FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2003
Exhibit R-2

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support

COST: (Dollars in Thousands)

PROJECT NUMBER/ TITLE	FY 2002 ACTUAL	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	FY 2006 ESTIMATE	FY 2007 ESTIMATE	FY 2008 ESTIMATE	FY 2009 ESTIMATE
R2357 Maritime Battle Center	20,845	19,559	19,712	14,888	15,298	18,457	18,790	19,129
R2630 Navy Collaborative Integrated IT	1,345							
X0798 OTH Targeting	1,999	1,627	1,591	1,728	1,627	1,996	2,034	2,071
X2144 SEW Engineering	8,686	9,717	10,066	9,750	11,478	12,497	12,732	12,971
X9054 IT-21 Block 1 C4ISR Computing Equipment Upgrade	5,789	1,662						
Total	38,664	32,565	31,369	26,366	28,403	32,950	33,556	34,171

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This Program Element (PE) contains three projects: Maritime Battle Center (MBC), Over-the-Horizon Targeting (OTH-T), and Space and Electronic Warfare (SEW) Engineering. The projects are systems engineering non-acquisition programs with the objectives of developing, testing, and validating Naval Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) architectures to support naval missions in Joint and Coalition Theater. The mission of this PE is carried out by multiple tasks that are used to ensure Naval C4ISR Command and Control Warfare (C2W) components of SEW are effectively integrated into the C4ISR architectures. Additionally the program ensures that (1) the composite operational capabilities of SEW systems (not the individual component systems) conform to the Naval C4ISR architecture as related to the objectives of National Defense Strategy and evolving joint visions and direction, such as Joint Vision 2010 (JV 2010), "Copernicus…C4ISR for the 21st Century," "Forward…From the Sea," C4I For the Warrior, and the Defense Science Board Summer Study Task Force on Information Architecture for the Battlefield and are guided by CINC requirements; and (2) that SEW systems and systems integration effort involves leading-edge technology transfer of information processing technologies primarily through integration of government and commercial off-the-shelf (GOTS/COTS) products to enhance the Navy's operational capability, interoperability, flexible reconfiguration, as well as reduce costs and (3) that SEW systems integration efforts support Expeditionary C5 Grid (EC5G) to provide the foundation for FORCEnet and the Navy's contribution to the Global Information Grid. The MBC is a distributed organization focusing on experimentation concept development and analysis tasks are coordinated by the Navy Warfare Development Command. The MBC will also act as the Navy representative to the Joint Battle Center and the Battle Labs of other services.

FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2003
Exhibit R-2

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support

B. PROGRAM CHANGE SUMMARY:

	FY 2002	FY 2003	FY 2004	FY 2005
FY 2003 President's Budget Submission:	39,273	31,623	34,915	33,062
Adjustments from FY 2003 President's Budget:				
FY 2002 SBIR	-431			
Post-Production R&D Continuation			-4,010	-4,673
Non-S&T R&D Offsets			-3,254	-544
Cong. Rescissions/Adjustments/Undist. Reductions	-195	-405		
Execution Adjustment	17			
NWCF Adjustment			1	32
Efficiencies at NWCF Activities			-154	-165
Pay Raise/Inflation Adjustments		-353	-724	-568
NWDC Sea Warrior Increase			5,400	
Reduction in Investment in Navy			-788	-761
Contractor Support Services			-17	-17
Congressional Plus Up		1,700		
FY 2004/2005 President's Budget Submission:	38,664	32,565	31,369	26,366

PROGRAM CHANGE SUMMARY EXPLANATION:

Schedule: Not applicable
Technical: Not applicable

FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION DATE: February 2003
Exhibit R-2a

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N Project Number: R2357
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support Project Title: Maritime Battle Center

COST: (Dollars in Thousands)

PROJECT NUMBER/ TITLE	FY 2002 ACTUAL	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	FY 2006 ESTIMATE	FY 2007 ESTIMATE	FY 2008 ESTIMATE	FY 2009 ESTIMATE
R2357 Maritime Battle Center	20,845	19,559	19,712	14,888	15,298	18,457	18,790	19,129

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The mission of the Maritime Battle Center (MBC) is to execute the Naval Warfare Innovation Process. The process takes concepts developed by the Strategic Studies Group and approved by the Chief of Naval Operations into Fleet Battle Experiments; conducts preliminary sub-scale experiments and technological demonstrations focused on the advanced engineering and operational system development of systems related to all conflict levels of Littoral Battlespace. The MBC environment is a network centric environment that links the existing “core” Naval facilities to the Marine Corps Warfighting Lab (MCWL), the Joint Battle Center/Federated Battle Lab, and technologists in industry and academia. The MBC is essential to the evolution of combat capabilities since it is the engine for validating the new network centric warfare techniques in conjunction with the Sea Based Battle Laboratories (SBBL), Science & Technology (S&T) initiatives and other initiatives that originate with the operating forces. The MBC supports the early and sustained involvement of Joint Warfighters in refining the technology to meet the tactics, techniques, and procedures needed for 2010-2020 Littoral Battlespace. The MBC will have multiple roles since it is a crosscutting organization involved in several facets of concept, platform, weapons, weapon systems and Information Technologies (IT), Information System (IS) and Information Management (IM) systems development and integration. These include collaborative planning, operational experimentation planning and execution, technology transition/acquisition support, systems engineering and integration, technology assimilation and operational demonstrations.

