



European Working Group
Non-Lethal Weapons

Programme

8th European Symposium on
Non-Lethal Weapons
May 18–20, 2015

Stadthalle Ettlingen, Germany

8th European Symposium on Non-Lethal Weapons



Programme Committee

The European Working Group on Non-Lethal Weapons (EWG-NLW) serves as the Programme Committee:

Massimo Annati
Italian Navy (ret'd), Milano, I

Rüdiger Haas
Armament and Defence Technology Agency, Vienna, A

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Royal Military Academy, Brussels, B

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Swiss Army, HEST, Bern, CH

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DGA, Bourges, F

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Segredifesa, Rome, I

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FFI, Kjeller, NO

Igor Plaksin
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Victor Selivanov
Baumann University, Moscow, RUS

Sofia Hedenstierna
Swedish Defence Research Agency, Tumba, SE

Graham Smith
Home Office Centre for Applied Science and Technology, St. Albans, UK

Chairman of the Symposium

Massimo Annati
Italian Navy (ret'd), Milano, I

8th European Symposium on Non-Lethal Weapons

After many years of development and operational experience Non-Lethal Weapons have eventually gained a firm place among the tools available to both military and police. These tools allow them to accomplish their tasks and reduce the risks of causing needless and undesired outcomes.

However, despite a number of evident successes, problems are still affecting the fielding of many promising technologies. Public opinion, media and, as a consequence, policy makers and sometimes even the operators themselves, can feel substantial uncertainty about the ratio of effectiveness to risk. Some novel technologies seem also to be inherently linked with a lack of understanding of their effects and safety by the general public and this consequently creates misconceptions and controversy in use.

Lack of acceptance is a critical key factor in the overall process that should lead, within a reasonable timeframe, technologies to go from laboratories to operators in the field. Collection and publication of real world operational data to allow assessment of effectiveness and safety may increase confidence and also support innovation and improvements in current technologies by highlighting any shortcomings and strengths and refining guidance for use.

The 2015 Symposium's overarching theme will be to examine the obstacles still faced in fielding non lethal technologies: assessment of effectiveness and safety; legal hurdles; public opinion objections; operators' trust. The Symposium will provide a valuable opportunity to hear from, and discuss the lessons learnt across the many disciplines of this subject from a range of scientists, subject matter experts and operational practitioners. This will identify where gaps still exist to steer future activities.

The Symposium will further include topics on technology development (new technologies, model validation); capability development (effectiveness, safety, standardization); and acceptance.

Chairman of the Symposium

Massimo Annati

Italian Navy (ret'd), Milano

General Information

REGISTRATION

Please return the enclosed registration form or register online:

www.ict.fraunhofer.de/nlw2015

Registration fees (incl. proceedings, coffee breaks, lunch), depending on arrival of the registration form at the Fraunhofer ICT:

- Registration up to **April 20, 2015**:
EURO 970,- (incl. 19 % VAT)
- Registration up to **May 8, 2015**:
EURO 1.070,- (incl. 19 % VAT)

Participation cannot be guaranteed for registrations arriving after May 8, 2015.

The fee must be paid **upon receipt of the invoice** by remittance to the account given on the invoice.

CANCELLATION POLICY

EURO 300,- will be charged for cancellations after **May 8, 2015**. No-shows will be charged with **EURO 800,-**.

ACCOMMODATION

HORE Hotel Reservation
Bockstalstraße 20
76327 Pfinztal (Kleinsteinbach)
Germany

Phone +49 (0) 7240 / 9445-850
Telefax +49 (0) 7240 / 9445-852
e-mail: HHRUdoHamm@t-online.de

An application form is enclosed.
Online: www.H-H-Reservation.de/nlw2015.html

CONFERENCE OFFICE

Foyer of the Stadthalle Ettlingen.

Monday, May 18, 13.00 h till
Wednesday, May 20, 18.00 h

Phone +49 (0) 72 43 / 101-158
Fax +49 (0) 72 43 / 101-157

CHECK IN / WELCOME RECEPTION

Please check in at the conference office on **Monday, May 18 between 13.00 and 20.00 h**.

