

## NORTH ATLANTIC TREATY ORGANISATION



## RESEARCH & TECHNOLOGY ORGANISATION

### HFM-141 SYMPOSIUM

#### **HUMAN FACTORS AND MEDICAL ASPECTS OF DAY/NIGHT ALL WEATHER OPERATIONS: CURRENT ISSUES AND FUTURE CHALLENGES**

*Les Aspects facteurs humains et médicaux des  
opérations jour/nuite, toutes conditions météorologiques :  
problèmes courants et enjeux futurs*

**A Symposium Organised by the  
Human Factors and Medicine Panel**

To be held in

**Heraklion, Greece**

**23-25 April 2007**

This Symposium is open to citizens from NATO Nations ONLY

**Latest enrolment dates:**

NATO Nations: **23 March 2007**

**ENROL ONLINE AT: <http://www.rta.nato.int>**

#### **Background**

The mission of RTO is to conduct and promote co-operative research and information exchange. RTO consists of a three level organisation: the Research and Technology Board (RTB), the Panels and the Technical Teams. The Human Factors and Medicine Panel (HFM) is one of the seven Panels under the RTB. HFM covers the fields of: (1) Human Factors related to topics like selection, recruitment, training, design of information displays and controls, communications and teamwork, human error, cognitive engineering and performance, (2) Operational Medicine with topics like aerospace, hyperbaric and military medicine necessary to ensure sustenance, health, safety and survival of military personnel, medical evacuation and (3) Human Protection in Adverse Environments with topics like cold, heat, hypobaric, hyperbaric, undersea, noise, vibration, motion, nuclear, biological, chemical acceleration, (non)ionising radiation.

#### **Theme**

Day/Night, All Weather Operations (D/NAWO) capabilities are of high priority in NATO technological improvement requirements. A review of the current situation, mainly for night operations, appears as a key point to address human factors and medical issues for future systems. The availability of the latest generation of image intensifiers for military air and land operations such as Night Vision Devices (NVD) and FLIRs has been of great advantage for military operations but it has also raised a number of operational, technological and human factor issues. It is therefore important to identify and analyse as early as possible new human factor issues associated with future "day/night, all weather operations". This Symposium will review the operational use and experience of the training provided to military personnel in real situations and at Nite-Labs. The human factor issues associated with the use of visionic systems will also be considered from pure visual physiology aspects to cognitive implications related to combat tasks performance. The main goal of this Symposium is to review current knowledge gathered so far and to identify and analyse the new operational and human factor issues pertaining to enabling technologies required for effective day/night operations under all weather conditions.

#### **Topics**

- Lessons Learned & Human Performance issues
- Medical, Operational, Physiological and Training Aspects
- Design of Current and Future Systems: Human Engineering and Cognitive Aspects

#### **Enrolment**

Citizens from NATO Nations may enrol for this Symposium via <http://www.rta.nato.int>. When your enrolment is accepted you will receive a general information package with the latest information on travel, accommodation, other local arrangements and the social programme. Please note that participants are to make their own travel arrangements and hotel bookings.

#### **Important date**

Please note the following latest date for enrolment:  
NATO citizens: **before 23 March 2007**

#### **Languages**

Simultaneous interpretation between English and French will be provided in all plenary sessions.

#### **Programme Committee**

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# HFM-141 Symposium on "Human Factors in Day/Night, All Weather Operations: Current Issues and Future Challenges"

## Programme

### Monday 23 April 2007

- 08:00** Registration
- 08:45** Briefing for Speakers
- 09:00** Opening Ceremony and Welcoming Address
- 09:30** **KN1** KEYNOTE ADDRESS 1: Operational Challenges when Using Visionic Systems: A Perspective on Current and Future Uses  
Dr. Joseph Antonio, NAVAIR Human Systems Dept, USA
- 10:15** **KN2** KEYNOTE ADDRESS 2: The Development and Evaluation of Day/Night All Weather Systems for fixed and rotary-wing aircraft - UK experiences  
Mr. Geoff Clarkson, QinetiQ, Air Vehicle Integration, GBR
- 11:00** BREAK

### SESSION 1 - LESSONS LEARNED

Chair - Willem Tielemans (NLD), Francisco Rios-Tejada (ESP)

