We Deliver....

- Technology solutions
- Strategic partnerships
- Access to funding sources
- Neutrality
- Program management expertise
- Business practice solutions
- Knowledge capture & e-learning solutions
- Networking opportunities

Who we are- a full complement of program support capabilities

- Program Management
- Finance and Accounting
- Contract Administration
- Legal
- Communications & Public Relations
- Management Information Systems
- Electronic Collaboration

NCMS Program Areas

- Government Partnerships
  - Commercial Technologies for Maintenance Activities (CTMA)
  - Environmental projects with EPA
  - R&D Joint Ventures through NIST ATP
- Manufacturing Trust
- Knowledge Solutions Division

Commercial Technologies for Maintenance Activities (CTMA)

- Identify, form, launch and deploy new projects coupling the needs and strengths of commercial industry with the DoD's maintenance, repair and remanufacturing facilities
- Focus on reducing overall costs and increasing readiness
- Cooperative Agreement between NCMS and the Office of the Secretary of Defense
- DoD-industry co-funding on a 2:1 match basis
- http://ctma.ncms.org

DoD Participants

- Tobyhanna Army Depot (AD)
- Corpus Christi AD
- Red River AD
- Anniston AD
- Fort Richardson, Fort Wainwright

- Norfolk Naval Shipyard (NSY)
- Portsmouth NSY
- Pearl Harbor NSY
- Puget Sound NSY

- Marine Corps Maintenance Center Albany
- Marine Corps Maintenance Center Barstow

- Naval Air Depot North Island (NADEP)
- NADEP Jacksonville
- NADEP Cherry Point

- OC- Air Logistics Center (ALC)
- OO- Air Logistics Center (ALC)
- WR-ALC
- Elmendorf AFB

- Naval Submarine Base- Kings Bay
- Naval Submarine Base- Bangor

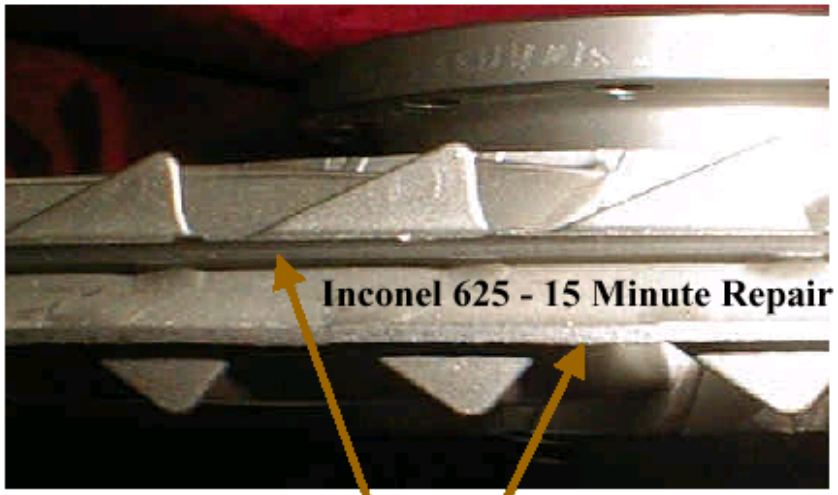
- Naval Undersea Warfare Center, Keyport
- Naval Surface Warfare Center, Crane

CTMA Ongoing Projects

- Isotropically Conductive Adhesives
- OptiCam/IPOMX
- Flat Wire Deposition Process
- Laser Decoating Process for Helicopter Blades
- Process Substitution for Composite Repairs
- Portable Thermal Spray Booth Equivalency Unit
- Laser Shot Peening for Life Cycle Increase
- Enhanced Wiring Integrity
- Next Generation Inspection Systems
- Maintenance Mentoring System
- Near Dry Machining of Aluminum
- Damage Wear Assessment of Rotating Equipment
- Laser Engineered Net Shaping
- Rapid Manufacturing and Repair
- High Throughput Production Processing
- Retrograde Part Identification Using 2nd Generation Permanent Marking Techniques
- E-Collaborative Maintenance
- High Density Chip-on-Board
- Alternative Air Pollution Control Systems
- LAV Life-Cycle Logistics Support Tool

As of October 2003

3rd Stage Turbine Rotor Repair



Area of Repair

.040”

Could not be repaired

Anniston Army Depot

Estimated Cost Savings

Inconel 625 - 15 Min

ITEM #1
Third (3rd) Stage Turbine Rotor

ITEM #2
Fourth (4th) Stage Turbine Rotor

ITEM #3
Second (2nd) Stage Nozzle

SS316 - 5 Min

ITEM #4
Compressor Stator 1st L.P.

