

# UNCLASSIFIED

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 3

PROGRAM ELEMENT: 0603706N

PROGRAM ELEMENT TITLE: Medical Development (Advanced)

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & ACTUAL	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0095 Fleet Health Technology	9,387	11,199	9,605	10,368	10,539	10,732	13,797	14,841	CONT.	CONT.
R0096 Fleet Health Standards	4,757	5,420	5,459	5,561	5,653	5,757	5,880	6,006	CONT.	CONT.
R2332 Mobile Medical Device	1,902	2,000	0	0	0	0	0	0	0	9,668
R2333 Rural Health	2,931	2,993	0	0	0	0	0	0	0	12,542
R2334 Bone Marrow	32,164	33,922	0	0	0	0	0	0	0	79,147
R2336 Freeze Dried Blood	1,416	848	0	0	0	0	0	0	0	4,598
R2375 Dental Research	0	2,993	0	0	0	0	0	0	0	2,993
R2376 Natural Gas Cooling/Desiccant Demo	2,362	0	0	0	0	0	0	0	0	2,362
R2377 National Biodynamics Lab	2,453	1,796	0	0	0	0	0	0	0	9,782
R2491 Naval Blood Research Lab	0	1,497	0	0	0	0	0	0	0	1,497

PROJECT NUMBER & ACTUAL	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R2492 Med Read Telemedicine	0	2,993	0	0	0	0	0	0	0	2,993
R2493 Directly Transfusable Blood										

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PROGRAM ELEMENT: 0603706N

PROGRAM ELEMENT TITLE: Medical Development (Advanced)

	0	848	0	0	0	0	0	0	0	848
R2494 Center for Disaster Management										
	0	998	0	0	0	0	0	0	0	998
R2495 Telemedicine										
	0	998	0	0	0	0	0	0	0	998
<b>TOTAL</b>	<b>57,372</b>	<b>68,505</b>	<b>15,064</b>	<b>15,929</b>	<b>16,192</b>	<b>16,489</b>	<b>19,677</b>	<b>20,847</b>	<b>CONT.</b>	<b>CONT.</b>

(U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Navy Medical Department's mission includes providing medical care and treatment to Navy and Marine Corps personnel in operational theaters. Goals include increasing return-to-duty rates of troops injured in combat, enhancing personnel performance in demanding Fleet jobs (and the selection of candidates for these jobs), reducing operationally related morbidity and mortality, and ensuring the physical readiness and safety of deployed personnel. This program element supports Joint Support Areas including Readiness, Support & Infrastructure, and Manpower, Personnel & Shore Training. Specific task areas include medical care and life-saving therapies for shipboard and battlefield casualties, blood and stem cell products and substitutes, treatments for wounds and multiple organ system failure, methods for managing injuries related to extreme thermal environments, and new capabilities in field diagnostics and medical/dental support. This program element also provides validated techniques for the selection of personnel based on medical criteria and standards and procedures which will protect Fleet personnel during exposure to Navy and Marine Corps operational environments. The impact of this program element includes improved medical logistics, safety, Service-wide standards and technologies. This program element also has supported the Navy's effort to register and match donors and complete bone marrow transplants.

(U) This Navy S&T program includes projects that focus on or have attributes that enhance the affordability of warfighting systems.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is budgeted within the ADVANCED TECHNOLOGY DEVELOPMENT Budget Activity because it encompasses design, development, simulation, or experimental testing or prototype hardware to validate technological feasibility and concept of operations and reduce technological risk prior to initiation of a new acquisition program or transition to an ongoing acquisition program.(U) COST: (Dollars in Thousands)

(U) PROGRAM CHANGE FOR TOTAL P.E.:

<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>
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(U) FY 1999 President's Budget:	68,151	18,728	15,865
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PROGRAM ELEMENT: 0603706N

PROGRAM ELEMENT TITLE: Medical Development (Advanced)

(U) Appropriated Value:	-	68,728	-
(U) Adjustments from the FY 1999 PRESBUDG:	-10,779	+49,777	-801
(U) FY 2000 President's Budget Submission:	57,372	68,505	15,064

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: The FY 1998 decrease is due to the Actual Update adjustment (-2,380), Small Business Innovative Research (-1,121) and transfer to Army of Biocide and Dental Congressional Plus-Ups (-7,278). The FY 1999 increase is due to Congressional Add for Telemedicine (+1,000), National Biodynamic Laboratory (+1,800), Rural Health (+3,000), Bone Marrow Donor (+34,000), Freeze Dried Blood (+850), Dental Research (+3,000), Navy Blood Research (+1,500), Medical Readiness Telemedicine (+3,000), Directly Transfusible (+850), Center for Disaster Management (+1,000), Revised Economic Assumption (-157) and minor adjustment (-66). The FY 2000 decrease is due to program adjustment (-583) and Non Pay Inflation adjustment (-218).

