34th Annual INCOSE international symposium

hybrid event

Dublin, Ireland
July 2 - 6, 2024

Tailoring of NASA-STD-3001 to Lunar Gateway Program Requirements

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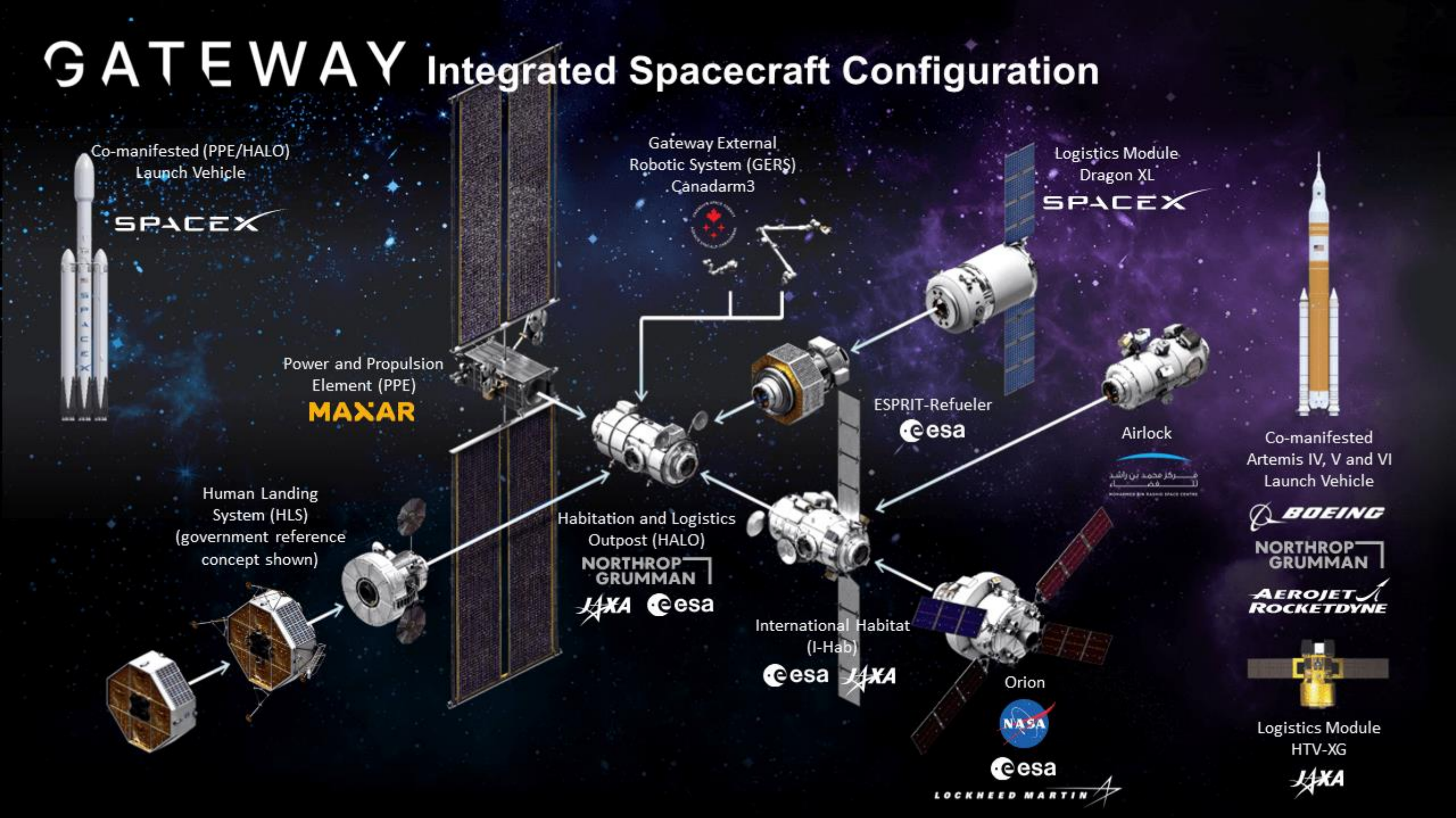
Agenda