All participants are cordially invited to the **Welcome Reception** on the same day, **18.30 h – 21.00 h** in the foyer of the Stadthalle Ettlingen.

CONFERENCE LANGUAGE

English

PROCEEDINGS

One copy is included in the registration fee. Additional copies cost **EURO 70,-** (Subscription price during the conference EURO 50,-).

Programme

Monday, May 18

15.45 – 16.00

Welcome

16.00 – 18.00

POSTER PRESENTATION (orally)

Chairman: M. Symons, Home Office CAST, St. Albans, UK

18.30 – 21.00

Welcome Reception

(in the Foyer of the Stadthalle Ettlingen)

Tuesday, May 19

08.30

Welcome and Opening

M. Annati

Chairman of the Symposium

08.45 V1

Keynote Lecture 1

J. Shea

NATO, Brussels, B

Session 1 – ACCEPTABILITY I

Session Chair: S. Orbons

Private Expert, The Hague, NL

09.30 V2

MILITARY EMPLOYMENT OF NON-LETHAL WEAPONS: A TECHNOLOGICAL IMMATURITY OR POLITICAL DISPENSABILITY

O. Fridman

University of Reading, Reading, UK

09.55 V3

CRIMINAL USE OF NLW AND IMPROVISED NLW

M. Filippi

Milano, I

10.20 V4

THE UTILITY, LIMITATIONS AND DANGERS OF USING „REMOTE CONTROL“ DELIVERY OF LESS-LETHAL WEAPONS IN LAW ENFORCEMENT AND MILITARY OPERATIONS

M. Crowley

Omega Research Foundation, Bradford, UK

10.45

Coffee Break

Session 2 – INNOVATION

Session Chair: G. Smith

Home Office CAST, St. Albans, UK

- 11.15 V5 REVIEW ON ICT'S RESEARCH ON SCALABLE NON-LETHAL LAUNCHERS AND PROJECTILES**
T. Armbrust, H. Krebs, J. Neutz, P. Scholz, K.-D. Thiel, S. Zettl
Fraunhofer ICT, Pfinztal, D
- 11.40 V6 COMPLEX FOR PERSONNEL NEUTRALIZATION WITH MINIMUM DANGER FOR VULNERABLE ORGANS**
V. Elfimov, S. Leznin, V. Korenkov
Bauman Moscow State University, Moscow, RUS
- 12.05 V7 NANOMOLECULAR CS**
B. Brunkow
NEWCO Safety Technologies, Hamburg, D
- 12.30 Lunch Break**

13.30 Poster Session

Session Chair: M. Symons, R. Rahimi, U. Arborelius

Session 3 – TESTING I

Session Chair: J. Neutz

Fraunhofer ICT, Pfinztal, D

- 14.30 V8 ASSESSMENT METHODS FOR THE NON-LETHAL PROJECTILE HEAD IMPACT INJURY PREDICTION**
A. Oukara
Polytechnic Military School of Algiers, Algiers, ALG
C. Robbe, A. Papy
Royal Military Academy, Brussels, B
N. Nsiampa
University of Liege, Liege, B
- 14.55 V9 FIRST STEP IN THE ASSESSMENT OF THE LETHALITY OF HIGH SPEED LOADINGS ON THE HUMAN TORSO**
A. Awoukeng Goumtcha, M. Bodo, S. Roth
Universite de Technologie de Belfort-Montbeliard, Belfort, F
K. Thoral-Pierre
CEDREM, Neung sur Bevrnon,. F
- 15.20 V10 AN EFFECTS-BASED DESIGN APPROACH TO REQUIREMENTS GENERATION**
E. Beier, T. Dayton, M. Jirjis, J. L. Simonds
Air Force Research Laboratory, Ft. Sam Houston, USA
- 15:45 Coffee Break**

