

'Very well run conference – on target with quantity, quality and timing'

John Coulthard, Directorate Logistic Strategy, DLO HQ

SMi's Fifth Annual...

Directed Energy Systems

18th & 19th September 2002, The Hatton, London

A unique opportunity to learn from leading military and research experts including:

- **Ed Pogue**, Director of High Energy Laser Joint Technology Office, **US Department of Defense**
- **Major Reg Hanbury**, Secretary UK MOD Military Laser Safety Committee, **Defence Procurement Agency, Ministry of Defence**
- **LT Col William Roach**, Chief, Optical Radiation Branch, **AFRL/HEDO**
- **LTC Cheryl DiCarlo**, Deputy Director, **US Army Medical Research Detachment**
- **Dr Robert Thomas**, Research Physicist, **Air Force Research Laboratory**
- **Dr Tim Andreadis**, High Power Microwaves Section Head, **Naval Research Laboratory**
- **Norman Barsalou**, Technical Director of Laser Department, **US Naval Health Research Center Detachment**

Key issues that will be addressed at the conference:

- **ASSESSING** developments with specific programmes and the latest laser technology and examining issues concerned with countermeasures, laser threats and safety
- **ADDRESSING** the operational assessments of laser threats in air operations using LTAMPS
- **REFLECTING** upon laser systems for the modern battlefield and assessing their future role as a tactical weapon
- **IDENTIFYING** the challenges, issues and trade-offs in the design of a High Power Microwave weapon for the Navy
- **ESTABLISHING** laser safety programmes to enable safe and effective deployment of laser systems



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8.30 Registration and Coffee

9.00 **Chairman's Opening Remarks**
Squadron Leader Douglas Vine, Night Vision Training Specialist,
RAF Henlow

DIRECTED ENERGY WEAPONS SYSTEMS

9.10 **An overview**

- Airborne laser
- Space based laser
- Tactical high energy laser
- DEW for ASAT use

Matthew Mowthorpe, Researcher, Centre for Security Studies,
University of Hull

HIGH-ENERGY LASER WEAPONS

9.40 **How bright is their future?**

- New and old concepts
- Current developments
- Possibilities and limitations
- Testing and demonstration programs for the future

Ed Pogue, Director of High Energy Laser Joint Technology Office,
US Department of Defense

LASER SAFETY

10.20 **In the UK Ministry of Defence**

- Abstract
- Introduction and background
- Authority for military laser safety in the UK
- Military laser safety committee – terms of reference
- Liaison with NATO allies on laser safety
- Conclusions

Major Reg Hanbury, Secretary UK MOD Military Laser Safety
 Committee, **Defence Procurement Agency, Ministry of Defence**

11.00 Morning Coffee

HIGH ENERGY LASER SAFETY PROGRAMS

11.20 **An AFRL perspective**

- Laser safety simulation and modeling of high energy laser systems
- Bio-effect studies of relevant laser wavelengths
- Field measurement and model validation efforts
- Software tools for laser safety analysis

Dr Robert Thomas, Research Physicist, **Air Force Research
 Laboratory**

12.00 **HIGH PERFORMANCE LASER WARNING RECEIVERS**

- Laser threat
- Systems issues
- Propagation and scatter effects
- Performance requirements
- Series 1223 LWR

Dr Clive Coleman, Technical Manager, Electro-Optical Systems,
BAE SYSTEMS Avionics

12.40 Lunch

INDUSTRIAL IODINE LASERS

1.40 **An untapped military resource**

- An introduction
- Working principles of iodine lasers
- Potential industrial applications
- Example: decontamination and decommissioning of nuclear facilities
- Disadvantages of alternative techniques for cutting thick metal sections
- Advantages of iodine lasers
- Survey of ongoing worldwide programs
- The future

Dr Robert Walter, Senior Scientist, **Schafer Corporation**

OPERATIONAL ASSESSMENTS OF LASER THREATS

2.20 **LTAMPS: A tool to assess MAN PAD laser threats to air operations**

- Motivation
- Data collection efforts for the model
- Other data products required
- Engagement considerations
- Eye-defeat calculations
- Uses in threat assessment and mission planning
- Other uses
- Conclusion

Norman Barsalou, Technical Director of Laser Department,
US Naval Health Research Center Detachment

