CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification							February 2005	
Appropriation/Budget Activity **RDT&E.A BA4**				R-1 Item Nomenclature: 0603725N/ Facilities Improvement				
COST ($ in millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	**1.424**	**4.577**	**4.158**	**4.335**	**4.314**	**4.235**	**4.119**	**4.161**
0995 Facilities System	**1.424**	**1.606**	**4.158**	**4.335**	**4.314**	**4.235**	**4.119**	**4.161**
9538 Playas Instrumentation Network (Congress' add)	**0.000**	**2.971**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**

A. Mission Description and Budget Item Justification:

(U) This program provides for capabilities to a) overcome performance limitations and reduce the life cycle cost of shore facilities, and b) provide protection against terrorist attacks for shore installations and their operations. The program focuses on technical and operational issues of specific Navy interest, where there are no unbiased test validated Commercial Off the Shelf (COTS) solutions available, and where timely capabilities may not materialize without specific demonstration or validation by the Navy. Additionally, the program completes the development of technologies originating from Navy, DOD and other sources of Science and Technology programs, including the National Science Foundation (NSF), the National Institute of Standards and Technology (NIST) and Department of Energy (DOE). Validated technologies are implemented in the Navy's Military Construction (MILCON) and Sustainment Restoration and Modernization (SRM) program, and Antiterrorism and Force Protection (ATFP) Other Procurement, Navy (OP,N) program.

Project 0995 addresses three Navy facilities requirements during the fiscal years FY 2004 through FY 2007: Waterfront Facilities Repair and Upgrade, Facilities Technologies to Reduce the Cost of Sustainment, Restoration and Modernization, and Modular Hybrid Pier for reducing the total ownership cost of future facilities. This project is consistent with recommendation of two National Academy of Sciences Reports: "The Role of Federal Agencies in Fostering New Technology and Innovation in Building" and "Federal Policies to Foster Innovation and Improvement in Constructed Facilities." This project also addresses Antiterrorism Force Protection, starting in FY06, which addresses selective topics in simulation and risk modeling and material technologies to reduce the vulnerability of installations and reduce the acquisition and operating costs of protective technologies. The demonstrations and validations provide the independent, technical and operational test data for the development of competitive performance specifications to acquire the required capabilities.

B. Program Change Summary:

Funding:	FY 2004	FY 2005	FY 2006	FY 2007
FY05 President's Budget	1.424	1.621	1.536	1.832
FY06 President's Budget	1.424	4.577	4.158	4.335
Total Adjustments	0.000	2.956	2.622	2.503
Summary of Adjustments				
Force Protection PE Realignment	0.000	-0.015	2.622	2.503
Playas Instrumentation Network		2.971		

C. Other Program Funding Summary: Provided in R-2a.

D. Acquisition Strategy: Provided in R-2a.

E. Performance Metrics: Provided in R-4.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: **February 2005**	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME 0603725N / Facilities Improvement				PROJECT NUMBER AND NAME 0995/ Facilities System			
COST ($ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Project Cost	**1.424**	**1.606**	**4.158**	**4.335**	**4.314**	**4.235**	**4.199**	**4.161**
RDT&E Articles Qty		**2**	**3**	**4**				

A. MIission Description and Budget Item Justification:

(U) This program provides the Navy with new civil engineering capabilities that are required to overcome specific performance limitations of Naval shore facilities while reducing the cost of sustaining the Naval shore infrastructure. The program focuses available resources on satisfying facility requirements where the Navy is a major stakeholder.The program completes the development and validation of facility technologies originating in Navy Science and Technology programs, plus a variety of other sources which includes the National Science Foundation (NSF) and the National Institute of Standards and Technology (NIST). Project Y0995 is addressing three Navy facilities requirements during the fiscal years FY 2004 through FY 2007: Waterfront Facilities Repair and Upgrade, Facilities Technologies to Reduce the Cost of Sustainment, Restoration and Modernization and Modular Hybrid Pier. The execution of this program is consistent with the findings and recommendation of two National Academy of Sciences Reports: "The Role of Federal Agencies in Fostering New Technology and Innovation in Building" and "Federal Policies to Foster Innovation and Improvement in Constructed Facilities."

