Planame     Gerk, Wayne Ph.D.       Project Title:     Optimization of Auronant Decompression Sickness Prevention Protocols Using Probabilistic Gas and Bubble Dynamics Models       Program Discipline:     Human Research       Program Discipline:     HUMAN RESEARCH Biomadical countermeasures       John Agnery Name:     Tech Pars:       No     Italiant Research       Human Research Program Biole     (DIFUE-Research Models)       Space Biology Consellante:     No       Space Biology Consellante:     No       Space Biology Consellante:     No       Plongatization Type:     Operations of Mission Inpacting Injury and Compromised Parly means.       Space Biology Consellante:     No       Space Biology Consellante:     No       Plongatization Type:     Operations Type:       Operation Type:     Nove Search Nove Type:       Plongatization Type:     Operation of Biomedical Research       Pl Address 1:     Operation of Biomedical Research       Pl Address 1:     Operation of Biomedical Research       Pl Address 1:     Operation Type:       Organization Type:     No       Ployee:     State Type:       Ployee:     State Type:       Operation of Biomedical Research     State Type:       Pl Address 1:     Operation of Biomedical Research       Pl Address 1:     No <th>TT* 1 %7</th> <th>EV 2004</th> <th></th> <th>EX 00/22/2005</th>	TT* 1 %7	EV 2004		EX 00/22/2005
Project Title:         Operational of Actoreant Decompression Sickness Prevention Protocols Using Prohabilistic Gas and Bubble Dynamics           Division Nume:         Human Research           Program/Divipiline:         BUMAN RESEARCH           Division Nume:         No           Division Nume:         Operational Mathibit Contermeasure:           Division Nume:         Operational Mathibit Contermeasure:           Space Biology Element:         No           Space Biology Spacial Category:         No           Pl Canaization Type:         Operational Diving Unit           Pl Organization Name:         Operational Diving Unit           Pl Address 1:         Operational Diving Unit </td <td>Fiscal Year:</td> <td colspan="3">FY 2004 Task Last Updated: FY 08/22/2005</td>	Fiscal Year:	FY 2004 Task Last Updated: FY 08/22/2005		
Index         Models           Division Name:         Human Research           Program/Divisipline:         IUMAN RESEARCH-Bionedial countermeasures           Program/Divisipline:         Ruman Research           Jaint Agne Shadher Sha	PI Name:			
Program/Discipline- fermen/Subscription- Enemotivability         HUMAN RESEARCH-Biomedical contermeasures           Dind Ageen X         TechPort         No           John Ageen X         Image Second Approxemation         No           John Ageen X         Very Rest of Aussian Inspacting Injury and Compromised Performance And Inspacts In Inspacts Inspaces Inspace Inspaces Inspace Inspace Inspace Inspaces Inspace	Project Title:		s Prevention Protocols Using Pro	babilistic Gas and Bubble Dynamics
Program/Dacipline- Bernen/Subdicipline- Bernen/Subdicipline- Bernen/Subdicipline- Bernen/Subdicipline- Bernen/Subdicipline- Bernen/Subdicipline- 	Division Name:	Human Research		
Element/Subdisc         Pich/Price         No           Jaint Ageny Name:         TechPort:         No           Human Research Program Element:         () HUR-Human Headult Countermeasures         No           Space Biology Stement:         () Dyzy, Risk of Mission Impacting Injury and Compromised Performance and Log Pe	Program/Discipline:	HUMAN RESEARCH		
