

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 2000		
BUDGET ACTIVITY 04 - Demonstration and Validation				PE NUMBER AND TITLE 0603434F National Polar-Orbiting Operational Environmental Satellite System (NPOESS)				PROJECT 644056		
COST (\$ in Thousands)		FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
644056	National Polar-orbiting Operational Env. Sat. Syst.	62,068	59,180	76,654	156,503	236,471	306,454	325,429	695,698	2,001,757
Quantity of RDT&E Articles		0	0	0	1	0	0	0	1	2
<p>(U) <b><u>A. Mission Description</u></b>                      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. At least two NPOESS satellites will be required 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). The European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) will provide a third satellite which, with the NPOESS satellites, will comprise the Joint Polar System of weather satellites. NPOESS successfully completed Milestone I on 17 March 1997.</p> <p>(U) <b><u>FY 1999 (\$ in Thousands)</u></b></p> <p>(U) \$647 Continued program office support for Program Definition and Risk Reduction efforts (PDRR).</p> <p>(U) \$3,804 Continued government-led risk reduction and technology development efforts.</p> <p>(U) \$4,500 Continued competitive system architecture studies.</p> <p>(U) \$53,117 Continued critical sensor/algorithm development efforts and design/fabrication for risk reduction missions.</p> <p>(U) \$62,068 Total</p>										
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BUDGET ACTIVITY <b>04 - Demonstration and Validation</b>		PROJECT <b>644056</b>
PE NUMBER AND TITLE <b>0603434F National Polar-Orbiting Operational Environmental Satellite System (NPOESS)</b>		
<p>(U) <b><u>A. Mission Description Continued</u></b></p> <p>(U) <u>FY 2000 (\$ in Thousands)</u></p> <p>(U) \$648 Continue program office support for PDRR efforts.</p> <p>(U) \$900 Completed government-led risk reduction and technology development efforts.</p> <p>(U) \$4,986 Continue system architecture studies and ground system risk reduction to include competitive contracts between TRW and Lockheed Martin to definitize the NPOESS space and ground segment architectures.</p> <p>(U) \$52,646 Continue critical VIIRS, CMIS, CrIS, OMPS, and GPSOS sensor and associated algorithm development efforts and sensor design and fabrication for risk reduction missions.</p> <p>(U) \$59,180 Total</p> <p>(U) <u>FY 2001 (\$ in Thousands)</u></p> <p>(U) \$617 Continue program office support for PDRR efforts.</p> <p>(U) \$12,850 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.</p> <p>(U) \$63,187 Continue critical VIIRS, CMIS, CrIS, OMPS, and GPSOS sensor and associated algorithm development efforts and sensor design and fabrication for risk reduction missions.</p> <p>(U) \$76,654 Total</p> <p>Acronyms:            VIIRS - Visible/Infrared Imager/Sounder Suite            CMIS - Conical Microwave Imager/Sounder            CrIS - Cross Track Infrared Sounder            OMPS - Ozone Mapper and Profiler Suite            GPSOS - Global Positioning System Occultation Sensor</p> <p>(U) <b><u>B. Budget Activity Justification</u></b>            This PE is in Budget Activity 4 (Demonstration and Validation) because it currently supports sensor and satellite bus development.</p>		
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BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT			
<b>04 - Demonstration and Validation</b>	<b>0603434F National Polar-Orbiting Operational Environmental Satellite System (NPOESS)</b>	<b>644056</b>			
<b>(U) C. Program Change Summary (\$ in Thousands)</b>					
		<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost</u>
(U) Previous President's Budget (FY 2000 PBR)		64,438	80,137	113,234	2,041,958
(U) Appropriated Value		64,732	60,137		0
(U) Adjustments to Appropriated Value					
a. Congressional/General Reductions		-294	-8		-302
b. Small Business Innovative Research		-2,023			-2,023
c. Omnibus or Other Above Threshold Reprogram			-480		-480
d. Below Threshold Reprogram					
e. Rescissions		-347	-469		-816
f. Other					
(U) Adjustments to Budget Years Since FY 2000 PBR				-36,580	-36,580
(U) Current Budget Submit/FY 2001 PBR		62,068	59,180	76,654	2,001,757
<b>(U) Significant Program Changes:</b>					
Funding: The FY01 reductions resulted from restructuring the program due to the FY00 congressional marks. FY01 funding for DMSP solid state recorders, which was previously included in the Multi-spectral Operational Linescan System (MOLS) risk reduction effort, was transferred to the DMSP program.					