(U) WATERFRONT FACILITIES REPAIR AND UPGRADE

(U) Over 75% of the Navy's waterfront facilities are over 45 years old. They were designed for a service life of 25 years and to satisfy the mission requirements existing at that time. The overaged reinforced concrete requires costly and repetitive repairs. In addition, to accomplish more pier side ship maintenance and thus reduce drydock costs, these piers must be strengthened to support concentrated crane loads up to 140 tons when piers were originally designed for no concentrated loads. This sub-project addresses new materials and design methods to extend the service life of existing waterfront facilities by an additional 15 or more years, and conventional concrete patches and composite-enhanced repairs. Other initiatives include; new longer-lasting low-maintenance fendering systems that eliminate the need for the frequent replacement of timber piles and fenders; a new Impluse Load Method (ILM) for accurately and quickly determining the vertical load capacity of piers and wharves; and a new Swinging Weight Deflectometer (SWD) technique to determine the lateral stability of piers for earthquake forces and docking ship's impact. Using this new technology at a cost of $1-2M for repairs and upgrades per pier will result in $50M in cost avoidance for demolition and replacement.

(U) FACILITY TECHNOLOGIES TO REDUCE THE COST OF SUSTAINMENT, RESTORATION AND MODERNIZATION (SRM)

(U) This effort will demonstrate and validate the cost and reliability of advanced technologies in order to assure their acceptance and implementation in traditionally conservative public works and construction industries. The effort will accelerate the validation, commercialization, and wide-spread implementation of the facility technologies urgently required to reduce the cost of correcting the deficiencies in the Navy's SRM backlog. Estimated returns on these investments are better than 60 to 1.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	PE0603725N / Facilities Improvement	0995/ Facilities System

(U) MODULAR HYBRID PIER (MHP)

(U) Modular Hybrid Pier started in FY 02 to achieve completions required by construction acquisition schedules.

The Navy is faced with the necessity of recapitalizing a large portion of its waterfront infrastructure over the next several decades. The Modular Hybrid Pier initiative develops and validates innovative material and design technologies for a mission-flexible waterfront infrastructure characterized by significantly reduced total ownership cost and increased mission flexibility. The proceeding sub-project Waterfront Facilities Repair and Upgrade will enable the Navy to economically extend the useful service life of existing piers and wharves. While reducing the need for immediate replacement, eventual replacement will be required. This MHP sub-project provides improved technology for new piers. Emerging innovative structural and materials technologies, particularly those that will transition from the Navy's applied research and advanced development program, will provide enhanced-capability. Structures may have a comparable initial cost yet have far less maintenance and repair costs. Use of advanced materials and high performance lightweight concrete will produce structures that have twice the economic service life of the conventional piers. Modular design will enable off-site fabrication in pre-cast plants that will shorten the duration and lower the cost relative to conventional on-site construction. Plant fabrication will vastly improve repair-free durability because of superior quality control and application of high performance concrete and post-tensioning technologies. The modular concept will facilitate change-out of components for modifications to increase or capacity to adapt to future in ship designs. Mobility/relocatability of barge size modules through flotation is a significant new capability option which saves money and provides new military worth. An economic analysis has shown that a modular hybrid (deployable) pier will have a Net Present Value (NPV) cost that is $15M less over its service life than that for a conventional pier constructed of ordinary reinforced concrete. The MHP will have superior operational benefits to ship/port operations.

(U) ANTITERRORISM/FORCE PROTECTION (ATFP)

(U) Protection of the Navy Installations against terrorist activities requires development and deployment of advanced technology for force protection capabilities that are cost effective. Manpower costs of protection systems with today's technology are very high. Performance is not adequate to reduce vulnenability cost-effective. This Antiterrorism and Force Protection Ashore Project will develop, demonstrate and validate technologies for the following: access control and perimeter denial; waterside protection against craft and swimmer intrusion; secure and efficient operations centers and emergency centers (including human and information supports systems); construction integrated surveillance sensors and robotic systems for intruder detection; material systems to improve utilities security and recovery; and material concepts to reduce injury and death. Through demonstration and validation of risk modeling and simulation models, the potential of emerging technologies will be evaluated and installation security strategies that reduce manpower and other costs will be formulated. Installation protection concepts against attacks from the air will be identified and jointly demonstrated. The demonstrations and validations derive from advanced technology from science and technology programs of government academia and industry. The technology produces data for performance specifications for competitive procurement. All work will be coordinated with other programs and through industry forums as appropriate.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	PE0603725N / Facilities Improvement	0995 / Facilities System