(U) Schedule: Not applicable

(U) Technical: Not applicable

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PROGRAM ELEMENT: 0603706N

PROGRAM ELEMENT TITLE: Medical Development (Advanced)

PROJECT NUMBER & ACTUAL	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0095 Fleet Health Technology	9,387	11,199	9,605	10,368	10,539	10,732	13,797	14,841	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Encompasses critical endeavors designed to enhance fleet health care, augment field treatment capabilities, and improve medical logistics necessary for support of Naval and Marine Corps forces and combat casualties. Ongoing projects focus on key biomedical and casualty-relevant areas including: (1) casualty stabilization and far-forward echelon critical care; (2) blood products, blood substitutes, and hematopoietic stem cells; (3) combat wounds and multiple organ system failure; (4) fleet health in extreme environments; and (5) field diagnostics and medical/dental support capabilities.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

- (U) (\$2,200) TREATMENT OF CASUALTIES TO PREVENT HEMORRHAGIC SHOCK AND COMPLICATIONS ASSOCIATED WITH COMBAT TRAUMA: Continued studies that validate the efficacy of life sustainment and stabilization interventions. Continued testing potential modalities that impact metabolic down-regulation and delayed resuscitation. Continued studies in large animal models into the medical complications of hemorrhagic shock and its late sequelae. Initiated studies to develop hemostatic agents/devices in formulations for easy delivery to wounds in the combat environment.

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DATE: February 1999

BUDGET ACTIVITY: 3

PROGRAM ELEMENT: 0603706N

PROGRAM ELEMENT TITLE: Medical Development (Advanced)

PROJECT NUMBER: R0095

PROJECT TITLE: Fleet Health  
Technology

- (U) (\$2,100) BLOOD AND BLOOD SUBSTITUTES: Continued clinical trials and modifications for final Food and Drug Administration (FDA) approval for technologies that extend the refrigerated liquid storage time for red blood cell transfusion units. Completed the enzymatic conversion of red blood cells to universal O. Completed the refinement of A to O conversion and transition Phase II/III clinical trials. Completed the development of Rh positive to Rh negative conversions. Completed studies to develop a one-step red blood cell freezing technology that permits immediate post-thaw transfusion without the necessity of pre-transfusion washing. Continued development of freeze-dried red blood cell units having a minimum of a two-year room temperature shelf-life and ease of use with immediate transfusion post-rehydration. Continued the development of improved frozen and freeze-dried platelet products with enhanced storage capabilities, Initiated clinical trials for freeze-dried platelets. Completed the development of liposome encapsulated hemoglobin as an oxygen carrying blood substitute.
- (U) (\$1,700) MODULATION OF IMMUNE SYSTEM IN COMBAT CASUALTIES: Continued the studies and development of advanced modulation techniques for cytokines and immune cell functions that impact the cellular and physiological responses of combat casualties. Continued large animal studies to demonstrate the efficacy of cytokines in preventing complications from combat relevant trauma and hemorrhage. Continued study to enhance transplant acceptance by modulation of the immune response.
- (U) (\$1,487) PHYSIOLOGICAL ENHANCEMENT OF PERFORMANCE IN MILITARY/EXTREME ENVIRONMENTAL CONDITIONS: Completed testing formulation of vasopressin regimen in clinical trials for submission to the FDA for licensure. Completed studies to reduce or prevent cold related injuries for combat personnel, particularly related to non-freezing cold related injuries in the extremities. Continued studies to modify physical training programs to reduce training related injuries in female recruits. Continued to study the value of intervention techniques which preclude high risk individuals from becoming victims of musculoskeletal trauma.
- (U) (\$1,200) MEDICAL MANAGEMENT TOOLS AND EQUIPMENT USED IN FIELD OPERATIONS: Continued to interface selected medical databases for advanced medical support planning and casualty management. Continued validation of the relationships of these databases and ensure their effectiveness in military environments. Continued to develop models for projecting casualty rates for various battle scenarios and war fighting intensities upgrading systems to current war fighting and enemy systems information. Continued to investigate and model casualty flows between echelons of care and developed planning factors needed to forecast medical requirements at these echelons and project necessary evacuation assets incorporating terrain features into optimization models based on changing warfighting scenarios and medical support capabilities.

