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

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N
PROGRAM ELEMENT TITLE: Industrial Preparedness

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
R1050 Manufacturing Technology	67,925	68,928	54,593	56,810	58,055	58,258	59,494	60,764
R2674 Manufacturing Technology	2,401	4,392						
Total	70,326	73,320	54,593	56,810	58,055	58,258	59,494	60,764

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Manufacturing Technology (MANTECH) Program is intended to improve the productivity and responsiveness of the U.S. defense industrial base by funding the development of manufacturing technologies. The MANTECH program, by providing seed funding for the development of moderate to high risk process and equipment technology, permits contractors to upgrade their manufacturing capabilities. Ultimately, the program aims to produce high-quality weapon systems with shorter lead times and reduced acquisition costs. Major areas of endeavor both underway and planned include: advanced manufacturing technology for electronics assembly, laser metalworking, flexible computer manufacturing, composites, metal working and welding technology. The MANTECH program is being integrated into the Seapower 21 and Joint Warfare Operational Capability process and will utilize the results of these initiatives as appropriate in the program planning process. The MANTECH program is aimed at achieving affordability in the acquisition of weapons systems by inserting manufacturing process solutions early into the design phase to reduce lifecycle costs, improve schedules and ensure quality.

B. PROGRAM CHANGE SUMMARY:

	FY 2002	FY 2003	FY 2004	FY 2005
FY 2003 President's Submission:	72,459	70,631	71,732	73,870
Adjustments from FY 2003 President’s Budget:				
Congressional Plus-Ups		4,500		
Cong. Rescissions/Adjustments/Undist.Reductions	-350	-859		
SBIR Adjustment	-1,783			
Inflation Adjustment		-952	-1,261	-1,225
NWCF Rate Adjustment			-11	-4
Efficiencies at ONR/NWCF Activities			-1,135	-1,161
Program Adjustment			-14,732	-14,670

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

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N
PROGRAM ELEMENT TITLE: Industrial Preparedness

FY 2004/2005 President's Budget Submission:	70,326	73,320	54,593	56,810

PROGRAM CHANGE SUMMARY EXPLANATION:

Schedule: Not applicable
Technical: Not applicable

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

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N Project Number: R1050
PROGRAM ELEMENT TITLE: Industrial Preparedness Project Title: Manufacturing Technology

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
R1050 Manufacturing Technology	67,925	68,928	54,593	56,810	58,055	58,258	59,494	60,764

MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Manufacturing Technology (MANTECH) Project is intended to improve the productivity and responsiveness of the U.S. defense industrial base by funding the development of manufacturing technologies. The MANTECH project, by providing seed funding for the development of moderate to high risk process and equipment technology, permits contractors to upgrade their manufacturing capabilities. Ultimately, the project aims to produce high-quality weapon systems with shorter lead times and reduced acquisition costs. Major areas of endeavor both underway and planned include: advanced manufacturing technology for electronics assembly, laser metalworking, flexible computer manufacturing, composites, metal working and welding technology. The MANTECH project is being integrated into the Seapower 21 and Joint Warfare Operational Capability process and will utilize the results of these initiatives as appropriate in the program planning process. The MANTECH project is aimed at achieving affordability in the acquisition of weapons systems by inserting manufacturing process solutions early into the design phase to reduce lifecycle costs, improve schedules and ensure quality.

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 02	FY 03	FY 04	FY 05
Composites Processing and Fabrication	6,000	6,000	6,000	6,000

Composites Processing and Fabrication: The primary technical goal of the Composites Processing and Fabrication activity is to maximize weapon system effectiveness through the increased utilization of composite materials and structures by reducing acquisition as well as life cycle costs, improving reliability and demonstrating performance improvements. This will be achieved through the development and maturation of affordable, robust manufacturing and assembly processes for composite structures.

FY 2002 ACCOMPLISHMENTS:

- Initiated: Manufacturing Technology for Silicon Carbide Flaps and Seals; Propulsion Shaft Composite Surface Treatment; Advanced Amphibious Assault Vehicle (AAAV) Troop Ramp.

- Continued: Composite Pressure Vessel Fabrication, Composite Gantry/Trolley Type Structures; Automation of Z-Fiber for Complex Shape; Teaching Factory Outreach; Rapid Responses.

