RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

DATE: June 2001

BUDGET ACTIVITY: 04 - Demonstration and Validation

PE NUMBER AND TITLE: 0603434F National Polar-Orbiting Operational Environmental Satellite System (NPOESS)

PROJECT: 4056

	COST ($ in Thousands)	FY 2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
4056	National Polar-orbiting Operational Env. Sat. Syst.	56,380	75,950	157,394	238,038	308,784	261,918	242,803	163,995	217,134	1,930,461
	Quantity of RDT&E Articles	0	0	2	0	0	0	0	0	2	2

NOTE: This administration has not addressed FY 2003-2007 requirements. All FY 2003-2007 budget estimates included in this book are notional only and subject to change.

Quantity of RDT&E articles in based on first year of funding.

(U) A. Mission Description

Presidential Decision Directive/NSTC-2 (May 1994) directs the Departments of Defense (DoD) and Commerce (DOC) and the National Aeronautics and Space Administration to establish a converged national polar-orbiting weather satellite program. The converged program, the National Polar-orbiting Operational Environmental Satellite System (NPOESS), will combine the follow-on to DoD's Defense Meteorological Satellite Program (DMSP) and the DOC's Polar-orbiting Operational Environmental Satellite (POES) program. A tri-agency Integrated Program Office (IPO) was established on 1 Oct 94 to manage the acquisition and operations of the converged system. NPOESS will provide operational military commanders and civilian leaders timely, quality weather and environmental information to effectively employ weapon systems and protect national resources. The converged program will be the nation's primary source of global weather and environmental data for operational military and civil use. It will provide visible and infrared cloud cover imagery and other atmospheric, oceanographic, terrestrial, and space environmental information. NPOESS will require a combination of satellites in sun synchronous 450 nm polar-orbit at all times (sun synchronous means the satellites cross the equator at the same local sun time on each of their 14 orbits/day). NPOESS successfully completed Milestone I on 17 March 1997. This budget submission includes funding for the June 2000 NPOESS Executive Committee (EXCOM) agreement in principle to add one NPOESS satellite to the program and decrease dependance on the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) Meteorological Operational (METOP) 3 & 4 satellites. This agreement was predicated on the inability of the METOP-3 spacecraft to host NPOESS sensors as needed to fulfill NPOESS requirements. Funding for the METOP-3 & 4 sensor packages has been used to offset the cost of the required additional NPOESS satellites.

(U) FY 2000 ($ in Thousands)

(U) $648 Continued program office support for PDRR efforts.

(U) $200 Completed government-led risk reduction and technology development efforts.

(U) $2,988 Continued system architecture studies and ground system risk reduction to include the start of competitive contracts between TRW and Lockheed Martin to definitize the NPOESS space and ground segment architectures.

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(U) A. Mission Description Continued

(U) FY 2000 ($ in Thousands) Continued

(U)	$52,544	Continued critical Visible/Infrared Imager Radiometer Suite (VIIRS), Conical-scanning Microwave Imager/Sounder (CMIS), Cross-track Infrared Sounder (CrIS), Ozone Mapping and Profile Suite (OMPS), and GPS Occultation Sensor (GPSOS) sensors and associated algorithm development efforts and sensor design and fabrication for risk reduction missions.
(U)	$56,380	Total

(U) FY 2001 ($ in Thousands)

(U)	$643	Continue program office support for PDRR efforts.
(U)	$24,800	Complete system architecture studies and continue system definition contracts and ground system risk reduction to include competitive contracts between TRW and Lockheed Martin to definitize the NPOESS space and ground segment architectures.
(U)	$50,507	Continue critical VIIRS, CMIS, CrIS, OMPS, and GPSOS sensor and associated algorithm development efforts and sensor design and fabrication for risk reduction missions.
(U)	$75,950	Total

The following net transactions are not reflected in the FY01 program total: BTR=+339K, and SBIR=-5.258M. These transactions are not reflected in other sections of the R-docs where an FY01 total is shown.

(U) FY 2002 ($ in Thousands)

(U)	$457	Continue program office support for PDRR and EMD efforts.
(U)	$30,170	Complete system definition contracts and ground system risk reduction to include competitive contracts between TRW and Lockheed Martin to definitize the NPOESS space and ground segment architectures.
(U)	$81,446	Transition critical VIIRS, CMIS, CrIS, OMPS, and GPSOS sensor and associated algorithm development efforts and sensor design and fabrication for risk reduction missions to EMD/Production contract.
(U)	$45,321	Initiate System Engineering and Manufacturing Development effort including sensor and associated algorithm development, design and fabrication.
(U)	$157,394	Total

(U) B. Budget Activity Justification

This PE is in Budget Activity 4 (Demonstration and Validation) because it currently supports sensor and satellite bus development prior to a milestone II/Production decision.