Human Research Program Element:       (1) HIC:Buman Health Countermeasures         Human Research Program Risks:       (1) EVA.Risk of Mission Inpacting Injury and Compromised Performance and Long-Term Health Effects due to EVA         Space Biology Element:       None         Space Biology Cross-Element       None         Space Biology Special Category:       None         Space Biology Special Category:       None         P1 Canalization Type:       GOVERNMENT         P1 Organization Name:       Navy Experimental Diving Unit         P1 Address 1:       Department of Biomedical Research         P1 Address 2:       321 Bullifich Road         P1 Web Page:       Zip Code:         City:       Panama City       State: FL         Zip Code:       22407-7015       Congressional District: Zimater State         Start Date:       05152004       End Date:       06302009         No. of Post Does:       0       No. of Master' Degrees:       No. of Master' Degrees:         No. of Post Does:       0       No. of Master' Degrees:       Nos. of Master' Degrees:         No. of Abster's Candidates:       0       No. of Master' Degrees:       No. of Master' Degrees:         No. of Bachelor's Candidates:       0       No. of Master' Degrees:       No. of Master' Degrees: <td< td=""><td>Program/Discipline Element/Subdiscipline:</td><td>HUMAN RESEARCHBiomedical countermeasu</td><td>res</td><td></td></td<>	Program/Discipline Element/Subdiscipline:	HUMAN RESEARCHBiomedical countermeasu	res	
Image Research Program Bisks       I) EVA.Risk of Mission Impacting Injury and Compromised Performance and Long-Term Health Effects due to EVA Operations         Space Biolog Stement:       None         Space Biolog Stement:       None         Space Biolog Stement:       None         Space Biolog Stement:       None         Space Biolog Stepein Category:       None         Pl Eanal:       wave acethéginavy mil         Pl Cagnization Type:       GOV/RNMENT         Pl Organization Type:       GOV/RNMENT         Pl Address 1:       Department of Biomedical Research         Pl Address 2:       State State State         Pl Address 2:       J21 Bullifich Road         Pl Yorganization Type:       State State         Chyper State:       Fund         State:       State:         Pl Address 2:       State:         State:       State:         Pl Address 4:       State:         State:       State:         Sta	Joint Agency Name:		TechPort:	No
Human Research Program Research     Operations       Space Biology Element:     None       Space Biology Cross-Element:     None       Space Biology Special Category:     None       PI Email:     wayne a gerhu@nawy.mil     Fax: FY       PI Organization Type:     OOVERNMENT     Phone: (850) 230-3100 3247       Organization Type:     OovERNMENT     Phone: (850) 230-3100 3247       Organization Name:     Navy Experimental Diving Unit     Ptoma:       PI Address I:     Department of Biomedical Research     Ptodess I:       PI Address I:     Department of Biomedical Research     Ptodess I:       PI Address I:     Department of Biomedical Research     Ptodess I:       Pi Address I:     Department of Biomedical Research & State: FL     FL       Zip Code:     32407-7015     Congressional District: 2       Comments:	Human Research Program Elements:	(1) <b>HHC</b> :Human Health Countermeasures		
The real back of the second	Human Research Program Risks:		mpromised Performance and Lon	g-Term Health Effects due to EVA
Discipline:       Note         Space Biology Special Category:       None         PI Email:       www.e.acertik/navy.mil       Fax:       FY         PI Organization Type:       GOVERNMENT       Phome:       (850) 230-3100 3247         Organization Type:       GOVERNMENT       Phome:       (850) 230-3100 3247         Organization Type:       GOVERNMENT       Phome:       (850) 230-3100 3247         PI Address 1:       Department al Diving Unit	Space Biology Element:	None		
