Official Written Testimony in Support of
Fiscal Year 2023 Science and Research Funding at the Department of Defense

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Committee on Appropriations
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On behalf of the Human Factors and Ergonomics Society (HFES), we are pleased to provide this written testimony to the Senate Subcommittee on Defense and Related Agencies for the official record. **HFES urges the Subcommittee to provide robust funding levels for Research, Development, Test, and Evaluation (RDT&E) at the Department of Defense (DOD) in the fiscal year (FY) 2023 appropriations process. Specifically, we urge the Subcommittee to direct DOD to identify opportunities across the services to transition human performance research to defense RDT&E activities and acquisition programs to reduce cost, strengthen force protection, reduce potential for re-engineering, and enhance training.**

HFES and its members believe strongly that investment in scientific research serves as an important driver for innovation and the economy, and for maintaining American global competitiveness. Accordingly, we thank the Subcommittee for its longtime recognition of the value of scientific and engineering research, and its contribution to innovation in the U.S.

The Value of Human Factors and Ergonomics Science

HFES is a multidisciplinary, professional association with over 4,500 individual members worldwide, including psychologists, scientists, engineers, and designers, all with a common interest in designing safe and effective systems and equipment that maximize and adapt to human capabilities.

For over 50 years, the U.S. federal government has funded scientists and engineers to explore and better understand the relationship between humans, technology, and the environment. Originally stemming from urgent needs to improve the performance of humans using complex systems such as aircraft during World War II, the field of human factors and ergonomics (HF/E) works to develop safe, effective, and practical human use of technology. HF/E does this by developing scientific approaches for understanding this complex interface, also known as "human-systems integration." Today, HF/E is applied to fields as diverse as transportation, architecture, environmental design, consumer products, electronics and computers, energy systems, medical devices, manufacturing, office automation, organizational design and management, aging, farming, health, sports and recreation, oil field operations, mining, forensics, and education.

With increasing reliance by federal agencies and the private sector on technology-aided decision-making, HF/E is vital to effectively achieving our national objectives. While a large portion of HF/E research exists at the intersection of science and practice—that is, HF/E is often viewed more at the "applied" end of the science continuum—the field also contributes to advancing "fundamental" scientific understanding of the interface between human decision-making, engineering, design, technology, and the world around us. The reach of HF/E is profound, touching nearly all aspects of human life from the health care sector, to the ways we travel, to the hand-held devices we use every day.

Human Factors and Ergonomics at the Department of Defense

HFES strongly believes that federal investments in DOD-funded research will have a direct and positive impact on national security, the economy, and the overall safety and well-being of Americans. For this, HFES supports robust funding for DOD RDT&E programs, including HF/E research programs across the Services to encourage further advancements in technology and safety, among other areas.

With the creation of the Department of Defense Human Factors Engineering Technical Group (DOD HFE TAG), DOD has demonstrated the value it places on the inclusion of HF/E-related research and has acknowledged the benefit of interagency collaboration, as it relates to RDT&E in this field. DOD HFE TAG is comprised of technical representatives from DOD, the National Aeronautical and Space Association (NASA), the Federal Aviation Administration (FAA), the Department of Homeland Security (DHS), and the Department of Veterans Affairs (VA).

The scope of this working group is broad, making its benefits diverse. The goals of DOD HFE TAG are to:

- Provide a mechanism for the timely exchange of technical information in the development and application of human factors engineering.
- Enhance coordination among government agencies involved in HF/E technology research, development, and application.
- Assist in the preparation and coordination of tri-service documents, and sponsor in-depth interaction, which aids in identifying HF/E technical issues and technology gaps.

In addition, the American National Standards Institute recently approved ANSI/HFES 400-2021, the Human Readiness Level Scale in System Development Process. This standard, created by HFES, defines the nine levels of the Human Readiness Level (HRL) scale and provides guidance for their application in the context of systems engineering and human systems integration processes. The HRL scale both complements and supplements the existing Technology Readiness Level scale to evaluate, track, and communicate the readiness of a technology or system for safe and effective human use.

HFES strongly believes that all DOD programs developing new technologies should be required to report to the Department on the HRL of their systems on an annual basis. The HRL should be reported for each major component of new military systems, and should be used to identify deficiencies and areas where additional attention to human-system integration is warranted to

reduce risks to program schedules, human safety, and effectiveness. DOD's HRL scale should correspond to the requirements set forth in ANSI/HFES 400-2021. By incorporating this standard DOD will better understand if needed human-system integration activities have been conducted before deploying new national security systems and technologies.

Continuing to prioritize HF/E research at DOD, along with incorporating the Department's use of the HRL system would undoubtedly produce positive impacts on the safety and well-being of American citizens.

Conclusion

Given DOD's critical role in supporting fundamental research and development across defense and engineering disciplines, HFES supports robust funding levels for DOD RDT&E programs, especially those that specifically fund human factors RDT&E activities, in FY 2023 as well as improvements to the inclusion of human systems integration in acquisition programs. These investments fund important research studies, enabling an evidence base, methodology, and measurements for improving organizational function, performance, and design across sectors and disciplines.

On behalf of the HFES, we would like to thank you for the opportunity to provide this testimony. Please do not hesitate to contact us should you have any questions about HFES or HF/E research. HFES truly appreciates the Subcommittee's long history of support for scientific research and innovation.