

EXHIBIT R-2, RDT&E Budget Item Justification							DATE: February 2000			
APPROPRIATION/BUDGET ACTIVITY RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-5					R-1 ITEM NOMENCLATURE SC-21 Total Ship Systems Engineering/0604300N					
COST (\$ in Millions)		FY 1999	(6) FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Total PE Cost		120.704	161.118	305.274	303.989	617.796	763.620	857.350	CONT.	CONT.
Design/32464		(1) 81.040	111.365	174.923	201.543	551.811	722.751	837.704	CONT.	CONT.
DC/Survivability/32465		(2) 6.019	3.141	3.318	3.121	6.631	6.762	6.913	CONT.	CONT.
Multi-Function Radar (MFR)/32466		(3) 33.645	46.612	(4) 69.576	52.136	31.006	21.295	12.733	CONT.	CONT.
Volume Search Radar (VSR)/32735		0.000	(5) 0.000	(4) 57.457	47.189	28.348	12.812	0.000	0.000	181.400
Quantity of RDT&E Articles			0	0	**2/TBD	0	0	0	CONT.	CONT.

Notes: (1) (U) FY 1999 funds were budgeted and executed under PE 0604567N/Project S1803 and Project S2198 as displayed in the FY 99 President's Budget exhibits. Funds from PE 0604567N/Project S1803 and Project S2198 transitioned into PE 0604300N/Project 32464 in FY 2000 and out.

(2) (U) FY 1999 funds were budgeted and executed under PE 0604516N/Project S1828 and Project S2054 as displayed in the FY 99 President's Budget exhibits. Funds from PE 0604516N/Project S1828 and Project S2054 transitioned into PE 0604300N/Project 32465 in FY 2000 and out.

(3) (U) FY 1999 funds were budgeted and executed under PE 0604755N/Project U2348 as displayed in the FY 99 President's Budget exhibits. Funds from PE 0604755N/Project U2348 transitioned into PE 0604300N/Project 32466 in FY 2000 and out.

(4) (U) Beginning in FY 2001, funds for VSR development were moved from Project 32466 into a separate project - 32735.

(5) (U) Additional FY 2000 funding for VSR development included in PE 0603512N, Project 42208 (Future Carrier R&D), PE 0604755N, Project 32735N (FY00 Congressional plus-up funding for VSR development), and Project 32464 within this PE (DD21 Design). All DD21 and CVN77 VSR requirements in FY 2001 and beyond are consolidated in PE 0604300N, Project 32735.

(6) (U) \$3.210M in FY 2000 funding is that portion of the extramural program reserved for the Small Business Innovation Research assessment in accordance with 15 USC 638.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This Program Element (PE) provides funds for development of the DD 21 Class of U. S. Navy surface combatants and advanced development R&D which is integral to DD 21. The mission of the DD 21 class is to provide affordable, credible, independent, forward presence/deterrence and operate as an integral part of Naval, Joint or Combined Maritime Forces. DD 21 will provide an advanced level of land attack in support of the ground campaign and contribute to Naval, Joint or Combined battlespace dominance in littoral operations. DD 21 will establish and maintain surface and sub-surface superiority, provide local air defense, and will incorporate signature reduction to operate in all threat environments. DD 21 will have seamless Joint Interoperability to integrate all source information for battlespace awareness and weapons direction.

* (U) For explanation of Test Articles, see Projects 32466 and 32735.

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APPROPRIATION/BUDGET ACTIVITY

R-1 ITEM NOMENCLATURE

RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-5

SC-21 Total Ship Systems Engineering/0604300N

B. (U) PROGRAM CHANGE SUMMARY:

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
FY 2000 President's Budget:	125.964	162.056	250.719
Appropriated Value:	125.964	162.056	
Adjustment to FY 1999/2000 Appropriated Value,	-5.260	-0.938	+ 54.555
FY 2000 President's Budget:			
FY 2001 OSD/OMB Budget Submit:	120.704	161.118	305.274

(U) Funding: The FY 1999 net decrease of \$5.260M is due to SBIR transfer (-\$2.955M), execution adjustments (-\$1.728M), inflation savings (-\$0.573M), and a civilian personnel underexecution (-\$0.004M). The FY 2000 net decrease of \$0.938M is due to a Strategic Sourcing reduction (-\$0.301M), across-the-board reduction (-\$0.893M) and an Outsourcing Restoral (+\$0.256M). The FY 2001 net increase of \$54.555M is due to the incorporation of Volume Search Radar (VSR) functionality (+\$54.700M), NWCF Rate Adjustments (+\$0.344M), Restore Outsourcing (+\$2.893M), miscellaneous adjustments (-\$0.606), revised inflation assumptions (-\$2.083) and Strategic Sourcing reduction (-\$0.693M).

(U) Schedule: See individual projects

(U) Technical Parameters: Technical parameters are contained in the DD 21 Operational Requirements Document (ORD) approved by JROC on 16 October 1997.

