

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2007

BUDGET ACTIVITY		PE NUMBER AND TITLE						PROJECT		
5 - System Development and Demonstration		0604646A - Non Line of Sight Launch System						F72		
COST (In Thousands)	FY 2006 Actual	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total Cost
F72 NON LINE OF SIGHT LAUNCH SYSTEM	216668	320650	253410	199064	40329	6000				1036121

A. Mission Description and Budget Item Justification: The Army's Future Combat System (Brigade Combat Team) (FCS (BCT)) is a joint system of systems consisting of a network and a combination of manned and unmanned systems that use an advanced network architecture to enable levels of joint connectivity, situational awareness and understanding, and synchronized operations previously unachievable. It is designed to interact with and enhance the Army's most valuable weapon - the Soldier. When fully operational, FCS will provide the Army and the joint force unprecedented capability to see the enemy, engage him on our terms, and defeat him on the 21st Century battlefield. The Army's first modernization effort in nearly four decades; FCS is the embodiment of the modular force, a modular system designed for "full spectrum" operations. It will network existing systems, systems already under development, and future systems to be developed to meet the requirements of the Army's Future Force. It is adaptable to traditional warfare as well as complex, irregular warfare in various rural and urban terrains. It can also be adapted to civil support, such as disaster relief. FCS is the #1 priority acquisition program for the Army.

This project funds the System Development and Demonstration (SDD) for the Non-Line of Sight Launch System (NLOS-LS), which is a core system of the FCS.

This project focuses on the development of a materiel solution to meet the NLOS-LS operational need as delineated in the FCS Operational Requirements Document (ORD). NLOS-LS provides enabling lethality for the FCS (BCT). NLOS-LS consists of the Precision Attack Missile (PAM) and a highly deployable, platform-independent Container Launch Unit (CLU) with self-contained technical fire control, electronics, communications and software for remote, unmanned operations. The PAM will be vertically launched directly from the CLU based on fire missions received via the FCS network and will be capable of being updated in-flight via on-board radios by the network. The vertical launch capability permits a system that is highly deployable as well as the ability to engage a wide spectrum of targets in diverse environments and terrain. The PAM will have Automatic Target Acquisition (ATA) capability which can be upgraded in future versions.

In January 2006, the NLOS-LS Project Office became a Joint Project Office with the Army and Navy entering into a Memorandum of Agreement to pursue NLOS-LS as the Navy's material solution for small boat threat on its Littoral Combat Ships.

The FY 06-11 funding supports the NLOS-LS SDD program. Beginning in FY 05, the NLOS-LS (CLU and PAM) was realigned to meet the FCS Spin Out 1 requirements and to be evaluated by the Evaluation Brigade Combat Team (EBCT) for insertion in current forces using their communications capability in lieu of the FCS network.

The FY07 funding reflected in these R-Forms does not contain FY07 SBIR/STTR reduction of \$9,024 million.

<u>Accomplishments/Planned Program:</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>
PAM Accomplishments FY 06 - Completed PAM System Functional Review (SFR) and Preliminary Design Review (PDR), Insensitive Munitions (IM) screening tests on warhead and motor designs, Control Actuation System (CAS) breadboard integration with pintle rocket	113702	133945	111332	58208