FY 2003 PLANS:

- Continue: Composite Pressure Vessel Fabrication, Composite Gantry/Trolley Type Structures; Automation of Z-Fiber for Complex Shape; Teaching Factory Outreach; Rapid Responses; Manufacturing Technology for Silicon Carbide Flaps and Seals; Propulsion Shaft Composite Surface Treatment.

FY 2004 PLANS:

The Navy is executing a new Naval Product Investment Strategy focusing on a few major ACAT I programs. The acquisition commands are in the process of roadmapping to those ACAT programs. Final decisions on critical manufacturing issues will not be made until mid-FY03.

- Continue: Teaching Factory Outreach; Rapid Responses; Manufacturing Technology for Silicon Carbide Flaps and Seals; Propulsion Shaft Composite Surface Treatment.
- Complete: Composite Pressure Vessel Fabrication, Composite Gantry/Trolley Type Structures; Automation of Z-Fiber for Complex Shape; AAAV Troop Ramp.

FY 2005 PLANS:

- Initiate: New Manufacturing Processes supporting Unmanned Combat Air Vehicle (UCAV)-Navy, F/A-18, the new EA-18G.
- Continue: Teaching Factory Outreach; Rapid Responses.
- Complete: Manufacturing Technology for Silicon Carbide Flaps and Seals; Propulsion Shaft Composite Surface Treatment.

	FY 02	FY 03	FY 04	FY 05
Metals Processing and Fabrication	19,000	19,000	19,000	19,000

Metals Processing and Fabrication: The objective of the Metals Processing and Fabrication activity is to develop affordable, robust manufacturing processes and capabilities for metals and special materials critical to defense weapon system applications. Major areas that support this objective include: processing methods, special materials, joining, and inspection and compliance. Thrust area projects directly impact the cost and performance of future aircraft, rotorcraft, land combat vehicles, surface and subsurface naval platforms, space systems, artillery and ammunition, and defense industry manufacturing equipment.

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

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N Project Number: R1050
PROGRAM ELEMENT TITLE: Industrial Preparedness Project Title: Manufacturing Technology

FY 2002 ACCOMPLISHMENTS:

- Initiated: High Strength Marine Grade Fasteners Extended Development; Advanced Thermal Battery Production; Distortion and Accuracy Control.
- Continued: Aluminum Alloy 2519 Material Evaluation for AAAV; Single-Melt Process for Reduced-Cost Aluminum Alloys for LW-155 Howitzer; Low Cost Fabrication of AAAV Components; AAAV Distortion; Enhanced Processing for High Strength Steel Castings and Forgings for Naval Components (CVN); Lead Magnesium Niobiate Electrorestrictive Transduction Material Manufacturing; Rhenium Fabrication Processing for Standard Missile; Optimized Flow formed Steel Cartridge Casings; Propulsor Affordability Initiative; Automated Paint Application Containment and Treatment System Process Development; Titanium Howitzer; Mechanized Welding; Hybrid Welding of Ship Structures; Titanium Welding; Knowledge Based Ultrasonic Testing of Welds; Weld Fume Manufacturing.
- Completed: High Temperature Lightweight Radial Manifold; Verification of Advanced Welding Consumables; Thin Wall Superalloy Structural Casting Technology; Titanium Metal Matrix Fabrication Technology.

FY 2003 PLANS:

- Continue: High Strength Marine Grade Fasteners Extended Development; Advanced Thermal Battery Production; Distortion and Accuracy Control; Single-Melt Process for Reduced-Cost Aluminum Alloys for LW-155 Howitzer; Propulsor Affordability Initiative; Automated Paint Application Containment and Treatment System Process Development.
- Complete: Mechanized Welding; Hybrid Welding of Ship Structures; Titanium Welding; Low Cost Fabrication of AAAV Components; AAAV Distortion; Knowledge Based Ultrasonic Testing of Welds; Weld Fume Manufacturing; Aluminum Alloy 2519 Material Evaluation for AAAV; Enhanced Processing for High Strength Steel Castings and Forgings for Naval Components (CVN); Lead Magnesium Niobiate Electrorestrictive Transduction Material Manufacturing; Rhenium Fabrication Processing for Standard Missile; Titanium Howitzer.