Schedule: The sensor, ground system, and first satellite acquisition schedule slipped due to FY00 congressional marks. The first satellite availability date has slipped three months from July 08 to Sept 08.					
Technical: In FY00, combined system architecture studies with system definition and ground system risk reduction contracts. No additional funding required to complete this previously scheduled effort. Prior to FY00, NPOESS planned a Multi-spectral Operational Linescan System (MOLS) modification to DMSP's primary sensor to reduce risk to the NPOESS VIIRS sensor development, the VIIRS user segments, and provide a required enhancement to DMSP's primary operational sensor. Congressional marks in FY00 made this effort unaffordable and thus forced the termination of MOLS. To make-up for the loss of MOLS, development of the NPOESS's VIIRS data processing software was accelerated to permit real-time user exploitation of VIIRS data from the NPOESS Preparatory Program (NPP) mission. Therefore, the risk reduction activities and operational user enhancement that were to be provided by DMSP's MOLS will now be provided by NPP.					
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BUDGET ACTIVITY			PE NUMBER AND TITLE					PROJECT	
<b>04 - Demonstration and Validation</b>			<b>0603434F National Polar-Orbiting Operational Environmental Satellite System (NPOESS)</b>					<b>644056</b>	
<b>(U) D. Other Program Funding Summary (\$ in Thousands)</b>									
	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>Cost to</u>	<u>Total Cost</u>
	<u>Actual</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Complete</u>	
(U) Related RDT&E: DMSP PE 035160F	19,983	21,207	25,372	14,934	11,882	11,131	11,396	22,057	955,279
(U) Related RDT&E: DMSP PE 0305160N for Navy unique efforts									
(U) Related NOAA PAC Funding: Polar Convergence*									
* National Oceanic and Atmospheric Administration Procurement, Acquisition, and Construction (NOAA PAC) appropriation. The Air Force (DoD) and NOAA (DoC) fund NPOESS 50/50.									
<b>(U) E. Acquisition Strategy</b>									
<p>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 Windsat/Coriolis mission will prove technologies to be used for the NPOESS Conical 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 is being deferred to minimize system level preliminary costs, allow sensor complement maturation, and delay the commitment to full system acquisition until approximately seven years before the first satellite need date. In FY00, eliminated the separate contract for system architecture studies due to contractor mergers. This effort will now be accomplished on the same contract as the ground system risk reduction efforts.</p> <p>The NPOESS Executive Committee (EXCOM) has restructured the program twice since the Milestone I decision. The combined result of the EXCOM's decisions has delayed the availability of the first NPOESS satellites from January 2007 to July 2008. Congressional reductions to the FY00 budget for NPOESS forced another three month delay to the availability of the first NPOESS satellite. The first satellite should be available in time to fulfill the requirement to back-up the last of the DMSP or POES launches, whichever comes first. The IPO downselected two sensor development contracts during FY99. Ball Aerospace was awarded the production contract for the Ozone Mapping and Profiler Suite (OMPS) and ITT Aerospace was downselected to build the Cross Track Infrared Sounder (CrIS) sensor. Also, in Dec 99 the IPO</p>									
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(U) **E. Acquisition Strategy Continued**  
awarded competitive Program Definition and Risk Reduction contracts to TRW and Lockheed Martin.