- 11:20** **1** Human Factors in C-130 and Rotary Wing Night Flight Mishaps  
Dr. R. Nullmeyer, Maj. B. Martyn, US Air Force Research Laboratory, USA
- 11:45** **2** Retrospective Flight Safety Review of Canadian Forces Night Vision Goggle (NVG) Experience In The Air Environment  
Maj. T. Sardana, MWO N. Belzile, National Defence Headquarters, CAN
- 12:10** **3** Driving with Night Vision Goggles: Operational Lessons Learned  
Dr. J. Crowley, Maj. R. Wildzunas, US Army Aeromedical Research Laboratory, USA
- 12:35** LUNCH
- 14:00** **4** Image Intensification/Forward Looking Infrared Sensor Comparison in Urban Combat In Operation Iraqi Freedom  
Mr. J. K. Heinecke, Mr. C.E. Rash, US Army Aeromedical Research Laboratory, USA
- 14:25** **5** Human Factors and Military Needs Using Imaging Sensors in Helicopters  
Capt. D. Kolletzki, Bundeswehr, DEU
- 14:50** **6** The Possible Need for Supplementary Oxygen in AH-64-D Night Operations  
Col. M. Haerkens, RNLAf Center for Man in Aviation, Maj. J. Steen, RNLAf Gilze-Rijen AFB, NLD
- 15:15** BREAK

### SESSION 2 - HUMAN PERFORMANCE

Chair - Sion Jennings (CAN), John Crowley (USA)

- 15:45** **7** Vestibular Suppression While Using NVG  
Dr. B. Cheung, DRDC-RDDC, CAN
- 16:10** **8** Multi Sensors Cross Check: A Perceptual Approach  
Dr. S. Buffat, Mr. J. Plantier, Dr. J. Lorenceau, Prof. C. Roumes Département de Sciences Cognitives – IMASSA, FRA
- 16:35** **9** Tactile Display for Rotary Wing Brownout Landings: First Evaluation and Hands on Demo  
Dr. E. Groen, MSc C. Jansen, Dr. H-J. Van Veen, TNO and Maj. J. Bart, RNLAf, NLD
- 17:00** **10** Hellenic Air Force (HAF) Aircrew Night Vision Performance Post Refractive Surgery  
Maj. I. Giannakis and Lt. I. Diamantopoulos, Hellenic Air Force, GRC
- 17:25** End of Day One
- 18:30** RECEPTION

### Tuesday 24 April 2007

### SESSION 3 - FUSION

Chair - Peter Hecker (DEU), Bernd de Graaf (NLD)

- 09:00** **11** Fusion of Synthetic and Enhanced Vision for All-Weather Commercial Aviation Operations  
Mr. R. Bailey, Mrs. L. Kramer, Mr. L. Prinzel, NASA Langley Research Center, USA
- 09:25** **12** Combining Enhanced and Synthetic Vision: DLR's Project ADVISE-PRO  
Dr.-Ing. B. Korn, Institute of Flight Guidance, DEU
- 09:50** **13** Towards Cognitive Image Fusion  
Dr. A. Toet, Dr. M. Hogervorst, Dr. M. Lucassen, TNO Human Factors NLD, Dr. S. Nikolov, Dr. J. Lewis, Dr. T. Dixon, Prof. D. Bul, Prof. C. Canagarajah, University of Bristol, GBR
- 10:15** **14** Own the Night with Flying Colors: Towards Ergonomic Full Color Multiband Night Vision Systems  
Dr. A. Toet, Dr. M. Hogervorst, Dr. M. Lucassen, TNO Human Factors, NLD
- 10:40** BREAK

### SESSION 4 - HUMAN ENGINEERING

Chair - Randy Bailey (USA), Peter Hecker (DEU)

- 11:00** **15** The Importance of Scene Complexity In User Performance With See-Through Symbology  
Dr. T. Harding, Mr. J. Martin, Mr. C. Rash, US Army Aeromedical Research Laboratory, USA
- 11:25** **16** The Crew Interface for Terrain Masking Low Level Flight  
Dr. J. Kaiser, Mr. H. Neujahr, EADS Military Air Systems, DEU
- 11:50** **17** Applied and Theoretical Aspects of Night Vision Goggle Resolution and Visual Acuity Assessment  
Dr. A. Pinkus, US Air Force Research Laboratory, Dr. H. Task, Task Consulting, USA
- 12:15** LUNCH