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(U) C. Program Change Summary ($ in Thousands)

		FY 2000	FY 2001	FY 2002	Total Cost
(U)	Previous President's Budget (FY 2001 PBR)	59,180	76,654	156,503	2,001,575
(U)	Appropriated Value	60,137	76,654		
(U)	Adjustments to Appropriated Value				
	a. Congressional/General Reductions	-477	-537		
	b. Small Business Innovative Research	-2,185			
	c. Omnibus or Other Above Threshold Reprogram				
	d. Below Threshold Reprogram	-860			
	e. Rescissions	-235	-167		
(U)	Adjustments to Budget Years Since FY 2001 PBR			891	
(U)	Current Budget Submit/FY 2002 PBR	56,380	75,950	157,394	2,032,841

(U) Significant Program Changes:

Schedule: Spacecraft fabrication and integration were accelerated to phase satellite deliveries in order to compensate for lost EUMETSAT METOP-3 capability. Delays in the requirements process drove the extension of the PDRR program and a delay to the scheduled award of the Total System Performance Responcibility (TSPR) contract from 2QFY02 to 4QFY02.

For planning and budget purposes, the NPOESS Integrated Program Office had assumed that a Joint Polar System agreement between the USG and EUMETSAT would include provisions for flying required NPOESS payloads on the METOP-3 spacecraft in the mid-morning orbit. These plans for NPOESS were predicated on the assumption that an agreement could be reached with EUMETSAT that would allow NPOESS instruments to be accommodated on the METOP-3 spacecraft (i.e., that EUMETSAT would make a 'block change' with its third spacecraft to ensure compatibility of instruments in the NPOESS era)

However, the 17-member nation EUMETSAT Council decided to develop and procure three identical METOP spacecraft as a 'block purchase' under a single contract cosigned by the European Space Agency (ESA) and EUMETSAT. EUMETSAT has concluded that the extension of the Initial Joint Polar System (IJPS) agreement would include additional NOAA instruments for METOP-3, identical to those provided for METOP-1 and METOP-2, and not NPOESS instruments.

As a result of these decisions, NPOESS instruments will not be flown on METOP-3, and as the notional spacecraft constellation was configured, the IPO would not have been able to fully achieve the IORD-I requirements (primarily the 4-hour refresh rate for high resolution imagery).

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(U) C. Program Change Summary ($ in Thousands) Continued

(U) Significant Program Changes Continued:

In June of 2000, the NPOESS Executive Committee (EXCOM) reviewed and endorsed the IPO recommended solution to reduce dependence on METOP-3 and 4 by adding an additional NPOESS spacecraft carrying only the critical VIIRS and CMIS sensors in the mid-morning orbit. Part of the cost of the additional spacecraft was offset by savings from selected sensors packages originally planned for delivery to EUMETSAT for METOP-3 and 4.

(U) D. Other Program Funding Summary ($ in Thousands)

		FY 2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
(U)	Related NOAA PAC Funding: Polar Convergence*	59,772	73,164	156,564	237,250	302,900	285,900	312,050	0	1,719,100	3,286,200
(U)	Related NPOESS MPAF: PE035178F						33,984	0	167,230	225,279	426,493
(U)	Related EELV MPAF: PE035953F**							75,000	0	375,000	450,000
(U)	Other operations and sustainment funding***									498,811	498,811

* National Oceanic and Atmospheric Administration Procurement, Acquisition, and Construction (NOAA PAC) appropriation. The Air Force (DoD) and NOAA (DoC) fund NPOESS 50/50. Total cost includes prior-year amount of $139.5M. Total NPOESS program cost is the sum of NPOESS RDT&E AF 0603434F, MPAF 0305178F, NPOESS portion of EELV MPAF 0305953F, and Polar Convergence NOAA PAC.

** NPOESS Launch vehicle funding is budgeted entirely in EELV PE 0305953F, and represents a portion of the DoD's 50% funding contribution in specific given years .

*** Operations and sustainment (O&S) may begin after Initial Operational Capability (IOC) in FY11 as either Operations & Maintenance AF, NOAA Operations Research and Facilities (ORF) or other appropriations depending on the concept selected for post IOC O&S.

(U) E. Acquisition Strategy

The guiding tenets for NPOESS acquisition include accomplishing substantial risk reduction with a focus on payload development, enhancing data utility to users, deferring major system decisions as long as reasonable, and protecting maximum flexibility to ensure the best overall system design. The program pursues a significant investment in the development and on-orbit testing of selected payload sensors while deferring individual sensor selections among competing international, NASA, military, and industry alternatives to assess and determine the optimum technical performance potential of each candidate sensor. NPOESS is currently pursuing two missions to reduce sensor development and data user segment risk. The Wind Sat/Coriolis mission will prove technologies to be used for the NPOESS Conical-Scanning

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(U) E. Acquisition Strategy Continued

Microwave Imager/Sounder (CMIS) sensor. The NPOESS Preparatory Project will fly and test-out three of NPOESS's most complex sensors: the Visible/Infrared Imager Radiometer Suite (VIIRS), the Cross Track Infrared Sounder (CrIS), and the Advanced Technology Microwave Sounder (ATMS). Overall system prime contractor selection was deferred until 2002 to minimize system level preliminary costs, allow sensor complement maturation, and delay the commitment to full system acquisition until approximately six years before the first satellite need date. The first two satellites will be incrementally funded with RDT&E funding. The rest will be fully funded with Missile Procurement funding.

