Programme

3rd European Symposium on Non-Lethal Weapons
May 10-12, 2005
Stadthalle Ettlingen, Germany

Non-Lethal Options Enhancing Security and Stability

Fraunhofer Institut Chemische Technologie
Programme Committee

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

Helmut Oppenheim
Bundesministerium für Landesverteidigung, Vienna, A

Stanislav Tecl
Military Technical Institute of the Ground Forces Czech Army, Vyskov, CZ

Norbert Eisenreich
Fraunhofer ICT, Pfinztal, D

Christophe Tamisier
DGA/SPART/DOEA, Saint Cloud, F

Roberto De Maio
Segrericerca, Rome, I

Zier Verheij
TNO Defence, Security and Safety, Rijswijk, NL

Victor Selivanov
Baumann University, Moscow, RUS

Ulf Sundberg
FOI, Tumba, SE

Martin Hubbard
DSTL, Sevenoaks, UK

Chairman of the Symposium
Klaus-Dieter Thiel
Fraunhofer ICT, Pfinztal, D
Conventional use of force solutions are struggling to manage the ever-changing challenges in military, law enforcement and peacekeeping operations. Hence there is the strong need for the adaptation and development of new use of force options. A potential solution to meet these new threats and challenges is through the use of Non-Lethal Weapons (NLWs). Non-Lethal Weapons provide military and law enforcement personnel with a tool to resolve conflict with a proportionate, lawful, appropriate and necessary use of force. Recent advances in non-lethal weapon technology have made it feasible for the military and law enforcement agencies to operate in situations and scenarios that would be unfeasible with conventional weapons. NLWs provide flexibility to influence many situations favourably with the reduced risk of human fatalities and collateral damage.

However current NLWs provided only limited capabilities and there is an urgent need for Research & Development into new Non-Lethal Technologies.

Topics

The 3rd European Symposium on Non-Lethal Weapons will act as a forum to review current and future non-lethal weapon technologies, to present new results and to discuss contributions to improve the understanding of the widespread and interdisciplinary phenomena of Non-Lethal Weapons.

The Symposium intends to encourage debate, to share knowledge and to promote international cooperation.

The Symposium will include topics such as:

- current and desired capabilities
- new technologies
- effects
- evaluation of effects
- modelling and simulation
- acceptability and implementation

Prior to the standard lectures of the Symposium, there will be given three presentations by the Chairmen of the virtual working groups on Non-Lethal Weapons.
REGISTRATION
Please return the enclosed registration form. Registration fees (incl. proceedings, coffee breaks, lunch), depending on arrival of the registration form at the ICT:

• Registration up to **April 18**:
  EUROS 900,-- (incl. 16% VAT)

• Registration up to **April 29**:
  EUROS 990,-- (incl. 16% VAT)

Participation cannot be guaranteed for registrations arriving after April 29, 2005.

The fee has to be paid **upon receipt of the invoice** either by

• remittance to the account given on the invoice
• cheque

CANCELLATION POLICY
EUROS 300.-- will be charged for cancellations after **April 29, 2005**. **No-shows** will be charged with EUROS 800,--.

ACCOMMODATION
HORE Hotel Reservation,
Weingartener Str. 70,
76229 Karlsruhe

Phone: +49-(0)7 21/ 48 23 56
Telefax: +49-(0)7 21/ 48 26 14
e-mail: HoreHotelReservation@t-online.de

An application form is enclosed.

CONFERENCE OFFICE
Foyer of the Stadthalle Ettlingen.
Open from
Tuesday, May 10, 14.00 h till
Thursday, May 12, 17.30 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 **Tuesday, May 10 between 14.00 and 20.00 h**.

All participants are cordially invited to the **Welcome Reception** on the same day, starting at **18.00 h** in the foyer of the Stadthalle Ettlingen.