Session 4 – UTILITY I

Session Chair: S. Hedenstierna
FOI, Tumba, SE

- 16.15 V11 UK POLICE CS AND PAVA SPRAYS FROM A TECHNICAL AND OPERATIONAL PERSPECTIVE**
S. O'Rourke
Home Office CAST, St. Albans, UK
- 16.40 V12 AN HOLISTIC EVALUATION OF THE STATE OF THE ART AND FUTURE DEVELOPMENTS ON NON-LETHAL MICROWAVE SYSTEMS**
F. Valente, P. Paulissen
TNO Defence, Security and Safety, Rijswijk, NL
J. Neutz, H. Urban
Fraunhofer ICT, Pfingsttal, D
A. Roland-Price
RP Star Ltd, Bradford, UK
- 17.05 V13 NATO NLW CASE STUDY DEVELOPMENT AND ANALYSIS**
P. Young
Joint Non-Lethal Weapons Directorate, Quantico, USA
J. Nelson
American Systems Corporation, Chantilly, USA
- 17.30 Poster Awards**
-

Wednesday, May 20

- 8.45 V14 KEY-NOTE LECTURE II**
C. Burrows
Critical Intervention Consultant Services, UK

Session 5 – ACCEPTABILITY II

Session Chair: P. Giannetti
MoD, Rome, I

- 9.30 V15 LESSONS LEARNED FROM DEPLOYMENT OF CONDUCTED ENERGY WEAPONS**
C. Lawrence
Ontario Police College, Aylmer, CAN
- 9.55 V16 ASSESSING THE UTILITY OF THE TASER FOR LAW ENFORCEMENT IN THE NETHERLANDS**
J.B.J. Orbons
Private Expert, The Hague, NL

10.20 V17 EYESAFETY FEATURES FOR LASER DAZZLER SYSTEMS
M. Lindley
B.E. Meyers, Redmond, USA

10.45 Coffee Break

Session 6 – HUMAN EFFECTS

Session Chair: U. Sundberg
FOI, Tumba, SE

11.15 V18 NOMINAL OCULAR DAZZLE DISTANCE (NODD) - APPLICATION TO LASER DAZZLERS
C.A. Williamson
Dstl Porton Down, Salisbury, UK
L. N. McLin
Air Force Research Laboratory, Ft. Sam Houston, USA

11.40 V19 THE ROLE OF HABITUATION DURING THE USE OF MULTISENSORIC NLW AND ITS CONSIDERATION IN THE DEVELOPMENT OF MODIFIED SYSTEMS
J. Burke
Sinnovation AG, Dortmund, D
E. David, A. Fretz, W. Will
ZEPU GmbH, Witten, D

12.05 V20 THE PHYSIOLOGICAL EFFECTS AND TACTICAL APPLICATION OF MILLIMETRE WAVE NON-LETHAL TECHNOLOGIES
R. D. Sheridan
Dstl Porton Down, Salisbury, UK

12.30 Lunch Break

13.30 OPEN DISCUSSION
Chairman: M. Annati
Milano, I

Session 7 – TESTING II

Session Chair: A. Papy
Royal Military Academy, Brussels, B

- 14.30 V21 EXPERIMENTS AND MATHEMATICAL MODELING FOR EVALUATION OF NON-LETHAL WEAPONS**
M. Risling, U. Arborelius
Karolinska Institute, Stockholm, SE
S. Hedenstierna
FOI, Stockholm, SE
J. Antona-Makoshi
Japan Automobile Research Institute, Tsukuba, JAP
J. Davidsson
Chalmers University of Technology, Gothenburg, SE
- 14.55 V22 NEW FEATURES OF THE TASER X2 AND X26P**
G. Dean
Home Office CAST, St. Albans, UK
- 15.20 Coffee Break**

