Fiscal Year:	FY 2010 Task Last Upda	ed: FY 09/29/2009
PI Name:	Sandor, Aniko Ph.D.	
Project Title:	Usability evaluation	
Division Name:	Human Research	
Program/Discipline:	HUMAN RESEARCH	
Program/Discipline Element/Subdiscipline:	HUMAN RESEARCHSpace 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:	(1) HSIA:Risk of Adverse Outcomes Due to Inadequate Human Systems Integration	Architecture
Space Biology Element:	None	
Space Biology Cross-Element Discipline:	None	
Space Biology Special Category:	None	
PI Email:	Aniko.Sandor-1@nasa.gov	ax: FY
PI Organization Type:	NASA CENTER Ph	ne: 281.483.9726
Organization Name:	Lockheed-Martin/NASA Johnson Space Center	
PI Address 1:	2101 Nasa Parkway	
PI Address 2:	Mail Code: C46	
PI Web Page:		
City:	Houston St	ate: TX
Zip Code:	77058 Congressional Dist	ict: 22
Comments:		
Project Type:	Ground Solicitation / Fund Sou	ing Directed Research
Start Date:	10/01/2008 End D	ate: 09/30/2011
No. of Post Docs:	No. of PhD Degr	ees:
No. of PhD Candidates:	1 No. of Master' Degr	es:
No. of Master's Candidates:	1 No. of Bachelor's Degr	ees:
No. of Bachelor's Candidates:	Monitoring Cer	ter: NASA JSC
Contact Monitor:	Woolford, Barbara Contact Ph	ne: 218-483-3701
Contact Email:	barbara.j.woolford@nasa.gov	
Flight Program:		
Flight Assignment:		
Key Personnel Changes/Previous PI:		
COI Name (Institution):	Holden, Kritina (Lockheed-Martin/ NASA Johnson Space Center) Archer, Ronald (Lockheed-Martin/ NASA Johnson Space Center)	
Grant/Contract No.:		
Performance Goal No.:		
Performance Goal Text:		
Task Description:	This proposal addresses the need for research in the area of metrics and methodologic usability testing in order to define quantifiable and verifiable usability requirements. human-in-the-loop evaluation where a participant works through a realistic set of rep hardware/software under investigation. The purpose of this research is to define metr measuring and verifying usability in the aerospace domain in accordance with FY09 mobility/maneuverability. Usability metrics must be predictive of success with the in and/or calculate, and must meet the intent of current Human Systems Integration Req must work within the constraints of the aerospace domain, be cost and time efficient, extensive specialized training.	s used in hardware and software A usability test is a esentative tasks using the cs and methodologies for ocus on errors, consistency, and erfaces, must be easy to obtain uirements (HSIR). Methodologies and be able to be applied without

	The key driver for this directed research project (DRP) is the desire to promote and facilitate the development of usable Constellation vehicles and habitats. In past programs, usability has often been an afterthought – with human factors activities coming far too late in the development lifecycle to make a difference. It is the goal of this DRP to provide research-based methodologies and metrics early enough in the Orion program to positively impact development.
	Once new methodologies and metrics are developed, they will be field tested in real-world design efforts, iterated based on results, and finally described in reports and guidelines manuals, along with their application to requirements
Rationale for HRP Directed Research:	
<b>Research Impact/Earth Benefits:</b>	
Task Progress:	In FY09, a literature review has been conducted in the area of usability and human factors for quality and usability. We investigated best practices in industry, academia, and DoD for possible application in the aerospace domain. The focus has been on gathering information on errors, consistency, and mobility or maneuverability. Based on the literature review, we proposed usability metrics that can be applied in the NASA testing environment, along with recommended usability methodologies for collecting the metrics. Another literature review has been in the area of legibility methodology and a method was selected that is appropriate for the NASA environment and for the legibility requirement verification. We developed an error collection and analysis methodology for requirement verification. We focused on challenges such as error definition, error classification, and acceptable error rates. The findings were documented in a guidelines manual. In the area of consistency, an approach was developed for objectifying consistency and we developed a consistency measurement scale. We did field testing with the consistency approach and scale, and documented the results. Similarly, we developed and field tested a maneuverability scale that can be used in suit and hardware testing.
Bibliography Type:	Description: (Last Updated: 03/03/2016)