

Fiscal Year:	FY 2015	Task Last Updated:	FY 04/13/2016
PI Name:	Salas, Eduardo Ph.D.		
Project Title:	Evidence-based Metrics Toolkit for Measuring Safety and Efficiency in Human-Automation Systems--NNX15AR28G		
Division Name:	Human Research		
Program/Discipline:			
Program/Discipline--Element/Subdiscipline:	HUMAN RESEARCH--Space Human Factors Engineering		
Joint Agency Name:	TechPort:	Yes	
Human Research Program Elements:	(1) HFBP :Human Factors & Behavioral Performance (IRP Rev H)		
Human Research Program Risks:	(1) HARI :Risk of Inadequate Design of Human and Automation/Robotic Integration		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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Zip Code:	77005	Congressional District:	7
Comments:	NOTE: Previous affiliation was University of Central Florida, until mid-2015		
Project Type:	GROUND	Solicitation / Funding Source:	2012 Crew Health NNX12ZSA002N
Start Date:	08/01/2015	End Date:	07/31/2017
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 ARC
Contact Monitor:	Gore, Brian	Contact Phone:	650.604.2542
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Flight Program:			
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):			
Grant/Contract No.:	NNX15AR28G		
Performance Goal No.:			
Performance Goal Text:	NOTE: Continuation of "Evidence-based Metrics Toolkit for Measuring Safety and Efficiency in Human-Automation Systems," grant #NNX13AO51G with Principal Investigator Eduardo Salas, Ph.D., due to PI move in mid-2015 to Rice University from University of Central Florida. Specific aims of this proposal are threefold: (1) develop a framework for human-systems integration requirements, (2) identify and develop a metrics criteria in which safety and efficiency can be characterized in human-automation teams, and (3) design, develop, and validate a theoretically-driven, empirically-based metrics toolkit that characterizes the safety and efficiency of human automation interactions. This proposal meets NASA goals and objectives by mitigating the risk of inadequate design of human and automation/robotic integration through the development of safety and efficiency metrics for human-automation systems. The proposal is divided into three primary phases. Phase 1 will consist of synthesizing and translating findings from the extant literature relevant to human automation/robotic integration. The		

Task Description:	result of this effort will be the development of objective metrics generalizable to individual and team levels that characterize the safety and efficiency of a human automation interaction. The final outcome of Phase 1 will be the development of a human automation interaction metrics (HAIM) toolkit. Phase 2 will involve in-depth preparation for scientifically sound experiments. Phase 2 ensures adequate time and methodology for meaningful outcomes for Phase 3. The central outcome of Phase 2 will be the final development of the experimental testbed and experimental protocol. Phase 3 will involve preparation for, and execution of, experiments. This will include the design and execution of a set of multi-level empirical studies aimed at validating the metrics toolkit. The validation studies will focus on testing different aspects of human automation interaction (e.g., levels of automation, task complexity, and the number and configuration of system operators). The outcome of the proposed effort will provide NASA a set of evidence-based, empirically-validated guidelines and a measurement toolkit for mitigating the risk of inadequate design of human and automation/robotic integration as it pertains to the development of safety and efficiency metrics for human automation systems.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2015. Continuation of project with the same title and Principal Investigator, grant NNX13AO51G, due to PI move in fall 2015 to Rice University from University of Central Florida.
Bibliography Type:	Description: (Last Updated: 06/10/2021)