LASER ENGINEERED NET SHAPING (LENS) - ESTIMATED PER YEAR COST SAVINGS

ITEM	PART	MATERIAL	PART NUMBER	NEW PART COST	ESTIMATED REPAIR COST	SAVINGS PER PART	PARTS REPAIRED PER YEAR	SAVINGS PER YEAR
1	Third (3rd) Stage Turbine Rotor	M3610C/Inconel 713LC	12271565	$ 8,297	$ 2,000	$ 6,297	230	$ 1,448,416
2	Fourth (4th) Stage Turbine Rotor	M3610C/Inconel 713LC	12281566	$ 5,485	$ 2,000	$ 3,485	230	$ 801,529
3	Second (2nd) Stage Nozzle	M3602/Inconel 713C	12286886	$ 6,032	$ 2,250	$ 3,782	600	$ 2,269,140
4	Compressor Stators (H.P. and L.P.)							
	1st L.P.	AMS 5510/321 Stainless	12302430	$ [illegible]	$ [illegible]	$ [illegible]	175	$ 106,759
	2nd L.P.	AMS 5510/321 Stainless	[illegible]	$ [illegible]	$ 870	$ 870	175	$ 152,264
	3rd L.P.	AMS [illegible] Stainless	[illegible]	$ 610	$ 300	$ 310	175	$ 54,304
	4th L.P.	AMS 5510/321 Stainless	12286161	$ 611	$ 300	$ 311	175	$ 54,495
	5th L.P.	AMS 5510/321 Stainless	12302429	$ 701	$ 300	$ 401	175	$ 70,091
	1st H.P.	AMS 5504/410 Stainless	12286257	$ 604	$ 300	$ 304	175	$ 53,155
	2nd H.P.	AMS 5504/410 Stainless	12286261	$ 1,188	$ 300	$ 888	175	$ 155,377
	3rd H.P.	AMS 5504/410 Stainless	12286266	$ 575	$ 300	$ 275	175	$ 48,038
	4th H.P.	AMS 5504/410 Stainless	12286568	$ 1,893	$ 300	$ 1,593	175	$ 278,782
5	Fourth (4th) Stage Seal Runner	AMS 5662/Inconel 718	12286490	$ 319	$ 200	$ 119	600	$ 71,268
				$ 28,395	$ 9,150	$ 19,245		$ 5,563,617

Annual Cost Avoidance > $5 million

HiThru Initial Results

NC programming/machining times comparing new HiThru methods, with conventional methods.

Part Picture	Part Name	Programming Time		Machining Time			
		Conventional	HiThru	Conventional		HiThru	
	wr2005	80 to 120 hrs	7 hrs	no data		CinMach V5-2000	
						Set10	0:31
						Set 20	0:23
						Total	0:54
							(h:mm)
	sik05	45 to 75 hrs	10 to 20 hrs	Hermle 3-axis		CinMach V5-2000	
				Set10	0:46	Set10	0:47
				Set20	1:22	Set 20	0:22
				Set30	2:05	-	-
				Total	4:13	Total	1:09
	sik06	45 to 75 hrs	6 hrs	Makino 4-axis		CinMach V5-2000	
				Set10	0:14	Set10	0:36
				Set20	2:05	-	-
				Set30	0:03	-	-
				Total	2:32	Total	0:36
	sik09	45 to 75 hrs	12 to 19 hrs	Makino 4-axis		CinMach V5-2000	
				Set10	0:06	Set10	0:29
				Set20	1:06	Set 20	0:15
				Set30	0:04	-	-
				Total	1:18	Total	0:44

