

DATE: Dec 28, 2004

Section I
Final Technical Status Report
Technology Investment Agreement 2004-330
between
Advanced Technology Institute (ATI)
and
Atlantic Marine Holding Company
for
Extended Lean Enterprise Project

Project Overview

Scope including summary of technical issues being addressed - The Value Chain spans from the customer, through the Lean Enterprise, to multiple suppliers, and eventually to raw resources. The scope of this project is to eliminate waste in the closest tiers to the Lean Enterprise and ultimate customer. The short time frame of the project does not allow a deeper reach into the Value Chain. However, this will not prohibit the development of effective approaches or a valid model. The approach and models will be scalable to and encourage continued development of the Value Chain since many opportunities will still be available. This project spans multiple shipyards and multiple tiers in the Value Chain. The model will be applicable to commercial ship construction, naval ship construction, commercial ship repair and naval ship repair.

The intended technical approach of this project will involve the expansion of the concepts of Lean throughout the critical value streams of the Shipbuilding and Ship Repair Enterprise to significantly reduce the cost and cycle time of the final product. The project will streamline operational, transactional, and systemic waste that exists in the relationships within and between the various entities along the following value streams:

- Customer Pre-Production Value Stream - The principal objective of this task is to create an improved Model of Operations for Naval ship maintenance in public/private partnerships.
- Material Value Stream - The purpose of this task is to apply the principles of lean manufacturing and waste removal to the stream of materials that flow through the industry's material value chain so that significant competitive advantage and best value positions can be secured.
- Engineering Value Stream - The purpose of this task is to create a Rapid Engineering Model through the application of lean manufacturing methodologies to the ship engineering / design value stream, in particular as applied to the effective integration of outsourced engineering/design work and other related value streams.
- Standard Engineered Components Value Stream - The purpose of this task is to apply lean principles and process analysis techniques to the cross-functional value streams that link the engineering and material functions. Two of the key cross-

functional value streams that exert a high degree of leverage over total company performance are: Engineering/Material Standards and Purchase Spec Equipment.

- On-board Construction & Testing Value Stream has been one of the most challenging aspects of ship construction given the complex interrelationships between general construction and test and activation activities. The purpose of this task is to apply lean principles and process analysis techniques to various ship construction milestone events in an attempt to link multiple independent value streams to obtain optimum “to be” work flows.

Technical Progress

This is the sixth Technical Status report for the subject agreement. Technical efforts for the period September 1, 2004 through December 7, 2004 include:

Task 1: Project Management

- Completed and delivered Material Workshop Report – Set 7 (Milestone 36)
- Completed documentation of internal lean model line case studies (Milestone 37)
- Completed and delivered Material Workshop Report – Set 8 (Milestone 39)
- Delivered Quarterly Report (Ph II- Qtr 1) (Milestone 40)
- Completed development of the final model for the Customer Value Stream (Milestone 41)
- Completed and delivered Material Workshop Report – Set 9 (Milestone 42)
- Completed 4th Quarterly Team Tech Transfer Workshop in Seattle, WA in October and prepared / submitted the associated report (Milestone 43).
- Completed development of the final model for the Material Value Stream (Milestone 44)
- Completed development of the final model for the Engineering Value Stream (Milestone 45)
- Completed and delivered Material Workshop Report – Set 10 (Milestone 47)
- Completed Lean Purchase Spec Pilot Report (Milestone 48)
- Constructed the Extended Lean Enterprise Model (Milestone 50)
- Completed and delivered Material Workshop Report – Set 11 (Milestone 51)
- Held Final Workshop for Industry in New Orleans, LA on December 7, 2004 (Milestone 52)
- Completed and delivered final Quarterly Report (Ph II – Qtr 2) (Milestone 53)
- Initiated development of Extended Lean Enterprise Model Final Report (Milestone 54)

Task 2: Transition of the Lean Enterprise to the Value Chain

- Completed documentation of internal lean model line case studies (Milestone 37)

Task 3: Customer Value Stream

- One day meeting with PSNS to develop the final model.

- Completed development of the final model for the Customer Value Stream (Milestone 41)
- Continued deployment of future state processes on the Stennis advanced planning
- Initiated a trial deployment of future state processes on the Lincoln upkeep
- Internally, Todd continued to deploy the metrics system.

Task 4: Engineering Value Stream

- Subtask 2.4.6 – Completed the Pilot Implementation of the Lean Engineering Model with the Manson Dredge project at Alabama Shipyard. Submitted in-process pilot findings and lessons-learned (Milestone 45).
- Subtask 2.4.5 – Completed downselect to preferred designed suppliers and extended vision to encompass suppliers; with key design agent suppliers selected for the pilot implementation and toolset use.