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PROGRAM ELEMENT: 0603706N

PROJECT NUMBER: R0095

PROGRAM ELEMENT TITLE: Medical Development (Advanced)

PROJECT TITLE: Fleet Health  
Technology

- (U) (\$700) NAVY DENTAL EMERGENCIES: Completed efforts encompassing the systematic investigation of problems related to the oral health, wellness, disease, and injuries of Navy and Marine Corps personnel that may adversely impact deployment and dental emergencies requiring evacuation from remote Navy platforms. Completed development of multimedia diagnostic systems for corpsmen and maintained advanced information through system updates, continued risk assessment strategies and programs.
2. (U) FY 1999 PLAN:
- (U) (\$2,800) TREATMENT OF CASUALTIES TO PREVENT HEMORRHAGIC SHOCK AND COMPLICATIONS ASSOCIATED WITH COMBAT TRAUMA: Continue studies that validate the feasibility and efficacy of life sustainment and casualty stabilization interventions. Continue testing modalities that impact metabolic down-regulation and delayed resuscitation. Continue studies into the complications of hemorrhagic shock and late sequelae that may be prevented with early immune modulator or other interventions. Continue to extend studies in large animal models. Continue development of improved local hemostatic agents/devices. Initiate studies of traumatic injury to the central nervous system.
  - (U) (\$3,500) BLOOD AND BLOOD SUBSTITUTES: Continue clinical trials and modifications for final FDA approval for technologies that extend the refrigerated liquid storage time for red blood cell transfusion units. Continue development of freeze-dried red blood cell units having a minimum of a two-year room temperature shelf-life and ease of use with immediate transfusion post-rehydration. Continue the development of improved frozen and freeze dried platelet products with enhanced storage capabilities. Continue clinical trials for freeze-dried platelets. Initiate studies to develop freeze-dried plasma.
  - (U) (\$1,900) MODULATION OF IMMUNE SYSTEM IN COMBAT CASUALTIES: Continue the studies and development of advanced modulation techniques for cytokines and immune cell functions that impact the cellular and physiological responses of combat casualties. Continue large animal studies to demonstrate the efficacy of cytokines in preventing complications from combat relevant trauma and hemorrhage. Continue study to enhance transplant acceptance by modulation of the immune response.
  - (U) (\$1,498) PHYSIOLOGICAL ENHANCEMENT OF PERFORMANCE IN MILITARY/EXTREME ENVIRONMENTAL CONDITIONS: Complete study to modify physical training programs to reduce training related injuries in female recruits. Complete study to assess the value of intervention techniques which preclude high risk individuals from musculoskeletal trauma. Initiate study to evaluate dietary interventions to reduce loss of bone mineral density in physically active females.

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PROGRAM ELEMENT: 0603706N

PROJECT NUMBER: R0095

PROGRAM ELEMENT TITLE: Medical Development (Advanced)

PROJECT TITLE: Fleet Health  
Technology

- (U) (\$1,399) MEDICAL MANAGEMENT TOOLS AND EQUIPMENT USED IN FIELD OPERATIONS: Continue interface for selected medical databases for advanced medical support planning and casualty management. Continue validation of the relationships of these databases and ensure their effectiveness in military environments. Continue to develop models for projecting casualty rates for various battle scenarios and war fighting intensities, upgrading systems to current war fighting and enemy systems information. Complete model of casualty flows between echelons of care and develop planning factors needed to forecast medical requirements at these echelons and project necessary evacuation assets incorporating terrain features into optimization models based on changing warfighting scenarios and medical support capabilities.
  - (U) (\$102) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.
3. (U) FY 2000 PLAN:
- (U) (\$2,400) TREATMENT OF CASUALTIES TO PREVENT HEMORRHAGIC SHOCK AND COMPLICATIONS ASSOCIATED WITH COMBAT TRAUMA: Continue studies that validate the feasibility and efficacy of life sustainment and casualty stabilization interventions. Continue testing modalities that impact metabolic down-regulation and delayed resuscitation. Continue studies into the complications of hemorrhagic shock and late sequelae that may be prevented with early immune modulator or other interventions. Continue to extend studies in large animal models. Continue development of improved local hemostatic agents/devices. Continue studies of traumatic injury to the central nervous system.
  - (U) (\$3,500) BLOOD AND BLOOD SUBSTITUTES: Continue clinical trials and modifications for final FDA approval for technologies that extend the refrigerated liquid storage time for red blood cell transfusion units. Continue development of freeze-dried red blood cell units having a minimum of a two-year room temperature shelf-life and ease of use with immediate transfusion post-rehydration. Continue the development of improved frozen and freeze-dried platelet products with enhanced storage capabilities. Continue clinical trials for freeze-dried platelets. Continue studies on the development of freeze-dried plasma.
  - (U) (\$1,800) MODULATION OF IMMUNE SYSTEM IN COMBAT CASUALTIES: Continue the studies and development of advanced modulation techniques for cytokines and immune cell functions that impact the cellular and physiological responses of combat casualties. Continue large animal studies to demonstrate the efficacy of cytokines in preventing complications from combat relevant trauma and hemorrhage. Complete study to enhance transplant acceptance by modulation of the immune response.

