

Abstract for 42nd International Conference on Environmental Systems

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Title: Performance and Life Tests of a Regenerative Blower for EVA Suit Ventilation

Session: ICES402 Extravehicular Activity: PLSS Systems

*Authors who wish to contribute a paper to the conference must submit a 300-word abstract by **15 November 2011**. Papers should present technical developments and progress in any of the fields of environmental systems listed in this Call for Papers and should make a new and original contribution to the state of the art, or be a constructive review of the technical field. Authors need not be affiliated with any of the co-sponsoring societies. Papers proposed will be evaluated solely on the basis of their suitability for inclusion in the program. Please note that only written papers will be accepted, except for sessions indicated as panels.*

Ventilation fans for future space suits must meet demanding performance specifications, satisfy stringent safety requirements for operation in an oxygen atmosphere, and be able to increase output to operate in buddy mode. A regenerative blower is an attractive choice due to its ability to meet these requirements at low operating speed. This paper describes progress in the development and testing of a regenerative blower designed to meet requirements for ventilation subsystems in a future space suit Portable Life Support Systems (PLSS). The blower assembly includes a custom-designed motor that has significantly improved in efficiency during this development effort. The blower was tested at both nominal and buddy mode operating points and head/flow performance and power consumption were measured. The blower was operated for over 1000 hours to demonstrate safe operation in an oxygen test loop at prototypical pressures. In addition, the blower demonstrated operation with the introduction of simulated lunar dust.