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APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NAME AND NUMBER			PROJECT NAME AND NUMBER					
RDT&E, N/BA-5		SC-21 Total Ship Systems Eng/0604300N			Design/32464					
COST (\$ in Millions)		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost		(1) 81.040	111.365	174.923	201.543	551.811	722.751	837.704	CONT.	CONT.
RDT&E Articles Qty		0	0	0	0	0	0	0	CONT.	CONT.
<p>Notes: (1) (U) FY 1999 funds were budgeted and executed under PE 0604567N/Project S1803 and Project S2198 as displayed in the FY 99 President's Budget exhibits. Funds from PE 0604567N/Project S1803 and Project S2198 transitioned into PE 0604300N/Project 32464 in FY 2000 and out.</p> <p>A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project encompasses efforts for the total ship system engineering development and integration of Hull, Mechanical and Electrical (HM&E), communications, electronics, command and control, combat, weapons and shipboard systems into the DD 21 class. These engineering development and integration efforts include systems engineering, analysis, computer program development, interface design, technical documentation, and system testing to ensure fully functional systems integration. These systems engineering development efforts are required to ensure that DD 21 is a totally integrated ship system, delivering required warfighting technologies to the fleet within the reduced manning and cost goals.</p> <p>1. (U) FY 1999 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none"> - (U) (\$38.300) Completed DD 21 System Concept Development (Phase I). System Concept Development included a top level DD 21 concept, an initial DD 21 Performance Specification, top level cost estimates, and Life Cycle Engineering and Support (LCE&S) and test plans to support the concept. Began development of a Smart Product Model virtual prototype, which constitutes a complete representation of the ship's requirements, design and capabilities. - (U) (\$21.060) Continued implementation of the DD 21 Technical Team responsible for the participation, oversight and monitoring of the DD 21 Industry team's contract Phase I concepts. The team provided the engineering expertise to evaluate/support the industry-developed concepts in the Combat Systems; HM&E; Signatures; C4ISR; Modeling and Simulation; Total Ship Computing; and Test and Evaluation; Manning and LCE&S. Completed development of Collaborative Engineering Development Center (CEDC) and Integrated Data Environment (IDE). - (U) (\$8.395) Continued DD 21 LFT&E Plan. FY 1999 DD 21 LFT&E efforts will be focused in the following areas: mission recoverability (including damage control with reduced manning), magazine vulnerability (improved capability to assess munitions magazine vulnerability to current and future threats), advanced threat weapons effects (improved weapons effects predictive capabilities to address the advanced threats identified in the DD 21 Special Threat Analysis Report (STAR), damaged seaway survivability, and selected equipment vulnerability. 										

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Exhibit R-2a, RDT&E Project Justification

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EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2000
APPROPRIATION/BUDGET ACTIVITY RDT&E, N/BA-5	PROGRAM ELEMENT NAME AND NUMBER SC-21 Total Ship Systems Eng/0604300N	PROJECT NAME AND NUMBER Design/32464
<p>- (U) (\$5.279) Completed development of the operational context in which DD 21 will operate. This included development of the DD 21 Design Reference Mission (DRM) and Concept of Operations (CONOPS). Developed and briefed results of DRM Operational Situations (OPSITs) to Navy fleet representatives.</p> <p>- (U) (\$8.006) Continued identification and risk mitigation efforts in high risk areas such as manning, LCE&S, Total Ship Computing and certification. Continued Manning/Human Systems Integration (HSI) and LCE&S Integrated Product Teams (IPTs) to address the impact of how industry-developed concepts will impact the future Navy support infrastructure in these functional areas. Reviewed and developed proposed policy changes as a result of DD 21 industry concepts that impact Navy manning and life cycle support structure as a result of Full Service Contractor (FSC) proposals.</p> <p>2. (U) FY 2000 PLAN</p> <p>- (U) (\$70.250) Begin Contract Phase II for the development of two competitive initial system designs for DD 21. DD 21 industry teams will continue development of the system functional baseline, continue refinement of the performance specification, continue to develop and validate cost estimates, and continue to develop a detailed total ship design including radar suite, leading to a Preliminary Design Review (PDR). Continue development of the Smart Product Model virtual prototype, which constitutes a representation of the ship's requirements, design and capabilities at the preliminary design level.</p> <p>- (U) (\$28.355) Continue implementation of the DD 21 Technical Team responsible for the participation, oversight and monitoring of the two industry designs in Contract Phase II. Evaluate contractor deliverables and conduct Engineering Review in preparation for downselect and Preliminary Design Review (PDR) in FY 2001. The Engineering team consists of Government Labs, Universities and selected technical support contractors. This technical team provides the expertise to evaluate/support the DD 21 industry design in the areas of Combat Systems; HM&E; Signatures; C4ISR; Modeling and Simulation; Total Ship Computing; Test and Evaluation; Manning and LCE&S.</p> <p>- (U) (\$5.830) Continue development of DD 21 LFT&E Plan. The DD 21 LFT&E program will focus on the following areas: Mission Recoverability, Magazine Protection, Damaged Seaway Survival, Selected Equipment Vulnerability, Advanced Weapon Threat Effects, and required documentation. These areas address critical elements of DD 21 survivability as defined in the Test and Evaluation Master Plan (TEMP) and the Operational Requirements Document (ORD). Test results will be used to improve modeling and simulation capability and will support DD 21 design evaluations.</p> <p>- (U) (\$6.930) Continue identification and risk mitigation efforts in high risk areas such as manning, LCE&S, Total Ship Computing and certification. Continue Manning/HSI and LCE&S IPTs to address the impact of how industry-developed concepts will impact the future Navy support infrastructure in these functional areas. Review and develop proposed policy changes as a result of DD 21 industry concepts that impact Navy manning and life cycle support structure as a result of FSC proposals.</p>		

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APPROPRIATION/BUDGET ACTIVITY RDT&E, N/BA-5	PROGRAM ELEMENT NAME AND NUMBER SC-21 Total Ship Systems Eng/0604300N	PROJECT NAME AND NUMBER Design/32464
<p>3. (U) FY 2001 PLAN</p> <ul style="list-style-type: none">- (U) (\$127.950) Complete Initial System Design (Contract Phase II). Complete initial development of Smart Product Model virtual prototype for contract Phase II. Begin DD 21 Ship System Design (Contract Phase III). Downselect to one DD 21 Industry team to begin system and subsystem design. This includes development of the total ship computing architecture and computer programs that will integrate Combat Systems to support reduced Navy manning and improved LCE&S concepts, HM&E, and administrative functions. Conduct System Functional Review (SFR), downselect and PDR. Continue development of Smart Product Model virtual prototype to support contract and detailed design of DD 21.- (U) (\$33.068) Continue implementation of DD 21 Technical Team responsible for the participation, oversight and monitoring of the two industry designs during Contract Phase II and following downselect to one DD 21 industry team. Participate in / evaluate SFR, downselect and PDR. The Engineering team consists of Government Labs, Universities and selected technical support contractors. The technical team provides the expertise to evaluate/support the DD 21 industry design in the areas of Combat Systems; HM&E; Signatures; C4ISR; Modeling and Simulation; Total Ship Computing; Test and Evaluation; Manning and LCE&S.- (U) (\$5.980) Continue development of DD 21 LFT&E plan. The DD 21 LFT&E program will focus on the following areas: Mission Recoverability and critical elements of DD 21 survivability as defined in the TEMP and the ORD. Test results will be used to improve modeling and simulation capability and will support DD 21 design evaluations.- (U) (\$7.925) Continue identification and risk mitigation efforts in high risk areas such as manning, LCE&S, Total Ship Computing and certification. Continue Manning/HSI and LCE&S IPTs to address the impact of how industry-developed concepts will impact the future Navy support infrastructure in these functional areas. Review and develop proposed policy changes as a result of DD 21 industry concepts that impact Navy manning and life cycle support structure as a result of FSC proposals.		