Pi Ennai: wavne a certhólnavy mil fax: FY Pi Organization Type: GOVERNMENT Phone: (850) 230-3100 3247 Organization Name: Navy Experimental Diving Unit Pi Address 1: Department of Biomedical Research Pi Address 2: 231 Bullfinch Road Pi Web Page: City: Panama City State: FL City: Panama City State: FL City: State: FL City: Solicitation / Funding 2003 Biomedical Research & Comments: Project Type: Ground Solicitation / Funding 2003 Biomedical Research & Source: Countermeasures 03-OBPR-04 No. of PhD Degrees: No. of Bachelor's Candidates: 0 { No. of Bachelor's Degrees: Counter Phone: Contact Fundi: Fight Arsignment: NOTE: Received NCE through 6/30/2009 per J. Dardano/JSC ; previous end date was 6/01/2008 (6/2008) Key Personnel Changes/Previous PI Col Name (Institution): Notion Physical Research (Wyle Laboratorise ) Simivasan, Ramachandra (Wyle Laboratorise ) Simivasan, Ramachandra (Wyle Laboratorise ) Simivasan, Ramachandra (Wyle Laboratorise ) Simivasan Ramachandra (Wyle Laboratorise ) Simivasan Ramachandra (Wyle Laboratorise ) Simivas	Space Biology Cross-Element Discipline:	None		
Interaction       GOVERNMENT       Phone: (850) 230-3100 3247         Organization Name:       GOVERNMENT       Phone: (850) 230-3100 3247         Organization Name:       Navy Experimental Diving Unit       Image: Comparisation Name:       Image: Comparisation Name:         P1 Address 1:       Opgranization Name:       321 Bultfinch Road       Image: Comparisation Name:       Image: Comparis Name:	Space Biology Special Category:	None		
Organization Name       Navy Experimental Diving Unit         P1 Address 1:       Department of Biomedical Research         P1 Address 2:       321 Bullfinch Road         P1 Web Page:       Enter Project Type:         City:       Panama City       State: FL         Zip Code:       32407-7015       Congressional District: 2         Comments:       Project Type:       Ground       Solicitation / Funding 2003 Biomedical Research & Source: Countermeasures 03-0BPR-04         Start Date:       05/15/2004       End Date: 06/30/2009         No. of Phot Docs:       0       No. of Phot Date: 06/30/2009         No. of Phot Docs:       0       No. of Bachelor's Degrees:         No. of Master' Scandidates:       0       No. of Bachelor's Degrees:         No. of Bachelor's Candidates:       0       Monitoring Cente: NASA JSC         Contact Email:       E       E         Flight Assignment:       NTE: Received NCE through 6/30/2009 per J. Dardamo/JSC ; previous end date was 6/01/2008 (6/2008)         Key Personnel Changes/Previous PI:       E       E         Flight Assignment:       Contain (Baylor College of Medicine )         Simivasan, Ramachandra (Wyle Laboratories )       Simivasan, Ramachandra (Wyle Laboratories )         Grant/Contract No:       NNJ04HF521	PI Email:	wayne.a.gerth@navy.mil	Fax:	FY
Pi Address 1: Department of Biomedical Research Pi Address 2: 2i Bullfinch Road Pi Web Page: City: Panama City Stat: FL Congressional Distric: 2 Comments: Project Type: Cound Source: Source: 2 Project Type: Cound Source: 2 Project Type: 0/5/5/2004 End Date: 0/6/30/2009 No of PhD Candidates: 0/5/5/2004 End Date: 0/6/30/2009 No of PhD Candidates: 0/5/5/2004 End Date: 0/6/30/2009 No of PhD Candidates: 0/5/5/2004 End Date: 0/6/30/2009 No of Master' Scandidates: 0/5/5/2004 End Date: No. of Master' Degress: No of Master's Candidates: 0/5/5/2004 No. of Bachelor's Degress: No of Master's Candidates: 0/5/5/2004 No. of Master' Degress: No of Master's Candidates: 0/5/5/2004 No. of Bachelor's Degress: No of Master's Candidates: No of Terressing No. Of Master's Degress: Fight Assignment: No TE: Received NCE through 6/30/2009 per J. Dardamo/JNC : previous end date was 6/01/2008 (6/2008) for Master Science (Science) Sciences (Science) Science	PI Organization Type:	GOVERNMENT	Phone:	(850) 230-3100 3247
PrivatePladiress 2:3 Ballifich RoadPl Web Page:Stat:FLCity:Panam CityStat:FLZip Code:3407-7015Congressional Distric:2Comments:	Organization Name:	Navy Experimental Diving Unit		
Pl Web Page:         City:       Panama City       State:       FL         Zip Code:       32407-7015       Congressional Distric:       2         Comments:	PI Address 1:	Department of Biomedical Research		