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 02	FY 03	FY 04	FY 05
FBE Analysis and Core Support	20,845	19,559	19,712	14,888

FY 2002 ACCOMPLISHMENTS:

- Executed Fleet Battle Experiment Juliet (FBE J) in conjunction with U.S. Joint Forces Command's (JFCOM) Millennium Challenge 02 (MC02). Integrated efforts of the CINCLANTFLT CINCPACFLT (CLF)/(CPF) Naval Afloat Targeting Integrated Process Team, OPNAV's Mission Capability Packages, ONR’s Future Naval Capabilities and related issues from the USN-USAF Warfighter talks. Sponsored two Joint Initiatives: Joint Fires Initiative (JFI) and the Joint High Speed Vessel. JFI proved fundamental to MC02 Joint Time Critical Targeting concept of operations and was subsequently elevated by JFCOM to a "key" initiative, indicating the critical nature of the architecture to the success of MC02. JFI also incorporated the Naval Fires Network and spearheaded the rapid prototyping and Navy acquisition of this important developing system.

- The following Doctrine, Organization, Training, Material, Leadership, Personnel and Facilities (DOTMLPF) packages will be developed by NWDC after FBE J/MC02:
  - Joint Packages: Joint Fires Initiative and Joint High Speed Vessel
  - Navy Packages: Joint Force Maritime Component Commander (JFMCC) and Naval Fires Network
- Other NWDC post FBE J/MC02 Deliverables:
  - FBE J Quicklook Message, FBE J Final Report, Mine Warfare Concept of Operations (CONOPS) and Doctrine input, SSGN CONOPS, Joint C2 for Navy Theater Air and Missile Defense.
- Executed an extremely aggressive series of Limited Objective Experiments (LOEs) for the High Speed Vessel Project (HSV) that included Joint Venture (HSV X1), HMNS Skjold, a prototype Norweigan Navy littoral combatant, and Sea Slice a corporate, commercial experimentation vessel.
- Executed two Mine Warfare LOEs that integrated the High Speed Vessel with the Very Shallow Water Unmanned Underwater Vehicle

FY 2003 PLANS:

- FBE Kilo to be held in April/May 2003 with Commander Seventh Fleet in conjunction with Tandem Thrust 03. FBE Kilo will expand on FBE J and explore:
  - Naval Fires Network
  - Area Air Defense Commander Tools
  - Information Operations
  - Joint Fires
  - Undersea and Antisubmarine Warfare (USW/ASW)
- Executing the Sea Trial Process in support of Commander Fleet Forces Command.
- Lease extension of the High Speed Vessel to continue experimentation in the areas Joint Logistics Over-The-Shore Roll-on/Roll-off Discharge Facility (JLOTS/RRDF) compatibility operations, NEO/HA operations, underway replenishment, SEARAM, seakeeping, maneuvering trials, unmanned vehicle recovery, RMS launch and recovery, module concept testing.
- Modifications to the High Speed Vessel
- Participation in JFCOMs Pinnacle Impact 03

FY 2004 PLANS:

- Support Fleet Battle Experiment Lima.
- Participate in JFCOMs Pinnacle Vision 04
- Conduct Limited Objective Experiments

- Sea Warrior is the process of developing 21st century Sailors. It identifies the knowledge, skills, and abilities needed for mission accomplishment.

FY 2005 PLANS:

- Support Fleet Battle Experiment Mike.
- Continue the JFCOM experimentation events
- Continue the Limited Objective Experiments

C. OTHER PROGRAM FUNDING SUMMARY: Not applicable

D. ACQUISITION STRATEGY: Not applicable

FY 2004/2005 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: February 2003
Exhibit R-3

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N Project Number: R2357
PROGRAM ELEMENT TITLE:SEW Architecture/Eng Support Project Title: Maritime Battle Center

Exhibit R-3 Cost Analysis (page 1)										Date: FEBRUARY 2003		
APPROPRIATION/BUDGET ACTIVITY RDT&E,N			PROGRAM ELEMENT 0604707N							PROJECT NAME AND NUMBER Maritime Battle Center R2357		
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY-03 Cost	FY-03 Award Date	FY-04 Cost	FY-04 Award Date	FY-05 Cost	FY-05 Award Date	Cost To Complete	Total Cost	Target Value of Contract
System Test and Evaluation	Various	Various	65773	16000	Various	16000	Various	12000		CONT	CONT	CONT
Subtotal T&E			65773	16000		16000		12000		CONT	CONT	CONT
Remarks												
Program Management	Various	Various	14820	3559	Various	3712	Various	2888		CONT	CONT	CONT
Subtotal Management			14820	3559		3712		2888		CONT	CONT	CONT
Remarks												
Total Cost			80593	19559		19712		14888		CONT	CONT	CONT

FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2003
Exhibit R-2a

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N Project Number: X0798
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support Project Title: OTH Targeting

COST: (Dollars in Thousands)