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B. (U) OTHER PROGRAM FUNDING SUMMARY:

COST (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	TotalCost
Shipboard System Component Dev/0603513N	99.395	113.474	244.437	317.176	239.701	136.747	116.371	CONT.	CONT.

C. (U) ACQUISITION STRATEGY:

(U) The DD 21 acquisition strategy encompasses five contract phases: Phase I – System Concepts, Phase II – Initial System Design, Phase III – System Design, Phase IV – Detail Design and Construction, and Phase V – Engineering and Logistics Life Cycle Support. The Navy will award section 845/804 agreements for Phases I and II for two DD 21 Industry teams. Downselection to a single DD 21 Contractor team will occur in mid FY 2001 to begin Contract Phase III.

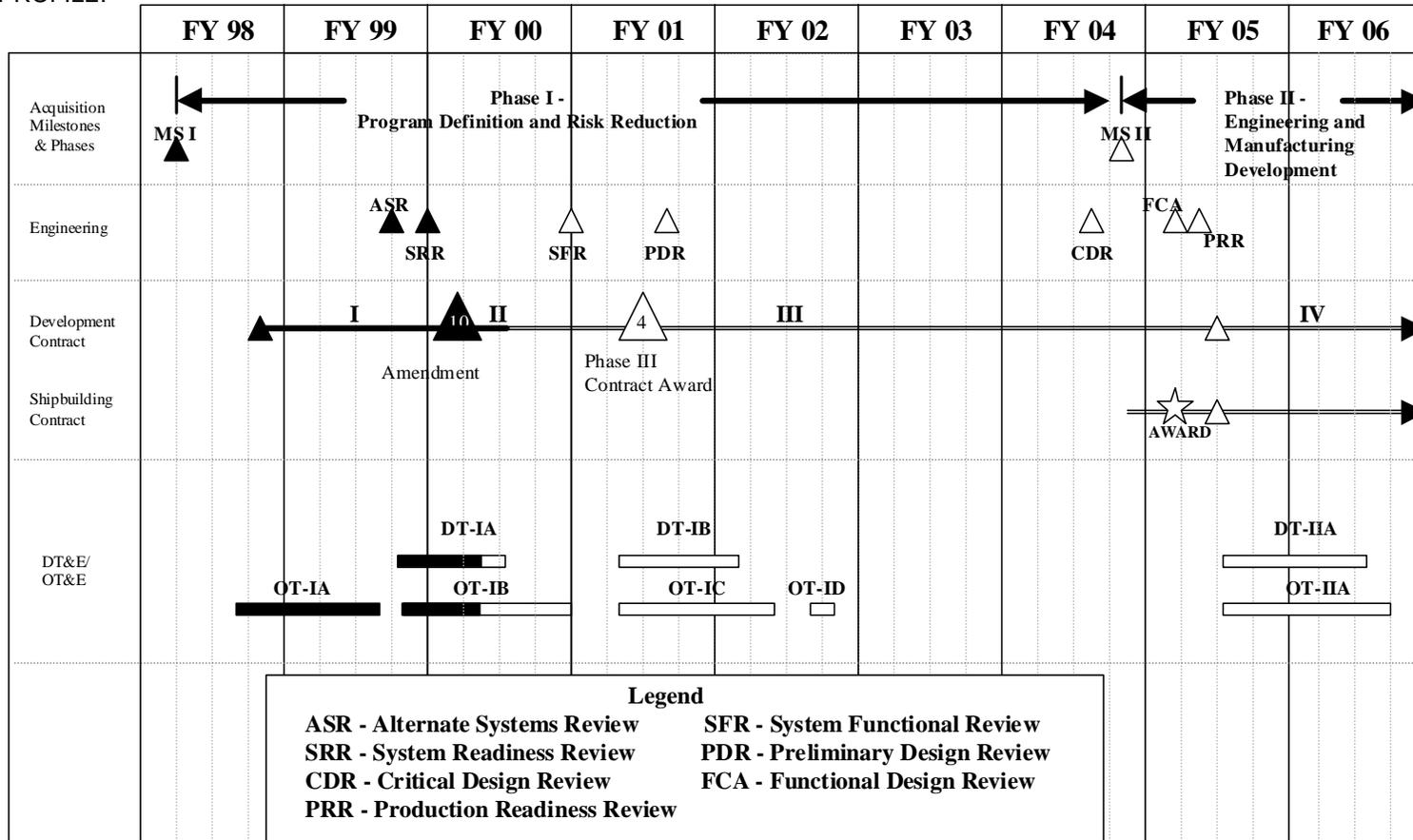
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EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2000
APPROPRIATION/BUDGET ACTIVITY RDT&E, N/BA-5	PROGRAM ELEMENT NAME AND NUMBER SC-21 Total Ship Systems Eng/0604300N	PROJECT NAME AND NUMBER Design/32464

D. (U) SCHEDULE PROFILE:



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Exhibit R-3 Cost Analysis (page 1)									DATE: February 2000			
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N/BA-5			SC-21 Total Ship System Engin/0604300N			Design/32464						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Initial System Concepts - Phase I	Sec 845/804	DD 21 Industry Team	16.500	38.300	11/98	0.000	N/A	0.000	N/A	CONT.	CONT.	
Initial System Design/System, Subsystem Design - Phases II & III	Sec 845/804	DD 21 Industry Team	0.000	0.000	N/A	70.250	11/99	127.950	Various	CONT.	CONT.	
Ancillary Hardware Development											0.000	
Systems Engineering											0.000	
Licenses											0.000	
Tooling											0.000	
GFE											0.000	
Subtotal Product Development			16.500	38.300		70.250		127.950		CONT.	CONT.	
Remarks:												
Development Support Equipment											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	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks: (U) Support costs during this period will be rolled up in development contracts costs.												

