for exp

11:45 AM

[211] FULL INTEGRATION OF FLIGHT SIMULATOR WITH NORMOBARIC HYPOXICATOR TECHNICALLY ACHIEVABLE?

O. Bassovitch[1], R. Westerman[2]
[1]*Biomedtech Australia Pty Ltd, Melbourne, VIC, Australia,*
[2]*Edith Cowan University, Melbourne, VIC, Australia*

INTRODUCTION: Validation of normobaric hypoxia training systems demonstrates their utility as alternatives to hypobaric chambers. Trainees sense their individual symptoms and experience gradually developing hypoxia insidiously affecting cognitive function and psychomotor performance. Feedback from tactical fighter pilots indicates their interest in recurrent hypoxia recognition training and also in repeated hypoxia training in full flight simulators. Currently no hypoxicators are system-integrated with task specific flight simulators. Especially in the context of F-22 hypoxia related issues this training paradigm may be worth consideration. **METHODS:** Analyse suitability of currently available technologies for integration with flight simulators pre-programmed flight missions. Identify their strengths, weaknesses, capabilities and safety aspects. Formulation of concept for simple integration of flight simulator software with hypoxicator. **RESULTS:** In some hypoxicators the monitoring operator communicates voice instructions and continuously interrogates the trainee about perceived hypoxia symptoms. Parameters of heart rate (HR) and SpO2 can be monitored but are not used for automatic safety cut-off. Other purpose-designed hypoxicators generate hypoxic and hyperoxic air using semipermeable membrane air-separation technology. Hypoxia is automatically aborted if any critical parameters (SpO2 and HR) are reached. This compact size 'on-demand' hypoxicator physically allows placement inside any simulator, has direct compatibility with military oxygen masks and replicates oxygen regulator breathing sensations. The simple communication protocol newly developed permits any flight simulator software control the hypoxicator and embeds hypoxia training segment into pre-programmed flight missions. **DISCUSSION:** Flight mission-integrated normobaric hypoxicators allow a new training modality: hypoxia segments are delivered unwarned for trainees with undetectable onset. In addition to classic hypoxia recognition training, students may experience it repetitively in various training scenarios. A particular merit of 'in flight mission' hypoxia recognition is in testing and evaluating hypoxia education efficiency. Technically, hypoxicator integration with flight simulator is possible via simple API protocol.

Learning Objectives:

1. Explore the technical possibility of further improvement of realism and fidelity of hypoxia training