Session 8 – UTILITY II

Session Chair: R. Haas
Armament and Defence Technology Agency, Vienna, A

- 15.50 V23 TASER AND LESS LETHAL FORCE: THE UK EXPERIENCE**
A. Dymond
University of Exeter & Bristol, Exeter, UK
- 16.15 V24 ASSESSMENT OF LESS-LETHAL METHODS APPLICATION IN A SUICIDE BOMBING EVENT**
F. Valente, Y. Khoe, M. van der Horst
TNO Defence, Security and Safety, Rijswijk, NL
N. Hale
CBRNE Ltd, Ashford, UK
- 16.40 V25 INFLUENCE OF COUNTER-MEASURES ON KINETIC ENERGY NON-LETHAL WEAPONS**
A. Papy, C. Robbe, T. Dombard
Royal Military Academy, Brussels, B
A. Oukara
Polytechnic Military School of Algiers, Algiers, ALG
N. Nsiampa
University of Liege, Liege, B
- 17.05 Closing Remarks**
M. Annati
Chairman of the Symposium

Poster Programme

Posters will be presented during the whole Symposium. A special Poster Session will take place on Tuesday, May 19, 13.30 – 14.30 h. During this time authors should be present for discussion at their poster boards in the foyer.

- P26** **LESS LETHAL IMPULSE NOISE AND OPTICAL EFFECTS: DGA LAND SYSTEMS INJURY RISK ASSESSMENT**
A. Rieseemann, E. Debord, J.-F. Jacquet, L. Pichonnat
DGA Techniques Terrestres, Bourges, F
- P27** **SAFETY TEST OF THE ELECTROSHOCK DEVICES: MODIFICATION OF THE BIOLOGICAL EFFECT OF ALCOHOL AND ADRENALINE**
O. Grigoriev, A. Koklin, V. Stepanov
Federal Medical-Biological Agency of Russia, Moscow, RUS
- P28** **INHIBITORS FOR NON-LETHAL ANTI-MATERIAL APPLICATIONS**
T. Armbrust, L. Rozincsak, M. Klemen, M. Hummel, J. Bernewitz, J. Neutz
Fraunhofer ICT, Pfingst, D
- P29** **RESULTS FOR MINIATURIZED DIRECTED ACOUSTIC ARRAYS**
T. Armbrust, H. Krebs, J. Neutz, E. Walschburger, N. Eisenreich
Fraunhofer ICT, Pfingst, D
- P30** **SAFE NEUTRALIZATION OF IEDs WITH APPLICATION OF PORTABLE SHIVA-LIKE SUPER-SONIC ABRASIVE WATER-JET GUNS**
I. Plaksin, L. Rodrigues, R. Mendes, S. Plaksin
University of Coimbra, Coimbra, PT
- P31** **CHALLENGES IN INTEGRATING EVIDENCE GATHERING TECHNOLOGY INTO A CONFLICT MANAGEMENT TECHNOLOGY**
M. Henry, G. Buckler, R. Davies
Cerberus Black Ltd., Haywards Heath, UK
- P32** **DISTANCE ACTIVE LESS-LETHAL WEAPONS**
C. Wolfschmitt
Diehl BGT Defence, Röhrenbach, D
- P33** **ELECTRICAL TESTING OF TASER X2 AND TASER X26P CONDUCTED ENERGY WEAPONS**
J. Bray
Royal Military College of Canada, Kingston, CAN
- P34** **DO CONDUCTED ELECTRICAL WEAPON PROBES CARRY DANGEROUS BACTERIA?**
J. Ho, V. Johnson, J. Karambay, C. Kniffin, R. Nelson, J. Miner
Hennepin County Medical Centre, Minneapolis, USA
D. Dawes
Santa Barbara Police Department, Santa Barbara, USA
- P35** **METHODOLOGY OF NON-LETHAL WEAPONS GRAPH-ANALYTICAL ASSESSMENT**
V. Selivanov, D. Levin
Bauman Moscow State University, Moscow, RUS