CONFERENCE LANGUAGE
English

PROCEEDINGS
One copy is included in the registration fee. Additional copies cost EUROS 70,-- (Subscription price during the conference EUROS 50,--).
Opening & Introduction

Opening
K.-D. Thiel
Fraunhofer ICT, Pfinztal, D

Welcome Address
H.-G. Witten
Ministry of Defence, Bonn, D

Key Note Lecture
J.B. Alexander
Las Vegas, USA

Session 1  VIRTUAL WORKING GROUPS
Chairman: H. Oppenheim,
Bundesministerium für Landesverteidigung,
Wien, A

9.00  V1 Critical Legal Aspects of Non-Lethal Weapons (NLW)
F. Krüger-Sprengel
International Society for Military Law and the Law of War, Brussels, B

9.35  V2 Human Factors and Implications of Non-Lethal Options Group
M. Risling
Swedish Defence Research Agency (FOI), Stockholm, SE

10.10  V3 Current and Emerging Non-Lethal Technologies
V.V. Selivanov
Bauman Moscow State Technical University, Moscow, RUS

10.45 Coffee Break

Session 2  CURRENT AND DESIRED CAPABILITIES
Chairman: R. de Maio, MOD-SEGREDIFESA, Rome, I

11.10  V4 HPM against Electronic Systems
M. Jung, G. Wollmann
Rheinmetall Waffe Munition GmbH, Unterlüß, D
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<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Speaker(s)</th>
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<tr>
<td>12.00</td>
<td>V6</td>
<td>The Netherlands Non-Lethal Weapons Programme</td>
<td>Z. Verheij TNO Defence, Security and Safety, Rijswijk, NL</td>
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<tr>
<td>12.25</td>
<td></td>
<td>Lunch Break</td>
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<td>13.30</td>
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<td>Poster Session</td>
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<td>Session 3</td>
<td>NEW TECHNOLOGIES</td>
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<td>Chairman: N. Eisenreich, Fraunhofer ICT, Pfinztal, D</td>
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<td>14.00</td>
<td>V7</td>
<td>Liquid Taser</td>
<td>J. Bohl Diehl BGT Defence, Röthenbach, D</td>
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<td>14.50</td>
<td>V9</td>
<td>Optical Distraction and Disorientation</td>
<td>A. Gibson, R. Ives, G. Perkins, E. Liggins QinetiQ, Farnborough, UK</td>
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<td>15.40</td>
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<td>Coffee Break</td>
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<td>Time</td>
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<td>16.00</td>
<td>V11</td>
<td>Behavioural and Medical Aspects of Non-Lethal Options in Actual Field Conditions</td>
<td>C. Heal</td>
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<td>16.25</td>
<td>V12</td>
<td>Conceptual Models of Psychological and Behavioral Reactions to the Use of Non-Lethal Weapons</td>
<td>M.D. Silver</td>
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<td>16.50</td>
<td>V13</td>
<td>Physical and Mathematical and Medico-biological Modeling of the Non-Lethal Kinetic Weapons’ Functioning and Effects</td>
<td>V.I. Khrupkin, V.V. Savostyanov, V.V. Selivanov</td>
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<td>17.15</td>
<td>V14</td>
<td>Effectiveness and Risk during Application of NLW from the Medical Point of View</td>
<td>E. David</td>
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<td>17.40</td>
<td>V15</td>
<td>Medical Information and Future Product Strategies for TASER Technology</td>
<td>T. Smith</td>
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<td>18.05</td>
<td>V16</td>
<td>Advanced Taser: Neurophysiological Aspects</td>
<td>A. Buguet, J.-F. Jacquet</td>
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Session 5  EVALUATION OF EFFECTS I  
Chairman: V.V. Selivanov, Bauman Moscow State Technical University, Moscow, RUS  

8.30 V17 Principles of Modeling of the Scenario of Calmative Application in a Building with Deterred Hostages  
V.L. Klochikhin, A.A. Lushnikov, V.A. Zagaynov  
Karpov Institute of Physical Chemistry, Moscow, RUS  
A.V. Putilov  
Federal Agency on Atomic Energy, Moscow, RUS  
V.V. Selivanov  
Bauman Moscow State Technical University, Moscow, RUS  
M.A. Zatevakhin  
St. Petersburg State University, St. Petersburg, RUS  

8.55 V18 Observations on Changes in the Content of Tubulin Protein in Cell Cultures Exposed to High Power Microwave, in vitro  
M. Risling, M. Sköld, E. Malm, A. Sonden, I. Larsson, M. Angeria  
Swedish Defence Research Agency FOI, Stockholm, SE  
L. Malmgren  
University of Lund, Lund, SE  

9.20 V19 PSDB Update on UK less Lethal Technologies  
G. Smith, M. Symons  
Police Scientific Development Branch, St. Albans, UK  

9.45 V20 NATO Studies on Non-Lethal Weapons (NLWs): Effectiveness, Human Effects and Future Technologies  
M.R. Murphy  
Air Force Research Laboratory, Brooks City-Base, USA  