B. Accomplishments/Planned Program

	FY 04	FY 05	FY 06	FY 07
Waterfront Repair and Upgrade	0.000	0.000	0.100	0.000
RDT&E Articles Quantity	1			

FY 06: Complete validation testing and evaluation of Swinging Weight Deflectometer (new capability) method for determining the remaining strength of piers to resist lateral loads from berthing ships. Initiate testing of agents to reduce corrosion inducing chloride ion penetration rates.

	FY 04	FY 05	FY 06	FY 07
Sustainment, Restoration & Moderization Tech Redu	0.000	0.000	0.970	1.336
RDT&E Articles Quantity				

FY 06: Complete field (validation) testing of high temperature pavement joint sealants. Complete testing (interim validation) of flexible (non-cracking) marking paint for bituminous airfield pavements. Continue testing of pile encasement to extend life of decomposing concrete.
FY 07: Complete testing of pile encasement to extend life of decomposing concrete. Initiate validation testing of high return-on-investment facilities technologies delivered from ONR FNC: Total Ownership Cost Reduction and other research by private/public sector.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2005**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	PE0603725N / Facilities Improvement	0995 / Facilities System

B. Accomplishments/Planned Program (Cont.)

	FY 04	FY 05	FY 06	FY 07
Modular Hybrid Pier	1.424	1.606	0.465	0.500
RDT&E Articles Quantity	2	2	77	

FY 04: Completed mooring design for test structure comprised of two floating modules with full scale mooring. Completed fabrication of two modules for test structure. Structurally joined test structure modules . Demonstrated ability to meet performance requirements for durable, high strength lightweight concrete on large test articles.
FY 05: Construct test structure mooring and moor modules. Demonstrate ability to hold strict tolerances during module assembly and mooring integration. Install and test shore access ramp and support bearings for required strength and rotational/traditional capabilities. Install and test full scale MHP service utility mock-ups at ramp articulation points.
FY 06: Complete structural and hydrodynamic tests (DT/OT) on critical subassemblies of demonstration structure (assembled modules and moorings).
FY 07: Initiate test planning and testing for first prototype MHP.

	FY 04	FY 05	FY 06	FY 07
Antiterrorism/Force Protection	0.000	0.000	2.623	2.499
RDT&E Articles Quantity				

FY 06: Develop and apply risk modeling to evaluate the potential of emerging technology and formulate installation protection concepts and operations that require reduced life cycle cost including manpower. The following technology areas will be explored for validation testing, cost reduction potential and transition to procurement: access control technology and configuration concepts; access denial concepts and technology against swimmers and submerged vehicles; secure operations centers and reduced manning concepts; material systems for utilities security and recovery; injury reduction design and material concepts, devices and systems; robotic devices to reduce human risk, enhance longevity and reliability of certain dangerous and repetitive functions in facilities protection; demonstrate simulation tools for resolving complex issues, such as terrorist attack probabilities and patterns and optimum defensive concepts for levels of technology; and demonstrate concepts of protection from air attacks. Appropriate test validations will be initiated.

FY 07: Validation of decision support risk modeling and simulation tools for Installation Protection Validation of Command Center security technology and reduced manning. Demonstration of robotic and neural networks in high risk and complex installation security functions. Concept demonstrations of protection from air attacks. Demonstration of material concepts in enhancing the probability of utilities continuity following and attack. Advanced access control technology demonstrations will reduce cost. .