CHALLENGES OF A SHIPBOARD HPM WEAPON

3.00 **The issues and trade-offs in the design of a HPM weapon for the Navy**

- Susceptibility measurements
- Delivering power to the antenna
- Antennas
- RF propagation in a maritime environment
- Targeting
- HPM weapon tactics

Dr Tim Andreadis, High Power Microwaves Section Head, **Naval
 Research Laboratory**

3.40 Afternoon Tea

LASER SYSTEMS FOR THE MODERN BATTLEFIELD

4.00 **Self-protection and remote sensing**

- Overview of Northrop Grumman laser efforts
- Lightweight mid-infrared laser uses for self-protection
- LIDAR/LADAR systems

David Snodgrass, Director EO/IR Products, **Northrop Grumman**

4.40 **DIRECTED ENERGY SYSTEMS AND THE LAW OF WAR**

- Fundamental principles of the law of war
- Obligation to assess the legality of any new weapons, means or methods of warfare
- The Vienna Protocol on blinding laser weapons

Dominique Loye, Technical Adviser, Mines-Arms Unit, Legal
 Division, **International Committee of the Red Cross**

5.20 **Chairman's Closing Remarks and Close of Day One**

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8.30 Re-registration and Coffee

9.00 **Chairman's Opening Remarks**

Squadron Leader Douglas Vine, Night Vision Training Specialist, **RAF Henlow**

INDUSTRY PERSPECTIVE

9.10 **The future of directed energy education**

- An introduction
- DEW laser payload – skills
- Optical design, analysis and fabrication – education and skills
- Optical components and systems – education and skills
- Beam control/tracking and pointing/beam director skills
- DEW systems integration skills
- System production
- The future

Dr H. Wilhelm Behrens, Technical Fellow and Mgr. Fluid and Thermophysics Department, **TRW Space & Electronics**

LASER BIOEFFECTS RESEARCH

9.40 **Supporting policy decisions on directed energy devices**

- Advocate scientifically based exposure standards to protect humans from laser exposures
- Enable safe and effective deployment of laser systems
- Support promulgation of national and international laser safety standards
- Counter optical threats and exploit optical systems

LT Col William Roach, Chief, Optical Radiation Branch, **AFRL/HEDO**

ASSESSING THE RESULTS OF MEDICAL THERAPIES FOR LASER RETINAL INJURIES

10.20 **With the use of the Multifocal Electroretinogram (MERG)**

- Multifocal electroretinogram in a nonhuman primate model
- Common laser retinal injuries
- Correlation to anatomic imaging
- Injury response to neuroprotective agents

LTC Cheryl DiCarlo, Deputy Director, **US Army Medical Research Detachment**

11.00 Morning Coffee

LASER BASED IR COUNTERMEASURES

11.20 **Defeat of the future threat**

- Conventional IRCM systems
- Advantages of laser enhancement
- Applicable laser technology
- Typical configurations

Stuart Duncan, Chief Systems Engineer EO/IR, **BAE SYSTEMS**

AN OVERVIEW

12.00 **Space based laser**

- Background
- The SBL system
- HELs and missile defence
- The benefits of SBL
- Summary

Carolina Piavis, Deputy Director, Affordability & Architecture Study, Space Based Laser Programs, **Lockheed Martin**

12.40 Lunch

2.00 **SPACE BASED LASER TECHNOLOGY DEVELOPMENT**

- Lasers
- Beam control
- Beam director
- Integration
- Future activities

Dan Wildt, Missile Defense Business Development, **TRW**

LASERS IN SPACE

2.40 **Erasing the constraints of time and distance**

- Military utility
- Technical reality
- Operational challenges
- Policy implications

Dr Roc White, Senior Project Engineer, **The Aerospace Corporation**

3.20 Afternoon Tea

3.40 **LASER MANUFACTURING PROCESSES OF MILITARY RELEVANCE**

- Laser manufacturing processes – an overview
- Selected examples of laser processing
- Recent developments

Dr J. Thomas Schriempf, Director, Laser Technology and Operations, **Electro-Optics Center, ARL Penn State**

LORD

4.20 **Laser Obstacle Range & Display**

- Obstacle warning system for helicopters
- Based on fibre optics eye-safe lasers
- Effective scanning of the field of regard

Avigdor Zajdman, Product Line Manager, **ELOP**

5.00 **Chairman's Closing Remarks and Close of Conference**

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Venue: The Hatton, 51-53 Hatton Garden, London EC1N 8HN.

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