10.10  Coffee Break
Session 6  EVALUATION OF EFFECTS II  
Chairman: S. Tecl, Military Technical Institute of the Ground Forces Czech Army, Vyskov, CZ

10.40 V21 Measurement of Vircator Ultra-Short Solitary Electromagnetic Pulses
M. Steinbauer, P. Drexler, P. Fiala  
Brno University of Technology, Brno, CZ

11.05 V22 Methods and Equipment for Assessment of Microwave Radiation Influence on Biological Objects
V.N. Makukhin  
Center of Scientific Engineering and Social Activities „Trymas“, Moscow, RUS

11.30 V23 Pharmacological Non-Lethal Weapons
L. Hess  
Institute for Clinical and Experimental Medicine, Prague, CZ
J. Schreiberova  
Department of Anesthesiology, Hradec Kralove, CZ
J. Fusek  
Military Medical Academy J.E.P., Hradec Kralove, CZ

11.55 Lunch Break
**Session 7  MODELLING AND SIMULATION**  
Chairman: M. Hubbard, DSTL, Sevenoaks, UK

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| 13.00 | **V24** Influence of Physical and Geometrical Parameters on Vortex Rings Generated by a Shock Tube  
M. Havermann  
ISL, Saint Louis, F  
M. Kainuma, K. Takayama  
Tohoku University Shock Wave Research Center, Sendai, JAP |
| 13.25 | **V25** Computer System to Simulate NLW Deployment  
M.V. Sinitsyn, V.V. Leonov, V.V. Selivanov  
Bauman Moscow State Technical University, Moscow, RUS |
| 13.50 | **V26** Developing a Process to Evaluate Non-Lethal Weapons (NLW)  
C. Pick, A. Groll  
EADS Deutschland GmbH, Friedrichshafen, D |
| 14.15 | **V27** Fluid Dynamic Issues in the Development of a Single Shot Vortex Gun  
J.A. Edwards  
DSTL Fort Halstead, Sevenoaks, UK  
K. Kontis  
University of Manchester, Manchester, UK |
| 14.40 | Coffee Break |

Thursday, May 12
Session 8  ACCEPTABILITY AND IMPLEMENTATION  
Chairman: Z. Verheij, TNO Defence, Security and Safety, Rijswijk, NL

15.00 V28  The International Development of Practitioners’ Requirements by the International Law Enforcement Forum
C. Ashe  
Northern Ireland Police Fund, Holywood, UK

15.25 V29  Preconditions and Capabilities of Development and Deployment of Special Means of Combined Non-Lethal Effect
V.N. Baranov, V.V. Lazarev  
Ministry of Internal Affairs, Moscow, RUS  
V.V. Selivanov  
Bauman Moscow State Technical University, Moscow, RUS

15.50 V30  Military Use of Chemical Riot Control Agents, a Case for Legal Assessment
M. Annati  
Italian Navy, Milano, IT

16.15 V31  Non-Lethal Options under Current International Law
A. Vanheusden  
Ministry of Defence, Brussels, B

16.40 V32  Issues for the Control of Non-Lethal Weapons Procurement
S. Combes  
MOD, London, UK

17.05  Summary

17.15  End of the Symposium
Posters will be presented during the whole Symposium. A special Poster Session will take place on Wednesday, May 11, 13.30 – 14.00 h. During this time authors should be present for discussion at their poster boards in the foyer.

P33 Jet Protector Technology
J. Thomann
Piexon AG, Aarwangen, CH

P34 Development of Compact Generators of Microwave and TeraHertz Radiation for the Non-Lethal Technology Stop Car
V.G. Baryshevsky, N.A. Belous, A.A. Gurinovich, V.A. Evdokimov, A.S. Lobko, P.V. Mlochanov, V.I. Stolyarsky, B.A. Tarnopolsky, V.V. Tikhomirov
Belarusian State University, Minsk, BY

P35 ISL’s Research on Systems with Controlled Effects for Non-Lethal Applications
J.-P. Moeglin, M. Havermann et al.
ISL, Saint Louis, F

P36 Non-Lethal Ammunition
R. Körver
Rheinmetall Waffe Munition GmbH, Oberndorf, D

P37 RF-Weapons for Non-Lethal Interference and Destruction of Communication, Information and Electronic Systems
J. Bohl, R. Stark
Diehl BGT Defence, Röthenbach, D

P38 Acoustic NLW Working in the Audio Range
J. Altmann
Ruhr-Universität, Bochum, D