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2007

BUDGET ACTIVITY	PE NUMBER AND TITLE			PROJECT
5 - System Development and Demonstration	0604646A - Non Line of Sight Launch System			F72
<p>motor, transitioned S&T 640x480 Focal Plane Array as PAM Baseline Seeker, Electro-Magnetic Interference testing on EPAM seekers and Captive Flight Tests (CFT) to validate EPAM Seeker and Moving Target Indicator software performances, CFT 9 (cold weather, Grayling, MI), CFT 10 (Tropical, Schofield Barracks, Hawaii), PAM Container Cover Live Fire Test, PAM Sub-system Detailed Design Reviews (DDR Software Engineering), Integration and Verification (IVO) simulations, PAM Integrated Flight Simulation (IFS), wind tunnel tests and developed Performance Baseline for PAM. --FY 06/07 ACTIVITY-- PAM IFS. --FY 07 ACTIVITY-- PAM detailed system design; software engineering; radio integration; Integration and Verification (IV1) simulations; PAM sub-system intermediate CDR; prototype manufacturing; component detailed design; component procurement; and qualification testing (engines, warheads, Electric Safe Arm Device (ESAD), etc.); CFT; air drop test; and wind tunnel tests. PAM IFS; support Live Fire activities with lethality analyses; and PAM Component Testing and Qualification. --FY 07/08 ACTIVITY-- Pilot line setup. --FY 08 ACTIVITY-- Continue Performance Based Logistics (PBL) Evaluations; support Development Test (DT) program through modeling, simulation, threat, and lethality analyses; and support evaluation against requirements for program. --FY 09 ACTIVITY-- Continued support for DT Guided Test Vehicle (GTV) Flight Tests with IFS and Hardware-in-the-Loop (HWIL), including pre-test predictions and post-test analysis; continued validation of the IFS (in support of ATEC Accreditation Package; PAM GTV flight tests, Flight Limited User Test (LUT), EW Test, Nuclear Test and E3 Tests.</p>				
<p>CLU Accomplishments FY 06 - CLU PDR, developed and received first CLU and battery prototypes, developed and fabricated first full scale CLU structure, CLU/System PDR, procure hardware components and design verification tests (DVT). --FY 06/07 ACTIVITY-- Prototype manufacturing. --FY 07 ACTIVITY-- Planned are CLU detailed system design; CLU support to FCS exp 1.1; software engineering; radio integration; current force interoperability; IV1 emulator; Procure components/build hardware and deliver EBCT CLUs; health hazard assessment; CLU Intermediate CDRs; CLU component level qualification testing; and subsystem hardware builds. --FY 07/08 ACTIVITY-- Pilot line setup; safety testing; establish PBL; support for the EBCT hardware. --FY 08 ACTIVITY-- Support technical field test-Ft. Bliss; follow-on DT and evaluation and limited user ground test-Ft. Bliss; software design analysis testing; and hardware testing. --FY 09 ACTIVITY-- Complete EBCT evaluations; prepare for Operational Test (OT); and continue preparations for First Unit Equipped (FUE).</p>	52250	104590	59666	55116
<p>System Accomplishments FY 06 - Completed development of a NLOS-LS Variable Message Format (VMF) Integrated Database (VID) and VMF Test Tool (VTT) based on the NLOS-LS ICD to support the FCS IV0 simulation exercise: Logistics Summit; commenced EBCT System Support Package preparation; participated in the Conduct of Pre-PBL Demo, updated Supportability Strategy and supported FCS IV0 & Integrated Mission Test 0 (IMT0). --FY 07 ACTIVITY-- Finalize Simulation Support Plan; draft Countermeasures Assessment Plan; and participate in Experiment 1.1 Phase 3. Planned System of System Common Operating Environment (SOSCOE) integration; develop interfaces for current force integration; support IV1 simulation exercises; common component detailed design; system level engineering and test and evaluation; FMTV modifications for EBCT; CLU/Advanced Field Artillery Tactical Data System (AFATDS)/SOSCOE interoperability testing; safety/hazard assessment testing; integration of hardware/software (HW/SW) into HWIL facility; updated Verification & Validation Plan to include countermeasures; HWIL; verification/validation of training support package (Operator, Instructor & Key Personnel, AFATDS Operator, Staff, and FMTV training); Sys Eng, Prog Mgmt, Test Support, and documentation preparation. --FY 07/08 ACTIVITY-- Start Type Classification, Basis of Issue Plan (BOIP), QQPRI process and develop and secure approval for Verification, Validation & Accreditation activities. --FY 08 ACTIVITY-- Support post EBCT Evaluation Hardware; support LOG contractor validation efforts; continue PBL Evaluation (PAM & CLU); EBCT Support; continue Software Design analysis and hardware testing; participate in FCS IMT1; support JEPX08 (Experiment 2). --FY 09 ACTIVITY-- EW Susceptibility Tests, Nuclear Effects Testing, Flight LUT, and Low Rate Initial Production (LRIP) Decision; post LUT updates to HW/SW based on test; and prepare for Initial Operational Test & Evaluation (IOT&E).</p>	50716	73091	82412	85740