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Exhibit R-3 Cost Analysis (page 2)								DATE: February 2000				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N/BA-5			SC-21 Total Ship System Engin/0604300N			Design/32464						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Live Fire Test & Evaluation	Sec 845/804	DD 21 Industry Teams	0.000	2.425	03/99	1.750	11/99	2.450	12/00	CONT.	CONT.	
	WR	NSWC CD Bethesda, MD	2.320	4.512	03/99	3.280	12/99	3.530	12/00	CONT.	CONT.	
	WR	NSWC CD Dahlgren,, VA	0.200	0.000	N/A	0.000	N/A	0.000	12/00	CONT.	CONT.	
	TBD	Various	0.911	1.458	TBD	0.800	TBD	0.000	TBD	CONT.	CONT.	
Subtotal T&E			3.431	8.395		5.830		5.980		CONT.	CONT.	
Remarks:												
Contractor Engineering Support	GSA	Techmatics Arlington,VA	1.800	1.500	12/98	1.500	12/99	1.500	12/00	CONT.	CONT.	
	GSA	Vitro Arlington, VA	1.000	1.000	12/98	1.000	12/99	1.000	12/00	CONT.	CONT.	
	Misc.	Various	1.300	0.500	12/98	0.500	12/99	0.500	12/00	CONT.	CONT.	
Government Engineering Support	WR	NSWC DD Dahlgren, VA	12.490	12.300	12/98	12.423	12/99	17.703	12/00	CONT.	CONT.	
	WR	NSWC CD Bethesda, MD	3.660	3.420	12/98	2.959	12/99	2.800	12/00	CONT.	CONT.	
	WR	NSWC CR Crane, IN	0.665	2.092	12/98	2.070	12/99	1.962	12/00	CONT.	CONT.	
	WR	NSWC PHD Pt Hueneme,CA	0.370	1.500	12/98	1.815	12/99	1.615	12/00	CONT.	CONT.	
	WR	SSCSD San Diego, CA	0.970	1.670	12/98	1.670	12/99	1.470	12/00	CONT.	CONT.	
	WR	NUWC/N Newport, RI	0.846	1.159	12/98	1.206	12/99	1.500	12/00	CONT.	CONT.	
	Various	Gov't Activities	4.370	2.310	12/98	2.430	12/99	2.542	12/00	CONT.	CONT.	
University Research	CPFF	APL/JHU Laurel, MD	0.940	3.132	12/98	2.722	12/99	2.500	12/00	CONT.	CONT.	
Program Management Support	Various	Various	4.071	3.200	12/98	3.590	12/99	4.501	12/00	CONT.	CONT.	
Travel	Various	Various	0.200	0.562	Various	1.400	Various	1.400	Various	CONT.	CONT.	
Subtotal Management			32.682	34.345		35.285		40.993		CONT.	CONT.	
Remarks:												
Total Cost			52.613	81.040		111.365		174.923		CONT.	CONT.	
Remarks:												

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EXHIBIT R-2a, RDT&E Project Justification						DATE: February 2000				
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NAME AND NUMBER			PROJECT NAME AND NUMBER					
RDT&E, N/BA-5		SC-21 Total Ship Systems Eng/0604300N			DC/Survivability/32465					
COST (\$ in Millions)		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost		(1) 6.019	3.141	3.318	3.121	6.631	6.762	6.913	CONT.	CONT.
RDT&E Articles Qty		0	0	0	0	0	0	0	CONT.	CONT.
<p>Notes: (1) (U) FY 1999 funds were budgeted and executed under PE 0604516N/Project S1828 and Project S2054 as displayed in the FY 99 President's Budget exhibits. Funds from PE 0604516N/Project S1828 and Project S2054 transitioned into PE 0604300N/Project 32465 in FY 2000 and out.</p> <p>A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project funds the engineering development of DD 21 ship protection and damage control/firefighting systems and features that reduce vulnerability against conventional weapons (e.g., missiles, mines, torpedoes) and peacetime accidents that enable an effective recovery of mission capability. The requirements for this project are based on the need to develop affordable, balanced DD 21 survivability designs that address recent wartime lessons learned and meet established DD 21 survivability goals. Additionally, this project addresses survivability requirements applicable to the existing fleet and other ship acquisition programs (e.g., LPD 17, CVX, LHX).</p> <p>(U) Development areas include: 1) computer-based damage control systems that enable reduced manning through systems automation, minimizing the need for manual Damage Control (DC) actions; 2) personnel protection systems/devices that increase endurance and reduce stress on DC personnel during sustained operations; 3) tactics and doctrine for attacking major threat, ship threatening conflagration; 4) damage tolerant structures that increase hull girder survival against underwater explosions; and 5) system protection devices that enable continued system operation after damage.</p> <p>1. (U) FY 1999 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none"> - (U) (\$0.557) Conducted full-scale weapons effects Test and Evaluation (T&E) of the electrical fault clearing device. - (U) (\$1.126) Completed firefighting experiments aboard the ex-USS SHADWELL in support of developing tactics and doctrine for the water mist and smoke ejection systems. - (U) (\$2.399) Continued development of the pre-hit configuration module. Completed software coding for moderately fast missile hit point prediction utilizing CIWS data. Initiated system automation designs for the electrical, fluid and total ship computing plant systems. Initiated DD 21 combat/damage control systems integration for monitoring advanced projected DD 21 threats. 										