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2005
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT NUMBER AND NAME PE0603725N / Facilities Improvement	PROJECT NUMBER AND NAME 0995 / Facilities System

C. Other Program Funding Summary:

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	To Complete	Total Cost
P-1 Procurement Line item No., Name:										
812800 Physical Security Equipment	73.477	124.239	109.620	129.271	117.180	120.939	123.979	122.004	Con't	Con't
C-1 MILCON Project No. & Name. Not applicable.										
(U) RELATED RDT&E:										
PE 0605862			5.249							

(U) RELATED RDT&E:
This project transitions waterfront facilities technology from applied research and advanced development programs PE0602234N, Materials, Electronics and Computer Technology, PE0602236N, Warfighter Sustainment Applied Research, and PE0603236N, Warfighter Sustainment Advanced Technology. It also transitions facility technologies developed at universities under the sponsorship of the National Science Foundation (NSF), by the Building and Fire Research Laboratory (BRL) of the National Institute of Standards and Technology (NIST), and by the Construction Engineering Research Laboratories (CERL) and Waterways Experiment Station (WES) of the U. S. Army Engineer Research and Development Center (USAERDC) when they can contribute to the solution of one of the Navy requirements being addressed by this project. The project pursues opportunities to leverage private sector investment through partnerships with private sector organizations, such as the Civil Engineering Research Foundation (CERF), the Marketing Development Alliance (MDA) of Fiberglass Reinforced Plastics Composites Industry and the Strategic Development Council of the American Concrete Institute. The project seeks to leverage and collaborate with the navy Sustainment, Restoration and efforts including Military Construction..

D. Acquisition Strategy:

(U) This project is categorized as Non-ACAT (Non Acquisition). The know-how produced from this project enables the safe and cost effective application of emerging/advanced technology concepts and products: 1) specifying or describing the performance, 2) enabling innovative design applications, 3) enabling quality control/quality assurance during constructions, 4) enabling reliability and maintainability during operations, and 5) developing lifecycle cost projections and environmental sustainability life cycle data for Navy policy guidance and criteria serving the Navy Sustainment, Restoration and Modernization and Military Construction (MILCON) programs. The data from this program enables earliest and safe utilization of advanced technology for cost avoidance in the facilities infrastructure. The technical know-how of this program is transferred to the construction industry that delivers Navy construction and maintenance through the inclusion of individual firms (using competitive selection processes) and industry organizations/associations in the development and testing activities. MILCON, Repair and Modernization are not serial production acquisition processes but site specific construction acquisitions.

Demonstration and validation is conducted for maximum transfer and interaction with industry such as to influence the industry COTS with the results of this demonstration and prototype validation. Acquisition is based on performance specifications enabled by this project..

E. Major Performers:

Major performers include Naval Facilities Engineering Service Center, Port Hueneme, CA.

Naval Air Station North Island Test Bed (NASNI/TB), San Diego, CA
Naval Facilities Engineering Service Center (NFESC), Port Hueneme, CA
Naval Surface Warfare Center (NSWC-DL), Dahlgren, VA
Naval Surface Warfare Center (NSWC) Panama City, FL
Naval Air Warfare Center (NAWC PAXRIV), Patuxent, MD
SPAWAR Systems Center San Diego Ca CA
Naval Air Warfare Center (NAWC) China Lake CA

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1) | DATE: **February 2005**

APPROPRIATION/BUDGET ACTIVITY: **RDT&E, N / BA-4** | PROGRAM ELEMENT: PE0603725N / Facilities Improvement | PROJECT NUMBER AND NAME: 0995 / Facilities System