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2007

BUDGET ACTIVITY 5 - System Development and Demonstration	PE NUMBER AND TITLE 0604646A - Non Line of Sight Launch System	PROJECT F72		
Small Business Innovative Research/Small Business Technology Transfer Programs		9024		
Total	216668	320650	253410	199064

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2007

BUDGET ACTIVITY 5 - System Development and Demonstration	PE NUMBER AND TITLE 0604646A - Non Line of Sight Launch System	PROJECT F72
--	--	-----------------------

<u>B. Program Change Summary</u>	FY 2006	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2007)	231209	322880	274793	256283
Current BES/President's Budget (FY 2008/2009)	216668	320650	253410	199064
Total Adjustments	-14541	-2230	-21383	-57219
Congressional program reductions		-1226		
Congressional rescissions				
Congressional increases		1350		
Reprogrammings	-14541	-2354		
SBIR/STTR Transfer				
Adjustments to Budget Years			-21383	-57219

Change Summary Explanation: Funding - FY 07: The above reprogramming has not yet occurred, but is reflected in the Army_s budget database. At present, the Army does not intend to use actual appropriated funds in 0604646A as an offset for a reprogramming action, therefore, the program will be executing to a funding level of \$313.9 million for the FY07 program year. The following R2s and R3s reflect the current database position.

FY 08 & 09: Funds realigned to support other FCS programs.

<u>C. Other Program Funding Summary</u>	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	To Compl	Total Cost
PE 0603581N Navy	10200	14012	9959	9978					Continuing	Continuing
PE 0603313 A263 Msl & Rocket Adv Tech	39635	14277							Continuing	Continuing
0604660A FCS Manned Grd Vehicles & Common Grd Vehicle Components			696333	772458	791186	361201	215665	103885		2940728
0604661A FCS System of Systems Engr & Program Management			1589466	1407410	1888349	1929853	1299062	1034307		9148447
0604662A FCS Reconnaissance (UAV) Platforms			41164	34220	14398	9301	4587	1344		105014
0604663A FCS Unmanned Ground Vehicles			90667	96666	65206	43912	27038	3603		327092
0604664A FCS Unattended Ground Sensors			10999	12942	19103	16874				59918
0604665A FCS Network Hardware & Software			678781	536387	336471	367894	292770	170602		2382905
0604646A Non Line of Sight - Launch System	216668	320650	253410	199064	40329	6000				1036121
0604647A Non Line of Sight - Cannon	132223	110998	137802	89189	71906	43531	28971			614620

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2007

BUDGET ACTIVITY			PE NUMBER AND TITLE						PROJECT	
5 - System Development and Demonstration			0604646A - Non Line of Sight Launch System						F72	
0604666A FCS Spin Outs			64796	32442	65000	50000	50000	10000		272238
0603639A FCS MRM			44578	45733	71961	56698	107077	51079		377126
0604715A STRICOM/NAWCTSD Support			381	391	401	409	418	429		2429
WTCV G86100 FCS Core Program			79483	155838	149367	683788	2194625	5795292		9058393
WTCV G86200 FCS Spin Out Program			20123	172746	373790	557060	779742			1903461
0604645 F52 UAV Recon & Sensors	50692	26360								77052
0604645 F53 UGV	121528	106516								228044
0604645 F54 UGS	31242	10612								41854
0604645 F55 SUSTAINMENT	139389	106517								245906
0604645 F57 MANNED GROUND VEHICLES	499469	563946								1063415
0604645 F61 SoS Engineering and Program Management	2027766	2142970								4170736

Comment: NLOS-LS is a joint program between the Army and Navy. The NLOS-LS Project Office and PMS 420 are the designated action offices for the respected services.

