LOG OF MEETING
DIRECTORATE FOR ENGINEERING SCIENCES

SUBJECT: Task Group Meeting on Spatial Perception, of UL 8400, *The Proposed First Edition of the Standard for Safety for Virtual Reality, Augmented Reality, and Mixed Reality Technology Equipment*.
DATE OF MEETING: October 1, 2020, 12:00pm, ET
LOG ENTRY SOURCE: Stephen Harsanyi (ESHF)
DATE OF LOG ENTRY: October 6, 2020
LOCATION: Teleconference
CPSC ATTENDEE(S): Stephen Harsanyi (ESHF), Emma Blair (Office of Commissioner Feldman), and Cecilia Bellet (Office of Commissioner Feldman).
NON-CPSC ATTENDEE(S): Contact UL for the attendee list.

Summary of Meeting:

The task group met to develop recommendations, requirements, or both, pertaining to enhancing the spatial perception afforded by Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR) head-mounted devices (HMDs), *i.e.*, section 12.3 of UL 8400, *The Proposed First Edition of the Standard for Safety for Virtual Reality, Augmented Reality, and Mixed Reality Technology Equipment*. The aim of the task group is to address the potential of death or severe injury from collisions between VR/AR/MR users and their physical environment related to optical occlusion of the user by the VR/AR/MR device. The main topics of today's discussion included the following:

- Improvements to the requirements for boundary detection of HMDs with total optical occlusion. The changes account for users thrusting limbs suddenly towards their boundaries, potentially impacting physical objects at their boundaries (such as walls).
- Considerations for HMDs with optical see through, such as acceptable transmissivity, interaction between ambient light levels and display luminosity, obstruction of view by physical elements of the HMD, obstruction of view by display overlay elements, user distraction, insufficient legibility of display text/elements, and application-specific concerns. At this time, given limitations of data and research, the team is considering recommending a risk assessment with consideration of these and other factors.
- The necessity for products to be tested with consideration for their specific use cases, such as necessary differences in requirements for AR glasses intended for use indoors with constrained movement versus outdoors while riding a bicycle.
- Prevention of impacts with ceilings, including ceiling fans. Given limitations of hardware in some HMDs, the task group may recommend relying on warnings and instructions to address impacts with ceilings.

Next Steps:

The team will continue to work on improving the recommendations and requirements for spatial perception, which will be proposed to the standard technical panel for UL 8400. The next meeting for this task group is scheduled for October 15, 2020 at 12:00 PM ET, during which the task group plans to continue these discussions and potential requirements and recommendations for HMDs with video see-through, optical see-through, and partial optical occlusion. Additionally, the task group may discuss in the next meeting, ways to address tripping hazards posed by external cables for HMDs.