City:Panama CityState:FLZip Code:32407-7015Congressional District:2Comments:	PI Address 2:	321 Bullfinch Road		
Zip Code:32407-7015Congressional District:2Comments:Congressional District:2Project Type:GroundSolicitation / Funding Source:2003 Biomedical Research & Source:Start Date:05/15/2004End Date:0/30/2009No. of Post Docs:0No. of PhD Degrees:No. of PhD Candidates:0No. of Master' Degrees:No. of Master's Candidates:0No. of Master' Degrees:No. of Bachelor's Candidates:0Monitoring Center:No. of Bachelor's Candidates:0Monitoring Center:Contact Monitor:Contact Phone:Contact Funail:Contact Phone:Flight Assignment:NOTE: Received NCE through 6/30/2009 per J. Dardano/JSC ; previous end date ws 6/01/2008 (6/2008)Key Personnel Changes/Previous PISontiny, (Baylor College of Medicine ) Srinivasan, Ramachandra (Wyle Laboratories')Grant/Contract No.:N104HF52Fright Assignment:N104HF52	PI Web Page:			
Comments:         Project Type:       Ground       Solicitation / Funding Source:       2003 Biomedical Research & Source:         Start Date:       05/15/2004       End Date:       06/30/2009         Start Date:       05/15/2004       End Date:       06/30/2009         No. of Post Docs:       0       No. of PhD Degrees:       0         No. of Master's Candidates:       0       No. of Bachelor's Degrees:       0         No. of Bachelor's Candidates:       0       Monitoring Center:       NASA JSC         Contact Monitor:       Contact Phone:       Contact Phone:         Contact Email:       Contact Phone:       Contact Phone:         Flight Assignment:       NOTE: Received NCE through 6/30/2009 per J. Dardano/JSC ; previous end date was 6/01/2008 (6/2008)         Key Personnel Changes/Previous PI:       Solicitation:       Sonition:         Conkin, Johnny (Baylor College of Medicine)       Srinivasan, Ramachandra (Wyle Laboratories)       Solicitation:         Grant/Contract No.:       NJ04HF52       NJ04HF52       Solicitation:	City:	Panama City	State:	FL
Project Type:       Ground       Solicitation / Funding Source:       Sourtermeasures 03-OBPR-04         Start Date:       05/15/2004       End Date       06/30/2009         No. of Post Docs:       0       No. of PhD Degrees:       Countermeasures 03-OBPR-04         No. of Post Docs:       0       No. of PhD Degrees:       Countermeasures 03-OBPR-04         No. of Post Docs:       0       No. of PhD Degrees:       Countermeasures 03-OBPR-04         No. of PhD Candidates:       0       No. of PhD Degrees:       Countermeasures 03-OBPR-04         No. of PhD Candidates:       0       No. of PhD Degrees:       Countermeasures 03-OBPR-04         No. of Master's Candidates:       0       No. of Master's Degrees:       Countermeasures 03-OBPR-04         Contact Monitor:       Contact Monitoring Center:       NASA JSC         Contact Email:       Contact Phone:       Contact Phone:         Flight Assignment:       NOTE: Received NCE through 6/30/2009 per J. Dardar-JSC ; previous end date ws 6/01/2008 (6/2008)         Key Personnel Changes/Previous PI       Srinivasan, Ramachandra (Wyle Laboratories)       Srinivasan, Candidate (Wyle Laboratories)         Grant/Contract No.:       NJ04HF52I       Standard (Wyle Laboratories)       Standard (Wyle Laboratories)	Zip Code:	32407-7015	<b>Congressional District:</b>	2
Project Type:       Countermeasures 03-OBPR-04         Start Date:       05/15/2004       End Date:       06/30/2009         No. of Post Docs:       0       No. of PhD Degrees:         No. of PhD Candidates:       0       No. of Master' Degrees:         No. of Master's Candidates:       0       No. of Bachelor's Degrees:         No. of Bachelor's Candidates:       0       Monitoring Center:       NASA JSC         Contact Monitor:       Contact Phone:       Contact Phone:         Cottact Email:       Contact Enroll       Contact Phone:         Flight Assignment:       NOTE: Received NCE through 6/30/2009 per J. Dardano/JSC ; previous end date was 6/01/2008 (6/2008)         Key Personnel Changes/Previous PI:       Conkin, Johnny (Baylor College of Medicine )         Strinivasan, Ramachandra (Wyle Laboratories )       Srinivasan, Ramachandra (Wyle Laboratories )         Grant/Contract No.:       NN04HF52I	Comments:			