The NPOESS EXCOM has restructured the program three times since the Milestone I decision. The last EXCOM decision reduces reliance of EUMETSAT by replacing their capability shortfall with an additional NPOESS satellite. In addition, the first NPOESS satellite will be launched in the early-morning orbit and the last DMSP satellite will be launched in the mid-morning orbit. This will ensure adequate meteorogical coverage in EUMETSAT's polar orbit until a replacement NPOESS spacecraft is ready. It also minimizes the cost impact of compensating for the lost capability caused by the EUMETSAT decision.

(U) F. Schedule Profile

		FY 2000				FY 2001				FY 2002			
		1	2	3	4	1	2	3	4	1	2	3	4
(U)	Program Rebaselined						*						
(U)	Competitive Sensor Development Contracts Downselected				*				X				
(U)	Award Competitive Program Definition & Risk Reduction contracts	*											
(U)	Milestone II/Production decision and Award of EMD/Production contract												X

(U) * = Completed Event X = Planned Event

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)

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(U) A. Project Cost Breakdown ($ in Thousands)

		FY 2000	FY 2001	FY 2002
(U)	Program Office Support for PDRR efforts	648	643	457
(U)	System Architecture Studies/Definition/Ground System Risk Reduction	2,988	24,800	30,170
(U)	Government Led Risk Reduction/ Technology efforts	200	0	0
(U)	Sensor/Algorithm Development and Design/Fabrication for Risk Reduction Missions/Program Support	52,544	50,507	81,446
(U)	Engineering and Manufacturing Development effort	0	0	45,321
(U)	Total	56,380	75,950	157,394

(U) B. Budget Acquisition History and Planning Information ($ in Thousands)

(U) Performing Organizations:

Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 2000	Budget FY 2000	Budget FY 2001	Budget FY 2002	Budget to Complete	Total Program
Product Development Organizations										
Syst. Arch. Studies	C/CPFF	Sep 96	12,820	12,820	12,820					12,820
TRW (PDRR)	C/FFP	Dec 99	28,535	28,535		1,050	12,400	15,085		28,535
Lockheed Martin (PDRR)	C/FFP	Dec 99	28,035	28,035		550	12,400	15,085		28,035
Lockheed Martin	C/CPAF	Dec 94	4,489	4,489	4,489					4,489
Raytheon (VIIRS & CrIS)	C/CPFF	Jul 97	28,716	28,716	18,860	9,856				28,716
Ball Aerospace (CMIS & OMPS)	C/CPFF	Jul 97	29,746	29,746	13,566	10,427	5,753			29,746
Ball Aerospace (OMPS)	C/CPAF	May 99	39,147	39,147	440	5,695	13,482	10,744	8,786	39,147
ITT Aerospace (VIIRS & CrIS)	C/CPFF	Jul 97	30,475	30,475	19,035	11,440				30,475
Boeing (formerly Hughes) Space and Communications	C/CPFF	Jul 97	27,195	27,195	12,055	11,324	3,816			27,195

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(U) Performing Organizations Continued:

Product Development Organizations (CMIS)										
Orbital Sciences (OMPS)	C/CPFF	Jul 97	2,578	2,578	2,578					2,578
SAAB Ericsson (GPSOS)	C/CPFF	Jul 97	2,786	2,786	2,786					2,786
SAAB Ericsson (GPSOS)	SS/FFP	Aug 99	6,108	6,108		850	2,450	2,808		6,108
ITT Areospace (CrIS)	C/CPAF	Aug 99	32,269	32,269		3,700	7,000	9,096	12,473	32,269
Raytheon (VIIRS)	C/CPAF	Nov 00	89,125	89,125			13,053	24,725	51,347	89,125
Other Contracts (CMIS, TSPR, ground system, leveraged sensors)	MISC	Various	N/A	N/A	21,156	640	4,953	79,394	1,412,584	1,518,727
Government Led Studies	Gov. Orgs.	Various	26,302	26,302	26,102	200	0		0	26,302
Support and Management Organizations										
Integrated Program Office (IPO) Support	Various	Various	23,408	23,408	13,464	648	643	457	8,196	23,408
Test and Evaluation Organizations										
TBD										

(U) Government Furnished Property:

Item Description	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery Date	Total Prior to FY 2000	Budget FY 2000	Budget FY 2001	Budget FY 2002	Budget to Complete	Total Program
Product Development Property									
NOT APPLICABLE									
Support and Management Property									
NOT APPLICABLE									
Test and Evaluation Property									
NOT APPLICABLE									

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Subtotals	Total Prior to FY 2000	Budget FY 2000	Budget FY 2001	Budget FY 2002	Budget to Complete	Total Program
Subtotal Product Development	133,887	55,732	75,307	156,937	1,485,190	1,907,053
Subtotal Support and Management	13,464	648	643	457	8,196	23,408
Subtotal Test and Evaluation						
Total Project	147,351	56,380	75,950	157,394	1,493,386	1,930,461