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<p>- (U) (\$1.937) Continued design of damage tolerant hull girder configurations that limit holing and flooding and prevent ship sinking from close-in UNDEX; developed designs. Completed Real Time Damage Tracking (RTDT) fire/smoke sensor evaluations aboard the USS RUSHMORE. Completed evaluations of cold water/weather and anti-exposure suits with body heat retention systems. Completed evaluation of conditioned firefighting clothing that increases the time firefighters can remain on-station during extreme environments. Continued evaluation of personnel monitoring systems. Initiated development of a lightweight firefighter/boundary suit ensemble. Evaluated hands-free communication devices that enable direct, clear communication between on-scene firefighters.</p> <p>2. (U) FY 2000 PLAN</p> <ul style="list-style-type: none">- (U) (\$0.514) Continue development of the pre-hit Configuration Management capability. Continue DD 21 combat/damage control systems integration for monitoring advanced, projected DD 21 threats. Continue development of a lightweight firefighting/boundary suit ensemble.- (U) (\$2.427) Begin initial System Design and engineering of DD 21 DC/Survivability systems.- (U) (\$0.200) Continue design of damage tolerant hull girder configurations that limit holing and flooding and prevent ship sinking from close-in UNDEX. <p>3. (U) FY 2001 PLAN</p> <ul style="list-style-type: none">- (U) (\$0.566) Continue development of the pre-hit Configuration Management capability. Initiate planning for electrical system T&E to evaluate system isolation performance under projected threat conditions. Complete development of a lightweight firefighting/boundary suit ensemble.- (U) (\$2.552) Complete initial System Design and engineering of DD 21 DC/Survivability systems. Begin system/subsystem development of DC/Survivability systems.- (U) (\$0.200) Continue design of damage tolerant hull girder configurations that limit holing and flooding and prevent ship sinking from close-in UNDEX.		

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PROJECT NAME AND NUMBER

RDT&E, N/BA-5

SC-21 Total Ship Systems Eng/0604300N

DC/Survivability/32465

B. (U) OTHER PROGRAM FUNDING SUMMARY:

COST (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	TotalCost
Shipboard System Component Dev/0603513N	99.395	113.474	244.437	317.176	239.701	136.747	116.371	CONT.	CONT.

C. (U) ACQUISITION STRATEGY:

(U) These development efforts were realigned into this project in an effort to consolidate related DD 21 RDT&E efforts and will be transitioned into the DD 21 acquisition strategy in FY 2000 and out.

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RDT&E, N/BA-5	SC-21 Total Ship Systems Eng/0604300N	DC/Survivability/32465
D. (U) SCHEDULE PROFILE:		
<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
4Q Pre-Hit Configuration Management Software Code	4Q Pre-Hit Configuration Management Software Code	4Q Pre-Hit T & E Plan
4Q UNDEX Designs	1Q Initial System Design	1Q System/Subsystem Development
4Q Water Mist/Smoke Ejection Systems Evaluations		4Q Lightweight Firefighting Boundary Suit
4Q Cold Water/Weather Evaluations		
4Q Personnel Monitoring System Evaluations		

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Exhibit R-3 Cost Analysis (page 1)										DATE: February 2000		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, NBA-5			SC-21 Total Ship System Engin/0604300N			DC/Survivability/32465						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development											0.000	
Ancillary Hardware Development											0.000	
Systems Engineering											0.000	
Product Development	Sec 845/804	DD 21 Industry Team	0.000	2.180	11/98	2.427	11/99	2.550	11/00	CONT.	CONT.	
	WR	NSWC CD Bethesda, MD	2.249	1.339	11/98	0.200	11/99	0.400	11/00	CONT.	CONT.	
	Various	Other Govt. Activities	2.911	2.045	Various	0.514	Various	0.232	Various	CONT.	CONT.	
	Various	Other Contractors	0.625	0.455	Various	0.000	N/A	0.136	Various	CONT.	CONT.	
Subtotal Product Development			5.785	6.019		3.141		3.318		CONT.	CONT.	
Remarks:												
Development Support Equipment											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	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												

R-1 SHOPPING LIST - Item No. 95-14 of 95-25

Exhibit R-3, Project Cost Analysis
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CLASSIFICATION:

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Exhibit R-3 Cost Analysis (page 2)										DATE: February 2000		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N/BA-5			SC-21 Total Ship System Engin/0604300N			DC/Survivability/32465						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation											0.000	
Operational Test & Evaluation											0.000	
Tooling											0.000	
GFE											0.000	
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Contractor Engineering Support											0.000	
Government Engineering Support											0.000	
Program Management Support											0.000	
Travel											0.000	
Labor (Research Personnel)											0.000	
Overhead											0.000	
Subtotal Management			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												
Total Cost			5.785	6.019		3.141		3.318		CONT.	CONT.	
Remarks:												

R-1 SHOPPING LIST - Item No. 95-15 of 95-25

Exhibit R-3, Project Cost Analysis
(Exhibit R-3, page 15 of 25)

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CLASSIFICATION:

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EXHIBIT R-2a, RDT&E Project Justification						DATE: February 2000				
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NAME AND NUMBER			PROJECT NAME AND NUMBER					
RDT&E, N/BA-5		SC-21 Total Ship Systems Eng/0604300N			Multi-Function Radar (MFR) / 32466					
COST (\$ in Millions)		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost		(1) 33.645	46.612	(2) 69.576	52.136	31.006	21.295	12.733	CONT.	CONT.
RDT&E Articles Qty		0	0	0	1	0	0	0	CONT.	CONT.
<p>Note: (1) (U) FY 1999 funds were budgeted and executed under PE 0604755N/Project U2348 as displayed in the FY 99 President's Budget exhibits. Funds from PE 0604755N/Project U2348 transitioned into PE 0604300N/Project 32466 in FY 2000 and out.</p> <p>(2) (U) During PR-01, funds were designated for Project 32735 and transferred from Project 32466.</p> <p>A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides funds for the development of the Multi-Function Radar (MFR) in association with DD 21. This provides DD 21 and other applicable surface ships with an affordable, high performance radar for ship defense well into the next century. This system is based on solid state, active array radar technology and will provide search, detect, track, and weapon control functions while dramatically reducing manning and life-cycle costs associated with multiple systems that perform these functions today. The MFR will achieve a level of force protection that greatly enhances ship defense capability against all threats envisioned in the littoral environment. A Test Article will be available in FY 02 to support DT/OT land-based and at-sea testing.</p> <p>1. (U) FY 1999 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none"> - (U) (\$24.414) Completed MFR Concept Definition (Contract Phase II). Awarded Engineering and Manufacturing Development (E&MD) contract to Raytheon Systems Company (Contract Phase III). Preliminary Design Review (PDR) is scheduled for 4th quarter FY 1999. - (U) (\$5.797) Provided engineering development support to successfully complete MFR Contract Phase II. Completed source selection process for E&MD award. - (U) (\$1.000) Provided program management in support of the above program milestones. - (U) (\$2.434) Defined DD 21 MFR concept and provided a risk mitigation plan and a DEMVAL program to mitigate those risks. 										