FY 2004 PLANS:

The Navy is executing a new Naval Product Investment Strategy focusing on a few major ACAT I programs. The acquisition commands are in the process of roadmapping to those ACAT programs. Final decisions on critical manufacturing issues will not be made until mid-FY03.

- Initiate: New manufacturing process improvements for the new attack submarine, DD-X, CVN, and LPD-17.

- Continue: Propulsor Affordability Initiative; Single-Melt Process for Reduced-Cost Aluminum Alloys for LW-155 Howitzer; High Strength Marine Grade Fasteners Extended Development; Advanced Thermal Battery Production; Distortion and Accuracy Control.
- Complete: Automated Paint Application Containment and Treatment System Process Development.

FY 2005 PLANS:

- Continue: Manufacturing process improvements for the new attack submarine, DD-X, CVN, and LPD-17.
- Complete: Propulsor Affordability Initiative; and Accuracy Control; Single-Melt Process for Reduced-Cost Aluminum Alloys for LW-155 Howitzer; High Strength Marine Grade Fasteners Extended Development; Advanced Thermal Battery Production; Distortion and Accuracy Control.

	FY 02	FY 03	FY 04	FY 05
Electronics Processing and Fabrication	10,500	10,000	10,000	10,000

Electronics Processing and Fabrication: Electronics Processing and Fabrication efforts develop and deploy affordable, robust manufacturing processes and capabilities for electronics critical to defense applications over their full life cycle. Efforts create new and improved manufacturing processes on the shop floor, as well as to repair and maintenance facilities such as depots and logistics centers, with a strong emphasis on process maturation.

FY 2002 ACCOMPLISHMENTS:

- Initiated: LINK-16 Low Cost Terminal; Monolithic Miniature Integrated Circuit (MMIC) Flip Chip Attach Production Processing.
- Continued: Teaching Factory Outreach, Rapid Response; Infrared Focal Plane Array Manufacturing; Affordable Diode Array Manufacturing; Fiber Optic Electrical Splice.
- Completed: Affordable Microwave Packaging System; Electronics Miniaturization for Missiles; Manufacturing Automation of Monolithic Ring Laser Gyros; Remote Source Lighting Femtosecond Laser; Torpedo Communications Tether; Fiber Optic Interconnect Technology; Sapphire Dome Strengthening.

FY 2003 PLANS:

- Continue: LINK-16 Low Cost Terminal; MMIC Flip Chip Attach Production Processing; Teaching Factory Outreach, Rapid Response; Infrared Focal Plane Array Manufacturing.
- Complete: Affordable Diode Array Manufacturing; Fiber Optic Electrical Splice.

FY 2004 PLANS:

FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2003
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BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N Project Number: R1050
PROGRAM ELEMENT TITLE: Industrial Preparedness Project Title: Manufacturing Technology

The Navy is executing a new Naval Product Investment Strategy focusing on a few major ACAT I programs. The acquisition commands are in the process of roadmapping to those ACAT programs. Final decisions on critical manufacturing issues will not be made until mid-FY03.

- Initiate: New efforts in Wide Band Gap Materials that support ship platforms.
- Continue: LINK-16 Low Cost Terminal; MMIC Flip Chip Attach Production Processing; Teaching Factory Outreach, Rapid Response; Infrared Focal Plane Array Manufacturing.

FY 2005 PLANS:

- Initiate: Manufacturing Process Improvement work for the new EA-18G.
- Continue: LINK-16 Low Cost Terminal; MMIC Flip Chip Attach Production Processing; Teaching Factory Outreach, Rapid Response; Wide Band Gap Materials project.
- Complete: Infrared Focal Plane Array Manufacturing.

	FY 02	FY 03	FY 04	FY 05
Advanced Manufacturing Enterprise	5,500	5,500	5,500	5,500

Advanced Processing and Fabrication (AME): AME is focused on accelerating defense industrial enterprise progress toward implementation of world-class industrial practices as well as advanced design and information systems that support weapon system development, production and sustainment. Key emphasis areas include: 1) benchmarking and accelerating the implementation of world-class industrial practices; 2) demonstrating and validating advanced business practices and information technologies capable of streamlining management functions in all industrial base tiers; and 3) leveraging information technologies in pursuit of tighter coupling of all defense industrial enterprise elements. AME efforts create improvements to cost and cycle time for weapon system development, production and repair.

