Fiscal Year:	FY 2009	**Task Last Updated:**	FY 06/19/2009
PI Name:	Sadler, George Ph.D.		
Project Title:	Dual Use Packaging		
Division Name:	Human Research		
Program/Discipline:	HUMAN RESEARCH		
Program/Discipline--Element/Subdiscipline:	HUMAN RESEARCH--Space Human Factors Engineering		
Joint Agency Name:		**TechPort:**	No
Human Research Program Elements:	(1) **SHFH**:Space Human Factors & Habitability (archival in 2017)		
Human Research Program Risks:	None		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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Zip Code:	60467-6046	**Congressional District:**	13
Comments:			
Project Type:	GROUND	**Solicitation / Funding Source:**	SBIR Phase II
Start Date:	02/11/2009	**End Date:**	03/01/2011
No. of Post Docs:		**No. of PhD Degrees:**	
No. of PhD Candidates:		**No. of Master' Degrees:**	
No. of Master's Candidates:		**No. of Bachelor's Degrees:**	
No. of Bachelor's Candidates:		**Monitoring Center:**	NASA JSC
Contact Monitor:	Woolford, Barbara	**Contact Phone:**	218-483-3701
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Flight Program:			
Flight Assignment:	NOTE: change in end date per HRP Master Task List information dated 1/11/2012 (Ed., 2/27/2012)		
Key Personnel Changes/Previous PI:			
COI Name (Institution):			
Grant/Contract No.:	NNX09CB05C		
Performance Goal No.:			
Performance Goal Text:			
Task Description:	NASA calculation that over a kg of packaging waste are generated per day for a 6 member crew. This represents over 1.5 metric tons of waste during a Mars mission. Currently, these wastes are considered a disposal burden. However, packaging can designed to have valuable secondary uses which can lighten other payloads. These include: Light generation, electricity generation, storage structures, building materials, and raw material for hardware items. These benefits are not readily available in NASA's foil laminate structures used for packaging. Other materials more amenable to secondary uses lack the moisture and oxygen barrier essential to achieve NASA's shelf life targets for foods. This project controls moisture electro-thermally and oxygen electrochemically in an overwrap container. Once oxygen and moisture are managed in the overwrap, individual packaging can be made of virtually any material and the broad potential of secondary packaging becomes available. Phase I developed the tools and mathematical equations necessary to construct and model the performance of the overwrap system. Phase II research will combine these tools to create a		

	working overwrap system capable of achieving NASA's shelf life requirements and providing valuable secondary uses to packaging wastes. As a result of this research, spent packaging will no longer be a waste burden, but will become a valuable mission asset. POTENTIAL NASA COMMERCIAL APPLICATIONS: The overpack system with secondary applications parallels military needs. The US Navy seeks strategies for reducing packaging wastes and the Army has need for lightweight packages which are more adaptable to field preparation. The proposal explores space savings innovations such as magnetic induction heating and laser fabrication using spent packaging. These have broad application across the space program and throughout the military.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	Proposed packaging innovations have commercial, military and environmental application. Strategies for imparting biochemical activity to packaging (including antimicrobial, oxygen scavenging, and antioxidant properties) have broad food and pharmaceutical applications. The military also relies on foil laminate containers. Innovations of this research would provide packaging to the military which are lighter in weight and which are more amenable to field preparation. Seeking strategies to build value into packaging waste is in itself environmentally responsible. However, as world environmental regulations become stricter, new markets will open for technologies which address packaging wastes.
Task Progress:	New project for FY2009. Reporting not required for this SBIR Phase 2 project.
Bibliography Type:	Description: (Last Updated:)