No. of Post Docs:       0       No. of PhD Degrees:         No. of PhD Candidates:       0       No. of Master' Degrees:         No. of Master's Candidates:       0       No. of Bachelor's Degrees:         No. of Bachelor's Candidates:       0       Monitoring Center: NASA JSC         Contact Monitor:       Contact Phone:       Contact Phone:         Contact Email:        Fight Program:       NOTE: Received NCE through 6/30/2009 per J. Dardano/JSC ; previous end date was 6/01/2008 (6/2008)         Key Personnel Changes/Previous PI:       VOTE: Received NCE through 6/30/2009 per J. Dardano/JSC ; previous end date was 6/01/2008 (6/2008)         Gol Name (Institution):       Conkin, Johnny ( Baylor College of Medicine ) simivasan, Ramachandra ( Wyle Laboratories )         Grant/Contract No.:       NNJ04HF52I	Project Type:	Ground		
No. of PhD Candidates:       0       No. of Master' Degrees:         No. of Master's Candidates:       0       No. of Bachelor's Degrees:         No. of Bachelor's Candidates:       0       Monitoring Center: NASA JSC         Contact Monitor:       Contact Phone:         Contact Email:       Contact Phone:         Flight Program:       VOTE: Received NCE through 6/30/2009 per J. Dardano/JSC ; previous end date was 6/01/2008 (6/2008)         Key Personnel Changes/Previous PI:       VOTE: Received NCE through 6/30/2009 per J. Dardano/JSC ; previous end date was 6/01/2008 (6/2008)         Col Name (Institution):       Conkin, Johnny (Baylor College of Medicine ) Srinivasan, Ramachandra (Wyle Laboratories )         Grant/Contract No.:       NNJ04HF52I	Start Date:	05/15/2004	End Date:	06/30/2009
No. of Master's Candidates:       0       No. of Bachelor's Degrees:         No. of Bachelor's Candidates:       0       Monitoring Center: NASA JSC         Contact Monitor:       Contact Phone:         Contact Email:	No. of Post Docs:	0	No. of PhD Degrees:	
No. of Bachelor's Candidates:       0       Monitoring Center: NASA JSC         Contact Monitor:       Contact Phone:         Contact Email:	No. of PhD Candidates:	0	No. of Master' Degrees:	
Contact Monitor:       Contact Phone:         Contact Email:       Contact Phone:         Flight Program:       VOTE: Received NCE through 6/30/2009 per J. Dardano/JSC; previous end date was 6/01/2008 (6/2008)         Key Personnel Changes/Previous PI:       VOTE: Received NCE through 6/30/2009 per J. Dardano/JSC; previous end date was 6/01/2008 (6/2008)         Key Personnel Changes/Previous PI:       Conkin, Johnny ( Baylor College of Medicine ) srinivasan, Ramachandra ( Wyle Laboratories )         Grant/Contract No.:       NNJ04HF521         Performance Goal No.:       VOTE:	No. of Master's Candidates:	0	No. of Bachelor's Degrees:	
Contact Email:         Flight Program:         Flight Assignment:       NOTE: Received NCE through 6/30/2009 per J. Dardano/JSC ; previous end date was 6/01/2008 (6/2008)         Key Personnel Changes/Previous PI:         COI Name (Institution):       Conkin, Johnny (Baylor College of Medicine ) Srinivasan, Ramachandra (Wyle Laboratories )         Grant/Contract No.:       NNJ04HF52I         Performance Goal No.:       VIIII - VIIIII - VIIIIIIIIIIIIIIIIIIIII	No. of Bachelor's Candidates:	0	Monitoring Center:	NASA JSC
Flight Program:         Flight Assignment:       NOTE: Received NCE through 6/30/2009 per J. Dardano/JSC; previous end date was 6/01/2008 (6/2008)         Key Personnel Changes/Previous PI:         COI Name (Institution):       Conkin, Johnny (Baylor College of Medicine ) srinivasan, Ramachandra (Wyle Laboratories )         Grant/Contract No.:       NNJ04HF52I         Performance Goal No.:       VIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Contact Monitor:		<b>Contact Phone:</b>	
