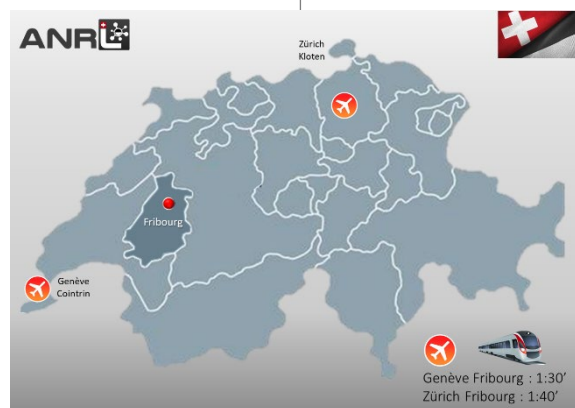
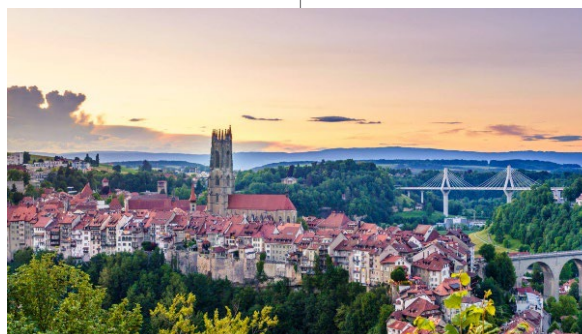




Promotional Document and Information's

Regarding our lab...

Located in Switzerland in the canton of Fribourg, our laboratory works at the heart of a combination of several scientific fields such as neuro-ergonomics, psychology and translational psychiatry, and automation of systems. We conduct experimental neurophysiological investigations that are part of a predictive safety approach, in terms of human performance and operational safety in operational, industrial and technological contexts in all sectors.



Our competencies

From different cultures, with transverse and complementary skills in the field of medicine, neurophysiology, neuro-ergonomics, Human Factors and IT, we are able to take into account your specificity's to define, with you, the best solutions. more suited to your needs in terms of security or operational technological developments.

Our objective :

Shedding new light on human performance on the cognitive and conative levels in order to contribute to the reinforcement of safety in complex operational environments.

The challenge for our laboratory:

Investigate human performance in an increasingly automated environment. This, by the correlation with the operational neuro-psycho-physiological model (MACOPS©).

In other words, to experimentally measure the psycho-physiological parameters under experimental and ecological conditions (in situ).



Scientific Station VOZHAR©



VOZHAR© Scientific Station:

Virtual Operational Zone Human Attitude Response

This station is a design of the Inuk Safety International Safety Agency whose field of expertise includes Human Factors, Crew Resource Management and Operational Neuroscience.

The usefulness of the scientific station:

Allow dedicated crews and multidisciplinary scientific teams in simulated conditions to coordinate their respective actions, the purpose of which is to measure cognitive performance, conduct neurophysiological investigations and measure the level of reliability of the operator-technology interface (flight controls or driving, control and command panels ../.)

Process :

Whether the air or land context, the operators (individually or in crews) are placed in a simulated operational environment in which they have been trained in this function and their integrated tasks.

Although simulated, the conditions are very close to reality they are almost ecological



Interior back view of the VOZHAR© station

Space configuration- Organization:

The station is structured into three distinct areas:

Part.1: The technical area equipped with several latest generation computers, they are powerful enough to deliver the wide projection space processing capacity and to supplement the driving or flight controls to the respective control panels equipped with modern instruments, as well as scientific measuring equipment.

Part.2: The simulation area in which the controls and instruments are located and the scene projection space on a 220-degree visual display (6 screens of 1.65 m diagonal, representing an area of 7 m.² In this zone, mobile platforms, Car (SIMCAR©), Airplane (SIMAVIA©) or Helicopter (SIMHELI©) can be integrated.

Part.3: The control area, in which there are two consoles for data acquisition, measurement and management. On the left, the SIM station, the operational part for controlling the simulator, and on the right, the SCAN station, the scientific part (Eye Tracking -EEG & NIRS measurement during implantation + measurements of physiological parameters).