- Gateway Overview
- Flow of Requirements from NASA Standards to Gateway Requirements
- Breakdown of Human Requirements across Gateway Specifications
- Challenges and Best Practices
- Forward Work & Conclusions

GATEWAY Integrated Spacecraft Configuration

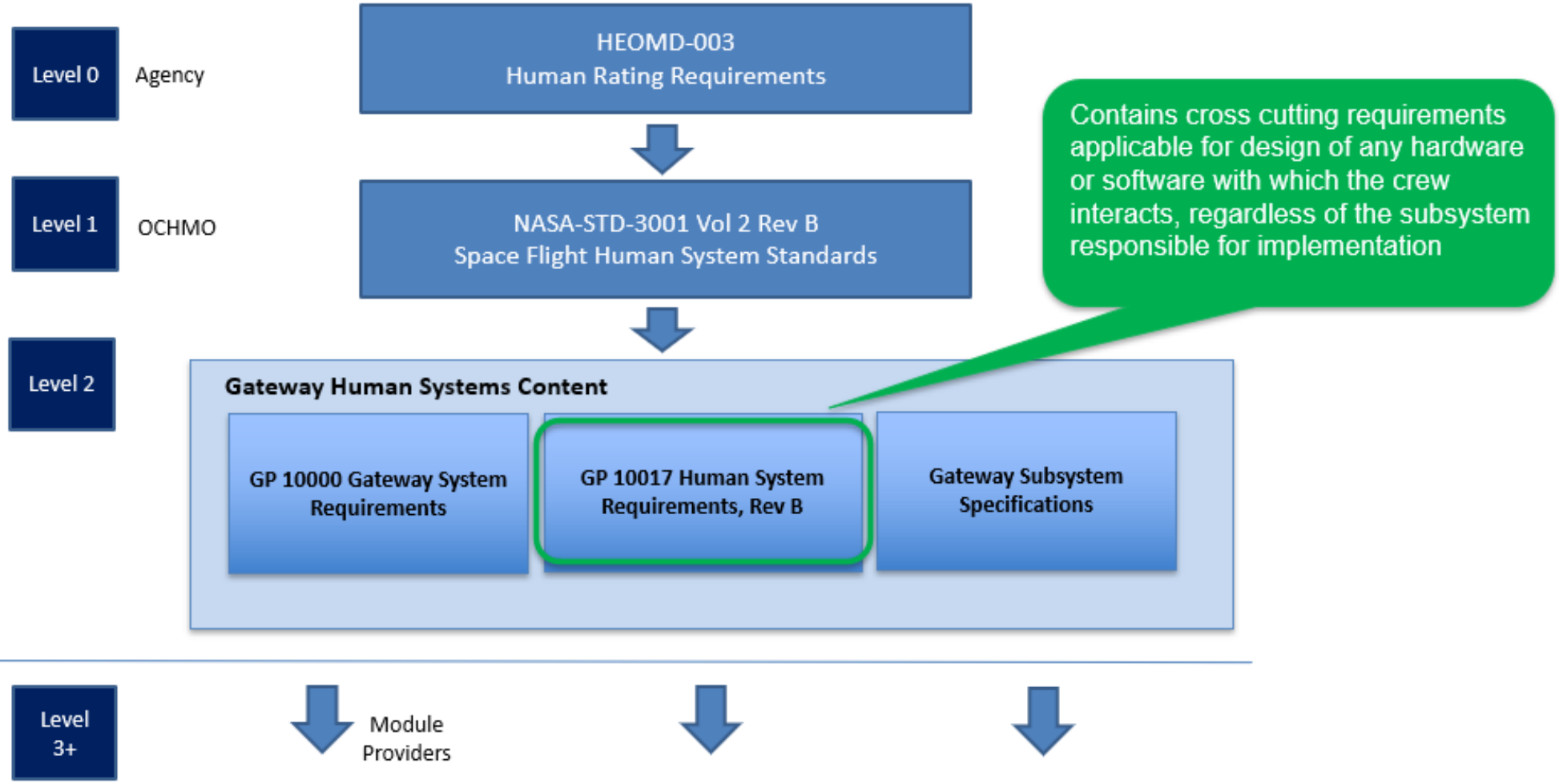


Overview

The Human Health & Performance Gateway SE&I Team has two main roles:

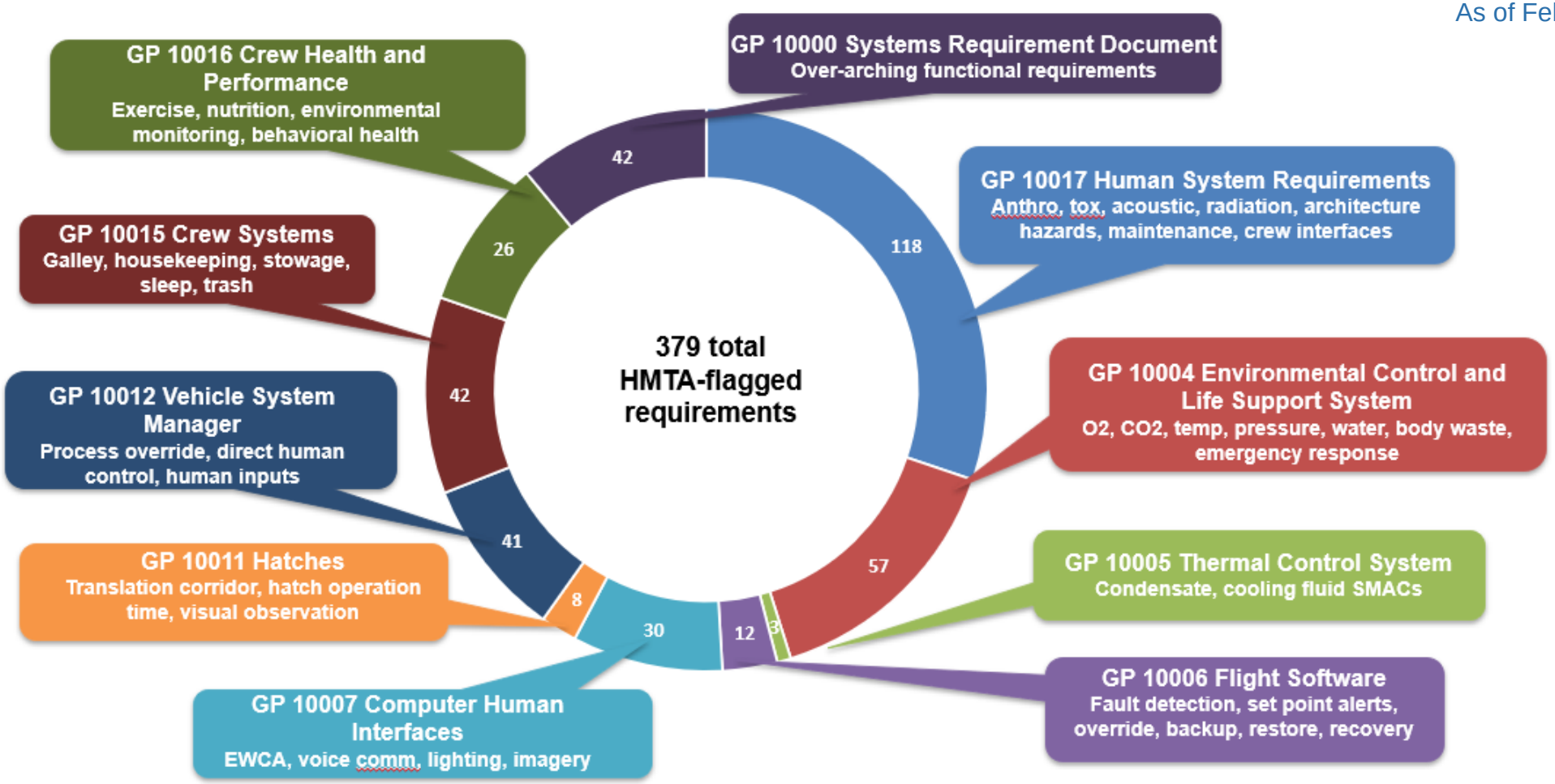
1) Lead Human System Integration (HSI) on behalf of the Gateway Program, and
2) Manage NASA-STD-3001 tailored requirements for Gateway Program in support of Health & Medical Technical Authority (HMTA)