- P36** **CONCEPTUAL STRUCTURE AND ARCHITECTURE OF NON-LETHAL WEAPONS DATABASE**
V. Selivanov, D. Levin
Bauman Moscow State University, Moscow, RUS
- P37** **CAMERA FOR LASER EYE DAZZLE ASSESSMENT (CLEDA)**
C.A. Williamson
Dstl Porton Down, Salisbury, UK
- P38** **GUIDELINES TO DEVELOP KINETIC ENERGY NON-LETHAL PROJECTILES**
C. Robbe, A. Papy, L. Fizaine
Royal Military Academy, Brussels, B
A. Oukara
Polytechnic Military School of Algiers, Algiers, ALG
N. Nsiampa
University of Liege, Liege, B
- P39** **THE EXPERIMENTAL METHOD FOR EVALUATING THE EFFECTIVENESS OF THE POLICE ACOUSTIC GENERATOR**
O. Grigoriev, A. Datsenko, A. Sazhin
Federal Medical-Biological Agency of Russia, Moscow, RUS
- P40** **ELECTRICAL SAFETY EVALUATION OF THE NEXT GENERATION CONDUCTED ELECTRICAL WEAPONS**
M. Jirjis, E. Beier, T. Dayton, J. L. Simonds
Air Force Research Laboratory, Ft. Sam Houston, USA
- P41** **ACOUSTIC NON-LETHAL WEAPONS' ANTIDOTES MODELS**
F. G. Nikolaevich, E. V. Ivanovna, B. V. Stanislavovich, S. V. Vadomovich
Bauman Moscow State University, Moscow, RUS
- P42** **OPTICAL CHARACTERISATION OF FLASH-BANGS**
G. Kalinka, T. Piller, A. Dötsch, A. Sarras, K. Groschupf
Armament and Defence Technology Agency, Vienna, A
- P43** **MATCHING OPERATIONAL REQUIREMENTS WITH NON-LETHAL CAPABILITIES**
T. Dayton, M. Jirjis, E. Beier, J. L. Simonds
Air Force Research Laboratory, Ft. Sam Houston, USA
- P44** **RE-PURPOSING EXISTING AND FAMILIAR TECHNOLOGIES: A SUCCESS STORY**
C. Lawrence
Ontario Police College, Aylmer, CAN
- P45** **EXPLORING THE USE OF RIOT CONTROL AGENTS AND MALODORANTS IN CURRENT AND FUTURE LAW ENFORCEMENT OPERATIONS**
M. Crowley, N. Corney
Omega Research Foundation, Bradford, UK

Poster Programme

- P46 THE GUIDELINES OF METHODS FOR THE SAFETY TESTS OF THE POLICE SPECIAL DEVICES**
O. Grigoriev, V. Stepanov, A. Sazhin, V. Alekseeva
Federal Medical-Biological Agency of Russia, Moscow, RUS
- P47 DOWN THE SLIPPERY SLOPE? A STUDY OF CONTEMPORARY DUAL-USE CHEMICAL AND LIFE-SCIENCE RESEARCH POTENTIALLY APPLICABLE TO INCAPACITATING CHEMICAL AGENT WEAPONS**
M. Dando, M. Crowley
University of Bradford, Bradford, UK
- P48 THE INTERNATIONAL MANUFACTURE, TRADE AND USE OF BODY WORN ELECTRIC SHOCK EQUIPMENT**
K. Wraith, A. Dymond
The Omega Research Foundation, Manchester, UK
- P49 ETHICAL IMPACT RISK ASSESSMENT FOR NON-LETHAL WEAPONS**
I. Stanciugelu, N. Hale, D. Usher, S. Swain, D. Kelly
CBRNE Ltd, Ashford, UK
L. Royackers
Technical University Eindhoven, Eindhoven, NL

Zimmerreservierung Accommodation

Name / Surname _____

Vorname / Christian Name _____

Straße / Street _____ Nr./ No. _____

PLZ / Zip Code _____ Ort / Address _____

Land / Country _____

Fax _____

Telefon / Phone _____

E-Mail _____

Datum / Date _____ Unterschrift / Signature _____

8th European Symposium on Non-Lethal Weapons, 18.-20.5.2015

Bitte reservieren Sie Hotel / Please reserve Hotel

Ankunft
Arrival

Abreise
Time of Departure

Ankunftszeit
Time of Arrival

Anzahl der Zimmer/
No. of Rooms EZ (Einzelzimmer) SGL (single room) DBL (double room)

Bitte reservieren Sie Hotel / Please reserve Hotel

Alle Zimmer mit Bad/Dusche/WC, inkl. Frühstück. / All rooms with bath/shower/WC, incl. breakfast.