Flight Assignment:       NOTE: Received NCE through 6/30/2009 per J. Dardano/JSC ; previous end date was 6/01/2008 (6/2008)         Key Personnel Changes/Previous PI:       Conkin, Johnny (Baylor College of Medicine ) Srinivasan, Ramachandra (Wyle Laboratories )         Grant/Contract No.:       NNJ04HF52I         Performance Goal No.:       VIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Contact Email:			
Key Personnel Changes/Previous PI:         COI Name (Institution):       Conkin, Johnny (Baylor College of Medicine ) Srinivasan, Ramachandra (Wyle Laboratories )         Grant/Contract No.:       NNJ04HF52I         Performance Goal No.:       Value of the state of the st	Flight Program:			
COI Name (Institution):       Conkin, Johnny (Baylor College of Medicine) Srinivasan, Ramachandra (Wyle Laboratories)         Grant/Contract No.:       NNJ04HF52I         Performance Goal No.:       Verformance Goal No.:	Flight Assignment:	NOTE: Received NCE through 6/30/2009 per J. De	ardano/JSC ; previous end date wa	as 6/01/2008 (6/2008)
Grant/Contract No.:     NNJ04HF52I       Performance Goal No.:     NNJ04HF52I	Key Personnel Changes/Previous PI:			
Performance Goal No.:	COI Name (Institution):			
	Grant/Contract No.:	NNJ04HF52I		
Performance Goal Text:	Performance Goal No.:			
	Performance Goal Text:			

Task Description:	Astronauts are routinely exposed to atmospheric decompressions that incur significant risks of Decompression Sickness (DCS). These exposures occur during in flight Extravehicular Activity (EVA) and during ground-based operations that include EVA training exercises in neutral buoyancy facilities under hyperbaric conditions followed by flight in hypobaric aircraft cabins. Programmatic management of these risks requires: a) definition of risk/hazard envelopes for all routine and emergency decompressions that may be encountered by NASA training and flightcrew; b) quantitative consideration of the inclusion or introduction of such risks in the design, testing and implementation of new operational procedures and equipment, and; c) real-time monitoring of DCS risk incurred by personnel during various training and spaceflight operations. Proposed work will contribute to meeting these objectives through continued refinement and application of methods that allow DCS risks to be quantitatively estimated throughout the time courses of pressure/respired gas/time profiles of arbitrary complexity. The risks are computed as probabilistic functions of various properties of modeled DCS etiologic processes during the profiles, including in vivo gas exchange and bubble dynamics. These models now account for effects of exercise on the rates of compartmental blood-tissue gas exchange and the efficacy of oxygen, and how the profusion of bubbles in any given tissue is affected by the magnitude of the prevailing gas supersaturation. They have been successfully used to aid development of a reduced EVA prebreathe protocol, which has supported a total of 34 DCS-free EVAs from Space Station and Shuttle to date since first use on STS 104 in July 2001. Parameters in the models are optimized using maximum likelihood to ensure that the models provide their best-possible reproductions of experience. Optimized models are then readily used to estimate DCS risks in particular profiles, or to compute prebreathe protocols and decompression schedules
Rationale for HRP Directed Research	:
Research Impact/Earth Benefits:	
Task Progress:	Please note that this is a new grant. There is no research progress to report for this period. For more information on this grant or this PI, please contact the Task Book Help Desk at taskbook@nasaprs.com.
Bibliography Type:	Description: (Last Updated: )