R-1 SHOPPING LIST - Item No. 95-16 of 95-25

Exhibit R-2a, RDT&E Project Justification
(Exhibit R-2a, page16 of 25)

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EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2000			
APPROPRIATION/BUDGET ACTIVITY RDT&E, N/BA-5		PROGRAM ELEMENT NAME AND NUMBER SC-21 Total Ship Systems Eng/0604300N			PROJECT NAME AND NUMBER Multi-Function Radar (MFR) / 32466					
<p>2. (U) FY 2000 PLAN:</p> <ul style="list-style-type: none"> - (U) (\$38.400) Continue E&MD phase of MFR. Develop and provide technical design data to support Critical Design Review (CDR). Procure Engineering Development Model (EDM) hardware. - (U) (\$8.000) Government Engineering Services and program management support for E&MD. Perform oversight and assessment of MFR E&MD efforts. Conduct CDR. - (U) (\$0.212) Provided Program Management in support of the above program milestones. <p>3. (U) FY 2001 PLAN:</p> <ul style="list-style-type: none"> - (U) (\$56.363) Continue E&MD phase of MFR. Continue EDM hardware procurement and start fabrication. - (U) (\$7.207) Government Engineering Services and program management support for E&MD. Perform oversight and assessment of MFR E&MD efforts. - (U) (\$5.000) MFR test and evaluation, planning, documentation and scheduling. - (U) (\$1.006) Provided Program Management in support of the above program milestones. <p>B. (U) OTHER PROGRAM FUNDING SUMMARY:</p>										
COST (\$ in Millions)		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	TotalCost
Shipboard System Component Dev/0603513N		99.395	113.474	244.437	317.176	239.701	136.747	116.371	CONT.	CONT.
<p>C. (U) ACQUISITION STRATEGY:</p> <p>(U) In FY 1999, the Government selected a single MFR contractor (Raytheon) to begin Phase III E&MD. PDR is scheduled for FY 1999, CDR is scheduled for FY 2000, and EDM delivery will be in FY 2002.</p>										

R-1 SHOPPING LIST - Item No. 95-17 of 95-25

Exhibit R-2a, RDT&E Project Justification
(Exhibit R-2a, page 17 of 25)

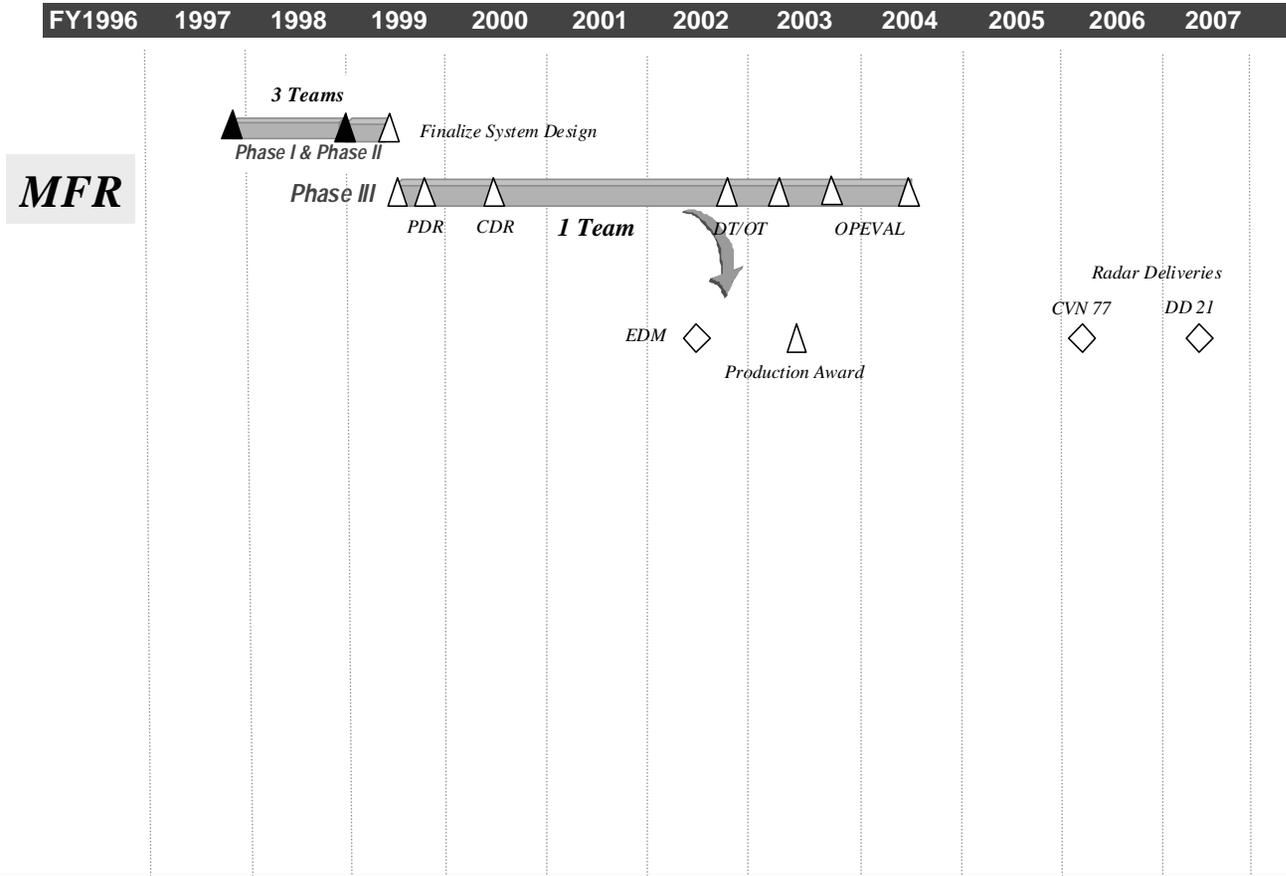
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EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2000
APPROPRIATION/BUDGET ACTIVITY RDT&E, N/BA-5	PROGRAM ELEMENT NAME AND NUMBER SC-21 Total Ship Systems Eng/0604300N	PROJECT NAME AND NUMBER Multi-Function Radar (MFR) / 32466

