AIRSpeed Works:

Success is possible at the Operational Level

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AIRSpeed, Naval Enterprise's integration of Theory of Constraints[1], Lean[2], and Six Sigma[3] has been implemented at the intermediate[4] and depot-level maintenance[5] activities across Naval Aviation.[6] Although these process improvement tools have proven successful in civilian corporations, the results at military installations have been mixed. To achieve success at the operational level, AIRSpeed implementation requires command buy-in, fleet-wide metrics, dedicated manpower, robust training, and change agent incentives.

Background

After the fall of the Berlin Wall in 1989, the role of the Department of the Navy and consequently its budget changed

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[1] Theory of Constraints (TOC) is based on rigorous cause-and-effect relationships in a system and acknowledges that a constraint exists in every organization that limits the system from achieving its goal. Nike is an example of a manufacturing company that has applied the principles of TOC.

[2] Developed from the Toyota production system, Lean examines the flow of material through a system and strives to improve throughput. The leanness describes the ability to do more with less: less inventory, less time, less effort, less space, and less manpower. But in order to do more with less, the waste in the system must be reduced and ultimately eliminated.

[3] Six Sigma examines variation within a process based on the statistical measurement of how well a system is satisfying the customer's needs. Every process has inherent variation. With the increase of variation comes an increased probability of defects. In order to meet customer demands, variation and subsequently defects must be reduced. In the analysis of a system, a sigma (σ) is defined as one defect per million opportunities. Therefore, the higher the sigma level the fewer defects and the better the system operates.

[4] Intermediate-level maintenance: Secondary level of maintenance working on aircraft components that must be repaired and then test on benches, which stimulate aircraft.

[5] Depot-level maintenance: Tertiary level of maintenance that repairs, refurbishes, and incorporates changes to aircraft surfaces and components that require aircraft surface removals.

[6] *Enterprise AIRSpeed*, <http://www.cnaf.navy.mil/airspeed/>(17 December 2008).

dramatically.[7] With a smaller Navy and decreased budgets, Naval Aviation's new challenge was balancing the increasing need for aircraft sorties with the cost of flying and maintaining aging airframes. In 2001, then Chief of Naval Operations, Admiral Vern Clark, established the Naval Aviation Readiness Integrated Improvement Program (NAVRIIP) to facilitate the changes needed to meet readiness and budget demands. In 2002, Naval Aviation Systems Command (NAVAIR) released an initiative under NAVRIIP's guidance to depot maintenance facilities.[8] With the aim of obtaining "the right force with the right readiness at the right cost at the right time...today and in the future," the initiative, called AIRSpeed, used proven better business practices to promote change.[9]

The foundation of AIRSpeed is Theory of Constraints (TOC). TOC is a process used to examine a system and identify factors that limit the throughput of the system. A limiting factor is called a constraint.[10] AIRSpeed then applies Lean (a process

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[7] Mike Malone, "Naval Aviation Readiness Integrated Improvement Program (NAVRIIP)," *Wings of Gold*, bNet Business Network, Summer 2003, <http://find articles.com/p/articles/mi_qa3834/is_/ai_n9249 893> (8 December 2008).

[8] Robert J. Williams, "Evaluation of Naval Aviation Enterprise AIRSpeed's Generation of Measurable Cost Savings and Reinvestment for Recapitalization of the Future Navy and Marine Corps," June 2007, <http://handle.dtic.mil/ 100.2/ADA473593> (26 November 2008), 12.

[9] Gary Shrout, *NAE Overview*, 16 October 2006, brief presentation, <http://www.paxpartnership.org/files/NAE%20Overview%20Cleared%20for%20Release %20Nov06.pdf> (25 November 2008).

[10] Constraint: a limited factor to the throughput of a system. Under the philosophy of TOC, there is a single constraint that prevents an organization or a system from reaching its production goal or producing an unlimited amount of product. If the constraint is properly identified and subsequently exploited than system production will improve.

that reduces waste) and Six Sigma (a process that reduces variability) to the system's constraints. Commencing in 2004 at the intermediate level, the Marine Corps implemented AIRSpeed at all intermediate and depot activities by 2007.[11]

The successes of these AIRSpeed efforts, however, are difficult to define. Robert Williams in his post graduate theses reports, "AIRSpeed has achieved measureable cost savings but does not have the system or processes in place to make the savings available for reinvestment and recapitalization."[12] The effects AIRSpeed efforts have on aircraft readiness are even more difficult to access. In 2009, Marine operational squadrons will begin the AIRSpeed process[13], but to increase squadron readiness, Naval Aviation must first address command buy-in, fleet-wide metrics, devoted personnel, training, and incentives.