Flow of Requirements from NASA Standards to Gateway Requirements

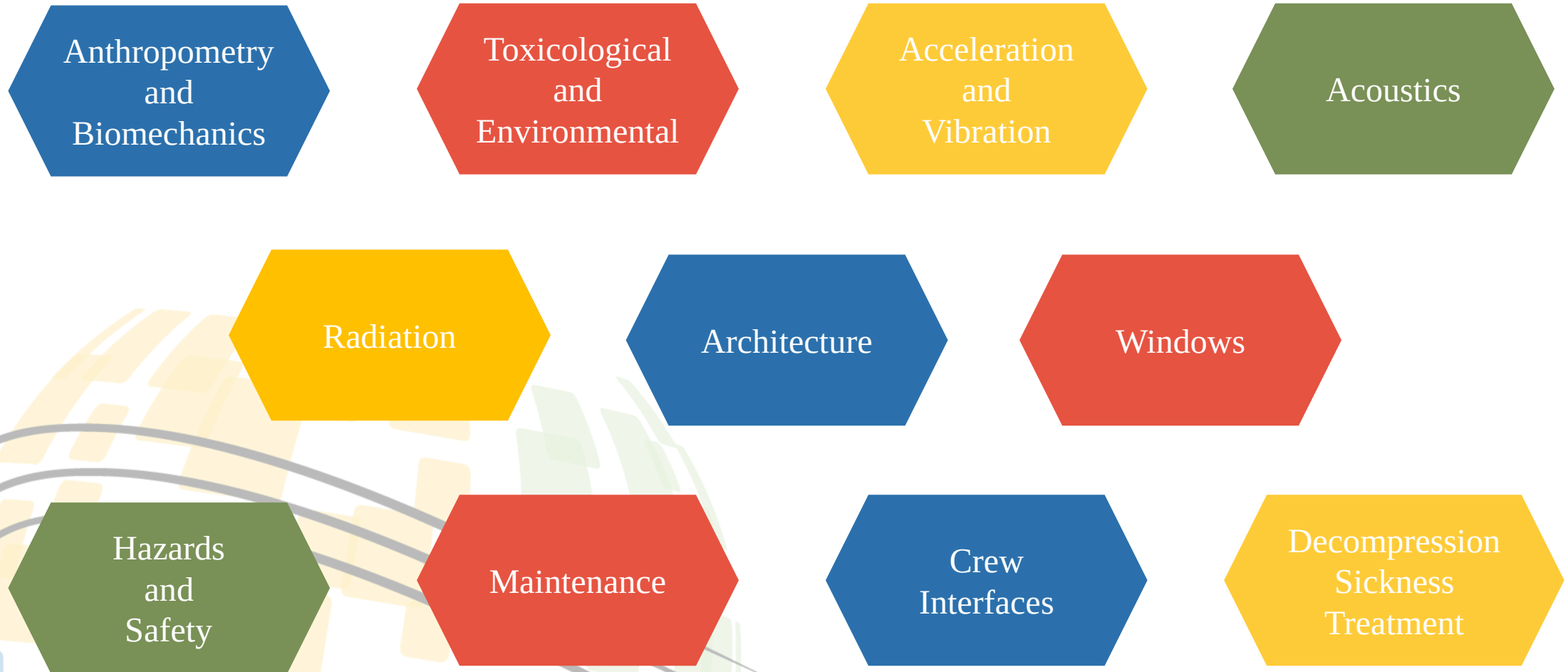


Breakdown of Human Requirements Across Gateway Specifications

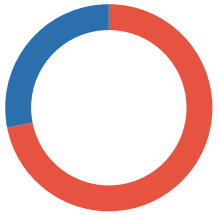
As of February 20, 2024



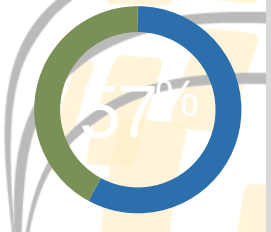
Human System Requirements



Challenges



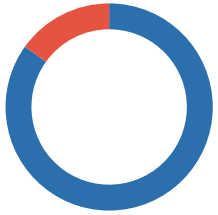
Container requirements: can be useful for early requirements development but become troublesome during verification writing and obscures traceability between levels.