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Waterfront Facilities Repair & Upgrade	WX	NFESC, Pt Hueneme, CA	1.760					0.100	10/05			nominal varies	cont.	na
	WR	NUWC, New London, CT	0.687										0.687	
	WR	EFANW, Poulsbo, WA	0.012										0.012	
	FP	MCA Engrg, Costa Mesa, CA	0.045										0.045	
Sustainment, Restoration & Modernization Tech	WX	NFESC, Pt Hueneme, CA	3.583					0.370	10/05	0.400	10/06	nominal varies	cont.	na
	FP	CERF, Washington, DC	0.045										0.045	
	RC	LANTDIV, Norfolk, VA	0.051										0.051	
	FP	NAS Misawa, Misawa, Japan	0.028										0.028	
	WR	SWDIV, San Diego, CA	0.002										0.002	
	FP	Han Padron Inc., NY	0.019										0.019	
	FP	Atmos Anal. &Consult, Inc.	0.006										0.006	
	RC	N. State Univ. Aberdeen, MD	0.042										0.042	
	WR	PWD, NWS, Charleston, SC	0.081										0.081	
	FP	ADC, Inc.	0.021										0.021	
	FP	Weston Geophysical, MA	0.025										0.025	
	FP	Northwestern Univ., IL	0.024										0.024	
	FP	Blackledge Diving	0.010										0.010	
	FP	ABC Painting, CA	0.032										0.032	
	FP	Polyspec Corp, TX	0.060										0.060	
	FP	Abras. Blast & Coat, CA	0.030										0.030	
	MP	U. S. Army Huntsville, AL	0.100										0.100	
	RC	Contractors TBD	0.050					0.600	03/06	0.936	03/07	cont.	cont.	
Modular Hybrid Pier	WR	NFESC, Pt Hueneme, CA	0.625	0.135	10/03	0.730	10/04	0.365	10/05	0.500	10/06	nominal varies	cont.	na
	WR	SWDIV, San Diego, CA	0.000	0.142	06/04	0.050	10/04						0.192	
	FP	BergerAbam. Seattle, WA	2.308			0.300	03/05	0.100	03/06				2.708	
	RC	Contractors TBD	0.000	1.147	09/04	0.526	10/05						1.673	
Antiterrorism/Force Protection	TBD	NASNI Test Bed, San Diego, CA	0.000	0.000		0.000		0.600	TBD	0.600	TBD	Cont.	Cont	
	TBD	NFESC, Port Hueneme, CA	0.000	0.000		0.000		0.400	TBD	0.400	TBD	Cont.	Cont	
	TBD	NSWC Panama City & Dahlgren	0.000	0.000		0.000		0.400	TBD	0.100	TBD	Cont.	Cont	
	TBD	NAWC CHINA LAKE	0.000	0.000		0.000		0.200	TBD	0.200	TBD	Cont.	Cont	
	TBD	SSC San Diego	0.000	0.000		0.000		0.523	TBD	0.699	TBD	Cont.	Cont	
			9.646	1.424		1.606		3.658		3.835		0.000	20.169	

Remarks:
Total Prior Years Cost summation does not include performing activities from projects completed in prior years.

Development Support													0.000	
Software Development													0.000	
Training Development													0.000	
Integrated Logistics Support													0.000	
Configuration Management													0.000	
Technical Data													0.000	
GFE													0.000	
Award Fees													0.000	
Subtotal Support			0.000	0.000		0.000		0.000				0.000	0.000	

Remarks: Included in Product Development costs.

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)

DATE: **February 2005**

APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT	PROJECT NUMBER AND NAME
RDT&E, N / BA-4	PE0603725N / Facilities improvement	0995 / Facilities System

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation								0.500	TBD	0.500	TBD	Cont.	Cont.	
Operational Test & Evaluation													0.000	
Live Fire Test & Evaluation													0.000	
Test Assets													0.000	
Tooling													0.000	
GFE													0.000	
Award Fees													0.000	
Subtotal T&E			0.000	0.000		0.000		0.500		0.500		0.000	1.000	

Remarks: Not applicable.

Contractor Engineering Support													0.000	
Government Engineering Support													0.000	
Program Management Support													0.000	
Travel													0.000	
Labor (Research Personnel)													0.000	
SBIR Assessment													0.000	
Subtotal Management			0.000	0.000		0.000		0.000		0.000		0.000	0.000	

Remarks: Not applicable.

Total Cost			9.646	1.424		1.606		4.158		4.335		0.000	21.169	

Remarks:

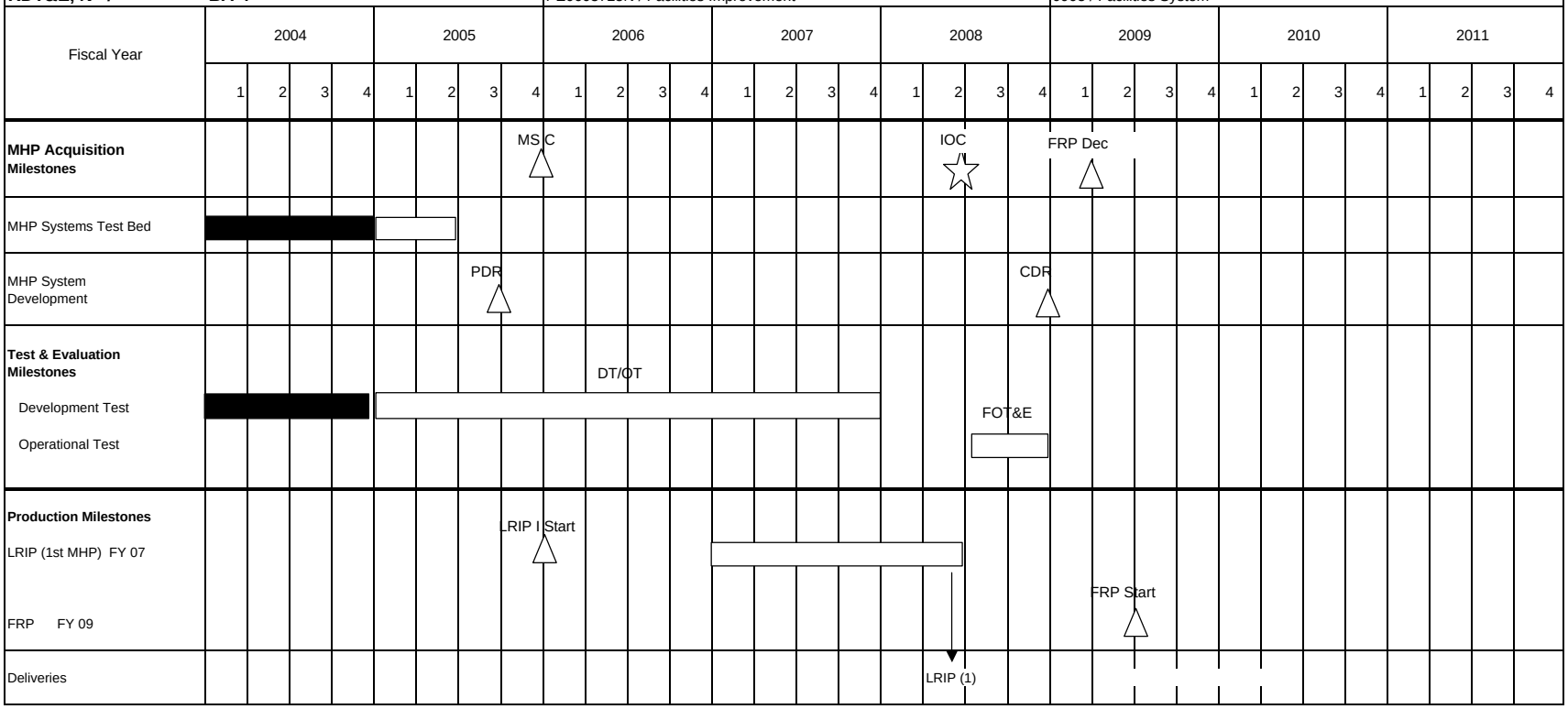
CLASSIFICATION:

EXHIBIT R4, Schedule Profile | DATE: **February 2005**

APPROPRIATION/BUDGET ACTIVITY: **RDT&E, N / BA-4**

PROGRAM ELEMENT NUMBER AND NAME: PE0603725N / Facilities Improvement

PROJECT NUMBER AND NAME: 0995 / Facilities System



R-4 Schedule Profile

CLASSIFICATION:

Exhibit R-4a, Schedule Detail						DATE: **February 2005**		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-4**	PROGRAM ELEMENT PE0603725N / Facililties Improvement				PROJECT NUMBER AND NAME 0995 / Facilities System			
Schedule Profile (MHP)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Milestone II (MSII)								
MHP Systems (Test Bed) Development	1Q-4Q	1Q-2Q						
Combined Developmental/Operational Testing (DT/OT)	1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q				
Preliminary Design Review (PDR)		3Q						
Milestone C (MS C)		4Q						
Start Low-Rate Initial Production I (LRIP)			1Q					
Low-Rate Initial Production Delivery					2Q			
Follow-On Operational Test & Evaluation (FOT&E)					3Q-4Q			
IOC					3Q			
Critical Design Review (CDR)					4Q			
Full Rate Production (FRP) Decision						1Q		
Full Rate Production Start						2Q		