Task 5: Material Value Stream

- Held final RIW and follow-up RIW meeting on shipping process for HNA Regional Distribution Center in September.
- Completed final RIW Workshop to characterize Strategic Alliances and develop action plan for team members to move toward strategic alliance relationships.
- Completed Milestone 51: Material Workshop #11

Task 6: Apply Lean Principles to the Standard Engineered Components Value Stream

- Subtask 2.6.9 – Select Equipment for Pilot Implementation, and 2.6.10 – Conduct Pilot Implementation, were completed with the rollout of the Lean Purchase Spec Work Instruction and its pilot implementation on the Manson Dredge project and the completion of MS 48 – Lean Purchase Spec Pilot Report.
- Subtask 2.6.5 – Develop Work Instructions and Training Materials (Standard Components), 2.6.6 – Conduct Implementation Training (Standard Components), 2.6.11 – Develop Work Instructions and Training Material (Purchase Specs), and 2.6.12 – Conduct Implementation Training (Purchase Specs) were accomplished through the rollout of these tools on the Manson Dredge project.

Task 7: On-board Assy & Test Value Stream

- Value Stream review for DDG 51 onboard products allowing performance metric migration to a new “standard” platform for project management reporting.
- “Scan and Plan” Workshop for AMR#1 Decongestion
- “Scan and Plan” Workshop for ER#1 Tradework Completion
- Modified “Scan and Plan” Workshop for Aft VLS Construction and Test
- Technical and Material Support to Hull 479 Shaft Sighting/Shaft Pull Initiative

Task 9 – Final Workshop

- Conducted Final Workshop (Milestone 52) in New Orleans, La on December 7, 2004 in conjunction with the NSRP joint panel meeting (SPPT,BPT,FT, and PDMT)

Major Developments

- Atlantic: Manson Dredge pilot project served as the successful pilot platform for roll-out of the lean engineering vision and the associated processes, standards and tools.
- BIW: Aft VLS Improvement Workshops held to identify opportunities to improve construction completion schedule performance to release Combat system tests. In-process DDG 51 Class hulls will have significant foundation work (installation and machining) moved to pre-outfit stages of construction. This will result in a four (4) week acceleration to VLS Module load-out. This acceleration will allow post load-out outfitting the time necessary to complete to release Combat testing on schedule.
- BIW: Initial shaft sighting is complete on Hull 479 resulting in a thirteen (13) week acceleration in the release of main engine intake and uptake outfit completion efforts. Internal shafting pull will commence this week on Hull 479 resulting in a twenty (20) week acceleration to the release of shaft line component completions and outfitting in machinery spaces delayed by shaft pull.
- BIW: An operational matrix of crews, shifting and physical accomplishments defined by week has been developed and implemented as a tool on Hull 479 to de-conflict trades in Auxiliary Machinery Space #1 and keeps total manning levels per shift below known threshold levels for efficient work execution
- BIW: Engine Room #1 Workshop has identified modifications to the planned work sequence (identified by Build Plan Reviews for Hull 477) to take advantage of the shafting initiative on Hull 479. Opportunities are being investigated to move the Lube Oil Flush "A" event out of the critical path to complete Engine Room #1 and release to final paint on the Land Level Transfer Facility.

Realized Benefits to Industry and Navy

- BIW: Delays to the release of Combat system initial light-off and integration testing which result from late to schedule Aft VLS space completions should be minimized. Recent increases to VLS system test requirements can be accomplished with reduced utilization of overtime to complete prior to trials.
- BIW: Shaft sighting, shaft pull and propulsion machinery alignment is typically a critical path activity prior to launching for complex naval combatants including DDG 51 Class Ships. Process changes that reduce the cycle time for this critical path of activities allows keel to launch duration to be compressed.
- BIW: Construction completion, test and activation of components and systems in Auxiliary Machinery Space No.1 is critical to achieving combat and machinery value stream milestone events such as Combat System Light-Off and Generator Light-Off for DDG 51 Class. A detailed weekly matrix of crews, shifting, work assignments and physical accomplishments can be the key tool to de-conflict work and achieve efficient manning levels with resultant cost and schedule benefits.

Technology Transfer

- Completed 4th Quarterly Tech Transfer Workshop in Seattle, WA in October 2004.
- Completed Final Industry Workshop in New Orleans, LA December 7, 2004.