Distribution of HMTA requirements across different specifications: makes requirements management difficult, requirement changes decisions were being made without the owner.

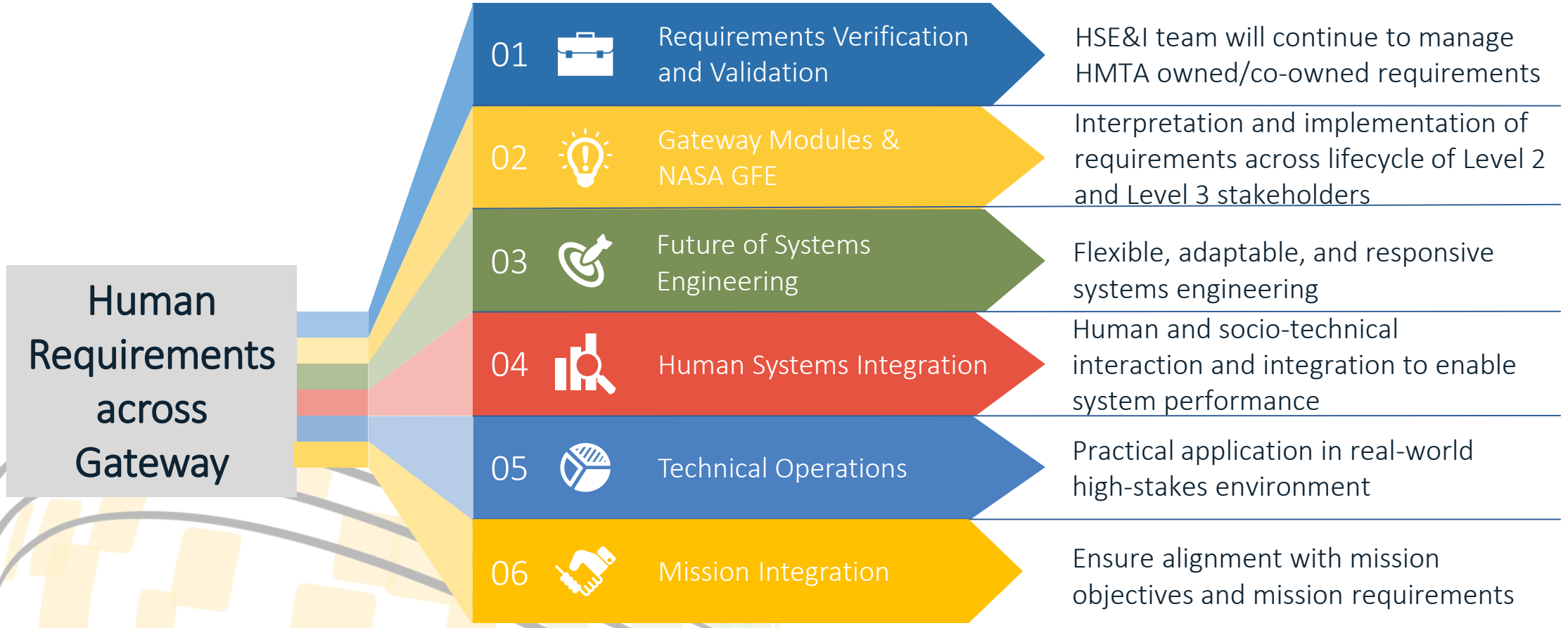
Best Practices

Level 2 & Level 3 integration: Discussions on design commonality and interpretation of requirements implementation occurred outside of formal design requirements documents and contract deliveries.



Gateway Human Systems Integration Working Group: involved diverse stakeholders early in the development of products and any proposed requirements and processes changes.

Forward Work



Conclusions

- Summarized a focused and systematic approach to tailoring, adapting, and applying NASA-STD-3001 Rev B Spaceflight Human System Standards to the Lunar Gateway Program
- Challenges and best practices were shared, denoting the importance of integration among various systems, disciplines, levels, module providers, international partners, and many others
- Incremental improvements are needed in systems engineering to support innovative and complex missions
- Contribution to the broader systems engineering challenge: standards and best practices evolve alongside technological and mission advancements

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