P39 Development of a Multi Functional Rapid Deployable Barrier
Fraunhofer ICT, Pfinztal, D

P40 Aspects of the Directed Stick Radiator (DSR)
N. Eisenreich, K.-D. Thiel, A. Herzog, E. Walschburger
Fraunhofer ICT, Pfinztal, D

P41 Engineering Method to Calculate Vortex Generators Parameters - Physical Capabilities Modeling of Vortex Ring and its Spreading Parameters
D. Levin, V. Selivanov
Bauman Moscow State Technical University, Moscow, RUS
P42  **Computer Simulation of Critical Behavior of Localized Masses (Crowd)**  
A.V. Kozyrev, V.V. Leonov, V.V. Selivanov  
Bauman Moscow State Technical University, Moscow, RUS

P43  **Social Aspects of NLW Deployment**  
N.G. Bagdasaryan, V.V. Leonov, V.V. Selivanov  
Bauman Moscow State Technical University, Moscow, RUS

P44  **Issues of Criminalistic Examination of Non-Lethal Weapons**  
V.A. Fedorenko  
Saratov Law Institute of the MVD of Russia, Saratov, RUS

P45  **Medical Biological Evaluation of Electroshock Stun Guns Efficiency**  
G.V. Batanov  
State Scientific Center Institute of Biophysics, Moscow, RUS  
M.D. Kontorov  
Group „MARCH“, Moscow, RUS

P46  **The New Class of Electroshock Stun Guns**  
M.D. Kontorov  
Group „MARCH“, Moscow, RUS

P47  **Self-Contained Sources of Acoustic Waves Using High-Energy Materials Oscillatory Burning Modes**  
G. Sakovich, A. Vorozhtsov, B. Vorozhtsov, S. Bondarchuk, V. Arkhipov  
Institute for Problems of Chemical and Energetic Technologies SB RAS, Tomsk, RUS

P48  **The Research of Blast-Acoustic Fields, Generated by a System of Distributed Explosives Charges**  
G. Sakovich, A. Vorozhtsov, B. Vorozhtsov, S. Bondarchuk, E. Maksimenko  
Institute for Problems of Chemical and Energetic Technologies SB RAS, Tomsk, RUS

P49  **Modeling the Effect of Acoustic Non-Lethal Weapons**  
G. Fadeev, V. Ermolaeva, A. Nikolaev  
Bauman Moscow State Technical University, Moscow, RUS

P50  **Special Pyrotechnic Non-Lethal Means**  
N. Varenykh, G. Bideev, A. Sporykhin  
Scientific Research Institute of Applied Chemistry, Sergiev Posad, RUS
Poster Programme

P51  International Less Lethal Weapons Database
     M. Symons
     Police Scientific Development Branch, St. Albans, UK

P52  NLW Overview with Particular Reference to Areas of Concern
     N. Lewer, N. Davison
     University of Bradford, Bradford, UK

P53  Non-Lethal Weapons for Peacekeeping Operations
     R. Rahimi, O.H. Arnesen, S. Hoibraten, H. Kippe
     Norwegian Defence Research Establishment, Kjeller, N

P54  Encyclopedia of Non-Lethal Weapons
     R.J. Bunker, P.L. Bunker
     California State University, San Bernardino, USA

P55  Non-State OPFORs and Tactical Laser Devices & Weapons
     R.J. Bunker
     California State University, San Bernardino, USA

P56  Diversionary Device History and Revolutionary Advancements
     M.C. Grubelich, P.W. Cooper
     Sandia National Laboratories, Albuquerque, USA

P57  Evolution of X-Net™ to TruX-Net: A Heavy Vehicle Arresting System
     C. Lyddon
     QinetiQ Vehicle Systems, Farnborough, UK

P58  Non-Lethal... Is it a Reality?
     D.M. Cole
     Shield Defense Corporation, Newport Beach, USA

P59  Non-Lethal Weapons Bases on Electro-Hydrodynamical Effect
     M. Silnikov, S. Kulakov, A. Mikhaylin
     NPO “Special Materials”, Sankt-Petersburg, RUS
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 you may go by train (approx. 1 hour) to Karlsruhe Hauptbahnhof (Main Station), then take the »Stadtbahn« (tramway) S1 or S11, direction Ettlingen or Ittersbach, and (after approx. 15 min.) get out at »Ettlingen Stadt« (»Stadtbahnhof Ettlingen«). After a short walk (approx. 10 min.) you reach the »Stadthalle Ettlingen« (see map).
Points of Contact

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