Plans for the Next Quarter

Task 1 – Project Management / Technology Transfer

- Close out project

Task 3 – Customer Value Stream

- Deploy as much as possible on the Lincoln upkeep and Stennis availability and monitor for impact
- Complete Lean Model Report for Customer Integration Model (Milestone 49)

Task 8 – Develop Extended Lean Enterprise Model

- Complete and distribute the final Extended Lean Enterprise Model Report

Project Issues

- None

Action Items

- None

Project Summary

The Extended Lean Enterprise Project technical and technology transfer activities were completed on schedule.

Section II
Business Status Report
Technology Investment Agreement 2004-330
between
Advanced Technology Institute (ATI)
and
Atlantic Marine Holding Company
for
Extended Lean Enterprise Project

Agreement Summary Information

Total Amount of the Agreement:	\$5,107,760
Total Estimated NSRP ASE Project Funding of the Agreement:	\$2,539,500
Total Estimated Recipient Cost Share:	\$2,607,760
Total Funds Obligated:	\$2,539,500

Project Resource/Cost Information (project funds only):

The following resources/costs are applicable to this project for the period September 21, 2004 through December 7, 2004:

Company	Man Months Provided This Period **	Cumulative Man Months Provided **	Significant Material Costs This Period	Cumulative Material Costs	List of Personnel Working This Period
Atlantic	2.73	32.26	\$27,325	\$79,234	V Dlugokecki M Rosecrans L Hepinstall
Todd Pacific	4	62.0	0	0	Camilla DiBarra, John Nelson, Phil Hughes, Mike Earles, Jason Hall, Denny Rasmussen, Terry Ingram, Gordon McDonald, Dave Stevens, Mike Murray
Bath Iron Works	12.923	27.624	\$3,423.12	\$10,462.22	C. Berlew, P. Laroche, J. Cantara, J. Frederick, M. McKenzie, C. Robbins, M. Fitzmaurice, L. Guliani, S. Korineck, K. Morse, J. McCarthy, J. Bragdon
V2RCG	3.81	15.18	\$19,340	\$97,700	M Boyer J LoPresti
Steve Streifer Assoc	1.2	5.123	\$10,771.58	\$33,384.04	Steve Streifer

Malone Consulting Services	1.08	4.62	\$823.61	\$4,090.00	John Malone
P. Jaquith & Assoc	1.18	4.60	\$1,071.33	\$9,400.01	Pete Jaquith
Moran Environmental Group	0	7.03	0	\$10,307.78	Steve Jenkins J Daniel C Nevin M Taylor K Hadix
Namasco	.31	3.253	\$1304.21	\$9538	Paul Crocker Sal Ranatza Tommy Mitchell Fred Lotz
Hagemeyer North America	0.571	2.999	\$3,249.00	\$9,902.00	D Underkofler Edwin Hicks Neil Hallman Charlotte Hicks Robin Helbert
Total	27.804	164.68	\$67,307.85	\$264,018	

** Use 173.33 as Man Months conversion

Status of Milestones

Milestone Number and Description	Percentage Completed During this Period	Cumulative Percentage Completed
0 – Revised Payable Milestone Plan	0%	100%
1 – Kick-off Meeting	0%	100%
2 – Quarterly Report 9/20/03	0%	100%
3 – Project Management Plan	0%	100%
4 – Tech Transfer Plan	0%	100%
5 – Macro Shipyard Value Chain Report	0%	100%
6-Customer Pre-Production Relationship Model	0%	100%
7 – Material Value Chain Relationship Model	0%	100%
8 – Engineering Relationship Model	0%	100%
9-Quarterly Report 12/2003	0%	100%
10 – Value Stream Mapping - Suppliers	0%	100%
11 – 1 st Quarterly Tech Transfer Workshop	0%	100%

