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### Title

## Space System Certification for Human Spaceflight-Historical Practices and New Approaches for Safety

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### Abstract

With the growth of new space systems for human exploration, including those international partners developing systems for future NASA and commercial missions, many international companies are challenged by the process of space system certification for Human Spaceflight. The process that is currently implemented has worked well from a safety perspective for the last 30 years, but at times is not compatible to commercial development timelines or budgets. The time and costs associated with organizations meeting the regimented and prescriptive safety requirements for an international government funded human exploration program, may be cost prohibitive for a commercial company to participate.

With the growth in privately funded commercial LEO Destinations, future private cis-lunar missions, and eventual private lunar missions; utilizing lessons learned from historical approaches coupled with best practice commercial systems engineering can be an effective means to develop safe and reliable commercial human spacecraft. This approach has been successfully utilized in the United States by commercially funded companies in the sub-orbital regime and is now being applied for orbital systems including the new Commercial LEO destinations program, and future crew landing systems for lunar missions.

This paper will discuss the historical approach for space system certification for launch and human spacecraft systems, provide new best practice commercial approaches for space system certification, and improved safety and system safety applications for human tended spacecraft systems.

### References

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