		EZ/SGL	150,-	EUR	DZ/DBL	250,-	EUR	km	0,5
A 1	**** ErbprinZComfort	EZ/SGL	150,-	EUR	DZ/DBL	250,-	EUR	km	0,5
A 2	**** ErbprinZClassic	EZ/SGL	130,-	EUR	DZ/DBL	200,-	EUR	km	0,5
B	*** Stadthotel Engel	EZ/SGL	100,-	EUR	DZ/DBL	135,-	EUR	km	0,5
C	*** Watthalden	EZ/SGL	112,-	EUR	DZ/DBL	132,-	EUR	km	0,5
D	** Ibis Styl	EZ/SGL	95,-	EUR	DZ/DBL	105,-	EUR	km	1,0
E	* Sonne	EZ/SGL	60,-	EUR	DZ/DBL	82,-	EUR	km	0,5

Alle Zimmer mit Bad/Dusche/WC, inkl. Frühstück. / All rooms with bath/shower/WC, incl. breakfast.

**Kreditkarte
Creditcard**

**Kreditkartennummer zur Garantie
Credit Card No.:**

**Gültigkeit:
Expiry Date of Credit Card**

Falls die gewünschte Hotelkategorie nicht mehr verfügbar ist, reservieren Sie bitte die Kategorie:

If accommodation not available in desired category, please reserve category:

online reservation: www.h-h-reservation.de/NLW2015.html

Registration form

8th European Symposium on Non-Lethal Weapons

Stadthalle Ettlingen, Germany

Online registration: www.ict.fraunhofer.de/nlw2015

May 18 – 20, 2015

.....
Last name

.....
Company

.....
First name

.....
Postal address

.....
Title / Position

The registration fee will be paid upon receipt of the invoice.

It is agreed that pictures taken during this event may be published.

.....
Date, Signature

Participation (please tick)

Welcome Reception
May 18, 18.30 – 21.00 h

.....
E-mail

.....
Phone no.

.....
Fax no.

.....
VAT-No. (European countries only)

Ettlingen City Plan

How to find the venue

Karlsruhe, A5, Frankfurt Durlach. B 3



Tram from/to Karlsruhe A5, Karlsruhe-Süd

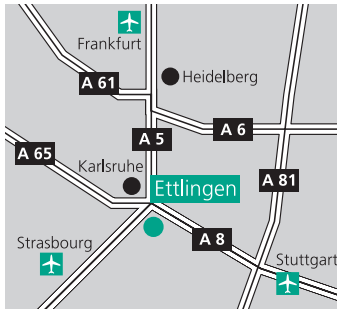
Herrenalb, A8, Stuttgart

Rastatt

Ettlingen is located in the vicinity of Karlsruhe, approx. 120 km south of Frankfurt / Frankfurt International Airport just beside the Autobahn A5.

Other airports are Strasbourg, France (approx. 100 km) and Stuttgart (approx. 90 km).

From the airport it is possible to travel by train (approx. 1 hour) to Karlsruhe Hauptbahnhof (Main Station), then take the "Stadtbahn" (tram) S1 or S11, direction Ettlingen or Ittersbach. Exit the tram at the stop "Ettlingen Stadt" (Stadtbahnhof Ettlingen) (journey time approx. 15 min). After a short walk (approx. 10 min) you reach the "Stadthalle Ettlingen" (see map).



Points of Contact

Chairman

RAdm Massimo Annati
E-mail m.annati@marina.difesa.it

Conference and exhibition management

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www.non-lethal-weapons.com



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