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PROGRAM ELEMENT: 0603706N

PROJECT NUMBER: R0095

PROGRAM ELEMENT TITLE: Medical Development (Advanced)

PROJECT TITLE: Fleet Health  
Technology

- (U) (\$800) PHYSIOLOGICAL ENHANCEMENT OF PERFORMANCE IN MILITARY/EXTREME ENVIRONMENTAL CONDITIONS: Initiate studies to develop predictors and preventive interventions for traumatic and exercise related injuries among shipboard personnel during deployment. Initiate studies to establish performance standards and training guidelines for Military Operations in Urban Terrain (MOUT), which optimize performance and minimize musculoskeletal injury. Continue study to evaluate dietary interventions to reduce loss of bone mineral density in physically active females.
- (U) (\$1,105) MEDICAL MANAGEMENT TOOLS AND EQUIPMENT USED IN FIELD OPERATIONS: Continue interface for selected medical databases for advanced medical support planning and casualty management. Continue validation of the relationships of these databases and ensure their effectiveness in military environments. Continue to develop models for projecting casualty rates for various battle scenarios and war fighting intensities, upgrading systems to current war fighting and enemy systems information.

B. (U) PROGRAM CHANGE SUMMARY: See total program summary for P.E.

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E:

(U) PE 0601153N (Defense Research Sciences)

(U) PE 0602233N (Human Systems Technology)

(U) PE 0604771N (Medical Development (ENG))

(U) This program is coordinated through the Armed Services Biomedical Research Evaluation and Management Committee.

D. (U) SCHEDULE PROFILE: Not applicable.

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PROGRAM ELEMENT: 0603706N

PROGRAM ELEMENT TITLE: Medical Development (Advanced)

(U) COST: (Dollars in thousands)

PROJECT NUMBER & ACTUAL	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0096 Fleet Health Standards	4,757	5,420	5,459	5,561	5,653	5,757	5,880	6,006	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Develops valid medical standards for selection, training, and retention, reduces attrition and injury, and enhances personnel performance in Navy operational environments.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

- (U) (\$600) UNDERSEA MEDICINE, DIVER DECOMPRESSION, AND OXYGEN TOXICITY: Continued development of programs to enhance the safety of Navy divers/submariners. Identified areas of the brain associated with high pressure oxygen seizures to help develop prevention drugs. A biochemical decompression technology developed to accelerate decompression. Pharmacological agents identified to reduce incidence of decompression sickness.
- (U) (\$500) DELIVER GUIDELINES: Provided recommendations for use of biomedical countermeasures to counteract performance decrements associated with sustained operations. Exploited current technology for evaluation of stimulant effects, susceptibility to sleep loss, and fatigue-related impairment. Fielded guidance for use of specific pharmacological agents during SUSOPS.
- (U) (\$550) MEDICAL STANDARDS FOR SELECTION: Fielded an integrated, updated database of medical conditions associated with, or precluding, service.