- 13:45** **18** Sensor Imagery and Symbology for Autonomous Approach and Landing in Zero-Zero Weather  
Dr. G. French, Mr. D. Zimmer, US Air Force Research Laboratory, USA
- 14:10** **19** Head Position of Helicopter Pilots Flying With and Without Night Vision Goggles  
Dr. L. Temme, Dr. D. Still, US Army Aeromedical Research Laboratory, USA

### SESSION 5 - TESTING

Chair - Joseph Antonio (USA), Alain Leger (FRA)

- 14:35** **20** Design Issues and Flight Assessment of an Integrated DNAW Helicopter Pilotage Display System  
Mr. D. Thorndycraft, Mr. P. Longman et al, GBR and Mr. S. Jennings, Institute for Aerospace research, CAN
- 15:00** **21** Test Techniques for Day/Night All Weather Operations based on Flying Qualities Evaluations at NRC  
Mr. S. Jennings, Institute for Aerospace Research, CAN, Mr. H. Fischer, German Federal Office of Defense Technology and Procurement, DEU
- 15:25** BREAK
- 15:45** **22** Head Mounted Display: Evaluation in Simulation and Flight Trials  
Mr. S. Schmerwitz, Dr. B. Lorenz, Dr.-Ing. H. Többen, Dr.-Ing. B. Korn, DEU
- 16:10** **23** Field Testing Driver Night Vision Devices  
Dr. F. Kooi, TNO Human Factors NLD, Capt. D. Kolletzki, Bundeswehr, DEU
- 16:35** **24** Evaluation of a Multi Modal Crew Interface for Obstacle Avoidance for Military Helicopter  
Dr. H-J. Hartz, Dr. T. Pfenninger, Dr. P. Stütz, ESG, DEU
- 17:00** **25** Ambient Lighting Simulation for Human – Vehicle Integration Purposes: The Alenia Aeronautica Sky Light Simulator  
Mrs. A. Russo, Mr. M. Fabri, Alenia Aeronautica SpA, ITA
- 17:25** End of Day Two

### Wednesday 25 April 2007

### SESSION 6 - TRAINING

Chair - Bernd de Graaf (NLD), Ioannis Diamantopoulos (GRE)

- 09:00** **26** Night Vision Training Capabilities In NATO: Trends And Challenges  
Capt. B. Puente Espada, LtCol. F. Rios Tejada, LtCol. C. Velasco Diaz, Maj. J. López López, Maj. P. Vallejo Desviat, LtCol. J. Del Valle Garrido and Maj. B. Esteban Benavides, C.I.M.A., Spain
- 09:25** **27** Review of Canadian Forces Training Doctrine With Night Vision Goggles (NVG's) in the Air Environment  
MWO N. Belzile, Maj T.M. Sardana, National Defence Headquarters, CAN
- 09:50** **28** NVG Training Developments in The Netherlands  
Dr. F. Kooi, TNO Human Factors, LtCol. T. Meeuwen, 1Lt. M. de Graaff, Center for Human Factors in Aviation, NLD
- 10:15** BREAK

- 10:35 29** Training Night Vision Goggle Use in a Game-based Environment  
Dr. J. Solberg, US Army Research Institute for the Behavioral and Social Sciences, E. Taggart, America's Army Project Office, USA
- 11:00 30** Adaptation to Increased Interocular Distance: Survey of Tiger Pilots Training  
Dr. A. Priot, Dr. S. Hourlier, IMASSA, Capt. E. Barbarat, EFA, Prof. Dr. C. Roumes, IMASSA, FRA
- 11:25** Panel
- 12:10** Technical Evaluation Report  
Dr. B. Cheung, DRDC-RDDC, CAN
- 12:35** Closing Remarks
- 12:40** End of Symposium/LUNCH

For more information,  
Please visit the following web sites:

<http://www.nato.int>



<http://www.rta.nato.int>



**Reference:**  
**HFM-141/RSY**

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