SIM Station - VOZHAR©



Visual Display - VOZHAR©

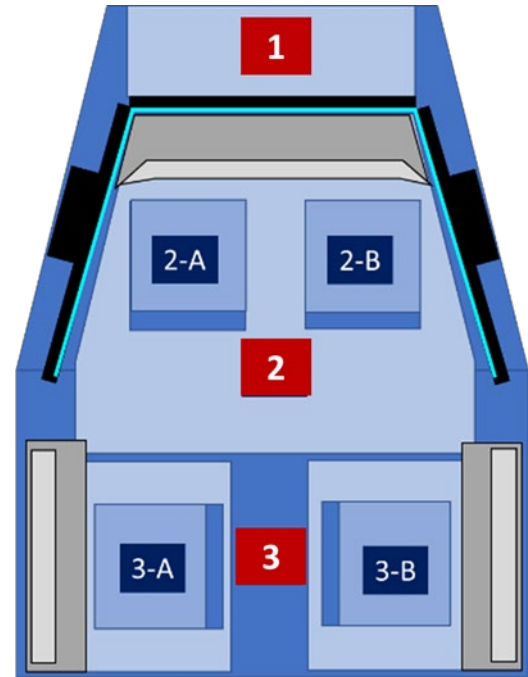


Functioning

Once installed in their Crew Working Station (2) operational environment, at their respective Crew Working Position (2-A and 2-B), the operators receive various stimuli, such as visual, auditory and kinesis representative of a situation in flight or road driving with its external environment.

The parameters transmitted by the modules of the Station-Sim (3-A) control and command post allow operators to find themselves in their real work spaces and react to various operational situations, this through their control panels, and flight controls (in the case of an aircraft or driving controls for a land vehicle).

Cognitive performance as well as physiological indices are measured and recorded in the Station-Scan console (3-B). This by using EEG and NIRS techniques with support from Eye Tracking, supplemented by monitoring of physiological parameters, ECG, T-A, Freq. Resp. Sat.O2.



Organization of the workspace of the VOZHAR© station



Installation of the EEG cap and its 32 electrodes



Simulated Experimental Flight Program (SEFP)

This program is dedicated to the field of civil air transport (Aircraft – Helicopter) with the aim of carrying out neurophysiological investigations, objective measurements making it possible to deliver operational solutions for flight safety.

Our investigations focus on operational conditions:

- o Cognitive load
- o Cognitive stress
- o Fatigue
- o Medication



A few words about the model (MACOPS®)

This model of cognitive information processing is part of an operational security approach, which allows various socio-technical devices such as the field of transport, essential services and interventionist medicine, to maintain an ultra-safe level of security or even the to strenghten.

It has been designed to provide dedicated educational support during security awareness training, allowing participants to discover how "information processing in an operational environment" works.

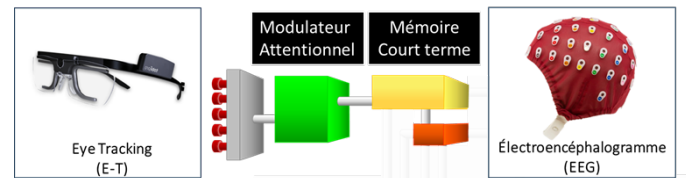
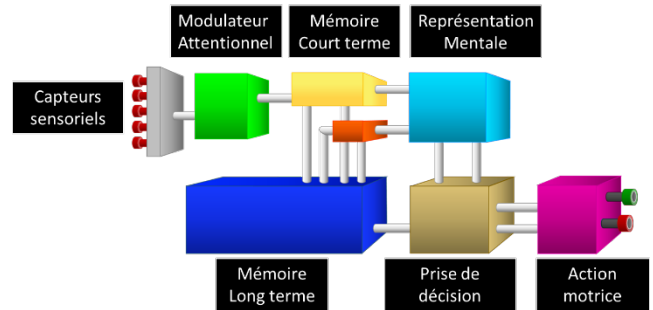
To achieve this, regulations, technology and training must both be standardized and simplified; MACOPS® goes in this direction, so that all first-line responders can not only become aware of the risks associated with their activities, but also have an understanding of fundamental security concepts such as vigilance, attention, mental representation and decision making.

The operational objective: "To make operators aware of the risks associated with their operational activities! "

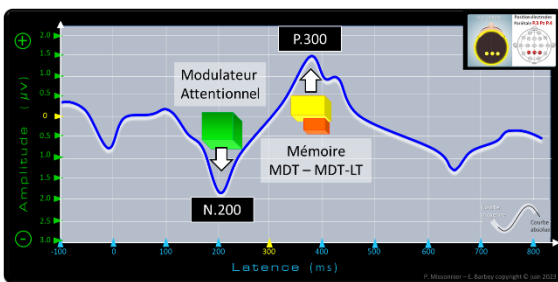


Neuro psycho physiology model operational MACOPS®

Anatomo-Functional Boxes

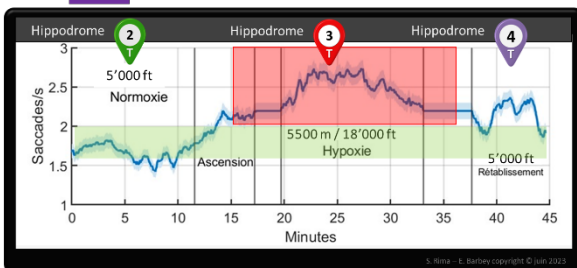


Attention and Work Memory :