PROJECT NUMBER/ TITLE	FY 2002 ACTUAL	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	FY 2006 ESTIMATE	FY 2007 ESTIMATE	FY 2008 ESTIMATE	FY 2009 ESTIMATE
X0798 OTH Targeting	1,999	1,627	1,591	1,728	1,627	1,996	2,034	2,071

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Over-the-Horizon Targeting (OTH-T) program provides a virtual, global systems integration and test facility for Information Technology for the 21st Century (IT-21) C4ISR technology that supports the collection, transmission, correlation, and display of track data into a Common Operational Picture (COP) in support of warfighting requirements. This effort was originally undertaken to support targeting of over-the-horizon weapons such as the TOMAHAWK cruise missile. The common view of the battle space that was provided to the war fighter by OTH-T has been applied across the spectrum of warfare missions; however, the technology and doctrine on which it was based has changed radically in recent years. The result is that the first goal of the OTH-T program is to transition the OTH-T architectures and systems from older Military Standard (MIL-STD) technologies to COTS (Commercial Off the Shelf) and GOTS (Government Off the Shelf) based technologies that support Network Centric Warfare and the Navy's plan to support JV 2020 implementing IT-21 technology. The second goal of the OTH-T program is to support integration and interoperability of all Command, Control, Communications, Computers and Intelligence (C4I) systems into warfighting capabilities. This support includes providing technical expertise afloat and ashore via a cadre of highly-trained Fleet Systems Engineers who ensure smooth integration of new capabilities to enhance OTH-T during major Fleet exercises and demonstrations which are used to validate and evaluate developed portions of configuration. The OTH-T program integration and testing in support of warfighting capabilities includes interoperability testing for both MIL-STD and IT-21 COTS equipment for submarines, surface, and land based components. Allied interoperability is an important issue for future naval operations, especially with the Navy initiative to expand Internet Protocol (IP) networking throughout the Fleet (IT-21 and Naval Intranet). Specific solutions do not exist to solve the IP connectivity issue with Allies. Funding will allow development of solutions for emerging Allied interoperability requirements. Data throughput will need to be increased for the exchange of large size files within the limitations of the high frequency (HF) medium in support of, for example, Collaboration at Sea (CAS). Funding will allow for further development of potential solutions for merging improved transmission control protocol/internet protocol (TCP/IP) capability with advance digital network systems (ADNS) and existing international standards (e.g.: STANAG 5066). Funding will also allow for development of subnet relay protocols and automatic link establishment standards, which will provide for a significant improvement within and between battlegroups.

FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2003
Exhibit R-2a

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N Project Number: X0798
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support Project Title: OTH Targeting

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 02	FY 03	FY 04	FY 05
BF E-MAIL	232	230	121	133

- Integrate code combination techniques developed during previous fiscal year into internationally agreed HF data profiles for significant improvement in guarantee of delivery of email attachments in poor propagation conditions associated with the HF medium. Exploit HF Full Duplex protocols and adaptive compression techniques to greatly improve data throughput. Beginning in FY03 convert primary transmission protocol to TCP/IP.

	FY 02	FY 03	FY 04	FY 05
Subnet Relay	262	255	121	133

- Exploit and coordinate subnet relay protocols and multi frequency band channels to provide greater data throughput in the HF and ultra high frequency (UHF) Line-of-Sight radio frequency (RF) mediums. Exploit HF Beyond-Line-of-Site and Extended-Line-of-Sight ground – and sky – waveforms to improve long range tactical communications. Adapt IP Quality of Service (QOS), Voice over IP (VoIP), and IP VTC (H.323) protocols to subnet relay communications.

	FY 02	FY 03	FY 04	FY 05
ALE Development	-	226	238	262

- Exploit Automatic Link Establishment (ALE) standard to support integration and interoperability of multi-level coalition forces to enhance OTH-T capabilities in a Network Centric Warfare environment. Adapt ALE toward future implementation as integral part of Joint Tactical Radio System (JTRS) for allied interoperability.

	FY 02	FY 03	FY 04	FY 05
ALE Issues	-	-	195	210

- Resolve Information Assurance (IA) issues generated by ALE development.

FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2003
Exhibit R-2a

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N Project Number: X0798
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support Project Title: OTH Targeting

	FY 02	FY 03	FY 04	FY 05
T&E Tools Development	146	-	-	-

- Based on results of integration testing, the OTH-T program developed capability functional description documents, which will be used by the programs of record to define system functional requirements that support these capabilities. Developed system interface standards where required. Provided a valid master configuration database in support of the new IT-21 Battle Group configurations in support of Sea Power 21's objectives.

	FY 02	FY 03	FY 04	FY 05
Systems Integration & Interoperability Testing (LBTN & SIE)	300	424	424	458

- Conduct systems integration and interoperability (Navy and Joint) testing, using the facilities of the Land Based Test Network (LBTN) and Systems Integration Environment (SIE). The Reconfigurable Land Based Test Sites (RLBTS) have been expanded to validate IT-21 technologies and architectures prior to shipboard installation in support of FORCENet. Develop test plans and execute integration tests for IT-21 networks to GCCS-M and for other C4ISR systems, participate in Distributed Engineering Plant (DEP) certification testing, by providing GCCS-M nodes and network infrastructure during the test and collecting track data. Provide the key C4ISR node to the DEP. Provide DEMO's, dry run, and briefings as required to visiting dignitaries, test agencies, program offices, etc. to describe interoperability efforts and certification requirements.