D. (U) SCHEDULE PROFILE:



R-1 SHOPPING LIST - Item No. 95-18 of 95-25

Exhibit R-2a, RDT&E Project Justification
(Exhibit R-2a, page 18 of 25)

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Exhibit R-3 Cost Analysis (page 1)										DATE: February 2000		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N/BA-5			SC-21 Total Ship System Engin/0604300N			Multi-Function Radar (MFR) / 32466						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	CPAF/IF	Prime E&MD (Raytheon)	0.000	12.000	06/99	38.400	11/99	56.363	11/00	CONT.	CONT.	195.000
	Sec 845/804	DD 21 Industry Team	0.000	2.434	11/98	0.000	N/A	0.000	04/01	CONT.	CONT.	
	CP	Competitive	0.000	12.414	10/98	0.000	N/A	0.000	N/A	12.414	12.414	
Ancillary Hardware Development											0.000	
Systems Engineering											0.000	
Licenses											0.000	
Tooling											0.000	
GFE											0.000	
Subtotal Product Development			0.000	26.848		38.400		56.363		CONT.	CONT.	
Remarks:												
Development Support Equipment											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	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												

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Exhibit R-3 Cost Analysis (page 2)							DATE: February 2000					
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N/BA-5			SC-21 Total Ship System Engin/0604300N			Multi-Function Radar (MFR) / 32466						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation											0.000	
Operational Test & Evaluation											0.000	
Tooling											0.000	
GFE											0.000	
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks: No Developmental or Operational Test and Evaluation will be conducted during FY 1999 through FY 2001.												
Government Engineering Support	WR	NSWC DD Dahlgren, VA	0.000	2.000	12/98	2.000	12/99	2.000	12/00	CONT.	CONT.	
	WR	NSWC PHD Pt Hueneme,CA	0.000	1.000	12/98	1.200	12/99	1.277	12/00	CONT.	CONT.	
	SS/CPFF	JHU/APL Laurel, MD	0.000	1.000	12/98	1.250	12/99	1.017	12/00	CONT.	CONT.	
	WR	Miscellaneous	0.000	2.197	12/98	2.182	12/99	2.339	12/00	CONT.	CONT.	
	WR	Various (Testing)	0.000	0.000	N/A	0.000	N/A	5.000	12/00	CONT.	CONT.	
Program Management Support	C/CPFF	Various	0.000	0.600	12/98	1.580	12/99	1.580	12/00	CONT.	CONT.	
Travel			0.000	0.000	N/A	0.000	N/A	0.000	N/A	CONT.	CONT.	
Subtotal Management			0.000	6.797		8.212		13.213		CONT.	CONT.	
Remarks:												
Total Cost			0.000	33.645		46.612		69.576		CONT.	CONT.	
Remarks:												

R-1 SHOPPING LIST - Item No. 95-20 of 95-25

Exhibit R-3, Project Cost Analysis
(Exhibit R-3, page 20 of 25)

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EXHIBIT R-2a, RDT&E Project Justification						DATE: February 2000				
APPROPRIATION/BUDGET ACTIVITY RDT&E, N/BA-5		PROGRAM ELEMENT NAME AND NUMBER SC-21 Total Ship Systems Eng/0604300N			PROJECT NAME AND NUMBER Volume Search Radar (VSR) / 32735					
COST (\$ in Millions)		FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to Complete	Total Cost
Project Cost		0.000	0.000	57.457	47.189	28.348	12.812	0.000	CONT.	CONT.
RDT&E Articles Qty		0	0	0	1	0	0	0	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides funds for the development of the Volume Search Radar (VSR) in association with DD 21. This provides DD 21 and other applicable surface ships with an affordable, high performance air search radar. This system is based on solid state, active array radar technology and will provide search, detect, and track while dramatically reducing manning and life-cycle costs associated with multiple systems that perform these functions today. VSR provides long range above-the-horizon surveillance and timely cueing to MFR. A Test Article will be available in FY 02 to support DT/OT land-based and at-sea testing.

* (U) Additional FY00 funding for VSR development included in PE 0603512N, Project 42208 (Future Carrier R&D), PE 0604755N, Project 32735N (FY00 Congressional plus up funding for VSR development). All requirements in FY 2001 and beyond are consolidated in PE 0604300N, Project 32735.

1. (U) FY 1999 ACCOMPLISHMENTS:

Not Applicable

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EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2000		
APPROPRIATION/BUDGET ACTIVITY RDT&E, N/BA-5	PROGRAM ELEMENT NAME AND NUMBER SC-21 Total Ship Systems Eng/0604300N				PROJECT NAME AND NUMBER Volume Search Radar (VSR) / 32735				
<p>2. (U) FY 2000 PLAN: - Please see Note (*) on previous page.</p> <p>3. (U) FY 2001 PLAN: - (U) (\$54.000) Complete CDR in early FY01. Procure EDM hardware and start fabrication. - (U) (\$3.000) Government Engineering Services and Program Management support for E&MD. Perform oversight and assessment of VSR E&MD efforts and system integration. - (U) (\$0.457) Provide Program Management in support of the above program milestones.</p> <p>B. (U) OTHER PROGRAM FUNDING SUMMARY:</p>									
COST (\$ in Millions)	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	To Complete	TotalCost
Shipboard System Component Dev/0603513N	99.395	113.474	244.437	317.176	239.701	136.747	116.371	CONT.	CONT.
<p>C. (U) ACQUISITION STRATEGY:</p> <p>(U) In FY 2001, the Government will downselect to a single DD 21 industry team. The Full Service Contractor (FSC) will fabricate and deliver the VSR EDM in FY 2002. MFR/VSR DT/OT is anticipated in FY 2002 through FY 2004.</p>									