Demonstration of MACOPS EEG measures

Saccades oculaire :



Demonstration of MACOPS Eye Tracking measures

From investigations to safety training

During "Human Factors" safety training, the use of MACOPS allows participants, regardless of their functions and prior medical knowledge, to create a coherent and logical mental representation of the cognitive process in an operational context.

So that they can become aware of the risks associated with their operational activities in the interest of safety. Thus, know-how gives way to know-how.

Additionally, through MACOPS, instructors are able to teach the basics of human factors cognition without having extensive medical science training.



Investigations neurophysiologiques en conditions simulées

Eye-Tracking

Modèle MACOPS

Technologies - Investigations

Eye Tracking (E-T)

Modulateur Attentionnel
Mémoire Court terme

Electroencephalogramme (EEG)

EEG - NIRS

Conditions Expérimentales Simulée

Résultats

From results to pedagogical notions:

Based on the results of the EEG-NIRS-E.T and physiological data obtained during the investigations in simulated conditions, an analysis of the integrated tasks is carried out in order to determine whether a "Training Need" is relevant.

If so, the data is then integrated into a Human Factors & CRM training syllabus developed according to international standards, such as the International Civil Aviation Organization (ICAO) and the European Aeronautical Safety Agency. (EASA).



The syllabuses are designed according to the FH-NTNG© reference developed by Inuk Safety International, which meets EASA IR-OPS / IOSA / ICAO standards.

The contribution of the training:

Following the training, the operators have the possibility of using our services to support the crews and carry out real flight investigations. This requires the wearing of light and non-invasive measurement equipment. In certain conditions the presence of a safety pilot is required.

The data collected will be compared with what was observed during the simulated flights. This will make it possible to objectively measure the contribution of the training.



Training Conception



Human Factors & CRM Referential





Pictures Gallery



Eye Tracking Sion Airport during approach



Eye Tracking Atterrissage Aéroport Sion



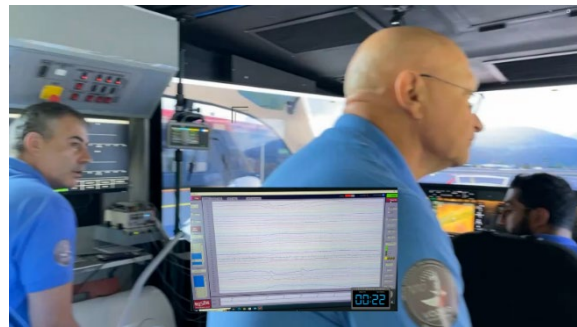
Panoramic view of Visual Display



BE-58 / External scenery over Alpes Valaisannes



Installation of equipment Eye Tracking



Physiological and EEG parameters monitoring



View of Main Panel Glass Cockpit GARMIN 1000



Focus on Primary Flight Display GARMIN 1000



The ANRL - VOZHAR© TEAM



Our Operational Partner



Our Operational Partner

It is within the framework of an international operational neuroscience partnership that the Inuk Safety International Operational Safety Agency and the ANRL laboratory are joining their efforts and making use of their respective expertise.

With Human Factors as its platform, this partnership provides industry and technology with next-generation security services dedicated to management and first-line responders.

Designer, holder of the concepts and rights of the Human Factors New To Next Generation repository, MACOPS Model and the VOZHAR Scientific Station, Inuk Safety International has been in operation since 2005

- Prof. Inta Dragos (*malheureusement pas sur la photo*)
- Dr Missonnier Pascal (Neurophysiologiste)
- Prof. Capt. Barbey Edward E. (Expert FH-CRM)
- Dr Danzeisen Claude (Ingénieur, Médecin – AME)
- Dr Rima Samy (S.R Neuroergonomie comportemental)
- Prof. Rüegg Curzio : Conseiller Scientifique
- Mr. Guimbert Dan (Expert en Informatique-Simulation)
- Mr. Roduit François Assistant Technique



www.inuksafety.com

Location son site of VOZHAR© station



Bâtiment PER.21 / 1st Floor Room G-114



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