(U) **F. Schedule Profile**

	<u>FY 1999</u>				<u>FY 2000</u>				<u>FY 2001</u>			
	1	2	3	4	1	2	3	4	1	2	3	4
(U) Program Rebaselined	*											
(U) Competitive Sensor Development Contracts Downselected			*	*					X		X	
(U) Award Competitive Program Definition & Risk Reduction contracts					*							
(U) Milestone II/III - 2QFY02												
(U) * = Completed Event X = Planned Event												

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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)							DATE February 2000			
BUDGET ACTIVITY					PE NUMBER AND TITLE			PROJECT		
<b>04 - Demonstration and Validation</b>					<b>0603434F National Polar-Orbiting Operational Environmental Satellite System (NPOESS)</b>			<b>644056</b>		
<b>(U) A. Project Cost Breakdown (\$ in Thousands)</b>										
					<u>FY 1999</u>		<u>FY 2000</u>			<u>FY 2001</u>
(U)	Program Office Support for PDRR efforts				647		648			617
(U)	System Architecture Studies/Definition/Ground System Risk Reduction				4,500		4,986			12,850
(U)	Government Led Risk Reduction/ Technology efforts				3,804		900			0
(U)	Sensor/Algorithm Development and Design/Fabrication for Risk Reduction Missions/Program Support				53,117		52,646			63,187
(U)	Total				62,068		59,180			76,654
<b>(U) B. Budget Acquisition History and Planning Information (\$ in Thousands)</b>										
<b>(U) Performing Organizations:</b>										
<u>Contractor or Government</u>	<u>Contract Method/Type</u>	<u>Award or Obligation Date</u>	<u>Performing Activity EAC</u>	<u>Project Office EAC</u>	<u>Total Prior to FY 1999</u>	<u>Budget FY 1999</u>	<u>Budget FY 2000</u>	<u>Budget FY 2001</u>	<u>Budget to Complete</u>	<u>Total Program</u>
<u>Product Development Organizations</u>										
Syst. Arch. Studies	C/CPFF	Sep 96	17,320	17,320	12,820	4,500			0	17,320
TRW (PDRR)	C/FFP	Dec 99	10,609	10,609			2,493	6,431	1,685	10,609
Lockheed Martin (PDRR)	C/FFP	Dec 99	10,609	10,609			2,493	6,431	1,685	10,609
Lockheed Martin	C/CPAF	Dec 94	4,597	4,597	4,489					4,489
Raytheon (VIIRS & CrIS)	C/CPFF	Jul 97	26,181	26,181	8,407	10,945	6,829			26,181
Ball Aerospace (CMIS & OMPS)	C/CPFF	Jul 97	24,961	24,961	3,498	10,068	6,179	5,216		24,961
Ball Aerospace (OMPS)	C/CPAF	May 99	30,627	30,627			3,848	8,556	18,223	30,627
ITT Aerospace (VIIRS & CrIS)	C/CPFF	Jul 97	26,325	26,325	7,407	12,089	6,829			26,325
Hughes Space and Communications (CMIS)	C/CPFF	Jul 97	23,002	23,002	2,074	9,533	6,179	5,216		23,002
Orbital Sciences (OMPS)	C/CPFF	Jul 97	2,425	2,425	1,425	1,000				2,425
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RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)										DATE
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04 - Demonstration and Validation										644056
PE NUMBER AND TITLE										
0603434F National Polar-Orbiting Operational Environmental Satellite System (NPOESS)										
<b>(U) Performing Organizations Continued:</b>										
<u>Product Development Organizations</u>										
SAAB Ericsson (GPSOS)	C/CPFF	Jul 97	2,786	2,786	2,386	400				2,786
SAAB Ericsson (GPSOS)	SS/FFP	Aug 99	3,496	3,496			488	1,380	1,628	3,496
ITT Areospace (CrIS)	C/CPAF	Aug 99	27,159	27,159			8,130	5,686	13,343	27,159
Other follow-on contract	MISC	Various	1,714,215	1,714,215	4,986	8,735	9,454	32,981	1,658,167	1,714,323
Government Led Studies	Gov. Orgs.	Various	51,007	51,007	22,344	4,151	5,610	4,140	14,762	51,007
<u>Support and Management Organizations</u>										
Integrated Program Office	Various	Various	26,438	26,438	13,464	647	648	617	11,062	26,438
(IPO) Support										
<u>Test and Evaluation Organizations</u>										
TBD										
<b>(U) Government Furnished Property:</b>										
	<u>Contract</u>									
	<u>Method/Type</u>	<u>Award or</u>								
<u>Item</u>	<u>or Funding</u>	<u>Obligation</u>	<u>Delivery</u>		<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Description</u>	<u>Vehicle</u>	<u>Date</u>	<u>Date</u>		<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
<u>Product Development Property</u>										
NOT APPLICABLE										
<u>Support and Management Property</u>										
NOT APPLICABLE										
<u>Test and Evaluation Property</u>										
NOT APPLICABLE										
					<u>Total Prior</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget</u>	<u>Budget to</u>	<u>Total</u>
<u>Subtotals</u>					<u>to FY 1999</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Complete</u>	<u>Program</u>
Subtotal Product Development					69,836	61,421	58,532	76,037	1,709,493	1,975,319
Subtotal Support and Management					13,464	647	648	617	11,062	26,438
Subtotal Test and Evaluation										
Total Project					83,300	62,068	59,180	76,654	1,720,555	2,001,757