FY 2002 ACCOMPLISHMENTS:

- Continued: Best Manufacturing Practices Surveys; Port Security Homeland Security efforts; Shipbuilding and Simulation Based Design; Maritime Environmental Information Center; Ship Propeller Thrust and Torque Measurement; Fiber-Bragg Optical Damage Control System; Continuous Improvement of Dry-Docking Management; Adaptation of Commercial Structural Criteria to Military Needs; Development of Erection Beam Fabrication Tools; Occupational Safety and Health Administration (OSHA) Compliance Management System; Development of High Strength Corrosion Resistant Aluminum Alloys for Maritime Applications; Quality Assurance of Reliability Data in the 3-M Database of the U.S. Navy; Ships Works Robotic Laboratory; Light Distance and Ranging Technology for Shipyards; Modeling Residual Stress in Steel Plates.
- Completed: Reduced Copper, Long Life Anti-Fouling Coatings through Microencapsulation; Waterjet, Inlet, Nozzle and Hull Integration; Limitation of Reduced Crew Performance in Various Sea States; Shipboard Learning of Diesel Engine Operating Characteristics; Active Control of Planing Hull Motions; Development of

Erection Beam Fabrication Tools; Simulation Based Workload Planning and Shipyard Scheduling; Load and Resistance Factor Design Rules as Performance-Based Design Criteria for Surface Ships.

FY 2003 PLANS:

- Continue: Best Manufacturing Practices Surveys; Port Security Homeland Security efforts; Shipbuilding and Simulation Based Design; OSHA Compliance Management System; Development of High Strength Corrosion Resistant Aluminum Alloys for Maritime Applications; Continuous Improvement for Drydock Management.
- Complete: Maritime Environmental Information Center; Ship Propeller Thrust and Torque Measurement; Fiber-Bragg Optical Damage Control System; Quality Assurance of Reliability Data in the 3-M Database of the U.S. Navy; Ships Works Robotic Laboratory; Light Distance and Ranging Technology for Shipyards; Modeling Residual Stress in Steel Plates.

FY 2004 PLANS:

The Navy is executing a new Naval Product Investment Strategy focusing on a few major ACAT I programs. The acquisition commands are in the process of roadmapping to those ACAT programs. Final decisions on critical manufacturing issues will not be made until mid-FY03.

- Continue: Best Manufacturing Practices Surveys; Port Security Homeland Security efforts; Shipbuilding and Simulation Based Design.
- Complete: OSHA Compliance Management System; Development of High Strength Corrosion Resistant Aluminum Alloys for Maritime Applications; Continuous Improvement for Drydock Management.

FY 2005 PLANS:

- Initiate: Manufacturing technology process changes for the DD-X, CVX, LPD-17.
- Continue: Best Manufacturing Practices Surveys; Port Security Homeland Security efforts; Shipbuilding and Simulation Based Design

	FY 02	FY 03	FY 04	FY 05
Other (Repair Tech, Program Initiatives)	26,925	28,428	14,093	16,310

The “Other” activity includes repair technology and those manufacturing efforts that are competed and executed by the Navy’s Centers of Excellence, including DD-X, LPD-17, Unmanned Combat Air Vehicle-Navy, Shipbuilding Initiative, Wide Band Gap Initiatives, and technical engineering support.

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

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N Project Number: R1050
PROGRAM ELEMENT TITLE: Industrial Preparedness Project Title: Manufacturing Technology

FY 2002 ACCOMPLISHMENTS:

- Initiated: Navy International Cooperative Program for Shipbuilding Process Simulation; Wide Band Gap Materials Technology project; Composites Affordability Initiative Phase II – Integrated and Bonded Structures Validation; Alternative Manufacture of Energetic Materials; Vertical Launch System (VLS) Tube Repair; Hazardous Material (HAZMAT) Analyzers for Rapid On-Site Analysis; Composites Manufacturing Technology for Low Cost Submarine Cover Plates; Overspray Elimination through Development of High Transfer Efficiency Painting Technologies; Cluster Based Manufacturing Through Integrated Product and Process Simulation.
- Continued: Pathways for Continuous Improvement, Supply Chain Integration Microelectromechanical Systems for Inertial Measurement Units; Dimensional and Accuracy Control; Collarless Construction; Large Marine Composite-to-Steel Adhesive Joints; Computer Numerically Controlled (CNC) Thermal Plate Forming; Low Cost, Improved Quality CL-20 Material, Co Layered Propellant Manufacturing; Low Cost, Reliable Packaging and Integration of Miniaturized Explosive Components; Amphibious Assault Vehicle (AAV) Enhanced Applique Armor Kit Product Improvement; Evaluation and Repair of Lightweight Armor Vehicle (LAV) Armor; Heavy Equipment Repair; Steering Block Repair; Surface Preparation Improvement; Smart Sensors/Actuators; Technical Engineering Support.
- Completed: Aircraft Carrier Arresting Gear Poured Cable End Sockets; ND-YAG Catapult Trough Covers; Effective Coatings Removal from Ships.