	FY 02	FY 03	FY 04	FY 05
Interoperability Validation	426	144	144	156

- In FY 2002, validated and verified the interoperability of architectures for new capabilities and supporting systems to the fleet. Made corrections and modified Repeatable Performance Evaluation Analysis Tool (REPEAT) software for use in interoperability testing, and distributed it to new and existing users to facilitate Navy and Joint interoperability testing.

- Beginning in FY 2003, will work with the fleet staffs and Naval Doctrine Command to develop policy and doctrine for operations of NVI in support of Network Centric Warfare ideology. Serve as technical expert in researching the fleet's technical questions and providing information. Conduct systems integration and interoperability testing using the facilities of the Land Based Test Network (LBTN) and Systems Integration Environment (SIE).

FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2003
Exhibit R-2a

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N Project Number: X0798
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support Project Title: OTH Targeting

	FY 02	FY 03	FY 04	FY 05
Joint Interoperability	394	-	-	-

- Ensured joint interoperability of systems on the NI by enforcing compliance with the Joint Technical Architecture, including Advanced Tomahawk Weapons Control System (ATWCS), Tactical Tomahawk Weapons Control System (TTWCS) and Global Command and Control System-Maritime (GCCS-M). Verified relevance, recommended modifications to, and maintained OTH-T specifications for support and distribution of the Common Operational Picture (COP)to Naval forces. The program's systems engineers input into the SPAWAR advanced technology division to insure critical deficiencies were high priority during investigation of IT-21 systems and architecture. Provided connectivity, conducted integration and interoperability testing, and provided systems engineering expertise for both IT-21 and MIL-STD technologies.

	FY 02	FY 03	FY 04	FY 05
Testing OTH-T Systems	239	348	348	376

- In FY 2002, performed integration and interoperability testing for OTH-T systems in accordance with OPNAV 9410.5A. Performed certification testing for systems undergoing configuration change, developmental testing and or operational testing in accordance with program requirements. Developed test plans and test procedures to perform such testing, record data, submit and track trouble reports and report on status to N62 as to disposition of certification status of OTH-T programs.

- Beginning in FY 2003, conduct integration testing and certification, in accordance with OPNAVINST 9410.5, of OTH-T and combat systems with tactical data exchanged over Common Operational Picture (COP) Synchronization Tools (CST) networks and other networks. These CST networks will operate within battle groups and to ashore nodes while other networks will continue to use Battle Group Database Management (BGDBM). Integration testing to include testing of GCCS-M and Combat Decision Systems (CDS) two-way interfaces. Testing to also address issues of Time Critical Strike for example TTWCS, FLEET essential capabilities and emerging mission essential needs both for new, legacy, and technology refreshed systems.

FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2003
Exhibit R-2a

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N Project Number: X0798
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support Project Title: OTH Targeting

C. OTHER PROGRAM FUNDING SUMMARY:

RELATED RDT&E:
SEW Architecture/Engineering Support program element is related to all Naval C4I related efforts.

D. ACQUISITION STRATEGY: Not applicable

FY 2004/2005 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: February 2003
Exhibit R-3

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N Project Number: X0798
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support Project Title: OTH Targeting

Exhibit R-3 Cost Analysis												Date: FEBRUARY 03
APPROPRIATION/BUDGET ACTIVITY RDT&E, N/4												PROGRAM ELEMENT 0604707N
			Contract Method & Type									PROJECT NAME AND NUMBER OTH Targeting X0798
Cost Categories	Various	Performing Activity & Location	Total PYs Cost	FY-03 Cost	FY-03 Award Date	FY-04 Cost	FY-04 Award Date	FY-05 Cost	FY-05 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various	Various	1468							Cont.	Cont.	Cont.
System Test and Evaluation	Various	Various	3648							Cont.	Cont.	Cont.
Systems Engineering	Various	Various	2047	711	Various	675	Various	738	Various	Cont.	Cont.	Cont.
Interoperability Requirements		Various	3266							Cont.	Cont.	Cont.
T & E Tools Development	Various	Various	429							Cont.	Cont.	Cont.
Systems Integration & Interoperability Testing (LBTN & SIE)	Various	Various	880	424	Various	424	Various	458	Various	Cont.	Cont.	Cont.
Interoperability Validation	Various	Various	1332	144	Various	144	Various	156	Various	Cont.	Cont.	Cont.
Joint Interoperability	Various	Various	1163							Cont.	Cont.	Cont.
Testing OTH-T Systems		Various	634	348	Various	348	Various	376	Various	Cont.	Cont.	Cont.
Subtotal T&E			14867	1627		1591		1728		Cont.	Cont.	Cont.
Remarks												
Subtotal Management												
Remarks												
Total Cost			14867	1627		1591		1728		Cont.	Cont.	Cont.

FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2003
Exhibit R-2a

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N Project Number: X2144
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support Project Title: SEW Engineering

COST: (Dollars in Thousands)

PROJECT NUMBER/ TITLE	FY 2002 ACTUAL	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	FY 2006 ESTIMATE	FY 2007 ESTIMATE	FY 2008 ESTIMATE	FY 2009 ESTIMATE
X2144 SEW Engineering	8,686	9,717	10,066	9,750	11,478	12,497	12,732	12,971

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Space and Electronic Warfare (SEW) Engineering is a non-acquisition engineering effort defined as the neutralization or destruction of enemy targets and the enhancement of friendly force battle management through integrated employment and exploitation of the electromagnetic spectrum and the medium of space. SEW Engineering encompasses efforts to ensure that 1) the composite operational capabilities of SEW systems (not the individual component systems) conform to the Naval C4ISR architecture as related to the National Defense Strategy and evolving joint visions and direction such as Joint Vision 2020, Joint Vision 2010, "Copernicus...C4ISR for the 21st Century," "Forward…From the Sea," C4I for the Warrior, and the Defense Science Board Summer Study Task Force Report on Information Architecture for the Battlefield, and are guided by CINC requirements; 2) the systems support emerging fleet requirements as documented and necessitated through concepts of Network Centric Warfare; 3) the SEW systems and systems integration effort involves leading edge technology transfer of information processing technologies primarily through integration of government and commercial off-the-shelf (GOTS/COTS) products to enhance the Navy's operational capability, interoperability, flexible reconfiguration, as well as reduce costs; and 4) systems integration efforts support Expeditionary C5 Grid (EC5G) to provide the foundation for FORCEnet and the Navy's contribution to the Global Information Grid. SEW Engineering also provides the Navy support in the demonstration and integration of C4I systems developed by the services and by commercial vendors as part of the annual Joint Warrior Interoperability Demonstration (JWID) sponsored by the Joint Chiefs of Staff as directed by CJCSI 6260.01A. Each JWID is designed to identify coalition interoperability deficiencies, and to solicit solutions to these deficiencies from commercial industry and military RDT&E agencies. JWID demonstrates these technologies and architecture improvements, conducts an assessment by the joint warfighters and develops operational procedures for use of these solutions. Service and allied participants benefit from the exposure and training on new and existing technologies, infrastructure improvements left behind from the demonstration, and the knowledge gained on joint and combined operations.

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 02	FY 03	FY 04	FY 05
JWID	2,480	2,558	1,759	1,979

- CJCSI 6260.01A directs all Services to provide funds to support Joint Warrior Interoperability Demonstrations (JWID). JWIDs integrate maturing system developments, military and commercial technologies that support enhanced operational capabilities in key CINC priority areas and Joint Mission Area (JMA) Assessment Thrust Areas with a combined force structure into the annual Joint Warrior Interoperability Demonstration (JWID). Beginning in FY 2003, JWID's advance technology introduction supports the goals and objectives of Joint Vision 2020, CINC priorities, and identifies relevant potential solutions for Allied C4I Interoperability and Coalition Operations.

	FY 02	FY 03	FY 04	FY 05
EC5G	2,879	4,678	3,927	4,220

- In FY 2002, developed architecture and supporting systems to tie together the unique C2 requirements of a battle force for a fully web enabled Network Centric operation that allowed the operators to take full advantage of the meta data available to them over sensor, weapon, and C4I information grids. Forward deployed forces fully netted with multiple air, sea, and undersea platforms created a huge base of information to be processed and analyzed. The Expeditionary C4 grid (EC4G) automated the infrastructure for forward deployed forces. Performed SEW systems integration efforts for the Expeditionary C5 Grid (EC5G) (the Navy's contribution to the Global Information Grid (GIG)) through the development, planning and execution of the EC5G Limited Objective Experiment (LOE). The LOE demonstrated/validated EC5G networking and communication capabilities to support all warfare missions (i.e. TAMD, TCS, USW, etc.) and support operations. The FY02 experimentation/demonstration was conducted in the lab. Specific experiment focus areas included integrating COTS and Science and Technology (S&T) to enhance communications capabilities via traffic prioritization, load distribution over multiple RF communications links (including a combination of space based and Line of Sight (LOS) links) and a world wide routing architecture.

- Beginning in FY 2003, demonstrate/validate EC5G networking and communication capabilities required to support all warfare missions (i.e. TAMD, TCS, USW, etc.) and support operations. Optimize experimentation, S&T, and acquisition to transform the tactical/operational network infrastructure for FORCEnet and Network-Centric Operations and provide the Navy's contribution to the Global Information Grid. Focus areas include Ashore Network Backbone Infrastructure, Wireless Line-of-Sight Networking, RF Connectivity and Throughput, TADILS Gateway, Composite Networking, Information Assurance, Automated Network Services, Aerial Communications Package, Allied/Coalition Interoperability. The FY03 demonstration/validation of EC5G networking and communication capabilities will occur via an operational Fleet Based experiment.

