

# SAIFE Certification: Promoting Astronaut Integration and Flight Ergonomics Best Practices

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## Summary

With the advent of substantially increased commercial suborbital and orbital spaceflight manufacturing and flight activity, there is a notable lack of a formalized framework to benchmark and rate spaceflight participant (astronaut) integration with, and the intrinsic ergonomic effectiveness of, a given spacecraft's systems and interior environment. Consequently, a means to promote human integration and ergonomics best practices is proposed under the auspices of Astrowright Spaceflight Consulting (ASC)'s Superior Astronaut Integration and Flight Ergonomics (SAIFE) Certification scheme.

## Introduction

The recent publication of NASA Human Integration and Design Handbook (HIDH), which includes suggested cornerstone human factors considerations and design requirements (NASA 2010), when considered in combination with previously and subsequently-published spacecraft interior and astronaut integration research and recommendations, (*e.g.*, Aoki 2005; Clement *et al.* 2008; Colford 2002; Dumontheil *et al.* 2006; Perchonok and Bourland 2002; Ramsden *et al.* 2007; Seguin 2005; Thomas *et al.* 2010), has made for an unwieldy, confusing, and potentially contradictory spacecraft design landscape. Weighing this reality in concert with increased commercial suborbital and orbital spaceflight manufacturing activity, a means to succinctly present and integrate NASA HIDH human factors requirements with proactive spacecraft interior design best-practices to rate and compare spacecraft interiors and systems is warranted. To this end, the ASC SAIFE certification scheme is proposed.

## SAIFE Overview

By providing a benchmark framework for spacecraft interiors with respect to human factors, such as human-systems integration and ergonomics, the SAIFE Certification scheme presents a formalized way to rate

(*i.e.*, compare,) the intrinsic relative efficiency, effectiveness, and ease-of-use of a given spacecraft's habitable space. This framework rests upon a database of existing, virtual, and proposed spacecraft designs in combination with formal and proposed best-practice design requirements, utilizing a points-based rating system to certify spacecraft according to established industry criteria as well as classify spacecraft relative to one-another.

## References

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