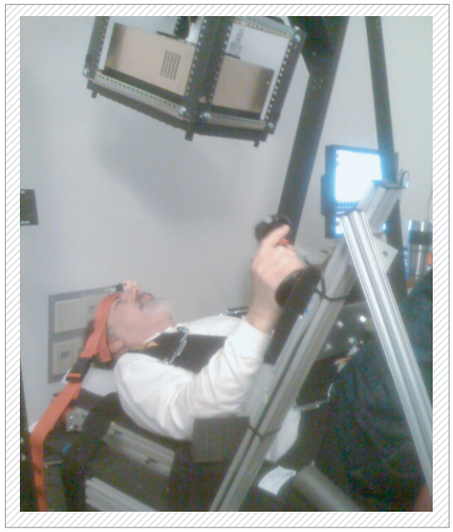
Human Systems integration division

ISIS Vibration Test Facility

Objective

1. Assess impact of flight-like whole-body vibration on human operational capabilities and ability to maintain situation awareness of vehicle operational state.
2. Quantify vibration effects on the usability of different forms of candidate next-generation cockpit display format symbology such as text, vehicle position, and vehicle attitude display indicators.
3. Develop advanced tools and methodologies to support testing by verification and testing by analysis



Approach

The ISIS Vibration Test Facility incorporates state-of-the-art vibration generation and measurement hardware and software into a part-task Crew Exploration Vehicle ascent/entry simulation environment. Researchers conduct part-task simulations of Orion ascents and analyze operator performance while experiencing whole-body vibration representative of the duration and intensity that astronauts could experience during actual Orion launch and ascent flight phases. Analyses of task performance indicators such as task response time and accuracy are used to quantify human performance changes due to vibration, and assess vibration- performance tradeoffs.

Impact

Our findings assist the spacecraft development community in the design, test, evaluation, and validation of operational concepts and supporting user interfaces for next-generation crewed vehicles. In addition, our results assist the human performance modeling community to develop modeling tools with increased ability to emulate complex stochastic behaviors such as scan patterns and fixation durations. The net result will be safer and more efficient spacecraft operations.

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