D. Acquisition Strategy The Army awarded the NLOS-LS SDD contract, on 19 March 2004, to Netfires Limited Liability Company (LLC), consisting of Lockheed Martin Corporation, doing business through its Missiles and Fire control and operating entity in Grand Prairie, TX; and the Raytheon Corporation, doing business through its Missile Systems Business Unit in Tuscon, AZ. The NLOS-LS SDD contract was definitized 20 August 2004. A series of Spin Out packages will begin in 2008 and continue through 2014 to insert NLOS-LS capability into Current Force Modular Brigade Combat Teams (M-BCTs).

ARMY RDT&E COST ANALYSIS (R3)

February 2007

BUDGET ACTIVITY			PE NUMBER AND TITLE									PROJECT		
5 - System Development and Demonstration			0604646A - Non Line of Sight Launch System									F72		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
PAM	CPIF	Netfires, LLC - Grand Prairie, Texas		113702	1Q	133945	1-3Q	111332		58208			417187	
CLU	CPIF	Netfires, LLC - Grand Prairie, Texas		52250	1Q	104590	1-3Q	59666		55116			271622	
NLOS-LS System Integration	MULTI	Netfires, LLC - Grand Prairie, Texas and Various Support		29197	1Q	50425	1-3Q	55206		47693			182521	
Subtotal:				195149		288960		226204		161017			871330	
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Various	Various	Multiple		1978		1744		1799		1853			7374	
Subtotal:				1978		1744		1799		1853			7374	
Remarks: .														
III. Test And Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Various	Various	Multiple		6611		8510		16172		26555			57848	
Subtotal:				6611		8510		16172		26555			57848	
Remarks: .														
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	FY 2008 Cost	FY 2008 Award Date	FY 2009 Cost	FY 2009 Award Date	Cost To Complete	Total Cost	Target Value of Contract

ARMY RDT&E COST ANALYSIS (R3)

February 2007

BUDGET ACTIVITY 5 - System Development and Demonstration			PE NUMBER AND TITLE 0604646A - Non Line of Sight Launch System								PROJECT F72	
Various	Various	Multiple		12930		21436		9235		9639		53240
Subtotal:				12930		21436		9235		9639		53240

Remarks: .

Project Total Cost:				216668		320650		253410		199064		989792
----------------------------	--	--	--	---------------	--	---------------	--	---------------	--	---------------	--	---------------

Schedule Detail (R4a Exhibit)

February 2007

BUDGET ACTIVITY
5 - System Development and Demonstration

PE NUMBER AND TITLE
0604646A - Non Line of Sight Launch System

PROJECT
F72

<u>Schedule Detail</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>
NLOS-LS SDD	1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 4Q	1Q - 2Q			
Preliminary Design Review	1Q							
Critical Design Review		1Q						
Spin Out 1 Assessment			1Q - 4Q	1Q				
Tactical Prototype CLUs to EBCT			1Q - 2Q					
SO 1 LLI			4Q					
SO 1 MS C				2Q				
LRIP Award				3Q - 4Q	1Q - 4Q	1Q - 4Q		
Operational Testing					3Q - 4Q			
Initial Operational Capability						2Q		
Full-Rate Decision						2Q		
NLOS-LS S&T Increment I and Objective Systems	1Q - 4Q	1Q - 4Q						

Termination Liability Funding For Major Defense Acquisition Programs, RDT&E Funding (R5)	February 2007
---	----------------------

BUDGET ACTIVITY 5 - System Development and Demonstration	PE NUMBER AND TITLE 0604646A - Non Line of Sight Launch System	PROJECT F72
--	--	-----------------------

Funding in \$000								
Program	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
F72 NLOS Launch System	129614	172835	141293	118733	26370	1000		
Total Termination Liability Funding:	129614	172835	141293	118733	26370	1000		

Remarks:
The NLOS-LS prime contract incorporates the "Limitation of Funds" clause (DFARS 52.232-22) to limit the Government's liability. For the NLOS-LS Program, the "Limitation of Funds" clause limits the Government's financial liability per the contract to those funds placed on contract, plus any outstanding commitments, plus costs associated with the orderly termination of contractual actions.