FY 2003 PLANS:

- Continue: Navy International Cooperative Program for Shipbuilding Process Simulation; Wide Band Gap Materials Technology project; Composites Affordability Initiative Phase II – Integrated and Bonded Structures Validation; Pathways for Continuous Improvement, Supply Chain Integration Microelectromechanical Systems for Inertial Measurement Units; Technical Engineering Support.
- Complete: Collarless Construction; CNC Thermal Plate Forming; AAV Enhanced Applique Armor Kit Product Improvement; Evaluation and Repair of LAV Armor; Heavy Equipment Repair; Steering Block Repair; Surface Preparation Improvement; Smart Sensors/Actuators; Low Cost, Reliable Packaging and Integration of Miniaturized Explosive Components; Low Cost, Improved Quality CL-20 Material, Co Layered Propellant Manufacturing; Dimensional and Accuracy Control; Large Marine Composite-to-Steel Adhesive Joints.

FY 2004 PLANS:

The Navy is executing a new Naval Product Investment Strategy focusing on a few major ACAT I programs. The acquisition commands are in the process of roadmapping to those ACAT programs. Final decisions on critical manufacturing issues will not be made until mid-FY03.

- Initiate: Manufacturing Process Improvements supporting DD-X, CVN-X, LPD-17

FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2003
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BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N Project Number: R1050
PROGRAM ELEMENT TITLE: Industrial Preparedness Project Title: Manufacturing Technology

- Continue: Composites Affordability Initiative Phase II – Integrated and Bonded Structures Validation; Pathways for Continuous Improvement, Supply Chain Integration; Microelectromechanical Systems for Inertial Measurement Units; Technical Engineering Support.

FY 2005 PLANS:

- Continue: Composites Affordability Initiative Phase II – Integrated and Bonded Structures Validation; Pathways for Continuous Improvement, Supply Chain Integration; Manufacturing Process Improvements supporting DD-X, CVN-X, LPD-17; Technical Engineering Support.
- Complete: Microelectromechanical Systems for Inertial Measurement Units.

C. OTHER PROGRAM FUNDING SUMMARY:

NAVY RELATED RDT&E:
Major Acquisition programs, such as: DD-X, LPD-17, V-22, AAAV, F/A-18, and CVN.

NON-NAVY RELATED RDT&E:
PE 0708011F Industrial Preparedness
PE 0708045A End Item Industrial Preparedness Activities
PE 0708011A Industrial Preparedness

D. ACQUISITION STRATEGY: Not applicable.

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

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N Project Number: R2674
PROGRAM ELEMENT TITLE: Industrial Preparedness Project Title: Manufacturing Technology

Congressional Plus-Ups:

R2674	FY 02	FY 03
Manufacturing Technology	2,401	4,392

FY 2002: Funding was distributed to five Centers of Excellence to complete projects in the FY03 portfolio.
FY 2003: Funding will be used to support transformation topics in coordination with ASN (RDA), and initiate a pilot program in manufacturing to support the Naval Research Enterprise.

FY 2004/2005 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: February 2003
Exhibit R-3

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0708011N Project Number: R1050
PROGRAM ELEMENT TITLE: Industrial Preparedness Project Title: Manufacturing Technology

A. (U) PROJECT COST BREAKDOWN: ($ in thousands)

Project Cost Categories	FY 2002	FY 2003	FY 2004	FY 2005
a. Process Development	62,425	63,428	50,293	52,310
b. Program Management Support	5,500	5,500	4,300	4,500
Total	67,925	68,928	54,593	56,810