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PROGRAM ELEMENT: 0603706N

PROJECT NUMBER: R0096

PROGRAM ELEMENT TITLE: Medical Development (Advanced)

PROJECT TITLE: Fleet Health Standards

- (U) (\$700) ENHANCED HUMAN PERFORMANCE: Fielded a model of the physical and perceptual stress of shipboard firefighting. Provided guidance for use of existing Physiological Heat Exposure Limits (PHEL) for women, including use of ice vests for microclimate cooling. Continued investigation of operational impact of photorefractive keratectomy (PRK). Initiated development of occupational physical standards for sustained operations. Initiated study concerning reduction of neck and back injuries in Naval aviators.
  - (U) (\$600) AVIATION/SPATIAL DISORIENTATION ATTRITION AND INJURY REDUCTION: Continued program in identification and prevention of aircraft mishaps due to spatial disorientation, human performance and human factors problems.
  - (U) (\$200) REDUCE ATTRITION AND INJURY RELATED TO HAZARDOUS MATERIALS: Initiated development of air sampling device utilizing state-of-art sensor technology to better evaluate shipboard hazardous chemical exposures.
  - (U) (\$550) REDUCE ATTRITION AND INJURY RELATED TO TOXICITY: Continued development of Neuromolecular Toxicity Assessment System (NTAS) a molecular-level set of tests that can assess possible performance deficits caused by exposure to hazardous chemicals.
  - (U) (\$400) REDUCE ATTRITION AND INJURY RELATED TO TOXICITY/SHIPBOARD FIRES: Initiated testing, evaluation, and refinement of physiologically-based pharmacokinetic and pharmacodynamic models of shipboard exposures to cleaning solvents. Completed toxicological evaluation of chemicals associated with Navy workplace to develop exposure standards. Developed a prototype Shipboard Industrial Hygiene Expert System to assist with health hazard evaluations; transitioned to field validation testing. Identified important toxicants involved with acute respiratory distress from shipboard fires.
  - (U) (\$200) HEALTH PROMOTION; REDUCTION OF MILITARY ATTRITION AND INJURY: Delivered guidelines for health promotion and physical readiness of active duty personnel.
  - (U) (\$457) RADIO FREQUENCY (RF) RADIATION EXPOSURE EFFECTS (REDUCE ATTRITION AND INJURY): Continued development of a computational dosimetry model for RF radiation exposures. Completed data on ocular effects of pulsed microwaves for development of exposure standards. Initiated testing and evaluation of chronic health effects of RF-induced body and limb currents from topside shipboard exposures; utilized results to develop exposure standards and guidelines.
2. (U) FY 1999 PLAN:

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PROGRAM ELEMENT TITLE: Medical Development (Advanced)

PROJECT TITLE: Fleet Health Standards

- (U) (\$852) UNDERSEA MEDICINE, DIVER DECOMPRESSION, AND OXYGEN TOXICITY: Continue development of programs to deliver products that enhance the safety and effectiveness of Navy divers/submariners and extend the operational envelope by permitting extended use of hyperbaric oxygen, faster decompression procedures, longer bottom time, and submersed rescue operations.
- (U) (\$450) DELIVER GUIDELINES: Continue to provide recommendations for use of biomedical countermeasures to counteract performance decrements associated with sustained operations. Continue to exploit current technology for evaluation of stimulant effects, susceptibility to sleep loss, and fatigue-related impairment. Complete guidance for use of specific pharmacological agents during SUSOPS.
- (U) (\$581) MEDICAL STANDARDS FOR SELECTION: Continue to field an integrated updated database of medical conditions associated with, or precluding, service. Begin validation.
- (U) (\$600) ENHANCED HUMAN PERFORMANCE: Continue to field a model of the physical and perceptual stress of shipboard firefighting. Complete guidance for use of existing PHEL for women, including use of ice vests for microclimate cooling. Continue investigation of operational impact of PRK. Continue development of occupational physical standards for sustained operations. Continue study concerning reduction of neck and back injuries in Naval aviators.
- (U) (\$600) AVIATION/SPATIAL DISORIENTATION ATTRITION AND INJURY REDUCTION: Continue program in identification and prevention of aircraft mishaps due to spatial disorientation, human performance and human factors problems.
- (U) (\$329) REDUCE ATTRITION AND INJURY RELATED TO HAZARDOUS MATERIALS: Continue development of air sampling device utilizing state-of-art sensor technology to better evaluate shipboard hazardous chemical exposures.
- (U) (\$580) REDUCE ATTRITION AND INJURY RELATED TO TOXICITY: Identify mechanisms of action for select neurotoxicants; utilize the results to develop the Neuromolecular Toxicity Assessment System (NTAS), a molecular-level set of tests that can assess possible performance deficits caused by exposure to hazardous materials. Upon completion of final validation studies, transition Neuromolecular Toxicity Assessment Battery (NTAB) to toxicology laboratories for testing of navy materials as part of the Health Hazard Evaluation program.
- (U) (\$523) REDUCE ATTRITION AND INJURY RELATED TO TOXICITY/SHIPBOARD FIRES: Develop capability to measure particle-vapor interactions of smoke and measure their effects upon pulmonary function. Initiate development of

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PROJECT TITLE: Fleet Health Standards

biomarkers (enzymes and cytokines) that can be used to identify the onset of acute respiratory distress syndrome (ARDS).