Programming Time Decreased by Two Weeks

Rapid Prototyping Technology Advancement - $1,000,000/year Savings Potential

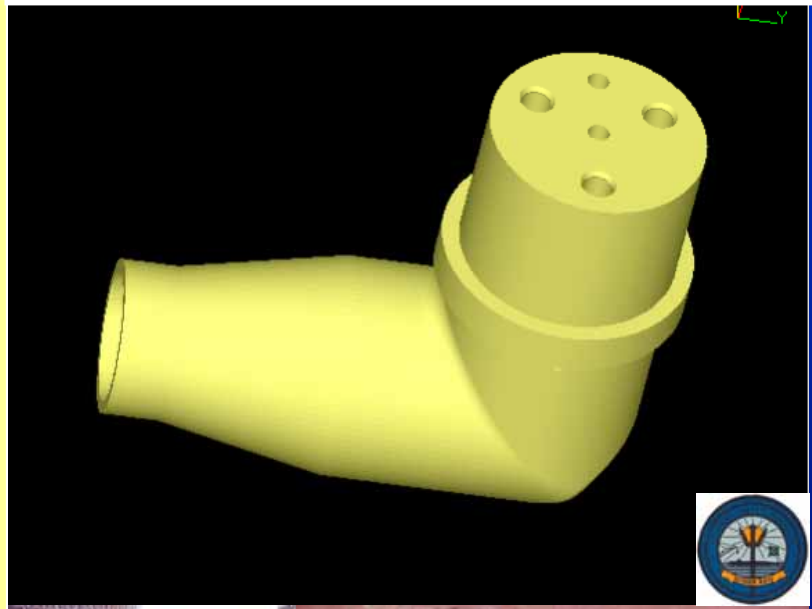
TRIDENT Submarine Tow-Point Cable Conn. (OK-542)

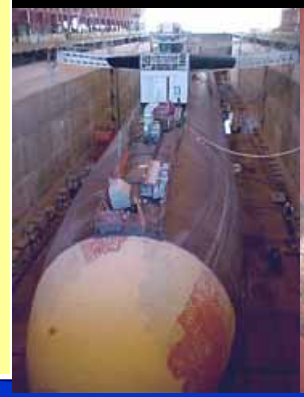
Problem/Challenge:

- Consistent failure of critical Tow Point Connector Cable due to design flaw and material degradation
- High cost and complexity to replace

Solutions/Results:

- NAWCWPNS and Pratt & Whitney teamed to deliver a rapid prototype tool in 14 days
- NAWCWPNS prepared an STL file from DOD's JEDMICS system
- Pratt & Whitney built the tool using the stereolithography process
- TRF created several injection mold prototypes with a variety of materials to find optimal solution





Emerging CTMA projects

- Rapid Manufacturing using Precision Metal Origami
- Coating Removal & Surface Prep
- Safety Line Track Manufacturing Process
- Inspection and Repair Preparation Cell for Radomes (IRPC)
- Six Sigma Product Quality
- Automated Test Equipment Test Program Set Migration System
- Automated Test Equipment - Synthetic Instrumentation Insertion
- Refurbishing and Extending Sealant Life
- Friction Stir Welding
- Selective Galvanizing by Cold-spray Deposition
- Heat Transfer Classification for Production Tooling and Composite Repairs

CTMA Project Launch Criteria

- Begins with a concept (~5 pages long)
- Joint Industry/DoD interest and needs
  - Hard deliverables, direct impact on manufacturing shop floor
- Cost/Benefits summary sketched out
  - Quantifiable
- Participant roles defined
- Letter of endorsement from base command
- Submission of concept to Pentagon (Office of Secretary of Defense)
- 10 day turnaround for approval...

Hurdles for New Project Ideas

- What new technology is being developed and implemented?
  - Not a mechanism for circumventing DoD procurement process.
- Is there cross-service involvement?
  - For broader dissemination of technology
- Is there sufficient industrial interest?
  - Greater than 2:1 cost share

Communications and Networking

- CTMA Website (http://ctma.ncms.org)
- The CTMA Connector Newsletter
- CTMA Working Symposium on Sustainment: “A Practical Roadmap to Manufacturing and Repair”, Emory Conference Center Hotel, Atlanta, GA 30 March – 1 April

Thank You!

Questions?