- Beginning in FY 2004, deploy an operational prototype of the EC5G networking and communication capabilities required to support all warfare missions (i.e. TAMD, TCS, USW, etc.) and support operations. Build upon the FY03 Fleet Based experiment and follow the model for Fleet Rapid Prototyping to accelerate delivery of Fleet capability. Continue to optimize experimentation, S&T, and acquisition to transform the tactical/operational network infrastructure for FORCEnet and Network-Centric Operations and provide the Navy's contribution to the Global Information Grid. The EC5G focus areas for the FY04 operational prototype include Ashore Network Backbone Infrastructure, Wireless Line-of-Sight Networking, RF Connectivity and Throughput, TADILS Gateway, Composite Networking, Information Assurance, Automated Network Services, Aerial Communications Package, and Allied/Coalition Interoperability.

- Beginning in FY 2005, insert capability enhancements into the operational prototype and continue to refine and mature the prototype while establishing and formalizing a sustainable transition path. Capability enhancements to the operational prototype will focus on the continued merging of stove pipe networks into a global networking and communications capability to support all warfare mission areas. Enhancements to the operational prototype should be made in the following EC5G focus areas: Ashore Network Backbone Infrastructure, Wireless Line-of-Sight Networking, RF Connectivity and Throughput, TADILS Gateway, Composite Networking, Information Assurance, Automated Network Services, Aerial Communications Package, and Allied/Coalition Interoperability.

	FY 02	FY 03	FY 04	FY 05
C4ISR-T Systems Design/Capabilities	433	303	381	426

- Perform C4ISR-T Systems Design effort across Battlegroups and new construction ships. Implement a C4ISR-T Systems Design effort that is comprised of Battlegroup engineering design activities for

FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2003
Exhibit R-2a

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N Project Number: X2144
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support Project Title: SEW Engineering

Battlegroup deployment and new ship construction, integration of C4ISR systems throughout the Battlegroup, systems interfacing, and high level design across Battlegroup activities (Configuration Management, integration with training, logistics, spares, safety and EMI).

	FY 02	FY 03	FY 04	FY 05
AC2WG	399	186	232	248

- Develop concept and evaluation alternatives to be explored as part of the CNO N6 Advanced Command & Control Wargame (AC2WG) series in order to further develop the operational concept and requirements for Battle Force C2. Provide technical guidance and roadmaps that link AC2WG concepts and Fleet Battle Experiments (FBE's) to evolving Naval C4ISR programs.

	FY 02	FY 03	FY 04	FY 05
C4ISR Architectural Development	1,198	553	1,108	817

- Enhance and refine the C4ISR Planned Systems Design and implementation of fleet systems. Continue to develop and validate a Naval C4ISR systems design environment to support the development and implementation of the Expeditionary C4 Grid to enable Network Centric Operations capabilities in support of Naval missions in a Joint and Coalition Theater. Architectural development consists of (1) assisting OPNAV, Navy Doctrine Command and Fleet Commanders in the development of battlegroup-wide and hull specific designs, (2) maintaining documentation describing the Systems Architectures/shipboard and ashore configurations; and (3) providing system architecture parameters, attributes, and characteristics necessary to ensure that program executives and managers acquire systems that achieve the desired operational objectives. Participate with the Joint Battle Center and Naval Battle Laboratories to verify and validate overall systems designs and detailed implementation designs. Accomplish the decomposition of the overarching POM C4ISR Systems Architecture, which involves breaking down the specifics of warfighter functions to lower levels of detail. From this, SPAWAR will develop functional design documents for Battle Groups/Amphibious Ready Groups, generic platform designs, and detailed designs for each platform. These developed documents, coupled with control measures, allow configuration management of installed designs. Sponsor and/or participate in related IPTs within the claimancy, and throughout the Navy and DoD as required. Participate in OSD and joint architectural working groups and panels. Define an end-to-end process model to document the C4ISR systems development process and relationships among the systems development components. Finally, generate and analyze a goal C4ISR integrated architecture that provides operational, system, and technical views for a notional Battle Group/Amphibious Ready Group in the future. The integrated architecture follows the guidance of applicable DoD and DoN policies i.e. Operational, Systems and

Technical Architectures as defined in the OSD DoD C4ISR Architecture Framework, Joint Technical Architecture, and Information Technology Standard Guidance. The goal architecture denotes integrated naval C4ISR system functionality that will help to guide future C4ISR system integration and interoperability. The Operational Architecture integrated architecture captures operational nodes, warfighter activities system functions, interoperability standards, information exchange requirements (IERs), and performance attributes associated with the IERs.

- In FY 2004, in addition to fleet experiments, OPEVAL and TECHEVAL are planned for large numbers of C4ISR systems below 2GHZ which will use the concepts and designs under this SEW effort, and will require additional research due to different procurement methods such as the spiral development model, to adequately reflect changes in technology and implementation of C4ISR with follow up evaluations in FY 2005.

	FY 02	FY 03	FY 04	FY 05
C4ISR Operational Requirements	532	330	434	462

- Augment/update/maintain the Overarching C4ISR Operational Requirements documentation. The composite operational capabilities of C4ISR systems must be designed so that they conform to the Naval C4ISR architecture as it relates to the National Defense Strategy and evolving joint visions and direction, such as Joint Vision 2020, Joint Vision 2010, "Copernicus...C4ISR for the 21st Century," "Forward…From the Sea", C4I for the Warrior and are guided by CINC requirements. As operational requirements change, either through changes in mission, technological change, technical insertion into systems, or through systems integration efforts, these changes must be reflected in all applicable requirements documents. Support related C4ISR projects as they define and maintain Theater and Battleforce C4ISR architectures. Integrate future Naval C4ISR capabilities within migration plans and roadmaps linked to operational requirements documentation. Assist OPNAV in REQ/BAM support for the development of warfighter C4ISR requirements. These requirements are defined by both OPNAV and the Fleet. The products include the support for requisite Baseline Assessment Memoranda, Copernicus Requirements Working Group statements of Fleet requirements, the generation of a SMIDB or like requirements functional traceability matrix from the Fleet based on requirements documents (ORDs, MNS, etc.) and IWARS inputs.