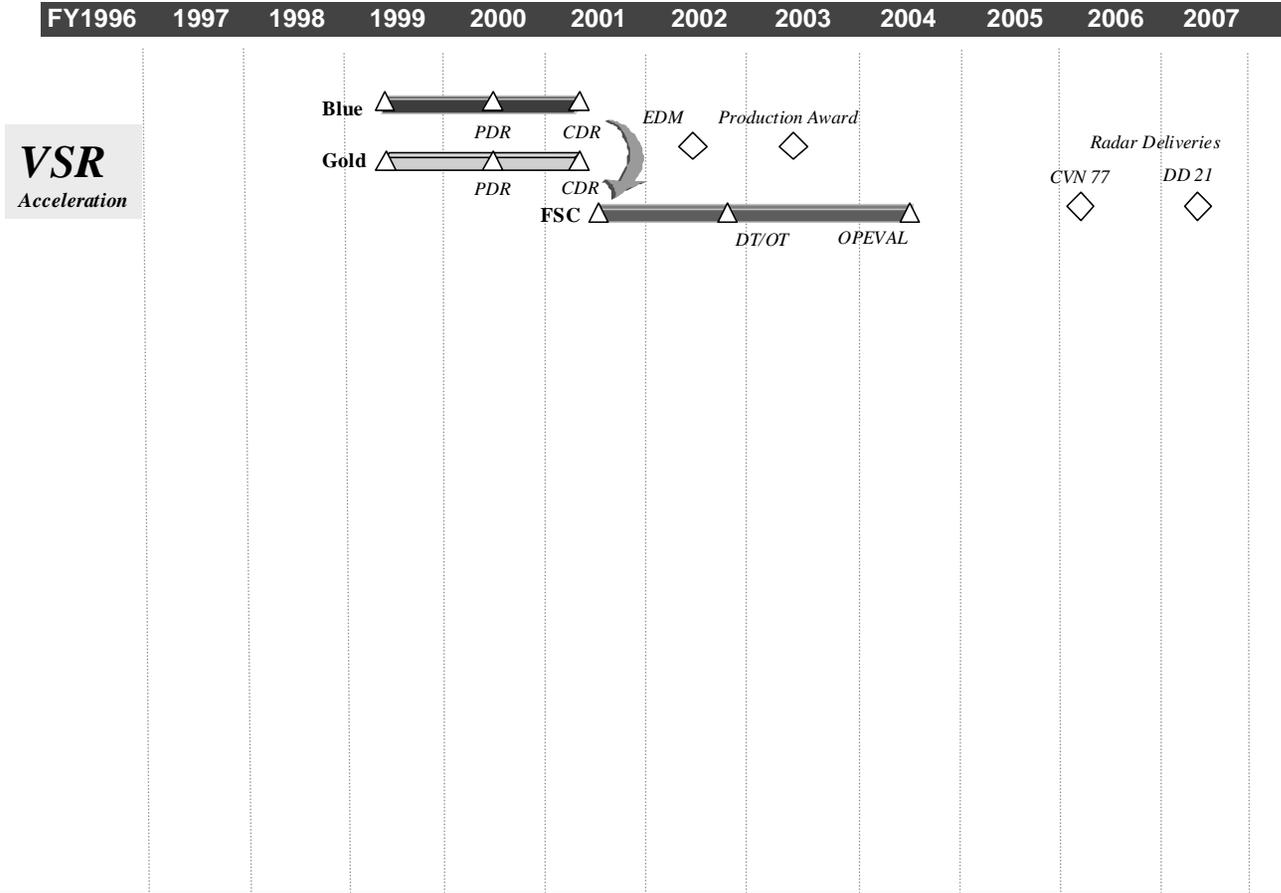
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EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2000
APPROPRIATION/BUDGET ACTIVITY RDT&E, N/BA-5	PROGRAM ELEMENT NAME AND NUMBER SC-21 Total Ship Systems Eng/0604300N	PROJECT NAME AND NUMBER Volume Search Radar (VSR) / 32735

D. (U) SCHEDULE PROFILE:



R-1 SHOPPING LIST - Item No. 95-23 of 95-25

Exhibit R-2a, RDT&E Project Justification
(Exhibit R-2a, page 23 of 25)

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Exhibit R-3 Cost Analysis (page 1)										DATE: February 2000		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N/BA-5			SC-21 Total Ship System Engin/0604300N			Volume Search Radar (VSR) / 32735						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	Sec 845/804	DD 21 Industry Team	0.000	0.000	N/A	0.000	N/A	16.000	11/00	CONT.	CONT.	
	Sec 845/804	DD 21 FSC	0.000	0.000	N/A	0.000	N/A	38.000	02/01	CONT.	CONT.	
Ancillary Hardware Development											0.000	
Systems Engineering											0.000	
Licenses											0.000	
Tooling											0.000	
GFE											0.000	
Subtotal Product Development			0.000	0.000		0.000		54.000		CONT.	CONT.	
Remarks:												
Development Support Equipment											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	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												

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Exhibit R-3 Cost Analysis (page 2)							DATE: February 2000					
APPROPRIATION/BUDGET ACTIVITY RDT&E, N/BA-5			PROGRAM ELEMENT SC-21 Total Ship System Engin/0604300N			PROJECT NAME AND NUMBER Volume Search Radar (VSR) / 32735						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 99 Cost	FY 99 Award Date	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation											0.000	
Operational Test & Evaluation											0.000	
Tooling											0.000	
GFE											0.000	
Subtotal T&E			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks: No Developmental or Operational Test and Evaluation will be conducted during FY 1999 through FY 2001.												
Government Engineering Support	WR	NSWC DD Dahlgren, VA	0.000	0.000	N/A	0.000	N/A	1.000	12/00	CONT.	CONT.	
Program Management Support	C/CPFF	Various	0.000	0.000	N/A	0.000	N/A	2.457	12/00	CONT.	CONT.	
Travel			0.000	0.000	N/A	0.000	N/A	0.000	N/A	CONT.	CONT.	
Subtotal Management			0.000	0.000		0.000		3.457		CONT.	CONT.	
Remarks:												
Total Cost			0.000	0.000		0.000		57.457		CONT.	CONT.	
Remarks:												

R-1 SHOPPING LIST - Item No. 95-25 of 95-25

Exhibit R-3, Project Cost Analysis
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