12 – Customer Workshop Report Set 1	0%	100%
13 – Customer Workshop Report Set 2	0%	100%
14 – Value Stream Mapping - Customer	0%	100%
15 – Value Stream Mapping On-board Assembly & Testing	0%	100%
16 – Value Stream Mapping Engineering/Design Agents	0%	100%
17 – Material Workshop Report Set 1	0%	100%
18 – Material Workshop Report Set 2	0%	100%
19 – Best Practice Guide for Standard Components	0%	100%
20 – Quarterly Report (Ph 1 – Qtr 3)	0%	100%
21 – Material Workshop Report Set 3	0%	100%
22 – 2 nd Qtr Tech Transfer Workshop	0%	100%
23 – Eng Design Mgmt Toolset Outline	0%	100%
24 – Material Workshop Report Set 4	0%	100%
25 – Customer Lean Value Chain Implementation Plan	0%	100%
26-Customer Workshop –Set 3	0%	100%
27-Best Practice Guide for Purchase Spec Equipment	0%	100%
28-Material Workshop Report – Set 5	0%	100%
29-Customer Workshop Report-Set 4	0%	100%
30-Extended Lean Interim Report	0%	100%
31-Quarterly Report (Ph 1-Qtr 4)	0%	100%
32 – Material Workshop Report – Set 6	0%	100%
33 – Customer Value Stream – Eval & Impact	0%	100%
34 – 3 rd Quarterly Tech Transfer Meeting	0%	100%
35 – Lean Purchase Spec – Work Instruction	0%	100%
36 – Material Workshop Report – Set 7	90%	100%
37 – Internal Lean Model Case Studies	40%	100%
38 – Engineering Design Mgmt Toolset Manual	0%	100%
39 – Material Workshop Report – Set 8	100%	100%
40 – Quarterly Report (Phase II – Quarter 1)	100%	100%
41 – Customer Value Stream – Validation and Integration	100%	100%
42 – Material Workshop Report – Set 9	100%	100%
43 – 4 th Quarterly Tech Transfer Workshop	100%	100%
44 – Lean Model Report for Material Value Stream	100%	100%
45- Lean Model Report for Engineering Value Stream	100%	100%

47 – Material Workshop Report – Set 10	100%	100%
48 – Lean Purchase Spec Pilot Report	100%	100%
50 – Construct the Extended Lean Enterprise Model	100%	100%
51 – Material Workshop Report – Set 11	100%	100%
52 – Final Workshop for Industry	100%	100%
53 – Final Quarterly Report (Phase II – Quarter 2)	100%	100%

Interest Earned \$0.00

Cost Share Provided by Project Participants

Cost share in the amount of \$456,932 is provided for this reporting period. Cumulative cost share to date for the project is \$3,465,233. The following summarizes the cost share provided for this period:

Type of Cost Share	Amount	Explanation
Cash (including donations from state or local governments)	\$0	Atlantic Marine, Inc
Labor costs	\$875	Malone Consulting Services
	\$96,000	Steve Streifer Associates – Reduced manday billing rate (26@ \$2000/manday) plus 52 hours of uncompensated labor at \$500 per hour, plus 9 uncompensated travel days at \$2000.0 per travel day
	\$165,000	V2R - Discounted Rate
	\$40,000	V2R- Non-billed travel at 1/2 rate
	\$145,000	V2R- Non-billed labor time for prep/support/ communications/ coordination/research
		P. Jaquith & Assoc – 24

	\$3,000	labor hours @ \$125/hour
	\$5,063	Hagemeyer NA
	0	Moran Environmental
	\$0	Atlantic – Uncompensated Labor Hours in support of Project Deliverables
	\$2000	Namasco- Uncompensated labor cost associated with 20 Mgmt mhrs
Expenses associated with allowable labor cost categories that are not billed directly to program funds		
Overhead (excluding labor related fringe benefits)		
General and Administrative Services		
SBIR and STTR in accordance with Government guidelines		
IR&D when appropriate		
M&PE (Manufacturing and Production Engineering)		
Estimated Implementation Costs included in participant proposals		
Use of equipment (including software)		
Technology transfer activities		
Intellectual property (market value)		
Space (land or buildings)		

Donated Services (Uncompensated)

The contribution of \$36,618 of uncompensated costs was made towards this project this quarter. The cumulative total of uncompensated costs to date is \$84,466.

Puget Sound Naval contributed \$5,460 of uncompensated labor cost for the quarter. The cumulative total of uncompensated labor cost to date for PSNS is \$62,757. NAVSEA

SUPSHIP Puget contributed \$280 of uncompensated labor cost for quarter. The cumulative total of uncompensated costs to date for NAVSEA SUSPSHIP – Puget is \$21,709.

Discussion

Quarterly expenditures for Moran Environmental were not reported. Final expenditures will be included in Close-Out Documents.

Modifications to Estimated Milestone Payments – None

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I certify to the best of my belief that this quarterly report is current, accurate, and complete.

Cumulative Cost Share Reported 12/20/04

Atlantic - \$386,484
Todd - \$795,303
BIW - \$112,000
V2RCG - \$1,637,000
SS - \$399,000
MCS – \$32,452
PJA - \$27,000
Moran - \$42,692
Namasco - \$10,000
Hage - \$23,302

Cumulative Donated Services

PSNS - \$62,757
SUPSHIP –Puget - \$21,709