Command Buy-In

Leaders at all levels must understand the benefits of AIRSpeed and their role in the process. They must have buy-in[14]

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[11] *Enterprise AIRSpeed*, <http://www.cnaf.navy.mil/airspeed/>(17 December 2008).
[12] Williams, 63.
[13] *Enterprise AIRSpeed*, <http://www.cnaf.navy.mil/airspeed/>(17 December 2008).
[14] Buy-in is a six-step process used to align the goals of change agents with members of the unit by addressing resistance to change. Once achieved, members are propelled toward agreed upon change without the need for prodding.

and "assume 'ownership' of the initiative."[15] If leadership does not assume an active role, the efforts made by the change agents – those applying AIRSpeed principles to the challenges of today and tomorrow - will never reach maximum potential nor be sustainable. Leadership, the commander in particular, drives command behaviors. If the commander demonstrates buy-in, he can persuade subordinate leaders to "internalize objectives as his or her own."[16] When a commander has a vested interest in AIRSpeed, the command will subsequently develop a culture in which improvement initiatives are sought and will thrive.

Although it is imperative that AIRSpeed must be driven from the top down, leaders must maintain a proper balance of involvement. Too little involvement sends the message that AIRSpeed is not important. As "leaders [lose] focus in the face of other fads or challenges" subordinates drive to meet different deliverables.[17] Conversely, too much involvement may jeopardize the mission and stifle the initiative of change agents, making the process cumbersome and ineffective.

Leaders are "best positioned to balance priorities and challenges" for process improvements.[18] Commanders should hold subordinates accountable for seeking improvements while granting

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[15] H. William Dettmer, *Goldratt's Theory of Constraints: A Systems Approach to Continuous Improvement* (New York: ASQ, 1997), 134.
[16] Dettmer, 134.
[17] Peter S. Pande, Robert P. Neuman, and Roland R. Cavanagh, *The Six Sigma Way How GE, Motorola, and Other Top Companies are Honing Their Performance* (New York: McGraw-Hill, 2000), 109.
[18] Pande, 110.

them the authority to execute changes that improve the organization. When command buy-in is lacking and the proper level of involvement is insufficient, efforts are hindered, and AIRSpeed becomes a project for the few and forgotten by many.

Fleet-Wide Metrics

An important step in gaining and maintaining leadership buy-in is establishing fleet-wide metrics that will define desirable behaviors. TOC maintains the axiom "tell me how you measure me, and I will tell you how I behave."[19] Desired behaviors must align with finite measurements. AIRSpeed must both establish new measurements and identify and discard old measurements that reinforce undesirable behaviors.

Currently, operational and intermediate level maintenance departments report measured standards, such as aircraft readiness, man-hours, and top degraders in the monthly Maintenance and Material Management (3M) report.[20] This report is briefed to the Wing and is a gauge to measure squadron effectiveness.

In April of 2006, NAVAIR requested AIRSpeed progress statistics from intermediate and depot-level commands.[21] Although this was an important first step, NAVAIR did not

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[19] Eliyahu M. Goldratt, *The Haystack Syndrome* (New York: Croton-on-Hudson, 1990), 114.
[20] COMNAVAIRISNT 4790.2A W/CH2.
[21] *Enterprise AIRSpeed*, <http://www.cnaf.navy.mil/airspeed/>(17 December 2008).

require AIRSpeed measurements to appear on the 3M, which consequently devalued AIRSpeed as a priority for the Marine Aircraft Group commander or his subordinate leaders. To gain acceptance, AIRSpeed progress reports must be used as a metric, integrated with the 3M, to evaluate commands at all levels.

Devoted Personnel

The majority of a squadron's personnel are focused on its mission: the safe execution of the flight schedule. Some commanders may view AIRSpeed as a fad, which is to be assigned, if at all, as a collateral duty. When a Marine is assigned both primary and collateral duties, the primary will always takes precedence. When AIRSpeed becomes a collateral duty, the program suffers.

Identifying constraints, leading Lean/Six sigma events, monitoring TOC information technology systems, and conducting training requires full-time personnel. If AIRSpeed responsibilities are assigned as a collateral duty, preparation for events is limited and execution is unsound, the work of the event group and proposed changes are not put into practice, and new behaviors are not sustained. When implementation, execution, and sustainment fail, worker buy-in ceases, and the AIRSpeed program irreconcilably losses credibility.

