

<b>Fiscal Year:</b>	FY 2016	<b>Task Last Updated:</b>	FY 07/17/2015
<b>PI Name:</b>	Somers, Jeffrey M.S.		
<b>Project Title:</b>	ATD (Anthropomorphic Test Dummy) Injury Metric Sensitivity and Extensibility Study		
<b>Division Name:</b>	Human Research		
<b>Program/Discipline:</b>			
<b>Program/Discipline--Element/Subdiscipline:</b>	HUMAN RESEARCH--Space Human Factors Engineering		
<b>Joint Agency Name:</b>	<b>TechPort:</b>	No	
<b>Human Research Program Elements:</b>	(1) <b>HFBP</b> :Human Factors & Behavioral Performance (IRP Rev H)		
<b>Human Research Program Risks:</b>	(1) <b>Dynamic Loads</b> :Risk of Injury from Dynamic Loads		
<b>Space Biology Element:</b>	None		
<b>Space Biology Cross-Element Discipline:</b>	None		
<b>Space Biology Special Category:</b>	None		
<b>PI Email:</b>	<a href="mailto:jeff.somers@nasa.gov">jeff.somers@nasa.gov</a>	<b>Fax:</b>	FY
<b>PI Organization Type:</b>	NASA CENTER	<b>Phone:</b>	281-483-6010
<b>Organization Name:</b>	KBR/NASA Johnson Space Center		
<b>PI Address 1:</b>	2400 NASA Parklway		
<b>PI Address 2:</b>	MAILCODE: WYLE/HAC/37C		
<b>PI Web Page:</b>			
<b>City:</b>	Houston	<b>State:</b>	TX
<b>Zip Code:</b>	77058	<b>Congressional District:</b>	36
<b>Comments:</b>			
<b>Project Type:</b>	GROUND	<b>Solicitation / Funding Source:</b>	Directed Research
<b>Start Date:</b>	01/01/2016	<b>End Date:</b>	01/03/2018
<b>No. of Post Docs:</b>		<b>No. of PhD Degrees:</b>	
<b>No. of PhD Candidates:</b>		<b>No. of Master' Degrees:</b>	
<b>No. of Master's Candidates:</b>		<b>No. of Bachelor's Degrees:</b>	
<b>No. of Bachelor's Candidates:</b>		<b>Monitoring Center:</b>	NASA JSC
<b>Contact Monitor:</b>	Whitmore, Mihriban	<b>Contact Phone:</b>	281-244-1004
<b>Contact Email:</b>	<a href="mailto:mihriban.whitmore-1@nasa.gov">mihriban.whitmore-1@nasa.gov</a>		
<b>Flight Program:</b>			
<b>Flight Assignment:</b>	NOTE: Period of performance changed to 1/1/2016-1/3/2018 due to refinement of and delays in starting this task (original period of performance was 7/2/2015-3/31/2016), per E. Connell/JSC HRP (Ed., 5/24/16) NOTE: End date changed to 1/3/2018 (original end date 3/31/2016) per PI (Ed., 2/16/16)		
<b>Key Personnel Changes/Previous PI:</b>			
<b>COI Name (Institution):</b>	Gernhardt, Michael Ph.D. ( NASA Johnson Space Center ) Newby, Nathaniel M.S. ( Wyle Science, Technology and Engineering Group/NASA Johnson Space Center ) Wells, Jessica B.S. ( Lockheed Martin/NASA Johnson Space Center )		
<b>Grant/Contract No.:</b>	Directed Research		
<b>Performance Goal No.:</b>			
<b>Performance Goal Text:</b>			

<b>Task Description:</b>	<p>Currently, injury assessment reference values (IARV) are based on volunteer and post-mortem human subjects tested in non-spaceflight setups specific to the environment of interest. In automotive research, the occupant is put in the "super-slouched" position and is subjected to either frontal or side impacts at specific velocities with a 3-point restraint and airbags. In military research, test configurations are commonly based on ejection seats. These tests employ seating geometries, restraint, and loading directions that are not consistent with spaceflight configurations. Acute seat pan angles, non-extended legs (fetal position), combined axis loading, as well as other seat, restraint, and loading conditions may induce unforeseen changes in injury risk. Because the current data available do not account for these variations, a sensitivity and extensibility study is needed.</p> <p>Aims:</p> <ol style="list-style-type: none"><li>1. Validate the response of each finite element model against matched physical ATD tests in the baseline seat from existing datasets.</li><li>2. Quantify ATD and human numerical model response variance and sensitivity to a limited set of small perturbations in seat, and restraint initial conditions.</li><li>3. Quantify the effects of spacecraft-specific seating and restraint configurations on ATD and human numerical model responses.</li></ol>
<b>Rationale for HRP Directed Research:</b>	<p>This task meets the criteria for a Directed Task because of insufficient schedule available to solicit this work. Based on the approved Path to Risk Reduction, this task is required to be completed by the end of FY16 in order to meet the Orion CDR date.</p>
<b>Research Impact/Earth Benefits:</b>	
<b>Task Progress:</b>	<p>NOTE: Period of performance changed to 1/1/2016-1/3/2018 due to refinement of and delays in starting this task (original period of performance was 7/2/2015-3/31/2016), per E. Connell/SHFH Element,JSC HRP (Ed., 5/24/16)</p>
<b>Bibliography Type:</b>	<p>Description: (Last Updated: 12/29/2020)</p>