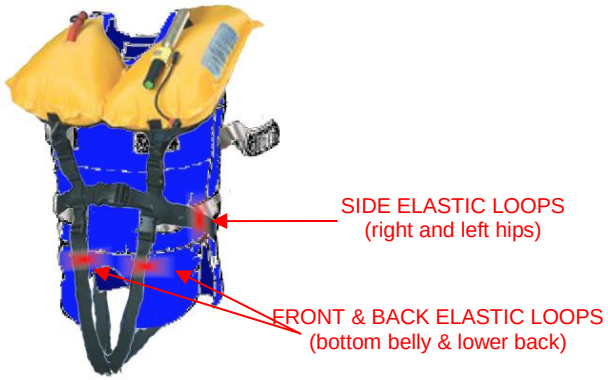

Figure 3-5

- Lifejacket's general requirements shall be compliant to ref. n., para 5.1 (-M-);
- the inflatable collar shall be equipped with removable retro-reflective strips that cover at least 400cm2 and conform to the specification described in ref cc. (-M-);
- inflatable collar's lifting loop shall be in accordance with ref. n., para 5.2.2 (-M-);
- inflatable collar's accessories shall be the ones stated as mandatory in Table 1 of ref. n.; their requirements shall be in accordance with ref. n., para 5.2.1 (-M-);
- inflatable collar's whistle shall be compliant to ref. n., para 5.2.3 (-M-);
- inflatable chambers' buoyancy shall be compliant to ref. n., para 5.3.1, 5.3.2, 5.3.4 and 5.7 (-M-);
- inflatable collar's color and strength shall be compliant with ref. n., para 5.4.1 and 5.5 (-M-);
- inflatable collar's performance shall be compliant to ref. n., para 5.6 (-M-);
- inflatable collar's marking shall be compliant to ref. n., para 6 (-M-);
- information provided by manufacturer shall be compliant to ref. n., para 7 (-M-).

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CHAPTER 4 ELECTRONIC LANGUAGE TRANSLATION DEVICES

Boarding team shall be equipped with stand-alone portable two-way[17] (both stand-alone and web-based) language translation device with following requirements:

4.1. GENERAL

- Battery
  rechargeable -M-

- Power supply
  110/220V 50/60 Hz -O-
  12V/24V DC -M-

- Enclosure
  IP54 (ref l.) -M-
  IP66 (ref l.) -O-

- Audio input levels
  20dB - 100dB max -O-

- Built-in noise cancelling integrated Microphone
  Yes -M-

- Speaker for translation output
  Yes -M-

- Screen
  min 3.5" full color touch-screen -O-

- SD slot:
  microSD HC (4GB to 64GB – class 6 or higher) -M-

- Audio In/Out 3.5mm jack
  Yes -M-

- Speech recognizer
  Yes -M-

[17] Two-way translation is translation from a source language into a target language and from a target language back into the source language.

- Audible translation verification
  Yes -M-

- User-friendly feature to add, store and use new phrases and relative translations
  Yes -M-

- Verbal and key word search
  Yes -O-

- Record mode with time stamp
  Yes -M-

- Supported audio codec:
  AC3 -M-
  MP3 -M-

- Operating temperature
  -10 to +50 °C (+14 to +122 °F) -M-

- Operating humidity
  20-80%RH (Non-condensing) -M-
  10-90%RH (Non-condensing) -O-

- PC system requirements
  MS Windows -M-

- Instant messaging “chat” (cable or wireless)
  Yes -M-

- Web enabled services
  Translation service support SW -M-
  Language module update/download -M-

The device shall be connected to the BTCS (as described in para 4) as an external device in order to allow following features:

- Boarding Team operator capability to use the BTCS microphone as translation device input; the feature shall be selectable by the operator -M-

- Boarding Team operator capability to use the BTCS headset as translation device output; the feature shall be selectable by the operator -M-

- Boarding Team operator capability to communicate with other operator through BTCS while still receiving on BTCS headset the translation device output. In case the translation device output is simultaneous with communications received by other operator through BTCS, the two communications shall be heard from the headset on different sides -M-

4.2. CONNECTIVITY

- Mini USB
  Yes -M-

- Wireless technology
  WiFi IEEE 802.11b/g -M-
  WiFi IEEE 802.11n -O-

- WiFi Tx speed auto-switch
  Yes -M-

- WiFi shutdown feature
  Yes -M-

- WiFi Security
  WEP (64/128 bit) -M-
  WPA-PSK (AES/TKIP) -M-
  WPA2-PSK (AES/TKIP) -O-

4.3. TRANSLATION FEATURES

- The language translation technology shall be as follows:

Language Translation Technology	S2S[18]	T2T[19]
Phrase-based[20]	-M-	-M-
Free-flowing[21]	-O-	-O-

- Free-flowing Speech-to-Text (S2T) feature is desirable -O-

- Supported languages[22]
  - Arabic (Egypt) -M-
  - Chinese (simplified, RPC) -M-
  - English (UK, US) -M-
  - French (FR) -M-
  - Hindi (India) -M-
  - Russian (Russia) -M-
  - Spanish (Spain) -M-
  - Any other language -O-

- Desirable supported strategic languages
  - Arabic (Iraq) -O-
  - Farsi (Iran) -O-
  - Somali (Somalia) -O-
  - Swahili (Kenya) -O-
  - Urdu (Pakistan) -O-

- Extensibility to additional language modules
  - Yes -M-

[18] S2S (Speech-To-Speech) is a translation of verbal communication between people who do not speak each other's language. It is typically initiated by a voice speaking in source language into a microphone input, and the resulting target language translation is produced audibly via an audio device such as a speaker.

[19] T2T (Text-To-Text) is translation of written, printed, or electronic text, and it is initiated and produced via text, such as on a computer keyboard and screen

[20] Phrased-based translation relies on speech recognition software to identify specific speech input in the source language and match is to a pre-recorded phrase in a target language.

[21] Free-flowing translation uses computer processing to translate any words or sets of words from a source language input into another language with equivalent meaning.

[22] The languages considered as mandatory (-M-) are the official NATO languages and the sixth world most spoken languages.

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ANEP-97(A)(1)