	FY 02	FY 03	FY 04	FY 05
BF Network	765	412	1,402	994

- Develop architecture for establishing a BF network using LOS C4ISR systems for surface and air

platforms that interface with organic shore elements and assess this LOS and the band and bandwidth requirements as well as the meta data requirements for this system. Beginning in FY 2003, include the network interoperability strategy to ensure this concept is integrated and not a stand alone. Update architecture and technology product initiatives to tie together the unique BFC2 requirements of a battle force for a fully web enabled Network Centric operation that will allow the operators to take full advantage of the meta data available to them over sensor, weapon, and C4I information grids. Forward deployed forces, fully netted with multiple air, sea, and undersea platforms, will create a huge base of information to be processed and analyzed. The Expeditionary C5 grid (EC5G) will automate the infrastructure for forward deployed forces. The tie in from intra ship networking concepts and shore infrastructure will also be developed into the BFC2 architecture.

- Beginning in FY 2004, in addition to fleet experiments OPEVAL and TECHEVAL are planned for large numbers of C4ISR systems below 2GHZ using concepts and designs resulting from this SEW effort. Due to different procurement methods such as the spiral development model, additional research is required to adequately reflect changes in technology and implementation of C4ISR. Follow up evaluations will occur in FY 2005.

	FY 02	FY 03	FY 04	FY 05
BF Architecture/Engineering	-	697	823	604

- Develop technology processes and products to tie together the unique C2 requirements of a battle force for a fully web enabled Network Centric operation that will allow the operators to take full advantage of the meta data available to them over sensor, weapon, and C4I information grids. Forward deployed forces, fully netted with multiple air, sea, and undersea platforms, will create a huge base of information to be processed and analyzed. Develop architecture and engineering concepts related inter battle group networking for C4ISR systems that interface with organic shore elements and assess meta data requirements for this system. Include the network interoperability strategy to ensure this concept is integrated and not a stand alone.

- In FY 2004, in addition to fleet experiments, OPEVAL and TECHEVAL are planned for large numbers of C4ISR systems below 2GHZ using the concepts and designs resulting from this SEW effort. Due to different procurement methods such as spiral development, additional research is required to adequately reflect changes in technology and implementation of C4ISR.

FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2003
Exhibit R-2a

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N Project Number: X2144
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support Project Title: SEW Engineering

C. OTHER PROGRAM FUNDING SUMMARY: Not applicable

D. ACQUISITION STRATEGY: Not applicable

FY 2004/2005 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: February 2003
Exhibit R-3

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N Project Number: X2144
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support Project Title: SEW Engineering

Exhibit R-3 Cost Analysis (page 1)										Date: FEBRUARY 2003		
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/4										PROGRAM ELEMENT 0604707N		
Cost Categories	Contract Method & Type									PROJECT NAME AND NUMBER SEW Engineering X2144		
		Performing Activity & Location	Total PYs Cost	FY-03 Cost	FY-03 Award Date	FY-04 Cost	FY-04 Award Date	FY-05 Cost	FY-05 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal Product Development												
Remarks:												
SEW/C4I Technology Integration	Various	Various	4554							0	4554	4554
Systems A&E and Validation	Various	Various	12985							0	12985	12985
C4ISR/C4ISR-T Systems Design/Capabilities*	Various	Various	13188	1965	Various	3714	Various	2841	Various	Cont.	Cont.	Cont.
C4ISR Operational Requirements	Various	Various	4984	330	Various	434	Various	462	Various	Cont.	Cont.	Cont.
AC2WG	Various	Various	1187	186	Various	232	Various	248	Various	Cont.	Cont.	Cont.
Information Repository/Naval Architecture Database	Various	Various	4544							0	4544	4544
Navy Collaborative Int	Various	Various	4000							0	4000	4000
Subtotal Support			45442	2481		4380		3551		Cont.	Cont.	Cont.
Remarks:												

FY 2004/2005 RDT&E,N PROGRAM ELEMENT/PROJECT COST BREAKDOWN DATE: February 2003
Exhibit R-3

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N Project Number: X2144
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support Project Title: SEW Engineering

Exhibit R-3 Cost Analysis (page 2)										Date: FEBRUARY 2003		
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/4										PROGRAM ELEMENT 0604707N		
Cost Categories			Contract Method & Type							PROJECT NAME AND NUMBER SEW Engineering X2144		
		Performing Activity & Location	Total PYs Cost	FY-03 Cost	FY-03 Award Date	FY-04 Cost	FY-04 Award Date	FY-05 Cost	FY-05 Award Date	Cost To Complete	Total Cost	Target Value of Contract
SEW Engr/JWID	Various	Various	12889	2558	Various	1759	Various	1979	Various	Cont.	Cont.	Cont.
SEW Engr/EC5G	Various	Various		4678	Various	3927	Various	4220	Various	Cont.	Cont.	Cont.
Subtotal T&E	Various	Various	12889	7236		5686		6199		Cont.	Cont.	Cont.
Remarks												
Subtotal Management												
Total Cost			58331	9717		10066		9750		Cont.	Cont.	Cont.

FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2003
Exhibit R-2a

BUDGET ACTIVITY: 4 PROGRAM ELEMENT: 0604707N Project Number: Various
PROGRAM ELEMENT TITLE: SEW Architecture/Eng Support Project Title: Congressional Plus-Ups

Congressional Plus-Ups:

R2630	FY 02	FY 03
Navy Collaborative Integrated Information Technology	1,345	N/A

Supports the Navy's effort at creating an initiative for integrating Information Technology (IT).

X9054	FY 02	FY 03
IT-21 Block 1 C4ISR Computing Equipment Upgrade	5,789	1,662

Information Technology for the 21st Century Block 1 C4ISR Computing Equipment (IT-21 BLK 1) is developmental engineering effort that will add functionality and focus on improving supportability of deployed systems that reduces fleet maintenance and training requirements.

EXHIBIT R4, Schedule Profile			DATE:
Not Applicable			**February 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
1319/BA 4	0604707N - SEW Architecture/Eng Support	R2357 - Maritime Battle Center	

Fiscal Year	2002				2003				2004				2005				2006				2007				2008				2009			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
C																																
C																																

R-1 Line Item No. 87

* Not required for Budget Activities 1, 2, 3, and 6

Exhibit R-4a, Schedule Detail **Not applicable**					DATE: **February 2003**			
APPROPRIATION/BUDGET ACTIVITY **1319/BA 4**	PROGRAM ELEMENT 0604707N				PROJECT NUMBER AND NAME R2357 - Maritime Battle Center			
Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008

R-4a Schedule Profile - Item No. 87

EXHIBIT R4, Schedule Profile			DATE:
Not Applicable			**February 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
1319/BA 4	0604707N - SEW Architecture/Eng Support	R2630 - Adv Comm & Info	

Fiscal Year	2002				2003				2004				2005				2006				2007				2008				2009			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
C																																
C																																

R-1 Line Item No. 87

* Not required for Budget Activities 1, 2, 3, and 6

Exhibit R-4a, Schedule Detail **Not applicable**					DATE: **February 2003**			
APPROPRIATION/BUDGET ACTIVITY **1319/BA 4**	PROGRAM ELEMENT 0604707N				PROJECT NUMBER AND NAME R2630 - Adv Comm & Info			
Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008

R-4a Schedule Profile - Item No. 87

EXHIBIT R4, Schedule Profile			DATE:
Not Applicable			**February 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
1319/BA 4	0604707N - SEW Architecture/Eng Support	X0798 - OTH Targeting	

Fiscal Year	2002				2003				2004				2005				2006				2007				2008				2009			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
C																																
C																																

R-1 Line Item No. 87

* Not required for Budget Activities 1, 2, 3, and 6

Exhibit R-4a, Schedule Detail **Not applicable**					DATE: **February 2003**			
APPROPRIATION/BUDGET ACTIVITY **1319/BA 4**	PROGRAM ELEMENT 0604707N				PROJECT NUMBER AND NAME X0798 - OTH Targeting			
Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008

R-4a Schedule Profile - Item No. 87

EXHIBIT R4, Schedule Profile			DATE:
Not Applicable			**February 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
1319/BA 4	0604707N - SEW Architecture/Eng Support	X2144 - SEW Engineering	

Fiscal Year	2002				2003				2004				2005				2006				2007				2008				2009			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
C																																
C																																

R-1 Line Item No. 87

* Not required for Budget Activities 1, 2, 3, and 6

Exhibit R-4a, Schedule Detail **Not applicable**					DATE: **February 2003**			
APPROPRIATION/BUDGET ACTIVITY **1319/BA 4**	PROGRAM ELEMENT 0604707N				PROJECT NUMBER AND NAME X2144 - SEW Engineering			
Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008

R-4a Schedule Profile - Item No. 87

EXHIBIT R4, Schedule Profile			DATE:
Not Applicable			**February 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME	
1319/BA 4	0604707N - SEW Architecture/Eng Support	X9054 - IT-21 BLOCK 1 C4ISR Computing Equipment Upgrade	

Fiscal Year	2002				2003				2004				2005				2006				2007				2008				2009			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
C																																
C																																

R-1 Line Item No. 87

* Not required for Budget Activities 1, 2, 3, and 6

Exhibit R-4a, Schedule Detail **Not applicable**					DATE: **February 2003**			
APPROPRIATION/BUDGET ACTIVITY **1319/BA 4**	PROGRAM ELEMENT 0604707N			PROJECT NUMBER AND NAME X9054 - IT-21 BLOCK 1 C4ISR Computing Equipment Upgrade				
Schedule Profile	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008

R-4a Schedule Profile - Item No. 87