- (U) (\$300) HEALTH PROMOTION; REDUCTION OF MILITARY ATTRITION AND INJURY: Complete evaluation of current health and physical readiness level of Navy personnel.
  - (U) (\$598) RADIO FREQUENCY RADIATION EXPOSURE EFFECTS (REDUCE ATTRITION AND INJURY): Complete computational dosimetry model of RF-induced current. Test and evaluate mock-up shipboard topside to evaluate RF-induced body and limb currents; utilize results to develop criteria for exposure standards and guidelines.
  - (U) (\$7) Portion of extramural program reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.
3. (U) FY 2000 PLAN:
- (U) (\$821) UNDERSEA MEDICINE, DIVER DECOMPRESSION, AND OXYGEN TOXICITY: Continue development of programs to deliver products that enhance the safety of Navy divers/submariners and extend the operational envelope by permitting extended use of hyperbaric oxygen, faster decompression procedures, longer bottom time, and submersed rescue operations.
  - (U) (\$450) DELIVER GUIDELINES: Provide recommendations for use of biomedical countermeasures to counteract performance decrements associated with military operations. Complete studies on evaluation of stimulate effect and provide guidance. Continue to exploit current technology for evaluation of methodologies to improve impaired operational performance due to stress and fatigue. Initiate development of measurement tests for assessment of performance of Navy/Marine Corps personnel in operational environments.
  - (U) (\$590) MEDICAL STANDARDS FOR SELECTION: Continue to field an integrated updated database of medical conditions associated with, or precluding, service. Continue validation.
  - (U) (\$600) ENHANCED HUMAN PERFORMANCE: Continue to field a model of the physical and perceptual stress of shipboard firefighting. Continue investigation of operational impact of PRK. Continue development of occupational physical standards for sustained operations. Continue study concerning reduction of neck and back injuries in Naval aviators.

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PROGRAM ELEMENT: 0603706N

PROJECT NUMBER: R0096

PROGRAM ELEMENT TITLE: Medical Development (Advanced)

PROJECT TITLE: Fleet Health Standards

- (U) (\$600) AVIATION/SPATIAL DISORIENTATION ATTRITION AND INJURY REDUCTION: Continue program in identification and prevention of aircraft mishaps due to spatial disorientation, human performance and human factors problems.
- (U) (\$487) REDUCE ATTRITION AND INJURY RELATED TO HAZARDOUS MATERIALS: Continue development of air sampling devices utilizing state-of-art detector technology to better evaluate hazardous chemical exposures aboard ship and in the field and work environments.
- (U) (\$680) REDUCE ATTRITION AND INJURY RELATED TO TOXICITY: Perform application testing of military-relevant chemicals utilizing the NTAS, a molecular-level set of tests that can assess possible performance deficits caused by exposure to hazardous materials; initiate development of a clinical set of tests based on the NTAS that can be used eventually for medical surveillance examinations of exposed personnel.
- (U) (\$615) REDUCE ATTRITION AND INJURY RELATED TO TOXICITY/SHIPBOARD FIRES: Develop real-time measures of acute response and hypersensitivity, and other measures of permanent damage, from certain smoke and fire gases and incorporate them into experimental models. Develop predictive models of aerosol lung deposition and clearance, carboxyhemoglobin formation (biomarker), and changes in lung ventilation.
- (U) (\$616) RADIO FREQUENCY RADIATION EXPOSURE EFFECTS (REDUCE ATTRITION AND INJURY): Compare and validate mockup exposures and models to RF-induced currents against actual shipboard exposures. Evaluate chronic health effects of RF-induced body and limb currents from topside shipboard exposures.

B. (U) PROGRAM CHANGE SUMMARY: See total program change summary for P.E.

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E:

(U) PE 0601152N (In-House Laboratory Independent Research)

(U) PE 0601153N (Defense Research Sciences)

(U) PE 0602233N (Human Systems Technology)

(U) PE 0604771N (Medical Development (ENG))

D. (U) SCHEDULE PROFILE: Not applicable.

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