Other benefits exist when permanent personnel are assigned. With no other assigned duties, these personnel can be held accountable for change initiatives. Their performance appraisals become solely dependent on the success of AIRSpeed. A secondary benefit is the reduction of the number of personnel required to participate in each improvement event. A cadre of dedicated AIRSpeed professionals can efficiently analyze and propose process changes, minimizing the involvement of other members of the command. With the number of personnel per event minimized, leaders will fill event requirements with higher caliber Marines, which in turn have the respect and authority to make effective changes.

Finding untapped manpower to commit to AIRSpeed fulltime will be difficult; however, investing in time and in personnel is the only way efficiencies can be achieved that will improve readiness today and in the future.

Robust Training

AIRSpeed change agents not only have a tremendous workload but also require extensive training to lead effectively a process improvement event. NAVAIR has established a qualification system to create minimum training needs and match skill progression with participation levels.[22] This training,

[22] *Enterprise AIRSpeed*, <http://www.cnaf.navy.mil/airspeed/>(17 December 2008).

spanning three to six months, includes reading, online courses, in-class instruction, and participation in Lean and Six-Sigma events. Additionally, command leadership must participate in training that focuses on "developing vision, empowering change agents, mobilizing commitment, installing support systems, auditing change and controlling the change process."[23] Furthermore, all squadron personnel need to obtain an understanding of the basic language of AIRSpeed, the commander's guidance, and operational change.

Not only should AIRSpeed training be extensive it must also be effective. Effective training must be specific, militarily focused, and taught by Marines. Training needs to be at appropriate level. Work center supervisors need a different level of proficiency and skills than do technicians. Training needs to be tailored to the military, specifically to the squadron level. Courses should avoid corporate jargon and examples and rely on military application. If possible, the curriculum should focus on individual specialties, or classes should integrated examples from all specialties to emphasize global applicability. Training needs to be given by Marines, not civilian contractors. Marine instructors have inherent understanding of improvement challenges, immediate credibility, and knowledge to answer military-centric questions.

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[23] Mikel Harry and Richard Schroeder, *The Six Sigma Fieldbook: how DuPont Successfully Implemented the Six Sigma Breakthrough Management Strategy* (New York: Currency, 2006), 20.

The time allotted for training will always compete with the execution of the flight schedule. However, commanders must understand that without AIRSpeed training, improvements in the squadron will be limited or nonexistent. Initial training will take time and resources, but in order for the command to embrace change, all members of the command must participate: “train everybody in the new philosophy...success is inherently a cooperative effort.”[24] Squadron personnel need an understanding of the new vision and have the knowledge that only effective training can provide.

Change Agent Incentives

All Marines, including dedicated change agents, need recognition for their contributions. Commanders must publicly identify individuals, work centers, and event teams that have improved the squadron’s ability to perform its mission. By doing so, the commander is not only rewarding the Marines for their efforts, but also reinforcing the importance of the AIRSpeed program.

Dedicated change agents should be rewarded with advanced training opportunities. To be effective, the AIRSpeed Lean/Six Sigma training regiment and qualification process for dedicated change agents needs to meet or exceed the industry standard.

[24] Dettmer, 10.

The current qualification system is quick and relatively easy to complete, thereby enabling Marines and sailors to receive basic training. But, to create a more knowledgeable and effective professional cadre, the Marine Corps should offer the formal industry Greenbelt[25] and Blackbelt[26] training and qualifications to Marines who already have or develop AIRSpeed expertise. This industry training and qualification would greatly benefit the Corps by providing more proficient change agents to the fleet.

Finally, a secondary MOS should be granted to those who meet established AIRSpeed requirements. Not only would a secondary MOS be beneficial at promotion, it would also help recruitment into site AIRSpeed offices.

Conclusion:"Changing things is central to leadership"[27]

As leaders, Marines need to identify and make changes fearlessly. AIRSpeed principles work. Nike with TOC, Toyota with Lean, and General Electric with Six Sigma have all seen great gains in the corporate setting. Naval Aviation has integrated all three philosophies into a seamless program, but success is dependent upon leaders that will drive the process, metrics that will encourage desired behaviors, Marines who will

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[25] Greenbelt: an intermediate-level Lean/Six Sigma qualification. Member has the skills required to actively participate Lean/Six Sigma tools and is the basis of knowledge in a corporation for process improvements.

[26] Blackbelt: an avadvanced=level Lean/Six Sigma qualification. Member has the skills required to lead improvement events and drive all process improvements across an organization.

[27] Dettmer, 137.

dedicate themselves to the process, and training that will educate the collective. While diverting time and manpower from directly supporting today’s mission is always difficult, visionary leaders will recognize that the potential benefits of AIRSpeed both today and in the future, are worth the investment.

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